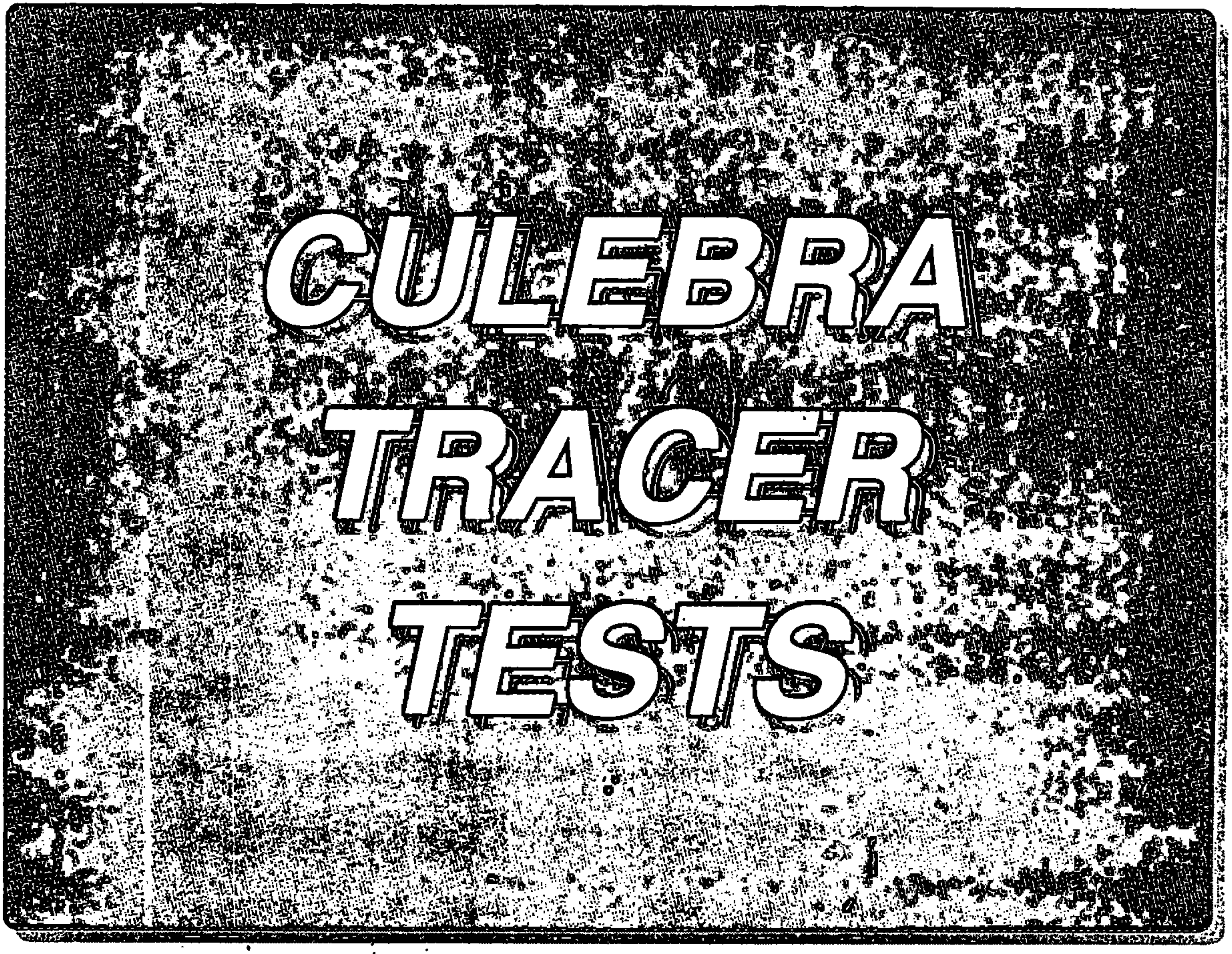
CULEBRA TRACER TESTS



Objectives of Tracer Tests

- Descriminate between conceptual models of flow and transport in the Culebra (e.g. single-porosity (fracture-only) vs. double-porosity).
- Evaluate the effects of heterogeneity, anisotropy, scale and possibly layering on transport.
- Provide quantitative parameter estimates.
- Evaluate the slug method of tracer injection (comparison to passive-injection).

Brief Outline of Tracer Test Plans

- Drilling of wells at new 7-well hydropad (H-19)
- Logging and hydraulic testing of wells.
- Single-well tracer test in central well.
- Multi-well tracer test (non-sorbing tracers).

Summary of Physical Transport Issues for Performance Assessment Compliance Calculations (Part 1 of 2)

- Transport Conceptual Model:
  - Fracture-only transport (no physical or chemical retardation) effectively eliminates the Culebra as a barrier to radionuclide transport to the accessible environment.
  - Double-porosity transport (i.e. matrix diffusion) has the capacity for significant physical retardation of radionuclide transport (one to several orders of magnitude shift of the CCDF).
  - Matrix diffusion in double-porosity transport significantly reduces uncertainty in the availability of sorption sites for chemical retardation; chemical retardation in the matrix has the capacity for another several orders of magnitude shift of the CCDF.

Summary of Physical Transport Issues for Performance Assessment Compliance Calculations (Part 2 of 2)

- **Parameter Uncertainty in the Double-Porosity Model:**
  - Both deterministic and stochastic parameter uncertainty analyses indicate that the physical transport parameter fracture spacing (matrix block size) has a very large impact on double-porosity transport.
  - Fracture spacing interpreted from existing tracer tests indicate values ranging from 0.06 to 1.2 meters; wider range (up to 8 meters) in current PA parameter distribution reflects convergent flow tracer test uncertainties due to questions about tracer injection technique and incomplete constraint on flow geometry.
  - 1992 Performance Assessment calculations indicate that the combined impact of fracture spacing less than approximately 1 meter and matrix chemical retardation results in ***no significant release*** through the Culebra (i.e. the Culebra is effectively a complete barrier to significant radionuclide transport).

Plans for Upcoming Conservative Tracer Tests

1) Complete pumping well and three tracer-injection wells 120° apart and 15 m from pumping well at new location (H-19 hydropad)

2) After each of the wells is completed, perform short pumping test, fluid logging, and televiewer and/or video logging to gain preliminary information on conductive features and hydraulic properties.

3) After all four wells are completed, perform a preliminary convergent-flow tracer test to identify which of the three tested flow paths provides the fastest transport.

4) Based on the preliminary tracer test results and hydraulic interpretation of anisotropy, locate last three wells diametrically opposed to first three tracer-injection wells, at greatest distances feasible for obtaining interpretable breakthrough curves.

5) Perform cross-hole, multi-layer hydraulic tests among all wells to characterize fracture interconnections.

6) Inject three slugs of tracer into central well for single-well test, pause overnight.

7) Begin pumping central well at low rate, recovering tracers and creating converging flow field.

8) After ~ steady-state gradients have been established, inject tracers in three 15-m wells, using two different tracer-injection techniques.

9) After breakthrough curves are defined, double pumping rate.

10) Inject tracers in all six wells, using two different tracer-injection techniques and, in some cases, tracers with different free-water diffusion coefficients.

Methods to Demonstrate and Evaluate the Magnitude of Diffusion into the Matrix

- Single-well tracer test.
- Double pumping rate (evaluate effects for 3 different flow paths).
- Use tracers with different free-water diffusion coefficients (for most wells inject benzoic acids, one well also inject deuterium and bromide).
- Possible continuous passive-'injection' of helium and neon (for a close well).

Non-Sorbing Tracer Tests - Phase I Single-Well Tests

- **Objectives:**
  - Focus on conceptual model differentiation between fracture-only transport (with channeling) and double-porosity (with matrix diffusion).
  - The strength of this test is its ability to focus on transport mechanism by elimination flow geometry factors; the limitation of this test is that it does not provide the flow geometry information required for quantification of key transport parameters (i.e. fracture spacing).
  - A technical challenge is elimination regional flow (drift) effects that could mask the difference between fracture-only channeling and matrix diffusion under double-porosity conditions.

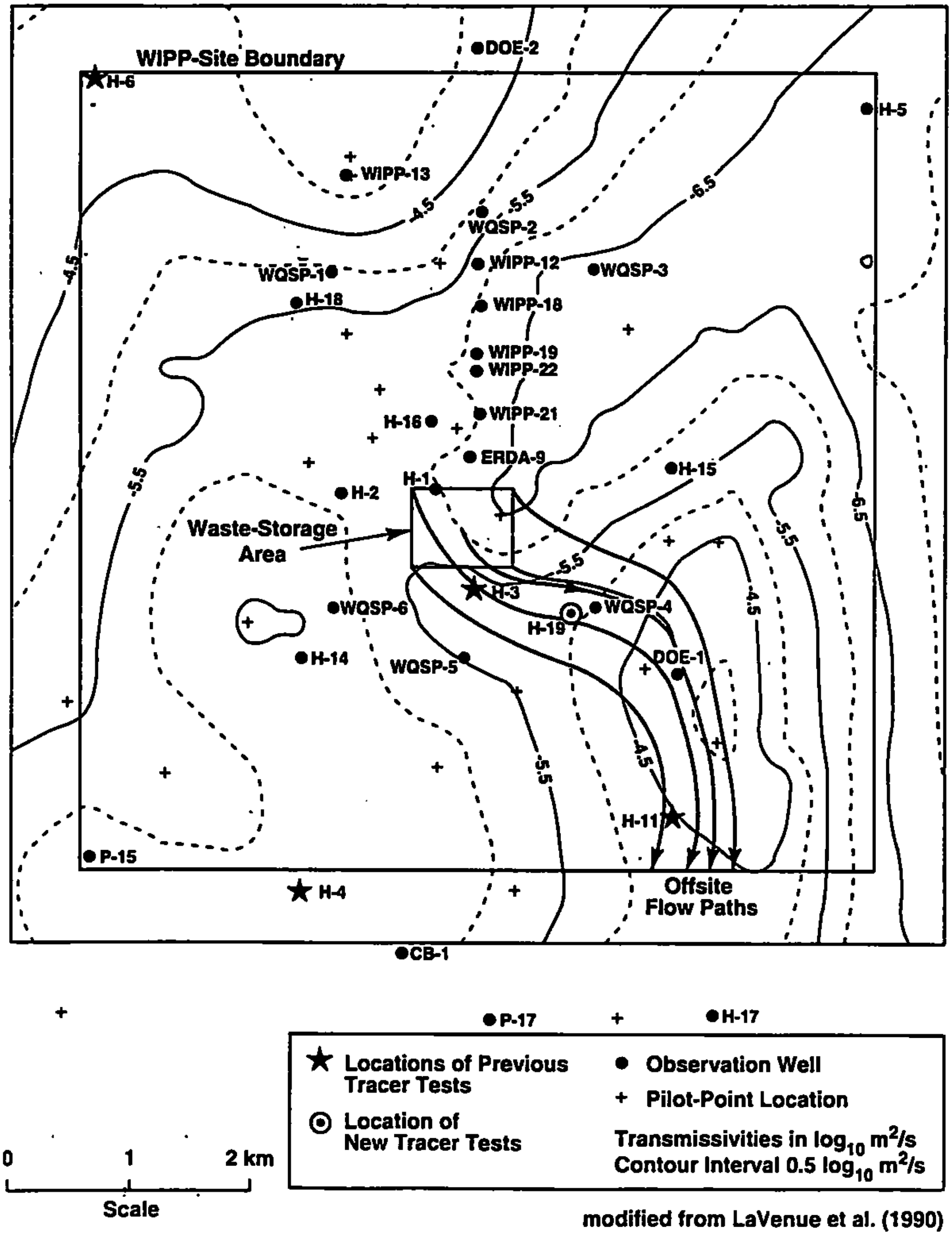
- **Procedure:**
  - Inject three 250-gallon slugs, each containing a different tracer
  - Pause 16 hours to allow matrix diffusion to occur
  - Pump for 2-3 weeks, monitoring tracer recovery
  - Compare tracer-recovery curves to predication made using double-porosity models and fracture-only (channeling) models

Non-Sorbing Tracer Tests - Phase II Multi-Well Test (Part 1 of 2)

- Objectives:
  - ⇨ Focus on well constrained quantification of physical-transport parameter values to reduce parameter uncertainty.
  - ⇨ Provides additional information on uniqueness of transport conceptual model.
  - ⇨ Strength of this test is its thorough characterization of flow geometry and elimination of tracer injection uncertainty.
  - ⇨ This test will allow rigorous interpretation of fracture spacing and other key physical-transport parameters; will also provide basis for evaluation of previous tracer tests.

Non-Sorbing Tracer Tests - Phase II Multi-Well Test (Part 2 of 2)

- **Procedure:**
  - Establish new 7-well test location (H-19) along expected flow path to site boundary.
  - Define permeable layers within Culebra (fluid density logging) and correlate these layers/fractures among wells (to aid definition of flow geometry).
  - Performance cross-hole hydraulic tests to identify any relatively high permeability connections.
  - Perform convergent-flow tracer test by pumping central well and injecting conservative tracers at the three 50 foot wells.
  - After breakthrough, increase pumping rate and inject different tracers in all six surrounding wells.
  - Test passive versus slug tracer injection techniques.
  - Apply different modeling approaches to test conceptual models and perform quantitative interpretation of transport parameters.

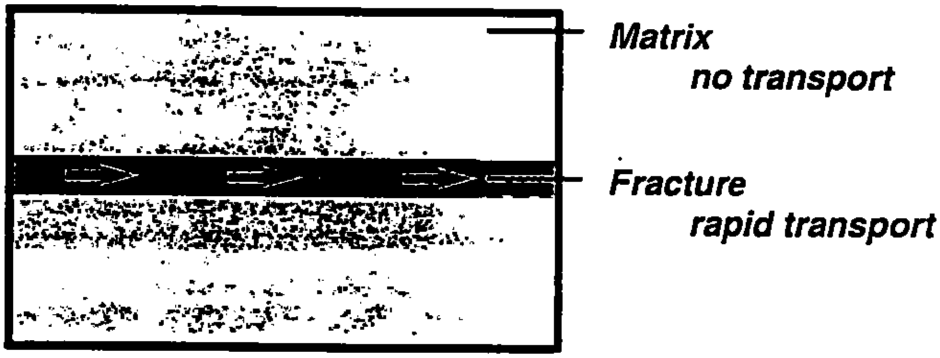


modified from LaVenue et al. (1990)

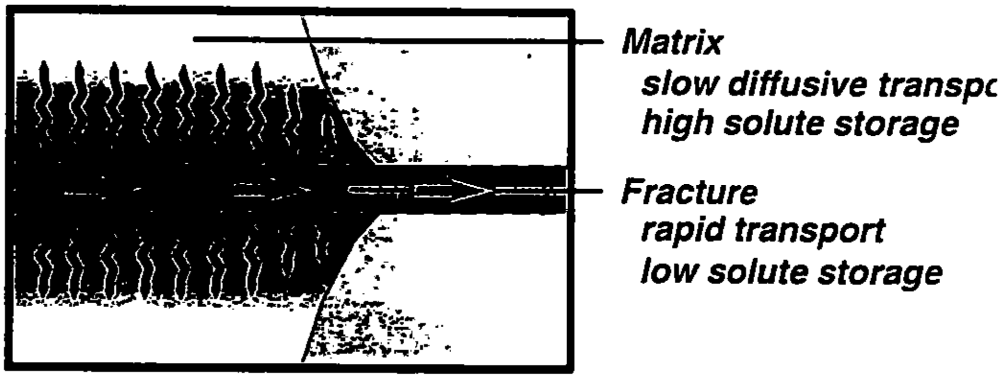
1120-3

Schematic Illustration of Fracture-Only Versus Double-Porosity Transport

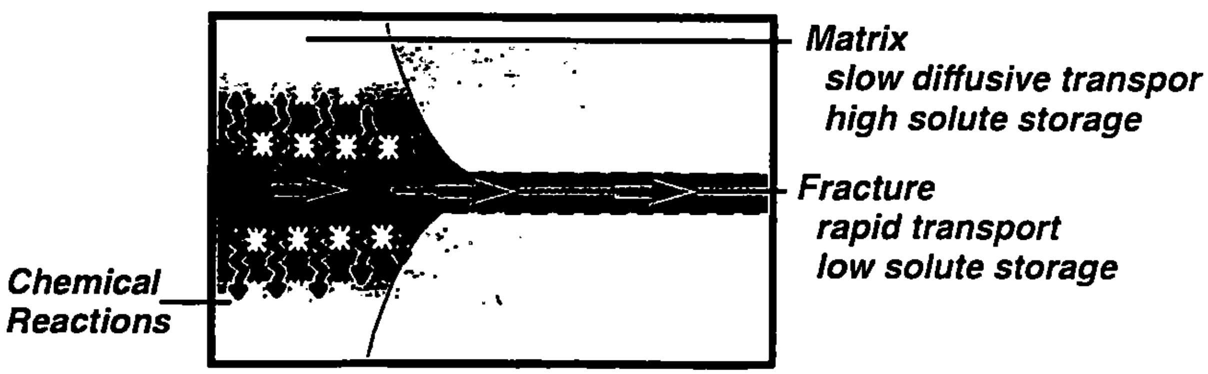
Fracture-Only Transport

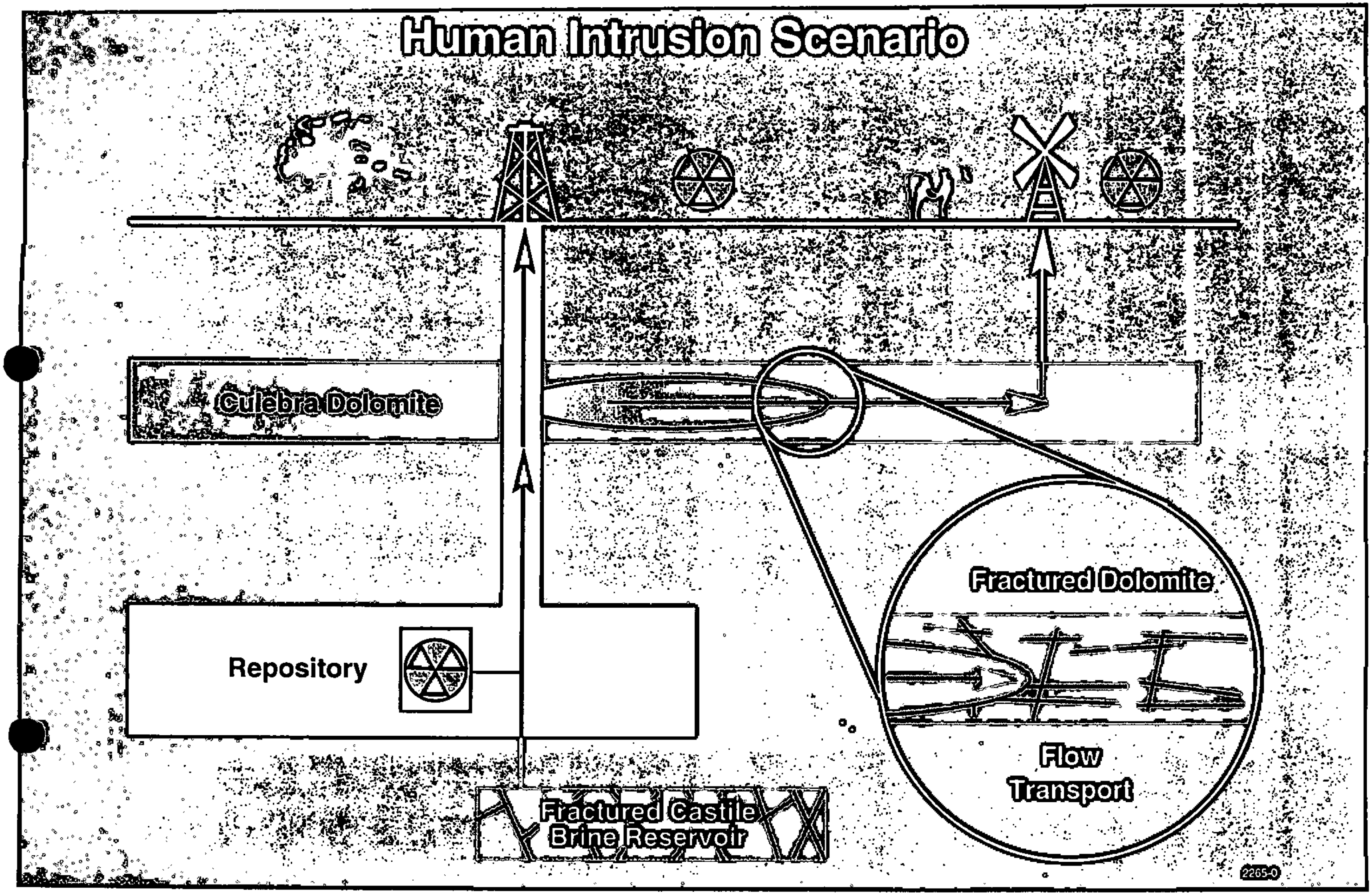


Double-Porosity Nonreactive Transport (Physical Retardation)

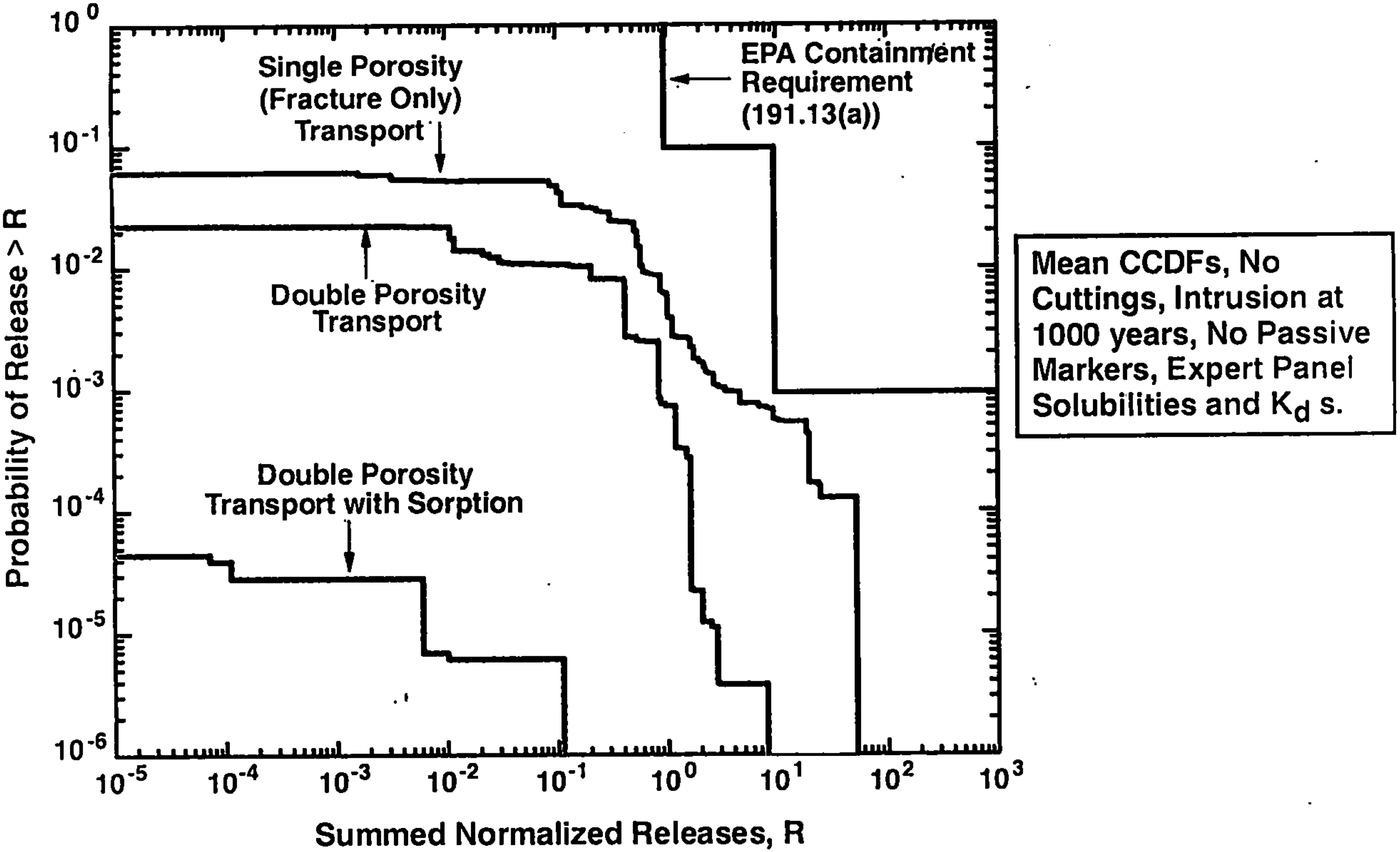


Double-Porosity Reactive Transport (Physical and Chemical Retardation)




Human Intrusion Scenario
Culebra Dolomite
Repository
Fractured Castile
Brine Reservoir
Fractured Dolomite
Flow
Transport
2265-0

Comparison of Fracture-Only, Double-Porosity, Chemical Retardation CCDF's from FY92 Performance Assessment Calculations



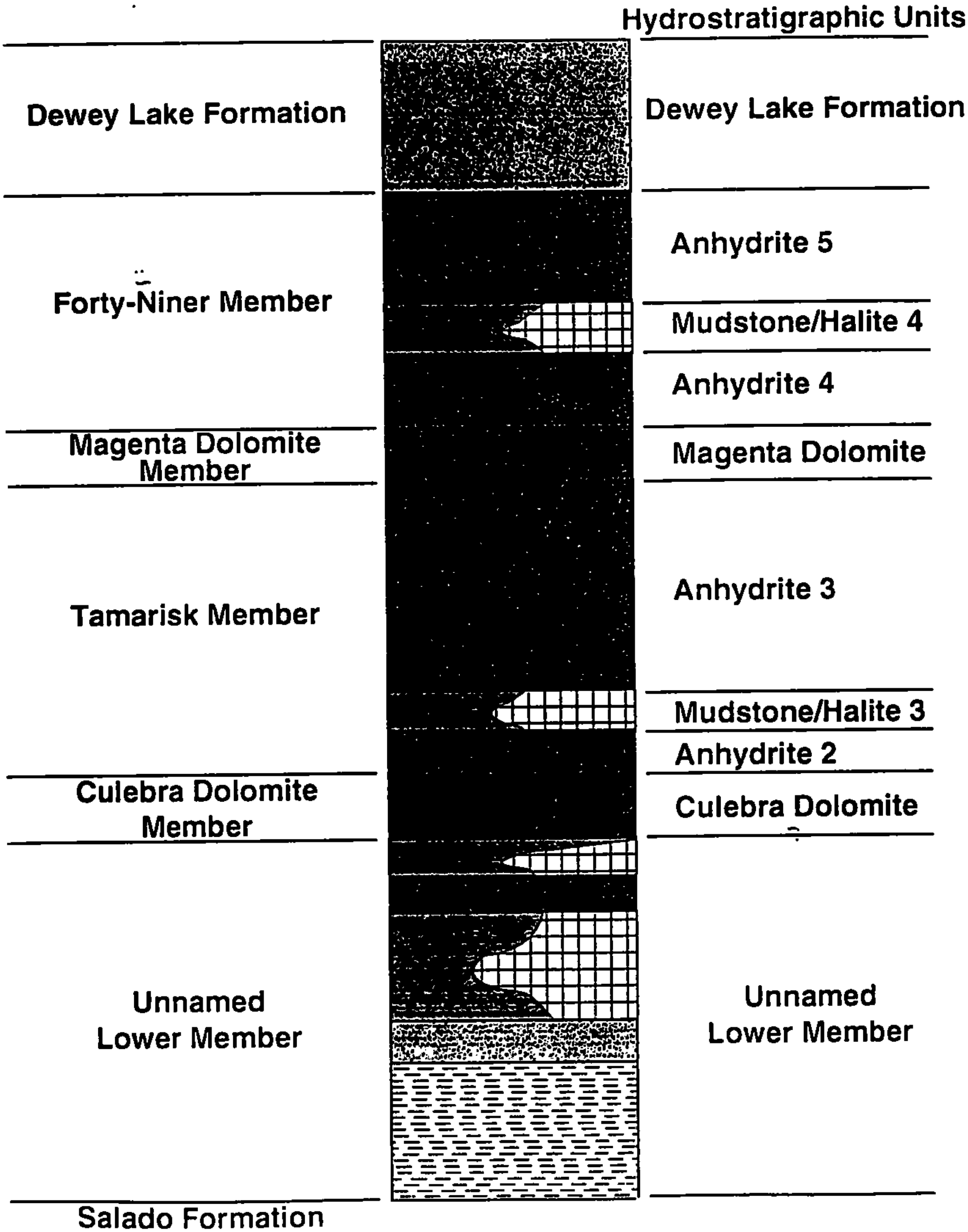
FLW/Peter/6-94 IAS pre

System	Series	Group	Formation	Member	Approximate Thickness* (m)	(ft)
Recent	Recent		Surficial Deposits		3	10
Quaternary	Pleistocene		Mescalero Caliche		10	30
			Gatuna			
Triassic		Dockum	Undivided		3	10
Permian	Ochoan		Dewey Lake Red Beds		150	500
			Rustler	Forty-niner	18	60
				Magenta Dolomite	7	24
				Tamarisk	26	85
				Culebra Dolomite	7	24
				unnamed	37	120
			Salado		600	2000
			Castile		400	1300
	Guadalupian	Delaware Mountain	Bell Canyon		310	1000
			Cherry Canyon		335	1100
			Brushy Canyon		550	1800

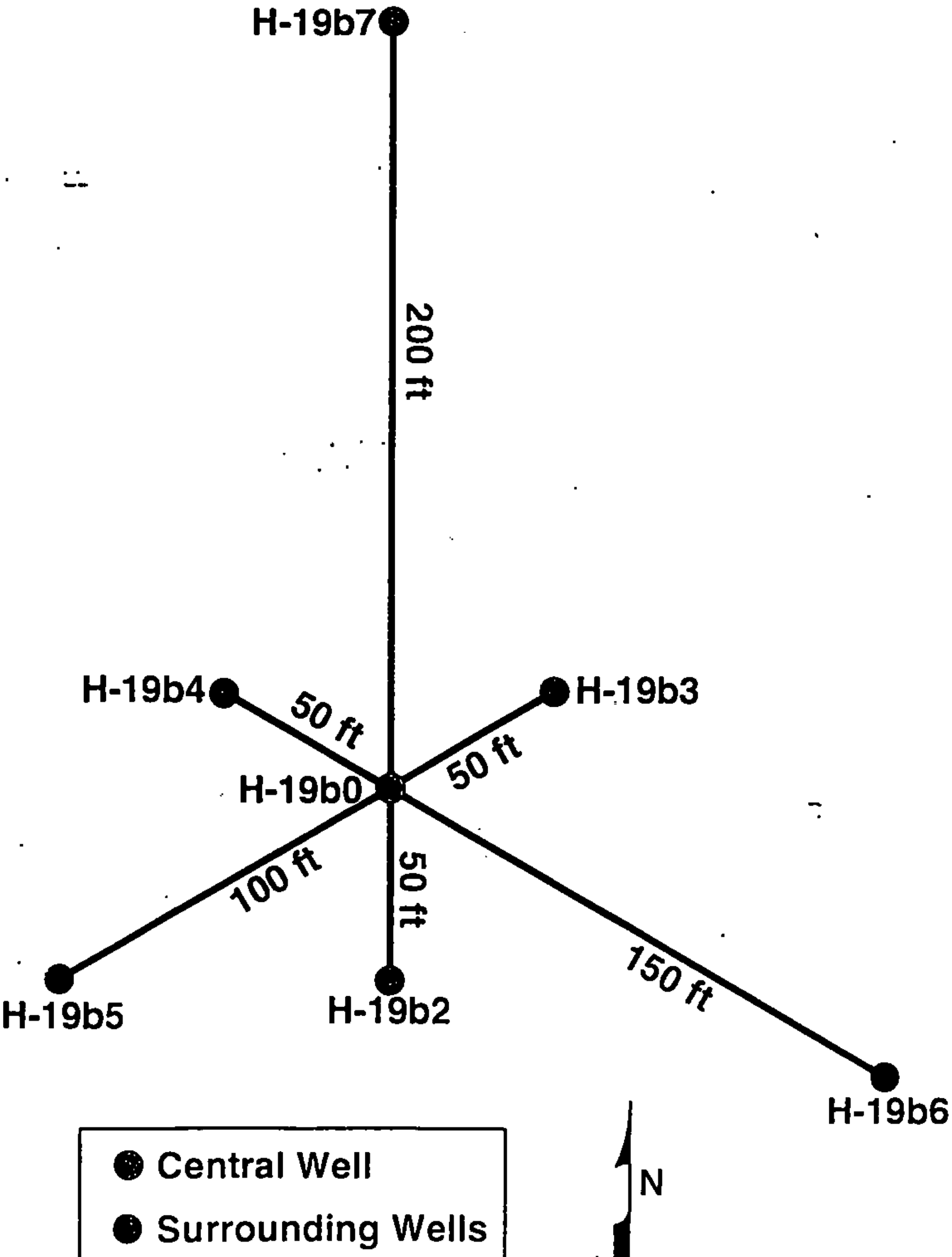
3441-0

Hydrostratigraphy

Ground-Surface to Top of salt

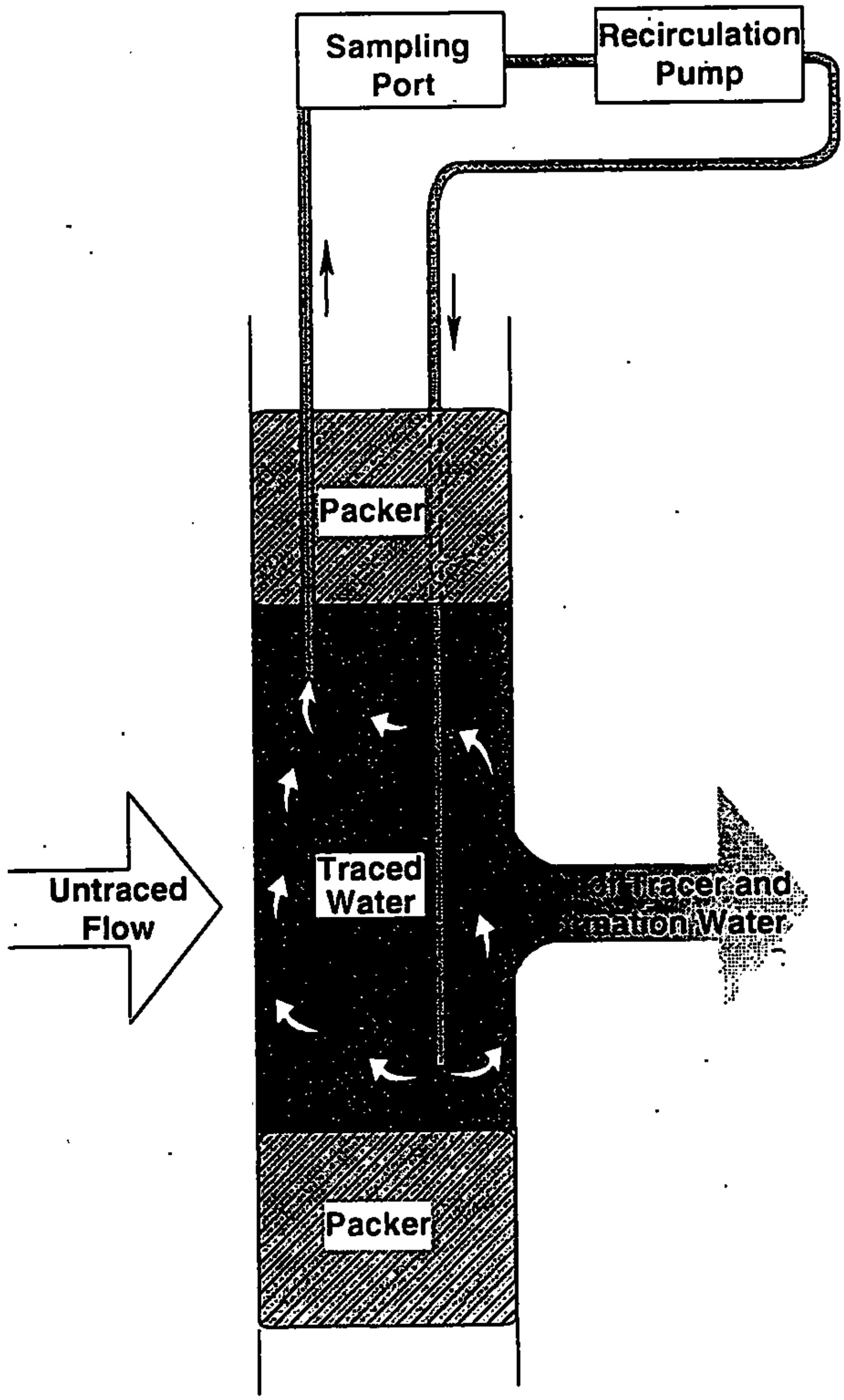


Possible Configuration of Wells at the H-19 Hydropad



1997-2

Schematic of Passive Injection Technique



WZ:95:03310
DA:95:2311

Westinghouse Electric Corporation

Government Operations

Waste Isolation Division

Box 2078
Carlsbad New Mexico 88221

April 12, 1995

RECEIVED

APR 14 1995

GROUND WATER BUREAU

Mr. Client Marshall, Geologist III
New Mexico Environment Department
Ground Water Bureau
P. O. Box 26110
1190 St. Francis Drive
Santa Fe, New Mexico 87502

Subject: REQUEST FOR CONCURRENCE THAT A DISCHARGE PLAN IS NOT REQUIRED FOR THE WASTE ISOLATION PILOT PLANT CULEBRA TRACER INJECTION TEST PROGRAM - ADDITIONAL POTENTIAL TRACER CHEMICALS

Dear Mr. Marshall:

The U. S. Department of Energy, Carlsbad Area Office (DOE-CAO) is requesting written concurrence that a Part 3-100 Discharge Plan will not be required for the proposed Culebra Transport Test Programs under development by Sandia National Laboratories at the Waste Isolation Pilot Plant (WIPP). The Culebra Transport Test Program is designed to collect additional hydrogeologic characterization data from the Culebra, and perhaps Rustler formation, to test hydrological models for the WIPP Performance Assessment.

To accomplish this, Sandia National Laboratories proposed to establish up to 10 hydrologic test wells located along the principle flow path of the Culebra aquifer. Most of the new test wells will be located on the new H-19 hydropad. Three existing wells in the vicinity of the H-19 hydropad and several new wells strategically located around H-19 will be used to monitor pressure responses associated with the hydrologic tracer tests being conducted at the H-19 hydropad.

The DOE-CAO believes that this project should be exempted from the discharge plan requirements because the existing concentration of ground water in adjacent wells exceeds 10,000 mg/l Total Dissolved Solids (TDS). Additionally, none of the proposed tracer chemicals are listed in the New Mexico Water Quality Control Regulations, Part 1-101(UU), *Toxic Pollutants*, or Part 3-103, *Standards for Ground Water of 10,000 mg/l TDS Concentration or Less*.

A list of additional potential tracer chemicals and Material Safety Data Sheets (MSDS) are attached to support our request for concurrence that a Discharge Plan is not required for the Tracer Test project.

If you have any questions about this proposed project or require any additional information, please contact Mr. J. R. Hollen at (505) 234-8271.

Sincerely,

L. R. Fitch, Manager
Environment, Safety, Health and Regulatory Compliance

JRH:saj

Attachments

cc:	M. E. Bennington, CAO	MS-564
	R. D. Kaiser, CAO	MS-570
	A. R. Sattler, SNL	MS-300

bcc: <u>WID Distribution</u>

G. J. Barnes	MS-120
(without attachments)	
W. H. Bodily	MS-170
J. L. Epstein	MS-115
D. C. Robertson	MS-170
M. E. Whatley	MS-170

Potential Tracer Chemicals for Use in the Culebra Transport Test Program

CAS Number	Chemical names
1313-73-2	SODIUM HYDROXIDE
548-24-3	EOSIN B, Certified
348-40-3	2-AMINO-6-FLUOROBENZOTHIAZOLE, 99%
15086-94-9	EOSIN Y FREE ACID
4404-43-7	FLUORESCENT BRIGHTNER 28
609-71-2	2-HYDROXYNICOTINIC ACID
18472-87-2	PHLOXINE B, Certified
3087-16-9	LISSAMINE GREEN B
2391-30-2	LISSAMINE FLAVINE FF

OHS21300

SECTION 1 CHEMICAL PRODUCTS & COMPANY IDENTIFICATION

OCCUPATIONAL HEALTH SERVICES, INC.
11 WEST 42ND STREET, 12TH FLOOR
NEW YORK, NEW YORK 10036
1-800-445-MSDS (1-800-445-6737) OR
1-212-789-3535

FOR EMERGENCY SOURCE INFORMATION
CONTACT: 1-615-366-2000 USA

CAS NUMBER: 1310-73-2
RTECS NUMBER: WB4900000

SUBSTANCE: SODIUM HYDROXIDE

TRADE NAMES/SYNONYMS:
CAUSTIC SODA; SODA LYE; LYE; WHITE CAUSTIC; CAUSTIC SODA, BEAD; CAUSTIC SODA, DRY; CAUSTIC SODA, FLAKE; CAUSTIC SODA, GRANULAR; CAUSTIC SODA, SOLID; SODIUM HYDRATE; SODIUM HYDROXIDE (NA(OH)); SODIUM HYDROXIDE, FLAKE; SODIUM HYDROXIDE, DRY; SODIUM HYDROXIDE, SOLID; ASCARITE; SODIUM HYDROXIDE, DRY SOLID, FLAKE, BEAD, OR GRANULAR; FOTOFOIL-ETCHANT (MILLER DIAL); STCC 4935235; UN 1823; NAOH; OHS21300

CHEMICAL FAMILY:
Inorganic base

CREATION DATE: 12/17/84 REVISION DATE: 01/15/94

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT : SODIUM HYDROXIDE
CAS NUMBER: 1310-73-2
PERCENTAGE: 100

OTHER CONTAMINANTS: NONE

SECTION 3 HAZARDS IDENTIFICATION

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=0 REACTIVITY=1 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=3 FIRE=0 REACTIVITY=1

EMERGENCY OVERVIEW:
Odorless, white or off-white hygroscopic solid.
Harmful if swallowed. Causes severe burns to mucous membranes. Causes respiratory tract, skin and eye burns. May cause blindness. May affect the heart. May damage the lungs. May react with water.
Do not breathe dust. Do not get in eyes, on skin, or on clothing. Do not allow water to get in container. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation. Handle with caution.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EFFECTS: May cause irritation, possibly severe. Additional effects may include coughing, difficulty breathing, lung damage and shock.
LONG TERM EFFECTS: May cause effects as in short term exposure. Additional effects may include sores, diarrhea, nervousness and lung effects.
SKIN CONTACT:
SHORT TERM EFFECTS: May cause burns. Additional effects may include sores.
LONG TERM EFFECTS: Same effects as short term exposure.
EYE CONTACT:
SHORT TERM EFFECTS: May cause burns. Additional effects may include sores and blindness.
LONG TERM EFFECTS: Same effects as short term exposure.
INGESTION:
SHORT TERM EFFECTS: May cause burns. Additional effects may include paleness, diarrhea, stomach pain, bloody vomit, blood in the stool, suffocation, shock, coma and heart failure.
LONG TERM EFFECTS: Same effects as short term exposure.

CARCINOGEN STATUS:
OSHA: N
NTP: N
IARC: N

SECTION 4 FIRST AID MEASURES

INHALATION:
FIRST AID- Remove from exposure area to fresh air immediately. If breathing has stopped, give artificial respiration. Maintain airway and blood pressure and administer oxygen if available. Keep affected person warm and at rest. Treat symptomatically and supportively. Administration of oxygen should be performed by qualified personnel. Get medical attention immediately.

SKIN CONTACT:
FIRST AID- Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). In case of chemical burns, cover area with sterile, dry dressing. Bandage securely, but not too tightly. Get medical attention immediately.

EYE CONTACT:
FIRST AID- Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Continue irrigating with normal saline until the pH has returned to normal (30-60 minutes). Cover with sterile bandages. Get medical attention immediately.

INGESTION:
FIRST AID- Do not use gastric lavage or emesis. Dilute the alkali by giving Water or milk to drink immediately and allowing vomiting to occur. As soon as possible, have qualified medical personnel do esophagoscopy and

irrigate injured areas with 1% acetic acid until the alkali is completely neutralized. (Dreisbach, Handbook of Poisoning, 11th Edition). Get medical attention immediately.

NOTE TO PHYSICIAN
ANTIDOTE:
No specific antidote. Treat symptomatically and supportively.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARD:
Negligible fire hazard when exposed to heat or flame.

EXTINGUISHING MEDIA:
Dry chemical, carbon dioxide, water spray or regular foam (1990 Emergency Response Guidebook, DOT P 5800.5).

For larger fires, use water spray, fog or regular foam (1990 Emergency Response Guidebook, DOT P 5800.5).

FIREFIGHTING:
Move container from fire area if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks (1990 Emergency Response Guidebook, DOT P 5800.5, Guide Page 60).

Use agent suitable for type of fire. Use water in flooding quantities as fog. Apply water from as far a distance as possible.

HAZARDOUS COMBUSTION PRODUCTS:
Thermal decomposition may release toxic fumes of sodium oxide.

SECTION 6 ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL SPILL:
Do not touch spilled material. Stop leak if you can do it without risk. For small spills, take up with sand or other absorbent material and place into containers for later disposal. For small dry spills, with clean shovel place material into clean, dry container and cover. Move containers from spill area. For larger spills, dike far ahead of spill for later disposal. Keep unnecessary people away. Isolate hazard area and deny entry.

Reportable Quantity (RQ): 1000 pounds
The Superfund Amendments and Reauthorization Act (SARA) Section 304 requires that a release equal to or greater than the reportable quantity for this substance be immediately reported to the local emergency planning committee and the state emergency response commission (40 CFR 355.40). If the release of this substance is reportable under CERCLA Section 103, the National Response Center must be notified immediately at (800) 424-8802 or (202) 426-2675 in the metropolitan Washington, D.C. area (40 CFR 302.6).

SOIL SPILL:

Dig holding area such as lagoon, pond or pit for containment.

Use protective cover such as a plastic sheet to prevent material from dissolving in fire extinguishing water or rain.

WATER SPILL:
Add suitable agent to neutralize spilled material to pH-7.

SECTION 7 HANDLING AND STORAGE

Observe all federal, state and local regulations when storing this substance.

Store in a cool, dry, well-ventilated location. Separate from acids, water, metals. Immediately remove and properly dispose of any spilled material. (NFPA 49, Hazardous Chemicals Data, 1991)

Store away from incompatible substances.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS:
SODIUM HYDROXIDE:
2 mg/m3 OSHA ceiling
2 mg/m3 ACGIH ceiling
2 mg/m3 NIOSH recommended ceiling
2 mg/m3 DFG MAK TWA (total dust);
4 mg/m3 DFG MAK 5 minute peak, momentary value, 8 times/shift

Measurement method: Particulate filter; hydrochloric acid; titration; (NIOSH Vol. III # 7401, Alkaline Dusts).

1000 pounds CERCLA Section 103 Reportable Quantity

OSHA revoked the final rule limits of January 19, 1989 in response to the 11th Circuit Court of Appeals decision (AFL-CIO v. OSHA) effective June 30, 1993. See 29 CFR 1910.1000 (58 FR 35338)

VENTILATION:
Provide local exhaust ventilation system to meet published exposure limits.

EYE PROTECTION:
Employee must wear splash-proof or dust-resistant safety goggles and a faceshield to prevent contact with this substance.

Emergency wash facilities:
Where there is any possibility that an employee's eyes and/or skin may be exposed to this substance, the employer should provide an eye wash fountain and quick drench shower within the immediate work area for emergency use.

CLOTHING:
Employee must wear appropriate protective (impervious) clothing and equipment to prevent any possibility of skin contact with this substance.

GLOVES:
Employee must wear appropriate protective gloves to prevent contact with this substance.

RESPIRATOR:
The following respirators and maximum use concentrations are recommendations by the U.S. Department of Health and Human Services, NIOSH Pocket Guide to Chemical Hazards; NIOSH criteria documents or by the U.S. Department of Labor, 29 CFR 1910 Subpart Z.
The specific respirator selected must be based on contamination levels found in the work place, must not exceed the working limits of the respirator and be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

SODIUM HYDROXIDE:

50 mg/m3- Any powered air-purifying respirator with a dust and mist filter.
Any supplied-air respirator operated in a continuous flow mode.

100 mg/m3- Any self-contained breathing apparatus with a full facepiece.
Any supplied-air respirator with a full facepiece.
Any air-purifying full facepiece respirator with a high efficiency particulate filter.

250 mg/m3- Any supplied-air respirator with a full facepiece and operated in a pressure-demand or other positive pressure mode.

Escape- Any air-purifying full facepiece respirator with a high efficiency particulate filter.
Any appropriate escape-type self-contained breathing apparatus.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

DESCRIPTION: Odorless, white or off-white hygroscopic solid.
MOLECULAR WEIGHT: 40.00
MOLECULAR FORMULA: NA-O-H
BOILING POINT: 2534 F (1390 C)
MELTING POINT: 604 F (318 C)
VAPOR PRESSURE: 100 mmHg @ 1111 C
SPECIFIC GRAVITY: 2.130
WATER SOLUBILITY: soluble
PH: 14 @ 5% solution

SOLVENT SOLUBILITY: Soluble in alcohol, glycerol; insoluble acetone, ether.

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY:
Reacts exothermically with water.

CONDITIONS TO AVOID:
May burn but does not ignite readily. Flammable, poisonous gases may accumulate in tanks and hopper cars. May ignite combustibles (wood, paper, oil, etc.).

INCOMPATIBILITIES:
SODIUM HYDROXIDE:
ACETALDEHYDE: May result in violent polymerization.
ACETIC ACID: Mixing in closed container increases temperature and pressure.
ACETIC ANHYDRIDE: Mixing in a closed container increases temperature and pressure.
ACIDS: May react violently.
ACROLEIN: May result in an extremely violent polymerization.
ACRYLONITRILE: May cause violent polymerization.
ALLYL ALCOHOL + BENZENE SULFONYL CHLORIDE: Possible explosion hazard.
ALLYL CHLORIDE: Hydrolyzes.
ALUMINUM: Vigorous reaction.
ALUMINUM, ARSENIC TRIOXIDE, SODIUM ARSENATE: May generate flammable hydrogen gas.
AMMONIA + SILVER NITRATE: Precipitation of explosive silver nitride may occur.
AMMONIUM SALTS: May react violently evolving ammonia gas.
BENZENE-1,4-DIOL: Exothermic reaction.
N,N'-BIS(TRINITROETHYL)UREA: Formation of explosive compound.
BROMINE: Possible explosion if not stirred continously.
CHLORINE TRIFLUORIDE: May cause violent reaction.
CHLOROFORM + METHYL ALCOHOL: Exothermic reaction.
CHLOROHYDRIN: Mixing in a closed container causes an increase in temperature and pressure.
4-CHLORO-2-METHYLPHENOL: Possible ignition.
CHLORONITROTOLUENES: Possible explosion.
CHLOROPICRIN: May cause violent reaction.
CHLOROSULFONIC ACID: Mixing in a closed container causes an increase in temperature and pressure.
CINNAMALDEHYDE: Exothermic reaction.
COATINGS: May be attacked.
COPPER: Solutions may slowly corrode.
CYANOGEN AZIDE: May form sodium 5-azidotetrazolide, which is explosive if isolated.
2,2-DICHLORO-3,3-DIMETHYLBUTANE: Hazardous reaction.
1,2-DICHLOROETHYLENE: May form spontaneously flammable monochloroacetylene.
DIBORANE AND OCTANAL OXIME: Exothermic reaction.
ETHYLENE CYANOHYDRIN: Mixing in a closed container causes an increase in temperature and pressure.
FLAMMABLE LIQUIDS: Fire and explosion hazard.
GLYCOLS: May cause exothermic decomposition with evolution of hydrogen gas.

GLYOXAL: Mixing in a closed container increases temperature and pressure.
HALOGENATED HYDROCARBONS: Violent reaction.
HYDROCHLORIC ACID: Mixing in a closed container causes an increase in temperature and pressure.
HYDROFLUORIC ACID: Mixing in a closed container causes an increase in temperature and pressure.
HYDROQUINONE: Rapid decomposition of hydroquinone with evolution of heat.
IRON: Solutions may slowly corrode.
LEAD: May be attacked; flammable hydrogen gas may be liberated.
LEATHER: May be attacked.
MALEIC ANHYDRIDE: Explosive decomposition.
METALS: Corrodes metals, reacting to form flammable hydrogen gas.
4-METHYL-2-NITROPHENOL: Exothermic reaction.
NITRIC ACID: Mixing in closed container increases temperature and pressure.
NITROBENZENE: Possibly explosive reaction upon heating in presence of water.
NITROETHANE: Forms an explosive salt.
NITROMETHANE: Forms an explosive salt.
NITROPARAFFINS: The nitroparaffins, in the presence of water, form dry salts with organic bases. The dry salts are explosive.
NITROPROPANE: Forms an explosive salt.
O-NITROTOLUENE: Possible explosion.
OLEUM: Mixing in a closed container causes an increase in temperature and pressure.
ORGANIC PEROXIDES: Incompatible.
PENTOL (3-METHYL-2-PENTENE-4-YN-1-OL): Possible explosion.
PHOSPHORUS: May form mixed phosphines which may ignite spontaneously in air.
PHOSPHORUS PENTOXIDE: May react violently when heated.
PLASTICS: May be attacked.
B-PROPIOLACTONE: Mixing in a closed container causes an increase in temperature and pressure.
PROPYLENE OXIDE: Ignition or explosion may occur.
RUBBER: May be attacked.
SODIUM TETRAHYDROBORATE: Dry mixtures with sodium hydroxide containing 15-40% of tetrahydroborate liberate hydrogen explosively at 230-270 C.
SULFURIC ACID: Mixing in a closed container causes an increase in temperaure and pressure.
1,2,4,5-TETRACHLOROBENZENE: Violent reaction.
TETRACHLOROBENZENE + METHYL ALCOHOL: Possible explosion.
TETRACHLOROETHYLENE: Possible explosion.
TETRAHYDROFURAN: Serious explosions can occur.
TIN: Evolution of hydrogen gas which may form an explosive mixture.
1,1,1-TRICHLOROETHANOL: Explosion may occur.
TRICHLOROETHYLENE: Formation of explosive mixtures of dichloroacetylene.
TRICHLORONITROMETHANE + METHANOL: May cause violent reaction.
WOOL: May be attacked.
ZINC (DUST): Fire and explosion hazard.
ZIRCONIUM: May cause explosive reaction upon heating.

HAZARDOUS DECOMPOSITION:
Thermal decomposition may release toxic fumes of sodium oxide.

POLYMERIZATION:
Hazardous polymerization has not been reported to occur under normal

temperatures and pressures.

SECTION 11 TOXICOLOGY INFORMATION

SODIUM HYDROXIDE:
IRRITATION DATA: 500 mg/24 hours skin-rabbit severe; 1% eye-rabbit severe; 50 ug/24 hours eye-rabbit severe; 1 mg/24 hours eye-rabbit severe; 400 ug eye-rabbit mild; 1 mg/30 seconds rinsed eye-rabbit severe; 1%/24 hours eye-monkey severe.
TOXICITY DATA: 1350 mg/kg skin-rabbit LD50 (Van Waters & Rogers Inc. MSDS); 500 mg/kg oral-rabbit LDLo; 104-340 mg/kg oral-rat LD50 (Van Waters & Rogers Inc. MSDS); 40 mg/kg intraperitoneal-mouse LD50; mutagenic data (RTECS).
CARCINOGEN STATUS: None.
LOCAL EFFECTS: Corrosive- inhalation, skin, eye, ingestion.
ACUTE TOXICITY LEVEL: Toxic by ingestion; moderately toxic by dermal absorption.
TARGET EFFECTS: No data available.
AT INCREASED RISK FROM EXPOSURE: Persons with pre-existing skin and eye conditions.

HEALTH EFFECTS
INHALATION:
SODIUM HYDROXIDE:
CORROSIVE. 250 mg/m3 Immediately Dangerous to Life or Health.
ACUTE EXPOSURE- Effects due to inhalation of dusts or mist may vary from mild irritation of the nose at 2 mg/m3 to severe pneumonitis depending on the severity of exposure. Low concentrations may cause mucous membrane irritation with sore throat, coughing, and dyspnea. Intense exposures may result in destruction of mucous membranes and delayed pulmonary edema or pneumonitis. Shock may occur.
CHRONIC EXPOSURE- Prolonged exposures to high concentrations of dusts or mists may cause discomfort and ulceration of the nasal passages. Repeated exposures of 5000 mg/L were harmless to rats, but 10,000 mg/L led to nervousness, sore eyes, diarrhea and retarded growth. Rats exposed 30 minutes/day to unmeasured concentrations of sodium hydroxide aerosols suffered pulmonary damage after 2-3 months. Death occurred in 2 of 10 rats exposed to an aerosol of 40% aqueous sodium hydroxide for 30 minutes, twice a week for 3 weeks. Histopathological examination showed mostly normal lung tissue with foci of enlarged alveolar septae, emphysema, bronchial ulceration, and enlarged lymph adenoidal tissues. An epidemiologic study of 291 workers chronically exposed to caustic dusts for 30 years or more found no significant increase in mortality in relation to duration or intensity of such exposures.

SKIN CONTACT:
SODIUM HYDROXIDE:
CORROSIVE.
ACUTE EXPOSURE- Upon contact with the skin, damage including redness, cutaneous burns, skin fissures and white eschars may occur without immediate pain. Exposure to solutions as weak as 0.03 N (0.12%) for 1 hour has caused injury to healthy skin. Solutions of 25-50% caused no sensation of irritation within 3 minutes in human subjects. With solutions of 0.4-4%, irritation does not occur until after several hours.

Skin biopsies from human subjects having 1 N sodium hydroxide applied to their arms for 15 to 180 minutes showed progressive changes beginning with dissolution of the cells in the horny layer and progressing through edema to total destruction of the epidermis in 60 minutes. A 5% aqueous solution caused severe necrosis to the skin of rabbits when applied for 4 hours. Alkalies penetrate the skin slowly. The extent of injury depends on the duration of contact. If sodium hydroxide is not removed from the skin, severe burns with deep ulceration may occur. Exposure to the dust or mist may cause multiple small burns and temporary loss of hair. Pathologic findings due to alkalies may include gelatinous, necrotic areas at the site of contact.

CHRONIC EXPOSURE- Effects are dependent upon concentration and duration of exposure. Dermatitis or effects similar to those for acute exposure may occur.

EYE CONTACT:
SODIUM HYDROXIDE:
CORROSIVE.

ACUTE EXPOSURE- Contact may cause disintegration and sloughing of conjunctival and corneal epithelium, corneal opacification, marked edema and ulceration. After 7 to 13 days either gradual recovery begins or there is progression of ulceration and corneal opacification. Complications of severe eye burns are symblepharon with overgrowth of the cornea by a vascularized membrane, progressive or recurrent corneal ulceration and permanent corneal opacification. Blindness may occur.

CHRONIC EXPOSURE- Effects are dependent upon concentration and duration of exposure. Conjunctivitis or effects similar to those for acute exposure may occur.

INGESTION:
SODIUM HYDROXIDE:
CORROSIVE/TOXIC.

ACUTE EXPOSURE- The reported lethal dose in rats is 140-340 mg/kg. Ingestion may cause a burning sensation in the mouth, corrosion of the lips, mouth, tongue and pharynx, and severe esophageal and abdominal pain, vomiting of blood and large pieces of mucosa, and bloody diarrhea. Asphyxia can occur from swelling of the throat. Mediastinitis, alkalemia, pallor, weak, slow pulse, cardiovascular collapse, shock, coma and death may occur. Perforation of the alimentary tract and constrictive scarring may result. Esophageal stricture may occur weeks, months, or even years later to make swallowing difficult. The estimated fatal dose in man is 5 grams. Cases of squamous cell carcinoma of the esophagus have occurred with latent periods of 12 to 42 years after ingestion. These cancers were believed to be sequela of tissue destruction and possibly scar formation rather than the result of direct carcinogenic action of sodium hydroxide.

CHRONIC EXPOSURE- Depending on the concentration, repeated ingestion of alkaline substances may result in inflammatory and ulcerative effects on the oral mucous membranes and other effects as with acute ingestion.

SECTION 12 ECOLOGICAL INFORMATION

ENVIRONMENTAL IMPACT RATING (0-4): no data available

ACUTE AQUATIC TOXICITY: no data available

DEGRADABILITY: no data available

LOG BIOCONCENTRATION FACTOR (BCF): no data available

LOG OCTANOL/WATER PARTITION COEFFICIENT: no data available

SECTION 13 DISPOSAL INFORMATION

Observe all federal, state and local regulations when disposing of this substance.

Disposal must be in accordance with standards applicable to generators of hazardous waste, 40 CFR 262. EPA Hazardous Waste Number D002.
100 pound CERCLA Section 103 Reportable Quantity.

SECTION 14 TRANSPORTATION INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101:
Sodium hydroxide, solid-UN 1823

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101:
8 - Corrosive material

U.S. DEPARTMENT OF TRANSPORTATION PACKING GROUP, 49 CFR 172.101:
PG II

U.S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS, 49 CFR 172.101 AND SUBPART E:
Corrosive

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS:
EXCEPTIONS: 49 CFR 173.154
NON-BULK PACKAGING: 49 CFR 173.212
BULK PACKAGING: 49 CFR 173.240

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101:
PASSENGER AIRCRAFT OR RAILCAR: 15 kg
CARGO AIRCRAFT ONLY: 50 kg

SECTION 15 REGULATORY INFORMATION

TSCA STATUS: Y

CERCLA SECTION 103 (40CFR302.4):	Y	1000 pounds RQ
SARA SECTION 302 (40CFR355.30):	N	
SARA SECTION 304 (40CFR355.40):	N	
SARA SECTION 313 (40CFR372.65):	N	
OSHA PROCESS SAFETY (29CFR1910.119):	N	

CALIFORNIA PROPOSITION 65: N

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40 CFR 370.21)
ACUTE HAZARD: Y
CHRONIC HAZARD: N
FIRE HAZARD: N
REACTIVITY HAZARD: Y
SUDDEN RELEASE HAZARD: N

SECTION 16 OTHER

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Milwaukee, WI 53233
Phone: 414-273-3850

Fluka Chemical Corp.
980 South Second St.
Ronkonkoma, NY 11779
Phone: 516-467-0980
Emergency Phone: 516-467-3535

SECTION 1. - - - - - - - - - - CHEMICAL IDENTIFICATION- - - - - - - - - - -
PRODUCT #: 86100-6 NAME: EOSIN B, CERTIFIED (C.I. 45400)
SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - - - -
CAS #:548-24-3
MF: C20H8BR2N2O9
SECTION 3. - - - - - - - - - - - - HAZARDS IDENTIFICATION - - - - - - - - - -
LABEL PRECAUTIONARY STATEMENTS
CAUTION:
AVOID CONTACT AND INHALATION.
SECTION 4. - - - - - - - - - - - - FIRST-AID MEASURES- - - - - - - - - - -
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.
IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN.
WASH CONTAMINATED CLOTHING BEFORE REUSE.
SECTION 5. - - - - - - - - - - - FIRE FIGHTING MEASURES - - - - - - - - - - -
EXTINGUISHING MEDIA
WATER SPRAY.
CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.
UNUSUAL FIRE AND EXPLOSIONS HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.
SECTION 6. - - - - - - - - - - ACCIDENTAL RELEASE MEASURES- - - - - - - - -
CHEMICAL SAFETY GOGGLES.
USE PROTECTIVE CLOTHING, GLOVES AND MASK.
SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL.
AVOID RAISING DUST.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
SECTION 7. - - - - - - - - - - - - HANDLING AND STORAGE- - - - - - - - - - -
REFER TO SECTION 8.
SECTION 8. - - - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION- - - - - -
CHEMICAL SAFETY GOGGLES.
COMPATIBLE CHEMICAL-RESISTANT GLOVES.
NIOSH/MSHA-APPROVED RESPIRATOR.
SAFETY SHOWER AND EYE BATH.
MECHANICAL EXHAUST REQUIRED.
AVOID INHALATION.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
WASH THOROUGHLY AFTER HANDLING.
KEEP TIGHTLY CLOSED.

STORE IN A COOL DRY PLACE.

SECTION 9. - - - - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - - - - -

APPEARANCE AND ODOR
BROWN TO DARK-GREEN POWDER

SECTION 10. - - - - - - - - - - -STABILITY AND REACTIVITY - - - - - - - - - -

INCOMPATIBILITIES
STRONG OXIDIZING AGENTS

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
CARBON MONOXIDE, CARBON DIOXIDE
NITROGEN OXIDES
HYDROGEN BROMIDE GAS

SECTION 11. - - - - - - - - - - TOXICOLOGICAL INFORMATION - - - - - - - - -

ACUTE EFFECTS
MAY BE HARMFUL BY INHALATION, INGESTION, OR SKIN ABSORPTION.
MAY CAUSE EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.
TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.

SECTION 12. - - - - - - - - - - ECOLOGICAL INFORMATION - - - - - - - - - - -

DATA NOT YET AVAILABLE.

SECTION 13. - - - - - - - - - - DISPOSAL CONSIDERATIONS - - - - - - - - - -

DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. - - - - - - - - - - - - TRANSPORT INFORMATION - - - - - - - - - -

CONTACT ALDRICH CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. - - - - - - - - - - REGULATORY INFORMATION - - - - - - - - - - -

DATA NOT AVAILABLE

SECTION 16. - - - - - - - - - - - - OTHER INFORMATION- - - - - - - - - - - - -

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980 South Second St.
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Phone: 516-467-0980
Emergency Phone: 516-467-3535

SECTION 1. - - - - - - - - - - - CHEMICAL IDENTIFICATION- - - - - - - - - -
PRODUCT #: 32421-3 NAME: 2-AMINO-6-FLUOROBENZOTHIAZOLE, 99%
SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - - - -
CAS #:348-40-3
MF: C7H5FN2S
SECTION 3. - - - - - - - - - - - HAZARDS IDENTIFICATION - - - - - - - - - -
LABEL PRECAUTIONARY STATEMENTS
IRRITANT
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
WEAR SUITABLE GLOVES AND EYE/FACE PROTECTION.
SECTION 4. - - - - - - - - - - - FIRST-AID MEASURES- - - - - - - - - - - -
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.
IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN.
WASH CONTAMINATED CLOTHING BEFORE REUSE.
SECTION 5. - - - - - - - - - - FIRE FIGHTING MEASURES - - - - - - - - - - -
EXTINGUISHING MEDIA
WATER SPRAY.
CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.
UNUSUAL FIRE AND EXPLOSIONS HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.
SECTION 6. - - - - - - - - - ACCIDENTAL RELEASE MEASURES- - - - - - - - -
WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY RUBBER GLOVES.
SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL.
AVOID RAISING DUST.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
SECTION 7. - - - - - - - - - - - HANDLING AND STORAGE- - - - - - - - - - -
REFER TO SECTION 8.
SECTION 8. - - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION- - - - - -
CHEMICAL SAFETY GOGGLES.
COMPATIBLE CHEMICAL-RESISTANT GLOVES.
NIOSH/MSHA-APPROVED RESPIRATOR.
SAFETY SHOWER AND EYE BATH.
MECHANICAL EXHAUST REQUIRED.
DO NOT BREATHE DUST.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.

WASH THOROUGHLY AFTER HANDLING.
IRRITANT.
KEEP TIGHTLY CLOSED.
STORE IN A COOL DRY PLACE.

SECTION 9. - - - - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - - - - -

APPEARANCE AND ODOR
OFF-WHITE TO YELLOW POWDER
MELTING POINT: 183 C TO 185 C

SECTION 10. - - - - - - - - - -STABILITY AND REACTIVITY - - - - - - - - - -

INCOMPATIBILITIES
STRONG OXIDIZING AGENTS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
CARBON MONOXIDE, CARBON DIOXIDE
NITROGEN OXIDES
SULFUR OXIDES
HYDROGEN FLUORIDE

SECTION 11. - - - - - - - - - - - TOXICOLOGICAL INFORMATION - - - - - - - - -

ACUTE EFFECTS
MAY BE HARMFUL BY INHALATION, INGESTION, OR SKIN ABSORPTION.
CAUSES EYE AND SKIN IRRITATION.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.
TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.

SECTION 12. - - - - - - - - - - - ECOLOGICAL INFORMATION - - - - - - - - - - -

DATA NOT YET AVAILABLE.

SECTION 13. - - - - - - - - - - - DISPOSAL CONSIDERATIONS - - - - - - - - - -

DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. - - - - - - - - - - - - - TRANSPORT INFORMATION - - - - - - - - - -

CONTACT ALDRICH CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. - - - - - - - - - - - - REGULATORY INFORMATION - - - - - - - - - - -

DATA NOT AVAILABLE

SECTION 16. - - - - - - - - - - - - OTHER INFORMATION- - - - - - - - - - - - -

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980 South Second St.
Ronkonkoma, NY 11779
Phone: 516-467-0980
Emergency Phone: 516-467-3535

SECTION 1. - - - - - - - - - - CHEMICAL IDENTIFICATION- - - - - - - - - -
PRODUCT #: E4009
NAME: EOSIN Y FREE ACID

SECTION 2. - - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - - - -
CAS #:15086-94-9
MF: C20H8BR4O5

SYNONYMS
BROMEOSIN * BROMOEOSIN * BROMOFLUORESCEIC ACID * C.I. 45380:2 * C.I. SOLVENT RED 43 * D AND C RED NO. 21 * EOSIN * EOSINE * 2,4,5,7-TETRABROMO-3,6-FLUORANDIOL * TETRABROMOFLUORESCEIN * 2',4',5',7'-TETRABROMOFLUORESCEIN *

SECTION 3. - - - - - - - - - - - HAZARDS IDENTIFICATION - - - - - - - - - -
LABEL PRECAUTIONARY STATEMENTS
CAUTION:
AVOID CONTACT AND INHALATION.

SECTION 4. - - - - - - - - - - - FIRST-AID MEASURES- - - - - - - - - - -
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.
IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN.
WASH CONTAMINATED CLOTHING BEFORE REUSE.

SECTION 5. - - - - - - - - - - FIRE FIGHTING MEASURES - - - - - - - - - - -
EXTINGUISHING MEDIA
WATER SPRAY.
CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.
UNUSUAL FIRE AND EXPLOSIONS HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

SECTION 6. - - - - - - - - ACCIDENTAL RELEASE MEASURES- - - - - - - - -
WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY RUBBER GLOVES.
SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL.
AVOID RAISING DUST.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

SECTION 7. - - - - - - - - - - - HANDLING AND STORAGE- - - - - - - - - - -
REFER TO SECTION 8.

SECTION 8. - - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION- - - - - -
CHEMICAL SAFETY GOGGLES.
COMPATIBLE CHEMICAL-RESISTANT GLOVES.
NIOSH/MSHA-APPROVED RESPIRATOR.
SAFETY SHOWER AND EYE BATH.

MECHANICAL EXHAUST REQUIRED.
AVOID INHALATION.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
WASH THOROUGHLY AFTER HANDLING.
KEEP TIGHTLY CLOSED.
STORE IN A COOL DRY PLACE.

SECTION 9. - - - - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - - - - -

APPEARANCE AND ODOR
PINK POWDER

SECTION 10. - - - - - - - - - - -STABILITY AND REACTIVITY - - - - - - - - - -

INCOMPATIBILITIES
STRONG OXIDIZING AGENTS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
CARBON MONOXIDE, CARBON DIOXIDE
HYDROGEN BROMIDE GAS

SECTION 11. - - - - - - - - - - - TOXICOLOGICAL INFORMATION - - - - - - - - -

ACUTE EFFECTS
MAY BE HARMFUL BY INHALATION, INGESTION, OR SKIN ABSORPTION.
MAY CAUSE EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.
TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND
TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.
RTECS NO: LM5800000
FLUORESCEIN, 2',4',5',7'-TETRABROMO-
ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES
(RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR
COMPLETE INFORMATION.

SECTION 12. - - - - - - - - - - - ECOLOGICAL INFORMATION - - - - - - - - - - -

DATA NOT YET AVAILABLE.

SECTION 13. - - - - - - - - - - - DISPOSAL CONSIDERATIONS - - - - - - - - - -

DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A
CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. - - - - - - - - - - - - TRANSPORT INFORMATION - - - - - - - - - -

CONTACT SIGMA CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. - - - - - - - - - - - REGULATORY INFORMATION - - - - - - - - - - -

REVIEWS, STANDARDS, AND REGULATIONS

IARC CANCER REVIEW:ANIMAL INADEQUATE EVIDENCE	IMEMDT 15,183,77
IARC CANCER REVIEW:HUMAN NO ADEQUATE DATA	IMEMDT 15,183,77
IARC CANCER REVIEW:GROUP 3	IMSUDL 7,56,87

NOES 1983: HZD T0363; NIS 2; TNF 347; NOS 5; TNE 7340; TFE 1584
EPA TSCA CHEMICAL INVENTORY, JUNE 1993
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, JULY 1994

SECTION 16. - - - - - - - - - - - - OTHER INFORMATION- - - - - - - - - - - - -

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Emergency Phone: 516-467-3535

SECTION 1. - - - - - - - - - - - CHEMICAL IDENTIFICATION- - - - - - - - - - -
PRODUCT #: 29418-7 NAME: FLUORESCENT BRIGHTENER 28
SECTION 2. - - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - - - -
CAS #:4404-43-7
MF: C40H44N12O10S2
SECTION 3. - - - - - - - - - - - - HAZARDS IDENTIFICATION - - - - - - - - - -
LABEL PRECAUTIONARY STATEMENTS
CAUTION:
AVOID CONTACT AND INHALATION.
SECTION 4. - - - - - - - - - - - - FIRST-AID MEASURES- - - - - - - - - - - -
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN.
IN CASE OF SKIN CONTACT, FLUSH WITH COPIOUS AMOUNTS OF WATER
FOR AT LEAST 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND
SHOES. CALL A PHYSICIAN.
IF INHALED, REMOVE TO FRESH AIR. IF BREATHING BECOMES DIFFICULT,
CALL A PHYSICIAN.
IN CASE OF CONTACT WITH EYES, FLUSH WITH COPIOUS AMOUNTS OF WATER
FOR AT LEAST 15 MINUTES. ASSURE ADEQUATE FLUSHING BY SEPARATING
THE EYELIDS WITH FINGERS. CALL A PHYSICIAN.
SECTION 5. - - - - - - - - - - - FIRE FIGHTING MEASURES - - - - - - - - - - -
EXTINGUISHING MEDIA
WATER SPRAY.
CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO
PREVENT CONTACT WITH SKIN AND EYES.
UNUSUAL FIRE AND EXPLOSIONS HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.
SECTION 6. - - - - - - - - - - ACCIDENTAL RELEASE MEASURES- - - - - - - - - -
WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY
RUBBER GLOVES.
SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL.
AVOID RAISING DUST.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.
SECTION 7. - - - - - - - - - - - - HANDLING AND STORAGE- - - - - - - - - - - -
REFER TO SECTION 8.
SECTION 8. - - - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION- - - - - - -
WEAR APPROPRIATE NIOSH/MSHA-APPROVED RESPIRATOR, CHEMICAL-RESISTANT
GLOVES, SAFETY GOGGLES, OTHER PROTECTIVE CLOTHING.
MECHANICAL EXHAUST REQUIRED.
SECTION 9. - - - - - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - - - - -
APPEARANCE AND ODOR
YELLOW POWDER
MELTING POINT: 290 C (DEC)
SECTION 10. - - - - - - - - - - -STABILITY AND REACTIVITY - - - - - - - - - -
STABILITY

STABLE.
INCOMPATIBILITIES
STRONG OXIDIZING AGENTS
STRONG REDUCING AGENTS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
CARBON MONOXIDE, CARBON DIOXIDE
NITROGEN OXIDES
SULFUR OXIDES
HAZARDOUS POLYMERIZATION
WILL NOT OCCUR.
SECTION 11. - - - - - - - - - - TOXICOLOGICAL INFORMATION - - - - - - - - -
ACUTE EFFECTS
MAY CAUSE IRRITATION.
THE TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY
INVESTIGATED.
SECTION 12. - - - - - - - - - - ECOLOGICAL INFORMATION - - - - - - - - - -
DATA NOT YET AVAILABLE.
SECTION 13. - - - - - - - - - - DISPOSAL CONSIDERATIONS - - - - - - - - -
DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A
CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.
SECTION 14. - - - - - - - - - - - TRANSPORT INFORMATION - - - - - - - - -
CONTACT ALDRICH CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.
SECTION 15. - - - - - - - - - - REGULATORY INFORMATION - - - - - - - - - -
DATA NOT AVAILABLE
SECTION 16. - - - - - - - - - - - OTHER INFORMATION- - - - - - - - - - - -
THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO
BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. SIGMA, ALDRICH,
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Fluka Chemical Corp.
980 South Second St.
Ronkonkoma, NY 11779
Phone: 516-467-0980
Emergency Phone: 516-467-3535

SECTION 1. - - - - - - - - - - CHEMICAL IDENTIFICATION- - - - - - - - - -
PRODUCT #: H1014
NAME: 2-HYDROXYNICOTINIC ACID

SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - - -
CAS #:609-71-2
MF: C6H5NO2

SECTION 3. - - - - - - - - - - - HAZARDS IDENTIFICATION - - - - - - - - -
LABEL PRECAUTIONARY STATEMENTS
IRRITANT
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
WEAR SUITABLE PROTECTIVE CLOTHING.

SECTION 4. - - - - - - - - - - - FIRST-AID MEASURES- - - - - - - - - - -
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.
IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN.
WASH CONTAMINATED CLOTHING BEFORE REUSE.

SECTION 5. - - - - - - - - - - FIRE FIGHTING MEASURES - - - - - - - - - -
EXTINGUISHING MEDIA
WATER SPRAY.
CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.
UNUSUAL FIRE AND EXPLOSIONS HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

SECTION 6. - - - - - - - - - ACCIDENTAL RELEASE MEASURES- - - - - - - - -
WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY RUBBER GLOVES.
SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL.
AVOID RAISING DUST.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

SECTION 7. - - - - - - - - - - - HANDLING AND STORAGE- - - - - - - - - - -
REFER TO SECTION 8.

SECTION 8. - - - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION- - - - - -
CHEMICAL SAFETY GOGGLES.
RUBBER GLOVES.
NIOSH/MSHA-APPROVED RESPIRATOR.
SAFETY SHOWER AND EYE BATH.
MECHANICAL EXHAUST REQUIRED.
AVOID CONTACT AND INHALATION.

DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
WASH THOROUGHLY AFTER HANDLING.
IRRITANT.
KEEP TIGHTLY CLOSED.
STORE IN A COOL DRY PLACE.

SECTION 9. - - - - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - - - - -

APPEARANCE AND ODOR
WHITE POWDER WITH LUMPS
MELTING POINT: 260 C TO 262 C

SECTION 10. - - - - - - - - - -STABILITY AND REACTIVITY - - - - - - - - - -

INCOMPATIBILITIES
STRONG OXIDIZING AGENTS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
CARBON MONOXIDE, CARBON DIOXIDE
NITROGEN OXIDES

SECTION 11. - - - - - - - - - - - TOXICOLOGICAL INFORMATION - - - - - - - - -

ACUTE EFFECTS
MAY BE HARMFUL BY INHALATION, INGESTION, OR SKIN ABSORPTION.
CAUSES EYE AND SKIN IRRITATION.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.
TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.

SECTION 12. - - - - - - - - - - - ECOLOGICAL INFORMATION - - - - - - - - - - -

DATA NOT YET AVAILABLE.

SECTION 13. - - - - - - - - - - - DISPOSAL CONSIDERATIONS - - - - - - - - - -

DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. - - - - - - - - - - - - - TRANSPORT INFORMATION - - - - - - - - - -

CONTACT SIGMA CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. - - - - - - - - - - - REGULATORY INFORMATION - - - - - - - - - - -

DATA NOT AVAILABLE

SECTION 16. - - - - - - - - - - - - - OTHER INFORMATION- - - - - - - - - - - - -

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. SIGMA, ALDRICH, FLUKA SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT. SEE REVERSE SIDE OF INVOICE OR PACKING SLIP FOR ADDITIONAL TERMS AND CONDITIONS OF SALE.

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Ronkonkoma, NY 11779
Phone: 516-467-0980
Emergency Phone: 516-467-3535

SECTION 1. - - - - - - - - - - CHEMICAL IDENTIFICATION- - - - - - - - - - -
PRODUCT #: 19827-7 NAME: PHLOXINE B, CERTIFIED

SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - - - -
CAS #:18472-87-2
MF: C20H4BR4CL4O5

SYNONYMS
ACID RED 92 * AIZEN ACID PHLOXINE PB * C.I. 45410 * C.I. ACID RED 92 * CYANOSIN * CYANOSIN (ACID DYE) * CYANOSINE * D AND C RED NO. 28 * EOSIN BLUE * EOSINE BLUE * EOSINE BLUISH * FOOD DYE RED NO. 104 * FOOD RED NO. 104 * JAPAN RED 104 * ORIENT WATER PINK 2 * PHLOXIN B * PHLOXINE B * PHLOXINE P * RED 104 * 11969 RED * RED NO. 104 * 3427 VERI PUR PINK *

SECTION 3. - - - - - - - - - - - - HAZARDS IDENTIFICATION - - - - - - - - - -
LABEL PRECAUTIONARY STATEMENTS
CAUTION:
AVOID CONTACT AND INHALATION.

SECTION 4. - - - - - - - - - - - - FIRST-AID MEASURES- - - - - - - - - - -
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.
IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.
CALL A PHYSICIAN.
WASH CONTAMINATED CLOTHING BEFORE REUSE.

SECTION 5. - - - - - - - - - - FIRE FIGHTING MEASURES - - - - - - - - - - -
EXTINGUISHING MEDIA
WATER SPRAY.
CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.
SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.
UNUSUAL FIRE AND EXPLOSIONS HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

SECTION 6. - - - - - - - - - ACCIDENTAL RELEASE MEASURES- - - - - - - - -
WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY RUBBER GLOVES.
SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL.
AVOID RAISING DUST.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

SECTION 7. - - - - - - - - - - - HANDLING AND STORAGE- - - - - - - - - - -
REFER TO SECTION 8.

SECTION 8. - - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION- - - - - -
CHEMICAL SAFETY GOGGLES.
COMPATIBLE CHEMICAL-RESISTANT GLOVES.
NIOSH/MSHA-APPROVED RESPIRATOR.

SAFETY SHOWER AND EYE BATH.
MECHANICAL EXHAUST REQUIRED.
AVOID INHALATION.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
WASH THOROUGHLY AFTER HANDLING.
KEEP TIGHTLY CLOSED.
STORE IN A COOL DRY PLACE.

SECTION 9. - - - - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - - - - -

APPEARANCE AND ODOR
DARK-RED POWDER

SECTION 10. - - - - - - - - - - -STABILITY AND REACTIVITY - - - - - - - - - -

INCOMPATIBILITIES
STRONG OXIDIZING AGENTS
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
CARBON MONOXIDE, CARBON DIOXIDE
HYDROGEN CHLORIDE GAS
HYDROGEN BROMIDE GAS

SECTION 11. - - - - - - - - - - - TOXICOLOGICAL INFORMATION - - - - - - - - -

ACUTE EFFECTS
MAY BE HARMFUL BY INHALATION, INGESTION, OR SKIN ABSORPTION.
MAY CAUSE EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.
TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.
RTECS NO: LM5900000
FLUORESCEIN, 2',4',5',7'-TETRABROMO-4,5,6,7-TETRACHLORO-, DISODIUM SALT
TOXICITY DATA
IVN-MUS LD50:310 MG/KG TXAPA9 44,225,78
ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFORMATION.

SECTION 12. - - - - - - - - - - - ECOLOGICAL INFORMATION - - - - - - - - - - -

DATA NOT YET AVAILABLE.

SECTION 13. - - - - - - - - - - - DISPOSAL CONSIDERATIONS - - - - - - - - - -

DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. - - - - - - - - - - - - - TRANSPORT INFORMATION - - - - - - - - - -

CONTACT ALDRICH CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. - - - - - - - - - - - REGULATORY INFORMATION - - - - - - - - - - -

REVIEWS, STANDARDS, AND REGULATIONS
NOHS 1974: HZD M4129; NIS 2; TNF 301; NOS 5; TNE 1460
NOES 1983: HZD M4129; NIS 3; TNF 550; NOS 10; TNE 9817; TFE 3173
NOES 1983: HZD X9003; NIS 2; TNF 220; NOS 3; TNE 4941; TFE 4182
EPA GENETOX PROGRAM 1988, INCONCLUSIVE: B SUBTILIS REC ASSAY; HISTIDINE REVERSION-AMES TEST
EPA TSCA CHEMICAL INVENTORY, JUNE 1993

SECTION 16. - - - - - - - - - - - - - OTHER INFORMATION- - - - - - - - - - - - -

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Ronkonkoma, NY 11779
Phone: 516-467-0980
Emergency Phone: 516-467-3535

SECTION 1. - - - - - - - - - - CHEMICAL IDENTIFICATION- - - - - - - - - -
PRODUCT #: 19958-3 NAME: LISSAMINE GREEN B (C.I. 44090)

SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - - -
CAS #:3087-16-9
MF: C27H26N2O7S2

SYNONYMS
ACIDAL WOOL GREEN BS * ACID BRILLIANT GREEN BS * ACID GREEN 50 * ACID LEATHER GREEN S * ACILAN GREEN BS * AMACID WOOL GREEN S * BRILLIANTSAEURE GRUEN BS (GERMAN) * BUCACID WOOL GREEN * CALOCID GREEN S * CALOCID GREEN SB * C.I. 44090 * C.I. ACID GREEN 50, MONOSODIUM SALT * C.I. FOOD GREEN 4 * E 142 * EDICOL SUPRA GREEN B * ERIO GREEN S * FOOD GREEN S * GREEN 5 * 12078 GREEN * GREEN BS * GREEN S * HEXACOL GREEN S * HIDACID WOOL GREEN * KITON GREEN S * LISSAMINE GREEN B * LISSAMINE GREEN BN * NAPHTHAZINE GREEN S * PHARMACID GREEN S * SCHULTZ NR. 836 (GERMAN) * SUMITOMO WOOL GREEN S * UNITERTRACID GREEN BS * VERT ACIDE BRILLIANT BS * VONDACID GREEN S * WATER GREEN SX * WOOL GREEN 5 * WOOL GREEN B * WOOL GREEN BS * WOOL GREEN BSNA * WOOL GREEN MS * WOOL GREEN S * WOOL GREEN S (BIOLOGICAL STAIN) * WOOL GREEN SG * ZELEN KYSELA 50 (CZECH) * ZELEN KYSELA BS (CZECH) * ZELEN POTRAVINARSKA 4 (CZECH) *

SECTION 3. - - - - - - - - - - - HAZARDS IDENTIFICATION - - - - - - - - -

LABEL PRECAUTIONARY STATEMENTS
HARMFUL
HARMFUL IF SWALLOWED.
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
WEAR SUITABLE PROTECTIVE CLOTHING.

SECTION 4. - - - - - - - - - - - FIRST-AID MEASURES- - - - - - - - - - -
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.
IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS. CALL A PHYSICIAN.
WASH CONTAMINATED CLOTHING BEFORE REUSE.

SECTION 5. - - - - - - - - - - FIRE FIGHTING MEASURES - - - - - - - - - - -

EXTINGUISHING MEDIA
WATER SPRAY.
CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.

SPECIAL FIREFIGHTING PROCEDURES
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

SECTION 6. - - - - - - - - - ACCIDENTAL RELEASE MEASURES- - - - - - - - -
WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY RUBBER GLOVES.
SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL.
AVOID RAISING DUST.
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

SECTION 7. - - - - - - - - - - - HANDLING AND STORAGE- - - - - - - - - - -
REFER TO SECTION 8.

SECTION 8. - - - - - - - EXPOSURE CONTROLS/PERSONAL PROTECTION- - - - - -
CHEMICAL SAFETY GOGGLES.
COMPATIBLE CHEMICAL-RESISTANT GLOVES.
NIOSH/MSHA-APPROVED RESPIRATOR.
SAFETY SHOWER AND EYE BATH.
MECHANICAL EXHAUST REQUIRED.
DO NOT BREATHE DUST.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
WASH THOROUGHLY AFTER HANDLING.
IRRITANT.
KEEP TIGHTLY CLOSED.
PROTECT FROM LIGHT.
STORE IN A COOL DRY PLACE.

SECTION 9. - - - - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - - - - -
APPEARANCE AND ODOR
BLACK POWDER

SECTION 10. - - - - - - - - - -STABILITY AND REACTIVITY - - - - - - - - - -
INCOMPATIBILITIES
STRONG OXIDIZING AGENTS
STRONG BASES
SENSITIVE TO LIGHT
HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
CARBON MONOXIDE, CARBON DIOXIDE
NITROGEN OXIDES
SULFUR OXIDES

SECTION 11. - - - - - - - - - - - TOXICOLOGICAL INFORMATION - - - - - - - - -
ACUTE EFFECTS
HARMFUL IF SWALLOWED.
MAY BE HARMFUL IF INHALED.
MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN.
CAUSES EYE AND SKIN IRRITATION.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.
TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE NOT BEEN THOROUGHLY INVESTIGATED.
RTECS NO: BQ1150000
AMMONIUM, (4-(P-(DIMETHYLAMINO)-ALPHA-(2-HYDROXY-3,6-DISULFO-1-NAPHTHYL)BENZYLIDE CYCLOHEXADIEN-1-YLIDENE)DIMETHYL-, HYDROXIDE, INNER SALT, SODIUM SALT
TOXICITY DATA
ORL-RAT LD50:2 GM/KG SCPHA4 47,39,79
TARGET ORGAN DATA
TUMORIGENIC (EQUIVOCAL TUMORIGENIC AGENT BY RTECS CRITERIA)
TUMORIGENIC (TUMORS AT SITE OF APPLICATION)
ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES

(RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR COMPLETE INFORMATION.

SECTION 12. - - - - - - - - - - ECOLOGICAL INFORMATION - - - - - - - - - - -

DATA NOT YET AVAILABLE.

SECTION 13. - - - - - - - - - - DISPOSAL CONSIDERATIONS - - - - - - - - - -

DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. - - - - - - - - - - - TRANSPORT INFORMATION - - - - - - - - - -

CONTACT ALDRICH CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. - - - - - - - - - - REGULATORY INFORMATION - - - - - - - - - - -

REVIEWS, STANDARDS, AND REGULATIONS

NOHS 1974: HZD M2207; NIS 1; TNF 18; NOS 1; TNE 175
NOES 1983: HZD M2207; NIS 1; TNF 98; NOS 4; TNE 1378
EPA GENETOX PROGRAM 1988, NEGATIVE: S CEREVISIAE GENE CONVERSION
EPA TSCA CHEMICAL INVENTORY, JUNE 1993

SECTION 16. - - - - - - - - - - - OTHER INFORMATION- - - - - - - - - - - - -

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. SIGMA, ALDRICH, FLUKA SHALL NOT BE HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH THE ABOVE PRODUCT. SEE REVERSE SIDE OF INVOICE OR PACKING SLIP FOR ADDITIONAL TERMS AND CONDITIONS OF SALE.

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MATERIAL SAFETY DATA SHEET

LISSAMINE FLAVINE FF 69240

SECTION I - IDENTIFICATION

COMPANY NAME............ PYLAM PRODUCTS
EMERGENCY PHONE NUMBER.. (516) 222-1750
EFFECTIVE DATE.......... 08/09/90
REVISED DATE............ 01/13/95
CHEMICAL NAME........... ACID YELLOW 7
TRADE NAME.............. LISSAMINE FLAVINE FF
CHEMICAL FAMILY......... AMINOKETONE
CHEMICAL FORMULA........ C20 H18 N4 O9 S2.2NA

SECTION II - HAZARDOUS INGREDIENTS

HAZARDOUS COMPONENTS	HAZARDOUS %	TLV (Units)	PROD. CAS #
NONE AS PER 29CFR PART 1910.1200.			2391-30-2

SECTION III - PHYSICAL DATA

BOILING POINT (F)....... N/A
FREEZING POINT (F)...... N/A
VOLATILITY/VOL (%)...... N/A
MELTING POINT........... N/A
VAPOR PRESSURE.......... N/A
VAPOR DENSITY.(Air=1)... N/A
SOLUBILITY IN H2O....... SOLUBLE
APPEARANCE/ODOR......... YELLOW POWDER/NO ODOR
SPECIFIC GRAVITY (H20=1) N/A
EVAPORATION RATE........ N/A
pH...................... NA

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT............. GREATER THAN 200'F
LOWER FLAME LIMIT....... N/A
HIGHER FLAME LIMIT...... N/A
EXTINGUISH MEDIA........ IN CASE OF FIRE, USE WATER SPRAY, FOAM, DRY CHEMICAL, OR CO2.
FOR FIRE................ FIREFIGHTERS SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND TURNOUT GEAR.
UNUSUAL FIRE HAZARD..... NONE

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE... N/A

▸ RIAL SAFETY DATA SHEET

LISSAMINE FLAVINE FF 69240

CERCLA . . . . . . NOT REGULATED.
USDA . . . . MANY PRODUCTS ARE ON FILE. PLEASE CHECK WITH OUR REGISTRATION DEPARTMENT.
DSL . . . . COMPONENTS OF MOST PRODUCTS ARE LISTED. PLEASE CHECK WITH OUR REGULATORY DEPARTMENT.

***

CARCINOGENICITY:
= = = = = = = = =
NTP : IARC : OSHA : NONE UNLESS INDICATED IN SECTION II OF THIS MATERIAL SAFETY DATA SHEET.

SECTION VIII - SPECIAL PROTECTION

RESPIRATORY PROTECTION.. EMPLOYEES SHOULD AVOID INHALATION OF DUSTS. WHENEVER POTENTIAL FOR DUSTING EXISTS AND APPROPRIATE NOISH/MSHA APPROVED RESPIRATOR WITH DUST FILTER SHOULD BE WORN.
VENTILATION............. USE LOCAL VENTILATION IF DUSTING IS A PROBLEM.
PROTECTIVE GLOVES....... WEAR SUITABLE GLOVES.
EYE PROTECTION.......... WEAR EYE/FACE PROTECTION.
OTHER PROTECTIVE EQUIP..
HANDLING & STORAGE...... KEEP IN COOL DRY PLACE.

SECTION IX - SPECIAL PRECAUTIONS

HAZARD CLASS............ NONE
DOT SHIPPING NAME....... NONE
REPORTABLE QUANTITY (RQ) NONE
UN NUMBER............... NONE
NA NUMBER............... NONE
PACKAGING SIZE.......... N/A

PYLAM PRODUCTS COMPANY INCORPORATED
1001 STEWART AVENUE GARDEN CITY, NY 11530

THE DATA AND INFORMATION GIVEN IN THIS MATERIAL SAFETY DATA SHEET ARE ACCURATE ON THE DATE OF PREPARATION. IT DOES NOT INDICATE ANY WARRANTY OR REPRESENTATION. WE DISCLAIM ALL LIABILITY RELATING TO USE OF MATERIAL SINCE THIS IS BEYOND OUR CONTROL.

MATERIAL SAFETY DATA SHEET

LISSAMINE FLAVINE FF 69240

OVER EXPOSURE EFFECTS... NO APPLICABLE INFORMATION WAS FOUND CONCERNING ANY ADVERSE ACUTE/CHRONIC HEALTH EFFECTS RESULTING FROM OVEREXPOSURE TO THIS PRODUCT.

FIRST AID PROCEDURES....

EMERGENCY FIRST AID

INHALATION:
IF LARGE AMOUNTS ARE INHALED, REMOVE TO FRESH AIR IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. IF BREATHING IS DIFFICULT GIVE OXYGEN, AND CALL A PHYSICIAN.

SKIN CONTACT:
FLUSH SKIN WITH PLENTY OF WATER AFTER EXCESSIVE CONTACT. WASH THOROUGHLY WITH HANDCREAM OR HANDCLEANER.

EYE CONTACT:
FLUSH EYES IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. CALL A PHYSICIAN.

INGESTION:
INDUCE VOMITING IMMEDIATELY BY GIVING TWO GLASSES OF WATER. GET MEDICAL ATTENTION. NEVER GIVE FLUIDS TO AN UNCONSCIOUS PERSON.

SECTION VI - REACTIVITY DATA

CHEMICAL STABILITY...... STABLE
CONDITIONS TO AVOID..... NONE
INCOMPATIBLE MATERIALS.. OXIDIZING AND REDUCING AGENTS MAY DESTROY COLOR.
DECOMPOSITION PRODUCTS.. CO,CO2,OXIDES OF NITROGEN, SULFUR, AND OTHER POTENTIALLY TOXIC FUMES.
HAZARDOUS POLYMERIZATION
POLYMERIZATION AVOID.... NONE EXPECTED

SECTION VII - SPILL OR LEAK PROCEDURE

FOR SPILL............... SPILLS SHOULD BE SWEPT UP AND PLACED IN CONTAINERS. SPILL AREAS CAN BE WASHED WITH WATER; COLLECT WASTE WATER FOR APPROVED DISPOSAL.

WASTE DISPOSAL METHOD... WASTE DISPOSAL SHOULD BE IN ACCORDANCE WITH EXISTING FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION VII - A

REGULARTORY INFORMATION

*

EPA . . . . IN COMPLIANCE WITH TSCA INVENTORY.
EINECS. . . . . ALL PRODUCT COMPONENTS ARE LISTED.
WHMIS . . . . NOT REGULATED.
RCRA . . . . NOT REGULATED.

MEMORANDUM OF MEETING OR PHONE CONVERSATION

☑ Telephone ☐ Meeting	Time 8:12	Date 2-21-95

Individuals Involved

Dan Robertson — Clint Marshall

WIPP

Subject Potential Release from Wash base Sump - results.

Discussion Dan called to say that a potential release of ~~???~~ petroleum hydrocarbon contaminated water from the wash base sump at the facility did not occur. After further investigation sampling revealed that standards were not exceeded.

Conclusions

Distribution

Initialed

8/89

688 016 064

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Sent to Culebra Transport Sales	
Street and No. E E Hunter	
P.O., State and ZIP Code DOE 1/31/95	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, March 1993

State of New Mexico
ENVIRONMENT DEPARTMENT
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2850

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

GARY E. JOHNSON
GOVERNOR

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

January 31, 1995

E. K. Hunter, Chief
DOE - WIPP Site Branch
P.O. Box 3090
Carlsbad, NM 88221

RE: WIPP - Culebra Transport Test Program

Dear Mr. Hunter:

The New Mexico Environment Department (NMED) has received your letter for the Culebra Transport Test Program at the Waste Isolation Pilot Plant (WIPP) in accordance with Section 1-201. of the NM Water Quality Control Commission (WQCC) Regulations. The facility is located approximately 30 miles east of Carlsbad in Section 29, T22S, R31E, Eddy County. The application satisfies the requirements of Section 1-201 of the WQCC Regulations.

Based on the presently available information in your letter, a discharge plan is not being required for this discharge as long as the discharge is as described in your letter of October 21, 1994.

A discharge plan is not being required because it appears that the discharge conforms to the numerical ground water standards and does not contain any toxic pollutants as defined in WQCC Reg.1-101.ZZ, and therefore is exempt from the discharge plan requirement under WQCC Reg.3-105.A.

The exempt discharge is briefly described as follows:

Tracer solutions will be injected into the Culebra Formation at the H-19 well at the WIPP site hydropad. Movement of the tracers will be achieved by pumping approximately 10 hydrologic test wells located along the principle flow path of the Culebra aquifer. Monitoring will take place in seven additional wells at the site. Among the list of constituents submitted as possible tracers for the tests, Trifluoroacetic Acid-d will be excluded because it may possibly degrade to one or more of the contaminants listed in WQCC Regulation 1-101.ZZ.

Although a discharge plan is not being required for this discharge, you are not relieved of liability should your operation result in actual pollution of surface or ground waters. Further, this decision by the NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, such as zoning requirements, plumbing codes and nuisance ordinances.

If at some time in the future you intend to change the amount, the character, or location of your discharge so that it will not be as described, or if observation or monitoring shows that the discharge is not as described, you must file a new request for exemption with the Ground Water Section.

If you have any questions, please contact either Clint Marshall of the Ground Water Section staff at 827-0027 or the Program Manager of the Ground Water Section at 827-2900.

Sincerely,

Marcy Leavitt, Chief
Ground Water Protection &
Remediation Bureau

ML:CLM/clm

xc: Garrison McCaslin, District Manager, NMED Dist. 4
Thomas Burt, HPM, NMED District 4, Carlsbad
Dan Robertson, Consultant, DOE - WIPP Site, P.O. Box 3090, Carlsbad, NM 88221

ENVIRONMENT DEPARTMENT ROUTING SLIP

LETTER/MEMO TO: E.K. Hunter - WIPP Site

FOR SIGNATURE/APPROVAL BY: Marcy

DRAFTED BY: Clint Marshall DATE: 1-27-95

SUBJECT: NO DP Required - Tracer Test.

FINAL DECISION NEEDED BY: ASAP. REASON: Waiting to perform test.

FEES RECEIVED? FIRST YEAR ____ FULL PAYMENT ____

REVIEW:

APPROVED:		INITIAL	DATE REC'D	DATE APRV'D
	SUPERVISOR			
Dale Doremus	PROGRAM MANAGER	DMD	1/31/95	2/1/95 mmr
Marcy Leavitt	BUREAU CHIEF	ML		2/1
	GRANTS			
	ACCOUNTING			
	BUDGETS			
	LEGAL REVIEW			
	ASD DIRECTOR			
Ed Kelley	WWMD DIRECTOR			
	ERD DIRECTOR			
Edgar Thornton	DEPUTY SECRETARY			
Mark E. Weidler	SECRETARY			

COMMENTS BY DRAFTER OR REVIEWER(S):

List of tracers were submitted - Rick Meyerheim reviewed it - excluded one constituent.

WA : ISOLATION DIVISI

ENVIRONMENT, SAFETY, & HEALTH

FACSIMILE TRANSMITTAL ROUTING SHEET

TELEFAX NUMBER (505) 885-4562

RECEIVED OCT 1994

Pages: 2 Date: 10/26/94 Time: 10:35

(including cover)

To: MR CLINT MARSHALL

Location: NMED GROUND WATER BUREAU

Fax: (505) 827-2965

From: DAN ROBERTSON

Location: WIPP SITE

Phone/Fax #: 234-8240 FAX (505) 885-4562

Authorization Signature:

Special Instructions: CLINT - I WOULD LIKE TO REQUEST AN ONGOING EXEMPTION TO POUR THIS PARTICULAR AC CONDENSATE DOWN THE DRAIN (SEWAGE SYSTEM) UNDER DP-831 PLEASE CALL IF YOU HAVE QUESTIONS THANKS

WASTE ISOLATION PILOT PLANT

WIPP

00058

Authorization to Discharge Unpermitted, Non-Hazardous Effluent into the WIPP Sewage Treatment Facility

Name: Tom Goff

Signature: Thomas E. Goff

Date: 10/11/94

Department/Section: ESH&RC D&AT

Origin of Effluent: Air conditioner condensate. Mobil room AC units drain condensate into buckets because room was not intended for this lab. (ROOM NOT ORIGINALLY DESIGNED TO BE A LABORATORY)

Type of Effluent: About 2 gallons / day
(in gallons)

Restrictions on Discharge: NONE - POUR DOWN DRAIN IN CHANGE ROOM

☑ Effluent has been characterized and the generation process has not changed: (Attach analytical results to the discharge form and submit to Environmental Compliance and Support for signature.)
EXEMPTED UNDER REGULATIONS

☐ Effluent Characterization is Required: (Attach sampling results to the discharge request form and return to Environmental Compliance and Support for submittal to NMED for discharge authorization signature.)

Authorization Signatures:

1. Authorization Signature: [signature] Date: 10/19/94
(Environmental Compliance and Support (EC&S))

2. Authorization Signature: Date:
(DOE Environmental, Safety and Health)

3. Authorization Signature: [signature] Date: 10/31/94
(NMED Groundwater Bureau)

4. Authorization Signature: Date:
(Environmental Monitoring (EM) Section)

State of New Mexico

ENVIRONMENT DEPARTMENT

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

FAX TRANSMITTAL

DATE: 10/31/94 TIME: ________ PAGE: 1 OF 2

PLEASE DELIVER THE FOLLOWING PAGES TO:

TO: Dan Robertson

AGENCY/LOCATION: WIPP Site

TELEPHONE: ________ FAX: 505-885-4562

FROM: Clint Marshall

AGENCY/LOCATION: NMED

TELEPHONE: 505-827-0027 FAX: (505) 827-2965

COMMENTS:

Faxed 10/31/94

DRUG FREE

00060

Department of Energy
Carlsbad Area Office
P. O. Box 3090
Carlsbad, New Mexico 88221

OCT 21 1994

RECEIVED
OCT 25 1994
GROUND WATER BUREAU

Mr. Clint Marshall, Geologist III
New Mexico Environment Department
Ground Water Bureau
P. O. Box 26110
Santa Fe, New Mexico

Subject: REQUEST FOR CONCURRENCE THAT A DISCHARGE PLAN IS NOT REQUIRED FOR THE WASTE ISOLATION PILOT PLANT CULEBRA TRACER INJECTION TEST PROGRAM

Dear Mr. Marshall:

The U. S. Department of Energy, Carlsbad Area Office (DOE-CAO) is requesting written concurrence that a Part 3-100 Discharge Plan will not be required for the proposed Culebra Transport Test Programs under development by Sandia National Laboratories at the Waste Isolation Pilot Plant (WIPP).. The Culebra Transport Test Program is designed to collect additional hydrogeologic characterization data from the Culebra, and perhaps Rustler formation, to test hydrological models for the WIPP Performance Assessment.

To accomplish this, Sandia National Laboratories proposed to establish up to 10 hydrologic test wells located along the principle flow path of the Culebra aquifer. Most of the new test wells will be located on the new H-19 hydropad. Three existing wells in the vicinity of the H-19 hydropad and several new wells strategically located around H-19 will be used to monitor pressure responses associated with the hydrologic tracer tests being conducted at the H-19 hydropad.

The DOE-CAO believes that this project should be exempted from the discharge plan requirements because the existing concentration of ground water in adjacent wells exceeds 10,000 mg/l Total Dissolved Solids (TDS). Additionally, none of the proposed tracer chemicals are listed in the New Mexico Water Quality Control Regulations, Part 1-101(UU), *Toxic Pollutants*, or Part 3-103, *Standards for Ground Water of 10,000 mg/l TDS Concentration or Less*.

A copy of water quality data from two existing wells located within one-half mile of the H-19 hydropad, and a list of proposed tracer chemicals are enclosed to support our request for concurrence that a Discharge Plan is not required for the Tracer Test project.

printed on recycled paper

If you have any questions about this proposed project or require any additional information, please contact Ms. M. E. Bennington at (505) 234-8132.

Sincerely,

E. K. Hunter

E. K. Hunter, Chief
WIPP Site Branch

Enclosure

cc w/o enclosure:
P. McCasland, NMED, Site
M. Bennington, CAO
D. Robertson, WID

WQSP:. H-03b3
ORIGINATOR: R.G.R.
DATE PRINTED: 09-30-93

CHARGE BALANCE FORMULAS
& TDS CALCULATIONS
H-03b3, CULEBRA, ROUND EIGHT
(RAS ANALYSIS)

	VALUE mg/l	ATOMIC/MOLE WEIGHT	CHARGE UNITS	meq/l
CATIONS				
SODIUM (AA)	12100.00	22.99	1	526.32
POTASSIUM (AA)	448.00	39.10	1	11.46
MAGNESIUM (ICP)	621.00	24.31	2	51.09
CALCIUM (ICP)	1210.00	40.08	2	60.38
BORON	22.50	10.81	3	6.24
SILICA	9.83	28.81	2	0.68
SUM OF CATIONS	14411.33	SUM OF CATION CHARGES		656.17
ANIONS				
CHLORIDE	26700.00	35.45	1	753.11
SULFATE	5275.00	96.05	2	109.84
IODIDE	0.00	126.90	1	0.00
BROMIDE	26.60	79.91	1	0.33
FLUORIDE	1.27	19.00	1	0.07
FIELD HCO3*	51.20	61.01	1	0.84
HCO3 CONVERT TO CO3**	25.18			
SUM OF ANIONS	32028.05	SUM OF ANION CHARGES		864.19
TOTAL DISSOLVED SOLIDS	52500.00	CHARGE DIFFERENCE		208.02
FIELD CONDUCTIVITY	68400.00	% CHARGE DIFFERENCE		13.68
FIELD COND./TDS	1.30			

*FIELD HCO3 UTILIZED FOR CHARGE BALANCE CALCULATION.
**FIELD HCO3 CONVERTED TO EQUIVALENT CO3 FOR SUMMATION OF ANIONS AND TDS

TABLE 2.13.2

ITAS FINAL RESULTS

DOE-1 CULEBRA

GENERAL CHEMISTRY

PARAMETER	SAMPLE	DUPLICATE SAMPLE	UNITS	DATE COLLECTED
ALKALINITY, BICARBONATE	44	40	mg/l	07/28/87
ALKALINITY, CARBONATE	0	0	mg/l	07/28/87
BROMIDE	61	N/A	mg/l	07/28/87
CHLORIDE	(81,000) *	N/A	mg/l	07/28/87
CYANIDE, TOTAL	<0.02	N/A	mg/l	07/28/87
FLUORIDE	0.8	N/A	mg/l	07/28/87
IODIDE	<2	<2	mg/l	07/28/87
NITRATE	3.4	N/A	mg/l NO3-N	07/28/87
pH	6.47	6.50	pH UNITS	07/28/87
PHENOLICS	0.012 *	N/A	mg/l	07/28/87
PHOSPHATE, TOTAL	0.01	0.04	mg/l T-PO4-P	07/28/87
RESIDUE, FILTERABLE @180 C	130,000	140,000	mg/l	07/28/87
RESIDUE, NONFILTERABLE @105 C	460	440	mg/l	07/28/87
SPECIFIC CONDUCTANCE	222,000	232,000	umhos/cm @25C	07/28/87
SULFATE	6,700	N/A	mg/l	07/28/87
TOTAL ORGANIC CARBON	1	1	mg/l	07/28/87
TOTAL ORGANIC HALIDES	9.7	N/A	mg/l	07/28/87

* See section 3.0

Thus, up to 17 wells are involved; ten test wells along the principal Culebra flow path, and seven monitoring wells which may or may not lie along this flow path.

Additional Monitoring and Required Coordination With Westinghouse

Additional fluid level monitoring for these tests could be carried on at any of the existing wells monitored by the Environmental Monitoring Group of the Westinghouse Waste Isolation Division (WID). Such monitoring and indeed many phases of this activity will require coordination and consent of many groups within the Waste Isolation Division, Environmental Monitoring Group, Regulatory Group, and Industrial Safety and Radiation Safety Group.

Further Details on the Proposed Hydropad and Monitoring Wells

The proposed hydrologic testing or monitoring wells will be drilled to an approximate depth of 800 ft. The wells will be constructed with a smaller (compared to oil field rigs) diamond core/wireline coring/minerals industry rig, a sonic rig, or an environmental drilling rig. The other types of rigs are about 1/3 the size of an oil field rig rated to the same depth. The volume of their drilling fluid systems is about 1/5 that of an oil field rig rated to the same depth. These smaller rigs and their drilling fluid system have a much smaller environmental impact/"footprint" than standard oil field rigs common to the Permian Basin. While the exact well design has not been determined, the wells, with one exception, will be similar in construction to H-18, shown in Figure 2a. Core, 3.5-inch o.d., will be taken from the Culebra in these wells. However, 6-inch o.d. core from the Culebra will be required from one well on the H-19 hydropad in addition to the 3.5-inch core from the top to the Culebra; a preliminary well design for this well is shown in Figure 2b. Figure 5 shows a possible hole configuration for a Convergent-Flow Tracer Test. The large well (Figure 2b) will be the pumping well. The other wells on H-19 will be tracer-injection wells.

Reentry Into Additional Wells Not Annotated In Earlier Culebra Transport Program Checklist

Prior to the construction of the H-19 hydropad and the drilling of the hydrologic testing wells on that pad, the drilling of additional new monitoring wells, and the possible deepening of the H-3d well, certain wells at the H-3 hydropad and the H-11 hydropad will be reentered, and may be cleaned out and worked over. The reentry into any H-3 and H-11 wells, with associated geophysical logging operations, was approved on an earlier National Environmental Policy Act (NEPA) checklist for the Culebra Transport Program, dated June/July 1993. Some work is already underway on the H-11 hydropad under that earlier checklist.

Potential Tracers for Use in the Culebra Transport Test Program

CAS Number	Chemical Names
433-97-6	Ortho-Trifluoromethy Benzoic Acid
454-92-2	A,A,A-Trifluoro-Meta-Toluic Acid
455-24-3	A,A,A-Trifluoro-P-Toluic Acid
4519-39-5	2,3-Difluorobenzoic Acid
1583-58-0	2,4-Difluorobenzoic Acid
2991-28-8	2,5-Difluorobenzoic Acid
385-00-2	2,6-Difluorobenzoic Acid
455-86-7	3,4-Difluorobenzoic Acid
455-40-3	3,5-Difluorobenzoic Acid
61079-72-9	2,3,4-Trifluorobenzoic Acid
2358-29-4	2,3,6-Trifluorobenzoic Acid
446-17-3	2,4,5-Trifluorobenzoic Acid
28314-80-9	2,4,6-Trifluorobenzoic Acid
121602-93-5	3,4,5-Trifluorobenzoic Acid
1201-31-6	2,3,4,5-Tetrafluorobenzoic Acid
652-18-6	2,3,5,6-Tetrafluorobenzoic Acid
602-94-8	Pentafluorobenzoic Acid
599-00-8	Trifluoroacetic Acid-d
422-64-0	Pentafluoropropionic Acid
375-22-4	Heptafluorobutyric Acid
451-69-4	2-Fluorocinnamic Acid
20595-30-6	Trans-3-Fluorocinnamic Acid
459-32-5	4-Fluorocinnamic Acid
94977-52-3	Trans-2,4-Difluorocinnamic Acid
112898-33-6	Trans-2,5-Difluorocinnamic Acid
102082-89-3	Trans-2,6-Difluorocinnamic Acid
112897-97-9	Trans-3,4-Difluorocinnamic Acid
84315-23-1	3,5-Difluorocinnamic Acid

50-45-3	2,3-Dichlorobenzoic Acid
50-84-0	2,4-Dichlorobenzoic Acid
50-79-3	2,5-Dichlorobenzoic Acid
50-30-6	2,6-Dichlorobenzoic Acid
51-44-5	3,4-Dichlorobenzoic Acid
51-36-5	3,5-Dichlorobenzoic Acid
50-73-7	2,3,5-Trichlorobenzoic Acid
50-31-7	2,3,6-Trichlorobenzoic Acid
50-82-8	2,4,5-Trichlorobenzoic Acid
50-43-1	2,4,6-Trichlorobenzoic Acid
345-16-4	5-Fluorosalicylic Acid
320-72-9	3,5-Dichlorosalicylic Acid
652-03-9	Tetrafluorophthalic Acid
2321-07-5	Fluorescein
7647-15-6	Sodium Bromide
7681-82-5	Sodium Iodide
7447-41-8	Lithium Chloride
2551-62-4	Sulfur Hexafluoride
81-88-9	Tetraethylrhodamine
3520-42-1	Sulforhodamine B
518-47-8	Uranine
7789-20-0	Deuterium Oxide
1310-58-3	Potassium Hydroxide

WASTE ISOLATION DIVISION
ENVIRONMENT, SAFETY, & HEALTH
FACSIMILE TRANSMITTAL ROUTING SHEET
TELEFAX NUMBER (505) 885-4562

Pages: 6 Date: 10/11/94 Time: 12:35
(including cover)

To: CLINT MARSHALL
Location: NMED GROUND WATER BUREAU
Fax: 505 827-2965

From: DAN ROBERTSON
Location: WIPP SITE
Phone/Fax #: (505) 234-8240 FAX (505) 885-4562

Special Instructions: HERE IS THE INFORMATION WE DISCUSSED THIS MORNING. PLEASE NOTE ALL ANALYSES ARE TOTAL CONCENTRATIONS FOR AN AQUEOUS SLUDGE OF SALT, SOIL AND BRINE WATER

WASTE ISOLATION PILOT PLANT
WIPP

Authorization to Discharge Unpermitted, Non-Hazardous Effluent into the WIPP Sewage Treatment Facility

Name: DAN ROBERTSON

Signature: [signature]

Date: 10/11/94

Department/Section: ENVIRONMENTAL COMPLIANCE AND SUPPORT

Origin of Effluent: FORMATION FLOW AND SALT DEBRIS PUMPED FROM THE WIPP WASTE SHAFT SUMP. EFFLUENT CONTAINS 10-20% SOLIDS. REQUEST NMED GROUND WATER BUREAU PERMISSION TO DISCHARGE EFFLUENT TO THE WIPP SALT PILE EVAPORATION POND. THIS POND WAS FORMERLY PERMITTED FOR SUMP EFFLUENT DISCHARGES

Type of Effluent: WATER, DIRT & SALT DEBRIS
(In gallons)

Restrictions on Discharge:

- [x] Effluent has been characterized and the generation process has not changed: (Attach analytical results to the discharge form and submit to Environmental Compliance and Support for signature.) (SEE ATTACHED ANALYSES)
- [ ] Effluent Characterization is Required: (Attach sampling results to the discharge request form and return to Environmental Compliance and Support for submittal to NMED for discharge authorization signature.)

Authorization Signatures:

1. Authorization Signature: [signature] Date: 10/11/94
   (Environmental Compliance and Support (EC&S))
2. Authorization Signature: Mary E. [signature] Date: 10/11/94
   (DOE Environmental, Safety and Health)
3. Authorization Signature: Clint Marshall Date: 10/12/94
   (NMED Groundwater Bureau)
4. Authorization Signature: Date:
   (Environmental Monitoring (EM) Section)

Halliburton NUS
CORPORATION

NUS LABORATORY
Two Marquis Office Plaza, Suite 200
5313 Campbells Run Road
Pittsburgh, Pennsylvania 15205

(412) 747-2560
FAX: (412) 747-2684

September 03, 1993
Report No.: 00016786
Section A Page 5

LABORATORY ANALYSIS REPORT

NUS CLIENT NO: 0527 0027
WORK ORDER NO: 55830
VENDOR NO: 01830782

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. DAN ROBERTSON

Carbon Copy: MR. RIJK MORAWE

DATE SAMPLED: 16-AUG-93
DATE RECEIVED: 17-AUG-93
APPROVED BY: Chuck Kieda

SAMPLE ID: HE-WHS-19930816-1.4
NUS SAMPLE NO: P0245281
P.O. NO.: 50846

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	1490	pH	7.7	

COMMENTS:

Halliburton NUS
CORPORATION

NUS LABORATORY
Two Marquis Office Plaza, Suite 200
5313 Campbells Run Road
Pittsburgh, Pennsylvania 15205

(412) 747-2580
FAX: (412) 747-2684

September 03, 1993
Report No.: 00016786
Section A Page 6

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. DAN ROBERTSON

NUS CLIENT NO: 0527 0027
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy: MR. RIJK MORAWE

SAMPLE ID: HE-WHS-19930816-2.4
NUS SAMPLE NO: P0245282
P.O. NO.: 50846

DATE SAMPLED: 16-AUG-93
DATE RECEIVED: 17-AUG-93
APPROVED BY: Chuck Kieda

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	AASW	Arsenic, Total (As)	0.3	mg/L
2	ABAW	Barium, Total (Ba)	3.1	mg/L
3	ACDW	Cadmium, Total (Cd)	< 0.005	mg/L
4	ACRW	Chromium, Total (Cr)	< 0.01	mg/L
5	APBW	Lead, Total (Pb)	1.1	mg/L
6	AHGW	Mercury, Total (Hg)	< 0.0002	mg/L
7	ASEW	Selenium, Total (Se)	< 0.1	mg/L
8	AAGW	Silver, Total (Ag)	< 0.01	mg/L

COMMENTS:

Halliburton NUS
CORPORATION

NUS LABORATORY
Two Marquis Office Plaza, Suite 200
5313 Campbells Run Road
Pittsburgh, Pennsylvania 15205

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FAX: (412) 747-2684

September 03, 1993
Report No.: 00016786
Section A Page 7

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. DAN ROBERTSON

NUS CLIENT NO: 0527 0027
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy: MR. RIJK MORAWE

SAMPLE ID: HE-WHS-19930816-3.4
NUS SAMPLE NO: P0245283
P.O. NO.: 50846

DATE SAMPLED: 16-AUG-93
DATE RECEIVED: 17-AUG-93
APPROVED BY: Chuck Kieda

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	1685	Petroleum Hydrocarbons	14	mg/L

COMMENTS:

Halliburton NUS
CORPORATION

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Pittsburgh, Pennsylvania 15205

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FAX: (412) 747-2684

September 03, 1993
Report No.: 00016786
Section A Page 8

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. DAN ROBERTSON

NUS CLIENT NO: 0527 0027
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy: MR. RIJK MORAWE

SAMPLE ID: HE-WHS-19930816-4.4
NUS SAMPLE NO: P0245284
P.O. NO.: 50846

DATE SAMPLED: 16-AUG-93
DATE RECEIVED: 17-AUG-93
APPROVED BY: Chuck Kieda

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	1680	Oil and Grease, Gravimetric	62	mg/L

COMMENTS:

Faxed 10-26-93
885-4562

Authorization to Discharge Unpermitted, Non-Hazardous Effluent into the WIPP Sewage Treatment Facility

Faxed 10-26-93
Original sent 10-26-93

Name: MIKE ATWOOD

Signature: Mike Atwood

Date: 10/21/93

Department/Section: HOISTING MAINTENAINCE

Origin of Effluent: RAIN OR STORMWATER FLOW COLLECTED IN THE SUMP OF THE EMERGENCY PORTABLE DIESEL HOIST

Type of Effluent: (in gallons) RAIN WATER (APPROXIMATELY 80 GALLONS

Restrictions on Discharge:

☐ Effluent has been characterized and the generation process has not changed: (Attach analytical results to the discharge form and submit to Environmental Compliance and Support for signature.)

☑ Effluent Characterization is Required: (Attach sampling results to the discharge request form and return to Environmental Compliance and Support for submittal to NMED for discharge authorization signature.)

Authorization Signatures:

1. Authorization Signature: [signature] (Environmental Compliance and Support (EC&S)) Date: 10/21/93
2. Authorization Signature: Mary E. Bennington (DOE Environmental, Safety and Health) Date: 10/22/93
3. Authorization Signature: Clint Marshall (NMED Groundwater Bureau) Date: 10/28/93
4. Authorization Signature: (Environmental Monitoring (EM) Section) Date:

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FAX: (412) 747-2684

September 16, 1993
Report No.: 00016973
Section A Page 20

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88220-
ATTENTION: MR. JOHN GRAN

NUS CLIENT NO: 0527 0028
WORK ORDER NO: 55030
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-040A
NUS SAMPLE NO: P0246633
P.O. NO.: 50846

DATE SAMPLED: 27-AUG-93
DATE RECEIVED: 30-AUG-93
APPROVED BY: Chuck Kieda

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OSVPPW	SEMIVOLATILE EXTRACTABLES		
		1,2,4-trichlorobenzene	< 10	ug/L
		1,2-dichlorobenzene [o-dichlorobenzene]	< 10	ug/L
		1,2-diphenylhydrazine (as azobenzene)	< 20	ug/L
		1,3-dichlorobenzene [m-dichlorobenzene]	< 10	ug/L
		1,4-dichlorobenzene [p-dichlorobenzene]	< 10	ug/L
		2,4,6-trichlorophenol	< 10	ug/L
		2,4-dichlorophenol	< 10	ug/L
		2,4-dimethylphenol	< 10	ug/L
		2,4-dinitrophenol	< 50	ug/L
		2,4-dinitrotoluene	< 10	ug/L
		2,6-dinitrotoluene	< 10	ug/L
		2-chloronaphthalene	< 10	ug/L
		2-chlorophenol	< 10	ug/L
		2-methyl-4,6-dinitrophenol [4,6-dinitro-o-cresol]	< 50	ug/L
		2-nitrophenol	< 10	ug/L
		3,3'-dichlorobenzidine	< 20	ug/L
		3,4-benzofluoranthene [benzo(b)fluoranthene]	< 10	ug/L
		4-bromophenyl phenyl ether	< 10	ug/L
		4-chloro-3-methylphenol [p-chloro-m-cresol]	< 10	ug/L
		4-chlorophenyl phenyl ether	< 10	ug/L
		4-nitrophenol	< 50	ug/L
		N-nitrosodi-n-propylamine	< 10	ug/L
		N-nitrosodimethylamine	< 10	ug/L
		N-nitrosodiphenylamine	< 10	ug/L
		acenaphthene	< 10	ug/L
		acenaphthylene	< 10	ug/L
		anthracene	< 10	ug/L
		benzidine	< 50	ug/L
		benzo(a)anthracene	< 10	ug/L
		benzo(a)pyrene	< 10	ug/L

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September 16, 1993
Report No.: 00016973
Section A Page 21

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
SAMPLE ID: WIPP-040A
NUS SAMPLE NO: P0246633

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		[illegible]	[illegible] 10	[illegible]
		benzo(k)fluoranthene	< 10	ug/L
		benzyl butyl phthalate	< 10	ug/L
		bis(2-chloroethoxy)methane	< 10	ug/L
		bis(2-chloroethyl)ether	< 10	ug/L
		bis(2-chloroisopropyl)ether [2,2'-oxybis(1-chloropropane)]	< 10	ug/L
		bis(2-ethylhexyl)phthalate	8 J	ug/L
		chrysene	< 10	ug/L
		di-n-butyl phthalate	18	ug/L
		di-n-octyl phthalate	61	ug/L
		dibenz(a,h)anthracene	< 10	ug/L
		diethyl phthalate	< 10	ug/L
		dimethyl phthalate	< 10	ug/L
		fluoranthene	< 10	ug/L
		fluorene	< 10	ug/L
		hexachlorobenzene	< 10	ug/L
		hexachlorobutadiene	< 10	ug/L
		hexachlorocyclopentadiene	< 10	ug/L
		hexachloroethane	< 10	ug/L
		indeno(1,2,3-cd)pyrene	< 10	ug/L
		isophorone	< 10	ug/L
		naphthalene	< 10	ug/L
		nitrobenzene	< 10	ug/L
		pentachlorophenol	< 50	ug/L
		phenanthrene	< 10	ug/L
		phenol	< 10	ug/L
		pyrene	< 10	ug/L
3	OSV7	LIBRARY SEARCH - SEMIVOLATILES	DONE	
		[TIC01] disulfide, bis (1,1-dimethyl)-	16 J	ug/L
		[TIC02] unknown	49 J	ug/L
		[TIC03] propane, 2,2-dimethyl-	66 J	ug/L
		[TIC04] unknown	26 J	ug/L
		[TIC05] unknown	21 J	ug/L
		[TIC06] 2-mercaptobenzothiazole	52 J	ug/L
		[TIC07] eicosene, 10-methyl	20 J	ug/L
		[TIC08] alkane	38 J	ug/L
		[TIC09] alkane	30 J	ug/L
		[TIC10] alkane	39 J	ug/L
		[TIC11] pentatriacontane	36 J	ug/L

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September 16, 1993
Report No.: 00016973
Section A Page 22

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
SAMPLE ID: WIPP-040A
NUS SAMPLE NO: P0246633

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		[TIC12] unknown	40 J	ug/L
		[TIC13] eicosane, 7-hexyl	96 J	ug/L
		[TIC14] phthalate ester	60 J	ug/L
		[TIC15] unknown	65 J	ug/L
		[TIC16] docosane	76 J	ug/L
		[TIC17] pentacosane	48 J	ug/L
		[TIC18] unknown	20 J	ug/L
		[TIC19] 4-decene, 7-methyl	46 J	ug/L
		[TIC20] octacosane	21 J	ug/L

COMMENTS:

1 "J" [for target analytes] indicates that the result is below the normal sample reporting limit.

3 "J" [for compounds identified during library search] indicates that the result is an estimate.

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CORPORATION

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September 16, 1993
Report No.: 00016973
Section A Page 23

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88220-
ATTENTION: MR. JOHN GRAN

NUS CLIENT NO: 0527 0028
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-040B
NUS SAMPLE NO: P0246634
P.O. NO.: 50846

DATE SAMPLED: 27-AUG-93
DATE RECEIVED: 30-AUG-93
APPROVED BY: Chuck Kieda

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	1685	Petroleum Hydrocarbons	10	mg/L

COMMENTS:

Halliburton NUS CORPORATION

NUS LABORATORY
Two Marquis Office Plaza, Suite 200
5313 Campbells Run Road
Pittsburgh, Pennsylvania 15205

(412) 747-2580
FAX: (412) 747-2684

September 16, 1993
Report No.: 00016973
Section A Page 24

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISOL PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88220-
ATTENTION: MR. JOHN GRAN

NUS CLIENT NO: 0527 0028
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-040C
NUS SAMPLE NO: P0246635
P.O. NO.: 50846

DATE SAMPLED: 27-AUG-93
DATE RECEIVED: 30-AUG-93
APPROVED BY: Chuck Kleda

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	AASW	Arsenic, Total (As)	< 0.1	mg/L
2	ABAW	Barium, Total (Ba)	0.044	mg/L
3	ACDW	Cadmium, Total (Cd)	< 0.005	mg/L
4	ACRW	Chromium, Total (Cr)	< 0.01	mg/L
5	APBW	Lead, Total (Pb)	< 0.05	mg/L
6	AHGW	Mercury, Total (Hg)	< 0.0002	mg/L
7	ASEW	Selenium, Total (Se)	< 0.1	mg/L
8	AAGW	Silver, Total (Ag)	< 0.1	mg/L

COMMENTS:

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT

September 16, 1993

Mr. Arlen E. Hunt, Manager
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, NM 88221

RE: 60-Day Extension for Brine Discharge at WIPP, DP-831

Dear Mr. Hunt:

Pursuant to Water Quality Control Commission (WQCC) Reg. 3-109, the proposed 60 day extension to discharge nonhazardous brine water into the existing salt pile evaporation pond at the Waste Isolation Pilot Plant (WIPP), is hereby approved. The facility is located approximately 30 miles east of Carlsbad in Section 29.142, T22S, R31E, Eddy County. In approving this extension, the New Mexico Environment Department has determined that the requirements of WQCC Reg. 3-109.C have been met.

The proposed discharge is briefly described as follows: Up to 1500 gallons per day of nonhazardous brine water will be discharged into the salt pile evaporation pond for a period not to exceed 60 days from the date of this letter. The original time period of 18 months is stated as a specific requirement of discharge plan #831 as approved on January 16, 1992. This condition was included to allow time for the construction of the proposed new evaporation lagoons.

This approval is contingent on your discharging as described in your discharge plan application received by our office on November 14, 1991.

This approval does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, such as zoning requirements and nuisance ordinances. Also this approval does not relieve you of liability should your operation result in actual pollution of surface or ground waters.

Bruce King
Governor

Judith M. Espinosa
Secretary

Ron Curry
Deputy Secretary

Harold Runnels Building
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502
(505) 827-2850
FAX (505) 827-2836

DRUG FREE

If you have any questions regarding this matter, please contact Clint Marshall at 827-0027.

Sincerely,

Marcy Leavitt, Acting Chief
Ground Water Protection &
Remediation Bureau

CLM:clm

cc: Garrison McCaslin, District Manager, NMED District IV
Thomas Burt, HPM, NMED District IV, Carlsbad
Dan Robertson, Environmental Coordinator, P.O. Box 3090, Carlsbad NM 88221

5-7

ENVIRONMENT DEPARTMENT ROUTING SLIP

LETTER / MEMO TO: Mr. Arlen Hunt

FOR SIGNATURE / APPROVAL BY: Marcy Leavitt

DRAFTED BY: Clint Marshall DATE 9-17-93

SUBJECT: 60-Day Extension for brine disposal at WIPP

FINAL DECISION NEEDED BY: 9-16-93 REASON dated letter

FEES RECEIVED? FIRST YEAR ☐ FULL PAYMENT ☐

REVIEW:

APPROVED:

Name	Title	INITIAL	DATE REC'D	DATE APRV'D
Karen McCormack	SUPERVISOR	KM	9-16-93	9-17-93
Marcy Leavitt	PROGRAM MANAGER	ML		9/17/93
Steven J. Cary	BUREAU CHIEF			
	GRANTS			
	ACCOUNTING			
	BUDGETS			
	LEGAL REVIEW			
	ASD DIRECTOR			
Kathleen Sisneros	WWM DIRECTOR			
	ERD DIRECTOR			
Ron Curry	DEPUTY SECRETARY			
Judith Espinosa	SECRETARY			

COMMENTS BY DRAFTER OR REVIEWER(S):

Clint

State of New Mexico
ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2850

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

August 24,1993

Dear Concerned Citizen:

Enclosed is a fact sheet regarding the New Mexico hazardous waste draft permit that the New Mexico Environment Department (NMED) and the Hazardous And Solid Waste Amendments of 1984 (HSWA) draft permit that the Environmental Protection Agency (EPA) propose to issue for the Waste Isolation Pilot Plant (WIPP).

The U.S. Department of Energy and the Waste Isolation Division of the Westinghouse Electric Corporation have requested a hazardous waste permit from the State of New Mexico to receive and manage hazardous waste at the WIPP site located approximately 26 miles east of the City of Carlsbad.

The HSWA permit proposed by the EPA implements the requirements imposed by the HSWA, such as hazardous waste minimization, hazardous waste process vents and corrective action to investigate possible releases from Solid Waste Management Units (SWMUs).

Copies of the proposed permits are available for review from August 30, 1993 through November 1, 1993 at the office of the NMED Hazardous and Radioactive Bureau (HRMB), 525 Camino De Los Marquez, Suite 4, P.O. Box 26110, Santa Fe, New Mexico 87502, during the hours of 8:00 A.M. to 5:00 P.M. and at the locations listed below:

SANTA FE
Ms. Norma McCallum
New Mexico State Library
325 Don Gaspar
Santa Fe, New Mexico 87503
(505) 827-3800

SOCORRO
Reference Librarian
Martin Speare Memorial Library
New Mexico Institute of Mining and Technology
Campus Station
Socorro, New Mexico 87801
(505) 835-5614

HOBBS
Ms. Ruth Hill / Ms. Gale Robinson
Pannell Library
New Mexico Junior College
Hobbs, New Mexico 88240
(505) 392-5473

LAS CRUCES
Reference Librarian
Thomas Brannigan Memorial Library
200 E. Picacho
Las Cruces, New Mexico 88005
(505) 526-1045

ALBUQUERQUE

Mrs. Diana Zepeda
WIPP Reading Room
National Atomic Museum
USDOE - Albuquerque
Operations Office
P.O. Box 5400
Albuquerque, New Mexico 87115
(505) 845-6670

Albuquerque Public Library
501 Copper Avenue NW
Albuquerque, New Mexico 87138
(505) 768-5140

Mrs. Glenda Sweatt
SNL Waste Management and
Transportation Library
Organization 6332
P.O. Box 5800
Albuquerque, New Mexico 87185
(505) 844-2416

Ms. Kathleen Keating
Zimmerman Library
Govt. Publications Office
University of New Mexico
Albuquerque, New Mexico 87138
(505) 277-2003

ROSWELL

Reference Librarian
Roswell Public Library
301 N. Pennsylvania
Roswell, New Mexico 88201
(505) 622-7101

CARSLBAD

Ms. Mary Elms
Carlsbad Public Library
101 S. Halaguero Street
Carlsbad, New Mexico 88220
(505) 885-6776

RATON

Mr. Richard Azar
Raton Public Library
244 Cook Avenue
Raton, New Mexico 87740
(505) 455-9711

OUT OF STATE

Document Control
Office of Science and
Technical Information
Technical Information Center
P.O. Box 62
Oak Ridge, Tennessee 37830

Mr. John T. Conway, Chairman
Defense Nuclear Facilities
Safety Board
625 Indiana Avenue NW
Suite 700
Washington, D.C. 20004

Mr. Rich Mayer, EPA Library
EPA Region 6
1445 Ross Avenue
Dallas, Texas 75202
(214) 655-7442

Ms. Joan Ogbazghi
DOE/Forrestal Building
Public Library Reading Room
AD - 234.1
FOI - USDOE
1000 Independence Avenue SW
Washington, D.C. 20585

Ms. Christine Shaver
Environmental Defense Fund
1495 Arapahoe Avenue
Boulder, Colorado 80302
(303) 440-4901

Please call the location of your choice for open hours if you wish to review the draft permits. Comments on either of these draft permits must be in writing and must be received by the NMED HRMB Attention: Ms. Barbara Hoditschek at the Santa Fe address mentioned above for the hazardous waste permit proposed by the NMED, Draft Permit Modules I through V, and at the following address for the HSWA permit proposed by EPA, Draft Permit Module VI:

Mr. Bill Honker, Chief
Hazardous Waste Permits Branch
US EPA, Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Please submit your comments by November 1, 1993. The Draft Permits may be modified based on comments received during the comment period.

The NMED Secretary has decided that public hearings will be held on the draft permits. Public notice on the hearings schedule will be given at a later date.

If you have any questions regarding the proposed hazardous waste permit, please contact me at (505) 827-4308. For questions concerning the HSWA permit contact Rich Mayer of the EPA Region 6 office in Dallas, Texas at (214) 655-7442.

Sincerely,

Judith M. Espinosa

Judith M. Espinosa, Secretary
New Mexico Environment Department

MEMORANDUM OF MEETING OR PHONE CONVERSATION

☐ Telephone ☑ Meeting | Time 2:06 | Date 9/14/93

Individuals Involved

Dan. Robertson
Beth. Bennington
Clint Marshall

Subject Discharge Form -
30 (or 60) day extension of brine discharge

Discussion I told Dan and Beth that the form for miscellaneous discharge into the sewage lagoon would be fine. ~~[illegible]~~ Each time a form is transmitted, I will follow it up with a confirmation letter.

Asked them ~~[illegible]~~ if 30 day extension of brine disposal into the salt stock runoff pond would be enough. They said 60 days would be better. I said no problem.

Conclusions Write up 60 day extension approval letter.

Distribution File

Initialed

8/89

FACT SHEET

Intent to Issue Permits for the Operation of
A Hazardous Waste Storage Facility under the
New Mexico Hazardous Waste Act (NMHWA)
and the Hazardous and Solid Waste Amendments of 1984 (HSWA)

Waste Isolation Pilot Plant (WIPP)
Carlsbad, New Mexico

Facility Name:	Waste Isolation Pilot Plant (WIPP)
EPA ID Number:	NM4890139088
Location:	The facility is located north of Jal Highway (State Highway 128) in Eddy County, New Mexico. The facility consists of 16 sections of federal land in Township 22 South, Range 31 East. The WIPP site is located approximately 20 miles east of Loving, and 26 miles east of Carlsbad.
Landowner:	U.S. Department of Energy (DOE)
Operator:	Westinghouse Electric Corporation Waste Isolation Division

Introduction of Facility and Purpose of Permit:

The U.S. Department of Energy (DOE) and the Waste Isolation Division (WID) of the Westinghouse Electric Corporation have requested permits from the State of New Mexico and the Environmental Protection Agency (EPA) to receive and manage hazardous waste at the Waste Isolation Pilot Plant (WIPP). The WIPP is located in southeastern New Mexico, approximately 26 miles east of the city of Carlsbad. In 1980, Congress authorized WIPP "for the express purpose of providing a research and development facility to demonstrate the safe disposal of radioactive waste resulting from the defense activities and programs of the United States." This research will be conducted during a "test phase," during which various tests or experiments will be performed to assess WIPP's viability for long-term disposal. DOE has indicated that it must manage TRU-mixed waste within the WIPP during the test phase. The waste will be transferred to WIPP from only two sites, the Idaho National Engineering Laboratory (INEL) and the Rocky Flats Plant (RFP) in Colorado. TRU-mixed waste contains both transuranic radioactive and a hazardous waste component(s), and the hazardous waste component is regulated under the New Mexico Hazardous Waste Regulations (HWMR-7). Since the WIPP will receive hazardous waste from off-site facilities, a permit to operate a hazardous waste storage facility in accordance with HWMR-7 is required for any area of the WIPP where waste will be stored.

The WIPP facility consists of surface buildings and structures, an underground network of subsurface mined openings and vertical shafts which connect the surface and subsurface areas. The New Mexico Environment Department (NMED) received a permit application from DOE and WID which requested a permit to operate a hazardous waste container storage area in the Waste Handling Building and to operate two miscellaneous hazardous waste management (Subpart X) units within a portion of the subsurface mined openings. The NMED has reviewed the permit application and determined that the application, as modified by the conditions of the draft permit, adequately addresses the requirements of the New Mexico Hazardous Waste Act and the New Mexico Hazardous Waste Management Regulations.

The State permit to operate the hazardous waste management units at the WIPP will be issued to both the owner and operator of the WIPP. The permit will allow the owner and operator to store hazardous waste within the Waste Handling Building and within Bin Scale Test Rooms 1 and 3 of Panel 1 in the underground mined openings, under specific conditions cited within the permit. The permit will be issued for storage of waste during the test phase only, and the term of the permit will be 10 years. The permit will only allow the owner and operator to receive contact handled (CH) TRU-mixed waste. The permit will not allow disposal of TRU-mixed waste and will require the complete removal of hazardous waste and hazardous waste constituents from the facility prior to the expiration of the permit, unless a new or revised permit is issued.

The NMED has based the State draft permit on Revision 3 of the RCRA Part B permit application submitted by DOE and WID, as well as associated attachments and clarifying information submitted by the Permittees. In addition to NMED HWMR-7 requirements and EPA HSWA requirements, WIPP must meet additional requirements of a number of other agencies and statues which have jurisdiction or regulatory authority over operations at the WIPP facility. The DOE and WID have and will continue to generate plans and procedures documents in response to requirements of these other agencies or statutes. The NMED understands that many of these documents will discuss issues related both directly and indirectly to topics/etc. addressed within the State draft permit. Issues discussed in documents prepared to meet requirements of other regulations include the types and quantities of TRU-mixed waste, the types of subsurface rooms used for testing, and the number and types of containers that DOE and WID would like to use for test phase experiments at the WIPP. However, the conditions of the permit issued to DOE and WID by the NMED will supersede all other documents with regard to storage and management of TRU-mixed waste. For example, if the DOE and WID desire to add to the types of TRU-mixed waste, the type of subsurface rooms used for experiments, or the number or type of containers which are used to manage TRU-mixed waste beyond that set forth in the draft permit, then DOE and WID must submit a request for permit modification to the NMED. Any TRU-mixed waste management activity described in a document that is not reflected in the draft permit shall not be allowed unless DOE or WID requests a permit modification. That request shall be subject to public notice and hearing.

There are a number of operational and waste handling activity issues concerning the WIPP which are not within the purview of the draft permit or that NMED does not have statutory or regulatory authority under the New Mexico Hazardous Waste Act or Hazardous Management Waste Regulations. Examples of these issues include: transportation of waste to and from the WIPP, handling and management of radioactive materials and the radioactive component of the TRU-mixed waste; the types of experiments to be conducted at WIPP (except to ensure that the experiments will not result in a release of hazardous waste or constituents); and compliance with regulations enforced by other agencies, such as the Mine Safety and Health Administration.

Description of the Permit:

Joint hazardous waste permits will be issued by both the New Mexico Environment Department (NMED) and the U.S. Environmental Protection Agency. The NMED and the U.S. EPA both must issue permits to the facility in order for WIPP to have a full Resource Conservation and Recovery Act (RCRA) permit to operate.

The permit proposed by the New Mexico Environment Department (NMED), which is found in draft permit modules I through V,under the NMHWA describes the structures, equipment, and procedures WIPP is required to comply with in order to store hazardous mixed waste. Hazardous mixed waste will be stored in specially designed containers in both above- and below-ground locations which are further described in the remainder of the fact sheet.

The permit proposed by the U.S. Environmental Protection Agency (EPA), which is found in draft permit module VI, implements the requirements imposed by the federal Hazardous and Solid Waste Amendments of 1984 (HSWA), such as hazardous waste minimization, hazardous waste land disposal restrictions, air emission standards for hazardous waste process vents, and corrective action to investigate possible releases from Solid Waste Management Units (SWMUs).

Waste to be Managed:

The types of waste to be managed during the Test Phase experiments at the site will be limited to Group I, contact handled (CH), Transuranic (TRU) mixed waste. The TRU-mixed waste designation refers to waste which contains both a transuranic radioactive and a hazardous waste component. TRU-mixed waste accepted at the site will be classified as contact handled waste, which is defined as TRU waste whose external surface (container) dose rate does not exceed 200 mrem per hour. The Group I designation refers to the type of TRU-mixed waste which will be placed into the container, and includes such items as clothing (boots, overalls, gloves etc.), lead shielding, glassware, paper, debris, etc., which are contaminated with hazardous constituents and radioactive components. A more complete definition of the type of waste can be found in Permit Attachment II-1, the Waste Analysis Plan. The State permit also allows the storage of derived wastes, which are mixed wastes generated from on-site operations with the experimental TRU-mixed waste.

Units to be Permitted:

The DOE and WID have requested a hazardous waste permit from the State to operate three hazardous waste management units at the WIPP site. The first unit is a hazardous waste container storage area which will be located above ground within the Waste Handling Building (WHB), which is facility Building #411. The second and third units are miscellaneous hazardous waste management units, which consist of Bin Scale Test Rooms (BSTRs) 1 and 3 located within Panel 1 of the underground mined openings.

Waste Handling Building

The Waste Handling Building (WHB) consists of a totally enclosed area of approximately 84,000 square feet. Of that 84,000 square feet, approximately 36,000 square feet will be permitted to store and manage TRU-mixed waste. The hazardous waste container storage area of the WHB will consist of three distinct interconnected rooms which will manage the waste. The rooms are: (1) Inventory and Preparation Area (IPA), approximately 27,000 square feet; (2) the Site Generated Waste Room (SGWR), approximately 5,250 square feet; and (3) the Overpack and Repair Room (OPRR), approximately 3,750 square feet. These rooms will be used to store TRU-mixed waste consisting of the test phase experiment wastes and "derived" wastes which are generated during the Test Phase and during closure.

The concrete floor, floor trenches and sump of the IPA, SGWR, and OPRR will be covered with an impermeable coating. The WHB ventilation system will be operated in such a manner that the interior of the WHB will be maintained at a lower atmospheric pressure than the outside of the building, thus mitigating potential contaminant release to the atmosphere through openings or air leakage points. The exhaust from the WHB ventilation system will be filtered prior to discharge to the atmosphere. The three areas of the WHB will be permitted to store a total of 172 test bin containers and four 55-gallon drums of derived wastes. It is anticipated that some of the 172 test bins that may be stored will be empty test bins.

During closure of the facility, the IPA room will be permitted to store up to 500, 55-gallon drums of derived waste. Complete decontamination of the two subsurface BSTRs and the WHB could generate relatively significant quantities of waste, necessitating the maximum 500 drum storage capacity during closure. In addition, up to 12 spent activated carbon canisters could be stored in the WHB during closure.

Bin Scale Test Rooms (BSTRs)

The BSTRs 1 and 3 are located within Panel 1 of the subsurface mined openings. The BSTRs are classified as miscellaneous hazardous waste management units since hazardous waste will be stored in units which do not have specific technical standards under New Mexico HWMR-7. The BSTRs are located within the bedded salt of the Salado Formation, and are approximately 2150 feet below the surface. BSTRs 1 and 3 have nominal dimensions of 13 feet high, 33 feet wide and 300 feet long, with an approximate floor area of 9,900 square feet. The two BSTRs will store TRU-mixed waste during test phase experiments as well as "derived" waste which is generated during the test phase. Test bins are carbon steel and polyethylene lined, with a nominal volume of 330 gallons. Each test bin will be completely enclosed in a carbon steel standard waste box/radiological control boundary (SWB/RCB) that has an approximate volume of 410 gallons. The SWB/RCB will also act as secondary containment for the test bin.

Derived waste will be stored in standard 55-gallon steel drums with polyethylene liners. Secondary containment is provided by either over packing four drums into a SWB or placing the drums on a steel portable containment tray.

The capacity of BSTR 1 is 68 test bins to store TRU-mixed waste, 8 empty baseline bins, 16 drums of derived waste within 4 SWBs, and 2 drums on a portable containment tray. BSTR 1 may also store up to 12 spent carbon canisters. The capacity of BSTR 3 is 104 test bins (inside RCBs) and 2 drums of derived waste on a portable containment tray.

Both of the BSTRs have been equipped with an engineering feature which consists of 10-foot long rock bolts, which are designed to enhance room stability. In addition, BSTR 1 has been equipped with a supplementary roof support system consisting of roof bolts, steel channel sets, and a wire rope/wire mesh lacing system to enhance the roof stability. The system is discussed further in Module IV and Permit Attachments III-1, IV-5, and IV-6. The permit application submitted by DOE and WID did not specify that a similar system would be used in BSTR 3. Therefore, the draft permit, under permit conditions IV.B.6 and I.J.1, requires the Permittees to demonstrate to NMED that a supplementary support system which can achieve the same degree of safety as the existing BSTR 1 supplementary system will be in place prior to acceptance of waste in BSTR 3.

Each of the BSTRs is also equipped with a geomechanical monitoring system which allows measurements to be taken to determine the nature and amount of wall, floor and ceiling movements within the BSTR. Analyses of the slat movement around the BSTR will provide advance warning of potential roof stability problems and allow for safe retrieval of waste if required. This system is described more fully in Module IV, and Permit Attachments III-1, IV-5, and IV-6.

Each test bin stored in a BSTR will be connected to an air emission collection, control, and monitoring system designed to prevent the release of volatile organic hazardous constituents to the atmosphere. In addition, the air entering and exiting each BSTR will be monitored on a regular basis to ensure that releases of volatile organic hazardous constituents have not occurred. These systems are more fully addressed in the unit description contained in Module IV, and in Permit Attachments III-1, IV-1, IV-2, and IV-3.

Organization of the Draft Permit:

The WIPP draft permit generally follows the format specified by NMED and used by the Department for other New Mexico permits. The draft permit also incorporates the format specified in the EPA guidance entitled the "Model RCRA Permit for Hazardous Waste Management Facilities," Office of Solid Waste, U.S. Environmental Protection Agency, September, 1988.

The WIPP draft permit is divided into six modules, each which will be briefly described in this fact sheet. The first two modules, Modules I and II, are entitled "General Permit Conditions" and "General Facility Conditions," respectively, and are generally applicable (included within) to all RCRA permits. Module I addresses such issues as permit expiration date, and the Department's authorization to inspect and obtain samples. Module II establishes permit conditions for such issues as security, training, waste analysis, and waste characterization. Module II also addresses emergency procedures (contingency plan) and general closure requirements.

Module III addresses the engineering design and operations of the above ground hazardous waste container storage area referred to as the Waste Handling Building. For example, this module describes the design requirements for the building, the secondary containment system, and the containers used to manage waste. The module also specifies the maximum number of waste containers which can be managed in the unit and how the containers will be managed, stored and inspected to minimize the potential for release of hazardous constituents to the environment. Module IV addresses the same issues concerning the design and operation of the Bin Scale Test Rooms (BSTRs) which are located in the subsurface mined openings. Module V addresses the groundwater monitoring program requirements for the WIPP facility. Module VI contains permit conditions that are required by the Hazardous and Solid Waste Amendments of 1984 (HSWA) under EPA authority.

Draft Permit Issues:

This section of the fact sheet addresses conditions within the permit which may be of widespread public interest or that may raise issues of concern. In order to facilitate public review, issues and conditions are discussed by permit module.

Module I

Module I of the draft permit contains a compliance schedule which is included as permit conditions I.J.1 through I.J.13. Under HWMR-7, pt. IX and 40 CFR 270.33, a permit may include a schedule of compliance which requires the facility to submit certain information or documents within a specified time period. The draft permit contains several compliance schedules which may be of interest to the public. The first is that by December 31, 1996, the Permittees must identify the name and location of the off-site, out-of-state interim storage facility(s) which will receive all of the TRU-mixed waste managed at the WIPP at the time of closure. In a related compliance schedule, the Permittees must identify, within a year of permit issuance, the name and location of the off-site facility to which TRU-mixed waste from the WIPP will be shipped if waste removal is required prior to identification of an interim storage facility. The second compliance schedule of interest requires the Permittees to submit detailed design plans for the proposed roof support and geomechanical monitoring systems in BSTR 3 to NMED for approval prior to managing waste in BSTR 3. Another compliance schedule issue requires the Permittees to provide a sampling and analysis plan and obtain samples in accordance with that plan to determine natural background levels (if any) of hazardous waste constituents in the below-ground salt formation prior to accepting waste at the facility. This information will be used to help demonstrate that all hazardous waste and hazardous constituents have been removed from the BSTRs at closure.

Module II

Module II addresses waste characterization and waste analysis plan requirements, as well as facility security, general inspection requirements, personnel training, preparedness and prevention, the facility contingency plan, and general closure requirements. Relative to waste characterization, a number of issues may be of interest to the public, including waste acceptance criteria. The draft permit limits WIPP to accepting waste only from INEL and RFP, while imposing waste acceptance criteria that are similar to those currently in place at WIPP, including restrictions on accepting explosive/flammable wastes and reactive wastes, free liquid limitations to <1%, and visual waste examination requirements.

Waste which may be managed in WIPP during the test phase have also been identified as an issue of concern to the public. The draft permit restricts WIPP to accepting only contact handled Group I TRU-mixed wastes, which is a waste grouping that includes waste categories such as combustibles and noncombustibles, benelex and plexiglass, firebrick and ceramic crucibles, graphite, filters, glass supercompacted waste, leaded rubber and metal wastes which have been contaminated with hazardous and TRU radioactive components. Combining of waste categories within a given bin is allowed because compatibility has been demonstrated.

Permit conditions within Module II require that Group I waste be characterized at the generator site via headspace gas analysis (in accordance with previously determined EPA requirements), process knowledge, real-time radiography (RTR), and visual examination. Chemical analysis of Group I wastes beyond headspace gas analysis is not required, although reporting of tentatively identified compounds detected during headspace gas analyses is dictated within draft permit conditions. The combination of process knowledge, visual examination, RTR, and headspace gas analysis provides sufficient information to ensure that Group I wastes are characterized and can be managed appropriately in accordance with RCRA requirements.

Although DOE requested that they be able to manage Group II and III wastes, acceptance of these waste Groups--which include solidified organic and inorganic sludges and pyrochemical salts, and combinations of sludges and Group I wastes--shall not be allowed because the application did not contain sufficient sampling and analysis information to ensure adequate waste characterization.

Characterization of on-site generated waste may also be of concern to the public. Wastes would be generated on-site, for example, if a small spill was cleaned up with an absorbent. On-site generated (derived) waste and retrieved waste shall be characterized via process knowledge, but if NMED questions waste contents, additional sampling and analysis may be required by NMED. Because characterization of Group I wastes prior to acceptance at WIPP is satisfactorily stringent, chemical characterization of a spill is not immediately required. DOE and WID are required to perform detailed waste shipment screening and verification and to follow prescribed quality assurance methodologies presented in Attachment II-2 of the permit. In response to public concerns regarding accuracy of generator-site bin loading and waste characterization, the draft permit requires DOE and WID to perform generator-site audits to verify that waste characterization as required under the permit are being satisfactorily performed, and to report all nonconformances and reject bins which have not met audit requirements unless the generators can demonstrate compliance with waste characterization requirements. Management of simulated (non-hazardous) wastes within the WIPP is allowed, but cannot interfere with the safe management of TRU-mixed waste management activities. If the simulated waste at some point generates a hazardous waste, management of this waste must be in accordance with all conditions of the permit.

Quarterly reports are also required within the draft permit to transmit information to NMED that is not included in annual reports, and to keep NMED informed throughout the waste characterization process. These reports shall include waste profile forms and bin case reports, visual and RTR examination reports, results of headspace gas analysis (for both drums prior to loading, and bins after loading, including TICs), results of generator site audits, an assessment of how visual, headspace gas, and RTR results compare with those anticipated via process knowledge, copies of manifests, and any additional information as acquired.

Module III

Module III provides permit conditions for the design and operation of the Waste Handling Building (WHB) hazardous waste container storage area. Several of the permit conditions may be of particular interest to the public. First, the Permittees will be limited to the use of only Type 1 dry and Type 1 humid test bins for managing experimental TRU-mixed waste. A permit modification request must be submitted and approved before the Permittees would be allowed to manage experimental TRU-mixed waste in Type 1 inundated test bins or Type 2 (pressurized) test bins. Additional public notice and comment opportunity would be required before such a modification could be approved. Second, the Permittees shall not be allowed to accept for storage any containers of TRU-mixed waste which contain greater than 1% free liquid by volume. Secondary containment for containers of TRU-mixed waste stored in the WHB will be provided either by the concrete floor and the fire suppression water trench/sump system, or by a supplementary secondary containment system such as a portable steel tray. Test bins stored in the WHB will be enclosed in standard waste boxes (RCBs) except when the bins are being prepared for Test Phase experiments or for shipping off-site. While test bin containers managing TRU-mixed waste are stored in the WHB, the Permittees will be required to conduct sampling, analysis, and purging of head space gases in the test bins at a frequency which ensures that the mixture of potentially flammable gases within the headspace remains at concentrations no more than one-half of the lower explosive limit.

Module IV

Module IV provides permit conditions for the design and operation of Bin-Scale Test Rooms (BSTRs) 1 and 3 within the subsurface. The use of subsurface mined openings called Alcoves for experiments using TRU-mixed waste is not included in this permit. As discussed under Module III, the draft permit will limit the Permittees to the use of only Type 1 dry and Type 1 humid test bins for conducting

Test Phase experiments with TRU-mixed waste. Test Bin containers will not be accepted for storage if they contain greater than 1% liquid by volume. However, the Permittees will be allowed to adjust the humidity of the atmosphere inside the test bins while they are stored in the BSTRs. Humidification of the atmosphere in a bin will be accomplished by recirculating the air in the bin over a reservoir of salt brine. The volume of liquid evaporated from the reservoir into the test bin atmosphere will be carefully measured to ensure that the total amount of free liquid (including moisture in the test bin at the time of receipt and moisture added during humidification) shall not be allowed to exceed 1% of the volume of the test bin. Secondary containment for containers of TRU-mixed waste stored in the WHB will be provided either by the RCB for test bins, or by a portable secondary containment tray or an SWB for derived waste containers. While test bin containers managing TRU-mixed waste are stored in the BSTRs, the Permittees will be required to conduct sampling, analysis, and purging of head space gases in the test bins at a frequency which ensures that the mixture of potentially flammable gases within the headspace remains at concentrations no more than one-half of the lower explosive limit.

Several of the permit conditions related to the management of TRU-mixed waste in the BSTRs may be of particular interest to the public. The first is the installation, monitoring and maintenance of the existing and proposed roof support systems. The conditions of Module IV require the Permittees to maintain the existing roof support, roof support monitoring, and geotechnical monitoring systems in good operating order. The conditions also require the Permittees to submit designs and plans for NMED approval if any proposed roof support or monitoring systems for BSTR 3 are different from the existing systems in BSTR 1. The Permittees are required to monitor the condition of the BSTRs and the supplementary roof support systems using the monitoring equipment described above. Corrective action, maintenance, and possibly waste retrieval, will be required if the monitoring indicates that deterioration of the roof or support system is occurring.

Another set of permit conditions in Module IV requires the Permittees to manage volatile organic compound (VOC) emissions from test bin containers in storage in the BSTRs to prevent releases to the atmosphere. This will be accomplished by connecting the test bin outlets to a manifold collection system which includes an activated carbon filter capable of removing at least 95% of the test bin VOC emissions. The Permittees will be required to monitor the outlet of the manifold collection system(s) as well as the outlets from the BSTRs themselves on a regular basis to ensure that significant releases of VOCs to the atmosphere are not occurring.

Module V

The permit does not require DOE and WID to perform groundwater monitoring during the term of the permit. This determination was made because the Waste Handling Building (WHB), Bin Scale Test Rooms (BSTRs), and waste container designs are such that release from the units to the uppermost aquifer is not likely. Site hydrogeologic conditions were also evaluated by examining hydrogeologic data included within the permit application and associated references. These site-specific hydrogeologic data, such as depth to groundwater, groundwater flow rates, and rock permeability, indicate that contaminant introduction to, or migration within the uppermost aquifer below the WHB or BSTRs during the permit period is highly unlikely. However, should conditions change within the Waste Handling Building (WHB) or Bin Scale Test Rooms (BSTRs), such that the potential for a release to the uppermost aquifer below the WHB or BSTR could occur, NMED can require groundwater monitoring.

Module VI

The permit proposed by the U.S. Environmental Protection Agency (EPA) is located in Module VI and implements the requirements imposed by the Hazardous and Solid Waste Amendments of 1984 (HSWA) to the federal Solid Waste Act. Conditions include requirements for hazardous waste minimization, hazardous waste land disposal restrictions, air emission standards for hazardous waste process vents, and corrective action to investigate possible releases from Solid Waste Management Units (SWMUs).

SWMUs are waste units that contain hazardous waste constituents, such as lead, benzene, xylene, etc. The facility must find the full extent of contamination for each SWMU identified in the permit. Some SWMUs may require cleanup/remediation. In addition, the permit requires the Permittees to notify EPA of newly identified SWMUs and newly identified releases from SWMUs at the WIPP.

Availability of the Draft Permits:

The draft permits are available for public review at the New Mexico Environment Department's Hazardous and Radioactive Materials Bureau, 525 Camino de Los Marquez, Suite 4 in Santa Fe, New Mexico 87502, Monday through Friday from 8:00 A.M. until 5:00 P.M., and at the library of the U.S. Environmental Protection Agency, (U.S. EPA), Region 6, 1445 Ross Avenue in Dallas, Texas 75202. Copies are also available for public review at the following locations:

Santa Fe

Ms. Norma McCallum
New Mexico State Library
325 Don Gaspar
Santa Fe, New Mexico 87503
(505) 827-3800

Albuquerque

Ms. Diana Zepeda
WIPP Reading Room
National Atomic Museum
USDOE - Albuquerque Operations Office
P.O. Box 5400
Albuquerque, New Mexico 87115
(505) 845-6670

Mrs. Glenda Sweatt
SNL Waste Management and Transportation Library
Organization 6332
P.O. Box 5800
Albuquerque, New Mexico 87185
(505)844-2416

Ms. Kathleen Keating
Zimmerman Library
Government Publications Department
University of New Mexico
Albuquerque, New Mexico 87138
(505) 277-2003

Albuquerque Public Library
501 Copper Avenue NW
Albuquerque, New Mexico 87138
(505) 768-5140

Socorro

Reference Librarian
Martin Speare Memorial Library
New Mexico Institute of Mining and Technology
Campus Station
Socorro, New Mexico 87801
(505) 835-5614

Las Cruces

Reference Librarian
Thomas Branigan Memorial Library
200 E. Picacho
Las Cruces, New Mexico 88005
(505) 526-1045

Carlsbad

Ms. Mary Elms
Carlsbad Public Library
101 S. Halaguero Street
Carlsbad, New Mexico 88220
(505) 885-6776

Hobbs

Ms. Ruth Hill or Ms.Gale Robinson
Pannell Library
New Mexico Junior College
5317 Lovington Highway
Hobbs, New Mexico 88240
(505) 392-5473

Roswell

Reference Librarian
Roswell Publc Library
301 N. Pennsylvania
Roswell, New Mexico 88201
(505) 622-7101

Raton

Mr. Richard Azar
Raton Public Library
244 Cook Avenue
Raton, New Mexico 87740
(505) 445-9711

Out of State

Document Control
Office of Science and Technical Information
Technical Information Center
P.O. Box 62
Oak Ridge, Tennessee 37830

Ms. Joan Ogbazghi
DOE/Forrestal Building
Public Library Reading Room
AD-234.1, FOI-USDOE
1000 Independence Avenue SW
Washington, D.C. 20585

Mr. John T. Conway, Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue NW, Suite 700
Washington, D.C. 20004

Ms. Christine Shaver
Environmental Defense Fund
1405 Arapahoe Avenue
Boulder, Colorado 80302
(303) 440-4901

Mr. Rich Mayer
EPA Region 6 Library
1445 Ross Avenue
Dallas, Texas 87502
(214) 655-7442

Please contact the location of your choice listed above for open hours that the draft permits are available for public review.

Comment Period and Regulatory Contacts:

For the RCRA hazardous waste permit:

Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502
Attention: Ms. Barbara Hoditschek
(505) 827-4308

For the HSWA hazardous waste permit:

Mr. Bill Honker, Chief
Hazardous Waste (RCRA) Permits Branch
1445 Ross Avenue
Dallas, Texas 75202
(214) 655-6770

Comments on either draft permit must be received by November 1, 1993, in order to be considered.

Permit Decision:

All comments submitted concerning the NMED hazardous waste draft permit will be considered in formulating the NMED permit decision. The Secretary of the NMED may propose a modified draft permit based on comments received during this comment period. After public hearings the Secretary of the NMED may either approve the permit as written, modify the permit, or deny the permit in whole or in part. Public hearings will be held before any NMED permit decision is made.

In order to store TRU-mixed wastes at the WIPP, the Permittees must obtain permits from both the NMED and the U.S. EPA. All comments submitted concerning the EPA draft permit will be considered in formulating the EPA permit decision. The Regional Administrator of the U.S. EPA, Region 6 may either issue the permit as proposed or modify the permit based on the comments received. EPA may participate in the public hearings that will be scheduled by the NMED.

If the permits are issued, they will become the facility operating conditions, in conjunction with all applicable regulations promulgated in the New Mexico or federal Hazardous Waste Regulations for hazardous waste management at the facility. The NMED and the U.S. EPA will notify DOE and Westinghouse of the final permit decision and each person who submits written comments during the public comment period and who provides a forwarding address.

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Your Phone Number (Very Important): (505) 887-8290

Company: WESTINGHOUSE

Department/Floor No.

Street Address: WIPP SITE/JAL HWY

City: CARLSBAD State: NM ZIP Required: 88220

2 To (Recipient's Name) Please Print: Ms. MARCY LEAVITT

Recipient's Phone Number (Very Important): (505) 827-2945

Company: NEW MEXICO ENVIRONMENT DEPARTMENT

Department/Floor No.

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 1190 St FRANCIS DR. HAROLD RUNNELS BUILDING

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Economy Two-Day (Delivery by second business day †)
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* Economy Letter rate not available. Minimum charge: One pound economy rate.

Government Overnight (Restricted for authorized users only)
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- 3 [ ] DELIVER SATURDAY (Extra charge) (Not available to all locations)
- 4 [ ] DANGEROUS GOODS (Extra charge)
- 5 [ ]
- 6 [ ] DRY ICE Dangerous Goods Shipper's Declaration not required
- Dry Ice 9, UN 1845 ___ x ___ kg. 904 III
- 7 [ ] OTHER SPECIAL SERVICE
- 8 [ ]
- 9 [ ] SATURDAY PICK-UP (Extra charge)
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155

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MEMORANDUM OF MEETING OR PHONE CONVERSATION

☐ Telephone ☑ Meeting | Time 9:30 AM | Date 8-25-93

Individuals Involved

Dan Robertson (CONTRACTOR) Clint Marshall
Beth Bennington (DOE) Marcy Leavitt

Subject Correspondance between WIPP and NMED concerning permission to despose of certain wastes waters into the sewage lagoon; permission to continue disposal of brine into evap pond.

Discussion WIPP wants to use a new form to expediate approval of certain waste waters coming from various parts of the plant to be discharged into the sewage lagoon. We said we would review the form and let them know. WIPP also wants to continue to dichange brine from the air intake shaft into the evap. pond instead of the sewage lagoon because it will only be happening for one more month. Emergency temp. approval is currently in effect and granted thru the language of the permit (not the formal 120 day extension). We said probably no problem - will let them know.

Conclusions Review form to see if it is adequate for approval correspondance (Will we have to follow it up with a letter of our own?). Review plan language to see if we can allow brine dischange into evap. pond for one more month.

Distribution ______

Initialed CM.

8/89

Authorization to Discharge Unpermitted, Non-Hazardous Effluent into the WIPP Sewage Treatment Facility

Name: ____________________

Signature: ____________________

Date: ____________________

Department/Section: ____________________

Origin of Effluent: ____________________

____

____

____

____

____

Type of Effluent: ____________________
(In gallons)

Restrictions on Discharge: ____________________

☐ Effluent has been characterized and the generation process has not changed: (Attach analytical results to the discharge form and submit to Environmental Compliance and Support for signature.)

☐ Effluent Characterization is Required: (Attach sampling results to the discharge request form and return to Environmental Compliance and Support for submittal to NMED for discharge authorization signature.)

Authorization Signatures:

1. Authorization Signature: ____________________ Date ________
(Environmental Compliance and Support (EC&S))

2. Authorization Signature: ____________________ Date: ________
(NMED Groundwater Bureau)

3. Authorization Signature: ____________________ Date: ________
(Environmental Monitoring (EM) Section)

DRAFT

Authorization to Discharge Unpermitted, Non-Hazardous Effluent into the WIPP Sewage Treatment Facility

Name: ______________________________

Signature: ______________________________

Date: ______________________________

Department/Section: ______________________________

Origin of Effluent: ______________________________

____

____

____

____

____

Type of Effluent: ______________________________
(In gallons)

Restrictions on Discharge: ______________________________

☐ Effluent has been characterized and the generation process has not changed: (Attach analytical results to the discharge form and submit to Environmental Compliance and Support for signature.)

☐ Effluent Characterization is Required: (Attach sampling results to the discharge request form and return to Environmental Compliance and Support for submittal to NMED for discharge authorization signature.)

Authorization Signatures:

1. Authorization Signature: ______________________________ Date ____________
(Environmental Compliance and Support (EC&S))

2. Authorization Signature: ______________________________ Date: ____________
(NMED Groundwater Bureau)

3. Authorization Signature: ______________________________ Date: ____________
(Environmental Monitoring (EM) Section)

DRAFT

EXPRESS MAIL AUTHORIZATION FORM

Date: 7/15/93 Airbill No.: 9915875325

Sender: DANIEL C. ROBERTSON

Recipient's Name & Street Address: MS. MARCY LEAVITT

NEW MEXICO ENVIRONMENT DEPARTMENT 1190 ST. FRANCIS DR

SANTA FE, NM 87502

Type of Materials Being Sent (Full description required):

DISCHARGE MONITORING REPORT

RECEIVED
JUL 15 1993
GROUND WATER BUREAU

Materials are Considered:

* Hazardous ☐ Non-Hazardous ☑ Uncertain ☐

Justification for Express Mail: COMPLIANCE COMMITMENT

Signature of Cognizant Manager: J. M. [signature]

* **NOTE:** In order to comply with 49 CFR and other regulations governing the shipment of hazardous materials, (i.e., radioactive materials, solvents, fuels, etc.) shipments must be accompanied by proper documentation. If shipment contains known or suspected hazardous material, contact Transportation Operations for assistance in properly documentating your shipment. Failure to comply with regulations, could result in substantial fines being imposed.

289:2717 WP Form 1411 Rev. 1, 2/89

MEMORANDUM OF MEETING OR PHONE CONVERSATION

☒ Telephone	☐ Meeting	Time 7:30	Date 4/26/93

Individuals Involved

DAN ROBERTSON to BOB GARCIA
887-8240

Subject OP-831 WIPP SEWAGE ponds

Discussion DAN plans to dispose 4-55 gallon drums of laboratory rinse water into the sewage evaporation lagoons. DAN sampled the water and faxed the results to me on 4/16/93. After reviewing the data and discussing this with MARCY, we decided to allow this because WQCC Section 3-103.A water quality standards were not exceeded.

Conclusions Mr. Robertson can proceed with his plan to dispose of this water in the sewage evaporation ponds.

Distribution MARCY LEAVITT
OP-831 File

Initialed RJG

8/89

00107

WESTINGHOUSE ELECTRIC CORPORATION
WIPP SITE
FACSIMILE TRANSMITTAL SHEET

TELEFAX NUMBER (505)885-4562

PAGES INCLUDING COVER	10	DATE	4/16/93	TIME	10:55

TO: MR ROBERT GARCIA, PE.

LOCATION: NMED GROUND WATER BUREAU

PHONE: 827-0027

RECEIVED
APR 16 1993
GROUND WATER BUREAU

FROM: DAN ROBERTSON

LOCATION: WIPP

PHONE: 887-8240

SPECIAL INSTRUCTIONS: BOB - WOULD YOU PLEASE REVIEW THESE ANALYSES OF DOSIMETRY LAB. RINSE WATER ANALYSES TO DETERMINE IF THEY CAN BE DISPOSED OF IN THE SEWAGE EVAPORATION PONDS. THERE ARE PRESENTLY 4 - 55 GALLON DRUMS OF RINSE WATER ACCUMULATED FOR DISPOSAL.

THANKS

D.C. ROBERTSON

COMMITTED TO EXCELLENCE

Total Quality

WESTINGHOUSE ELECTRIC CORPORATION
WIPP SITE
FACSIMILE TRANSMITTAL SHEET

TELECOPY NUMBER

PAGES INCLUDING COVER: 10 DATE: 4/16/93 TIME: 10:55

TO: Mr Robert Garcia, PE

LOCATION: NMED Ground Water Bureau

PHONE: 827-0021

RECEIVED
APR 16 1993
GROUND WATER BUREAU

FROM: Dan Robertson

LOCATION: WIPP

PHONE: 887-8240

SPECIAL INSTRUCTIONS: Bob - would you please review these analyses of Dosimetry Lab. rinse water analysis to determine if they can be disposed of in the sewage evaporation ponds. There are presently 4-55 gallon drums of rinse water accumulated for disposal.

Thanks

D.C. Robertson

COMMITTED TO EXCELLENCE

Total Quality

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Ca...__lls Run Road
Pittsburgh, PA 15205

800 Gemini Avenue
Houston, TX 77058

Dosimetry Lab H2O: (Review for Revision to Send to S. Wilson)

February 13, 1993
Report No.: 00013502
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: F. LOPEZ

NUS CLIENT NO: 0527 0021
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP 003 / AS REC'D
NUS SAMPLE NO: P0223748
P.O. NO.: 75WFL50848SX

DATE SAMPLED: 25-JAN-93
DATE RECEIVED: 28-JAN-93
APPROVED BY: Joanne Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNIT
1	I490	pH	6.8	
2	S090	Flash Point (Pensky-Martens)	>200	F
3	I278	Cyanide, Reactive (HCN) - modified	< 10	mg/L
4	I750	Sulfide, Reactive (as H2S)	< 10	mg/L

COMMENTS:

HALLIBURTON NUS
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Environmental Laboratories

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Pittsburgh, PA 15205

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Houston, TX 77058

February 13, 1993
Report No.: 00013502
Section A Page 2

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: F. LOPEZ

NUS CLIENT NO: 0527 0021
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP 003 / TCLP LEACH
NUS SAMPLE NO: P0223749
P.O. NO.: 75WFL508465X

DATE SAMPLED: 28-JAN-93
DATE RECEIVED: 28-JAN-93
APPROVED BY: Joanne Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	S903	Toxic Characteristic Leaching Procedure [TCLP]	DONE	
2	AASL	Arsenic, Leachable (As)	< 0.1	mg/L
3	ABAL	Barium, Leachable (Ba)	0.18	mg/L
4	ACDL	Cadmium, Leachable (Cd)	< 0.005	mg/L
5	ACRL	Chromium, Leachable (Cr)	0.02	mg/L
6	APBL	Lead, Leachable (Pb)	< 0.05	mg/L
7	AHGL	Mercury, Leachable (Hg)	< 0.0002	mg/L
8	ASEL	Selenium, Leachable (Se)	< 0.1	mg/L
9	AAGL	Silver, Leachable (Ag)	0.01	mg/L

COMMENTS:

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MAR 16 1993

March 11, 1993
Report No.: 00013956
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOSE LAGARETTA

NUS CLIENT NO: 0527 0036
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP 030
NUS SAMPLE NO: P0227352
P.O. NO.: 50846

DATE SAMPLED: 03-MAR-93
DATE RECEIVED: 04-MAR-93
APPROVED BY: Ruth Volk

LN	TEST CODE	DETERMINATION	RESULT	UNIT
1	OVPPW	VOLATILES		
		1,1,1-trichloroethane	< 5	ug/L
		1,1,2,2-tetrachloroethane	< 5	ug/L
		1,1,2-trichloroethane	< 5	ug/L
		1,1-dichloroethane	< 5	ug/L
		1,1-dichloroethene [1,1-dichloroethylene]	< 5	ug/L
		1,2-dichloroethane	< 5	ug/L
		1,2-dichloroethene (total)	< 5	ug/L
		1,2-dichloropropane	< 5	ug/L
		2-chloroethylvinyl ether	< 10	ug/L
		acrolein	< 100	ug/L
		acrylonitrile	< 100	ug/L
		benzene	< 5	ug/L
		bromodichloromethane [dichlorobromomethane]	< 5	ug/L
		bromomethane [methyl bromide]	< 10	ug/L
		carbon tetrachloride	< 5	ug/L
		chlorobenzene	< 5	ug/L
		chloroethane	< 10	ug/L
		chloroform	< 5	ug/L
		chloromethane [methyl chloride]	< 10	ug/L
		cis-1,3-dichloropropene	< 5	ug/L
		dibromochloromethane	< 5	ug/L
		dichloromethane [methylene chloride]	19	ug/L
		ethylbenzene	< 5	ug/L
		methylbenzene [toluene]	28	ug/L
		tetrachloroethene [tetrachloroethylene]	< 5	ug/L
		trans-1,3-dichloropropene	< 5	ug/L
		tribromomethane [bromoform]	< 5	ug/L

5065271985:# 4 SAFETY AND ENG- : 4-19-93 : 10:01 : CLIENT ID:WIPP SITE

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MAR 16 1993

March 11, 1993
Report No.: 00013858
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOSE LAGARETTA

NUS CLIENT NO: 0527 0030
WORK ORDER NO: 55030
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP 030
NUS SAMPLE NO: P0227352
P.O. NO.: 50846

DATE SAMPLED: 03-MAR-93
DATE RECEIVED: 04-MAR-93
APPROVED BY: Ruth Volk

LN	TEST CODE	DETERMINATION	RESULT	UNIT
1	OVPPM	VOLATILES		
		1,1,1-trichloroethane	< 5	ug/L
		1,1,2,2-tetrachloroethane	< 5	ug/L
		1,1,2-trichloroethane	< 5	ug/L
		1,1-dichloroethane	< 5	ug/L
		1,1-dichloroethene [1,1-dichloroethylene]	< 5	ug/L
		1,2-dichloroethane	< 5	ug/L
		1,2-dichloroethene (total)	< 5	ug/L
		1,2-dichloropropane	< 5	ug/L
		2-chloroethylvinyl ether	< 10	ug/L
		acrolein	< 100	ug/L
		acrylonitrile	< 100	ug/L
		benzene	< 5	ug/L
		bromodichloromethane [dichlorobromomethane]	< 5	ug/L
		bromomethane [methyl bromide]	< 10	ug/L
		carbon tetrachloride	< 5	ug/L
		chlorobenzene	< 5	ug/L
		chloroethane	< 10	ug/L
		chloroform	< 5	ug/L
		chloromethane [methyl chloride]	< 10	ug/L
		cis-1,3-dichloropropene	< 5	ug/L
		dibromochloromethane	< 5	ug/L
		dichloromethane [methylene chloride]	18	ug/L
		ethylbenzene	< 5	ug/L
		methylbenzene [toluene]	25	ug/L
		tetrachloroethene [tetrachloroethylene]	< 5	ug/L
		trans-1,3-dichloropropene	< 5	ug/L
		tribromomethane [bromoform]	< 5	ug/L

CLEVELAND (216) 881-7700 • HOUSTON (713) 488-1810 • PITTSBURGH (412) 747-2580

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March 11, 1993
Report No.: 00013956
Section A Page 2

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
SAMPLE ID: WIPP 030
NUS SAMPLE NO: P0227352

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		trichloroethene [trichloroethylene]	< 5	ug/L
		vinyl chloride	< 10	ug/L
3	OSVPPW	SEMIVOLATILE EXTRACTABLES		
		1,2,4-trichlorobenzene	< 10	ug/L
		1,2-dichlorobenzene [o-dichlorobenzene]	< 10	ug/L
		1,2-diphenylhydrazine (as azobenzene)	< 20	ug/L
		1,3-dichlorobenzene [m-dichlorobenzene]	< 10	ug/L
		1,4-dichlorobenzene [p-dichlorobenzene]	< 10	ug/L
		2,4,6-trichlorophenol	< 10	ug/L
		2,4-dichlorophenol	< 10	ug/L
		2,4-dimethylphenol	< 10	ug/L
		2,4-dinitrophenol	< 50	ug/L
		2,4-dinitrotoluene	< 10	ug/L
		2,6-dinitrotoluene	< 10	ug/L
		2-chloronaphthalene	< 10	ug/L
		2-chlorophenol	< 10	ug/L
		2-methyl-4,6-dinitrophenol [4,6-dinitro-o-cresol]	< 50	ug/L
		2-nitrophenol	< 10	ug/L
		3,3'-dichlorobenzidine	< 20	ug/L
		3,4-benzofluoranthene [benzo(b)fluoranthene]	< 10	ug/L
		4-bromophenyl phenyl ether	< 10	ug/L
		4-chloro-3-methylphenol [p-chloro-m-cresol]	< 10	ug/L
		4-chlorophenyl phenyl ether	< 10	ug/L
		4-nitrophenol	< 50	ug/L
		N-nitrosodi-n-propylamine	< 10	ug/L
		N-nitrosodimethylamine	< 10	ug/L
		N-nitrosodiphenylamine	< 10	ug/L
		acenaphthene	< 10	ug/L
		acenaphthylene	< 10	ug/L
		anthracene	< 10	ug/L
		benzidine	< 50	ug/L
		benzo(a)anthracene	< 10	ug/L
		benzo(a)pyrene	< 10	ug/L
		benzo(g,h,i)perylene	< 10	ug/L
		benzo(k)fluoranthene	< 10	ug/L
		benzyl butyl phthalate	< 10	ug/L
		bis(2-chloroethoxy)methane	< 10	ug/L
		bis(2-chloroethyl)ether	< 10	ug/L
		bis(2-chloroisopropyl)ether [2,2'-oxybis(1-chloropropane)]	< 10	ug/L

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Houston, TX 77058

March 11, 1993
Report No.: 00013656
Section A Page 2

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
SAMPLE ID: WIPP 050
NUS SAMPLE NO: P0227392

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		trichloroethene (trichloroethylene)	< 5	ug/L
		vinyl chloride	< 10	ug/L
3	OSVPFW	SEMIVOLATILE EXTRACTABLES		
		1,2,4-trichlorobenzene	< 10	ug/L
		1,2-dichlorobenzene (o-dichlorobenzene)	< 10	ug/L
		1,2-diphenylhydrazine (as azobenzene)	< 20	ug/L
		1,3-dichlorobenzene (m-dichlorobenzene)	< 10	ug/L
		1,4-dichlorobenzene (p-dichlorobenzene)	< 10	ug/L
		2,4,6-trichlorophenol	< 10	ug/L
		2,4-dichlorophenol	< 10	ug/L
		2,4-dimethylphenol	< 10	ug/L
		2,4-dinitrophenol	< 50	ug/L
		2,4-dinitrotoluene	< 10	ug/L
		2,6-dinitrotoluene	< 10	ug/L
		2-chloronaphthalene	< 10	ug/L
		2-chlorophenol	< 10	ug/L
		2-methyl-4,6-dinitrophenol (4,6-dinitro-o-cresol)	< 50	ug/L
		2-nitrophenol	< 10	ug/L
		3,3'-dichlorobenzidine	< 20	ug/L
		3,4-benzofluoranthene (benzo(b)fluoranthene)	< 10	ug/L
		4-bromophenyl phenyl ether	< 10	ug/L
		4-chloro-3-methylphenol (p-chloro-m-cresol)	< 10	ug/L
		4-chlorophenyl phenyl ether	< 10	ug/L
		4-nitrophenol	< 50	ug/L
		N-nitrosodi-n-propylamine	< 10	ug/L
		N-nitrosodimethylamine	< 10	ug/L
		N-nitrosodiphenylamine	< 10	ug/L
		acenaphthene	< 10	ug/L
		acenaphthylene	< 10	ug/L
		anthracene	< 10	ug/L
		benzidine	< 50	ug/L
		benzo(a)anthracene	< 10	ug/L
		benzo(a)pyrene	< 10	ug/L
		benzo(g,h,i)perylene	< 10	ug/L
		benzo(k)fluoranthene	< 10	ug/L
		benzyl butyl phthalate	< 10	ug/L
		bis(2-chloroethoxy)methane	< 10	ug/L
		bis(2-chloroethyl)ether	< 10	ug/L
		bis(2-chloroisopropyl)ether (2,2'-oxybis(1-chloropropane))	< 10	ug/L

HALLIBURTON NUS
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Environmental Laboratories

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Houston, TX 77058

March 11, 1993
Report No.: 00013956
Section A Page 3

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
SAMPLE ID: WIPP 030
NUS SAMPLE NO: P0227352

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		bis(2-ethylhexyl)phthalate	10	ug/L
		chrysene	< 10	ug/L
		di-n-butyl phthalate	11	ug/L
		di-n-octyl phthalate	< 10	ug/L
		dibenz(a,h)anthracene	< 10	ug/L
		diethyl phthalate	13	ug/L
		dimethyl phthalate	< 10	ug/L
		fluoranthene	< 10	ug/L
		fluorene	< 10	ug/L
		hexachlorobenzene	< 10	ug/L
		hexachlorobutadiene	< 10	ug/L
		hexachlorocyclopentadiene	< 10	ug/L
		hexachloroethane	< 10	ug/L
		indeno(1,2,3-cd)pyrene	< 10	ug/L
		isophorone	< 10	ug/L
		naphthalene	< 10	ug/L
		nitrobenzene	< 10	ug/L
		pentachlorophenol	< 50	ug/L
		phenanthrene	< 10	ug/L
		phenol	< 10	ug/L
		pyrene	< 10	ug/L

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbell's Run Road
Pittsburgh, PA 15205

200 Gemini Avenue
Houston, TX 77058

March 11, 1993
Report No.: 00013059
Section A Page 3

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
SAMPLE ID: WIPP 030
NUS SAMPLE NO: P0227352

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		bis(2-ethylhexyl)phthalate	10	ug/L
		chrysene	< 10	ug/L
		di-n-butyl phthalate	11	ug/L
		di-n-octyl phthalate	< 10	ug/L
		dibenz(a,h)anthracene	< 10	ug/L
		diethyl phthalate	13	ug/L
		dimethyl phthalate	< 10	ug/L
		fluoranthene	< 10	ug/L
		fluorene	< 10	ug/L
		hexachlorobenzene	< 10	ug/L
		hexachlorobutadiene	< 10	ug/L
		hexachlorocyclopentadiene	< 10	ug/L
		hexachloroethane	< 10	ug/L
		indeno(1,2,3-cd)pyrene	< 10	ug/L
		isophorone	< 10	ug/L
		naphthalene	< 10	ug/L
		nitrobenzene	< 10	ug/L
		pentachlorophenol	< 50	ug/L
		phenanthrene	< 10	ug/L
		phenol	< 10	ug/L
		pyrene	< 10	ug/L

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 C... ...ells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

March 11, 1993
Report No.: 00013956
Section A Page 4

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOSE LAGARETTA

NUS CLIENT NO: 0527 0036
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP 031
NUS SAMPLE NO: P0227353
P.O. NO.: 50846

DATE SAMPLED: 03-MAR-93
DATE RECEIVED: 04-MAR-93
APPROVED BY: Ruth Volk

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OVPPW	VOLATILES		
		1,1,1-trichloroethane	< 5	ug/L
		1,1,2,2-tetrachloroethane PCE	< 5	ug/L
		1,1,2-trichloroethane	< 5	ug/L
		1,1-dichloroethane	< 5	ug/L
		1,1-dichloroethene [1,1-dichloroethylene]	< 5	ug/L
		1,2-dichloroethane	< 5	ug/L
		1,2-dichloroethene (total)	< 5	ug/L
		1,2-dichloropropane	< 5	ug/L
		2-chloroethylvinyl ether	< 10	ug/L
		acrolein	< 100	ug/L
		acrylonitrile	< 100	ug/L
		benzene	< 5	ug/L
		bromodichloromethane [dichlorobromomethane]	< 5	ug/L
		bromomethane [methyl bromide]	< 10	ug/L
		carbon tetrachloride	< 5	ug/L
		chlorobenzene	< 5	ug/L
		chloroethane	33	ug/L
		chloroform	< 5	ug/L
		chloromethane [methyl chloride]	< 10	ug/L
		cis-1,3-dichloropropene	< 5	ug/L
		dibromochloromethane	< 5	ug/L
		dichloromethane [methylene chloride]	< 5	ug/L
		ethylbenzene	< 5	ug/L
		methylbenzene [toluene]	< 5	ug/L
		~1,1,2,2 tetrachloroethene [tetrachloroethylene] .01 mg/l PCE	30	ug/L
		trans-1,3-dichloropropene	< 5	ug/L
		tribromomethane [bromoform]	< 5	ug/L
		trichloroethene [trichloroethylene]	< 5	ug/L
		vinyl chloride	< 10	ug/L

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

800 Gemini Avenue
Houston, TX 77058

March 11, 1993
Report No.: 00013936
Section A Page 4

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO, PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOSE LAGARETTA

NUS CLIENT NO: 0527-0036
WORK ORDER NO: 55030
VENDOR NO: 0183078Z

Carbon Copy:

SAMPLE ID: WIPP 031
NUS SAMPLE NO: P0227133
P.O. NO.: 50948

DATE SAMPLED: 03-MAR-93
DATE RECEIVED: 04-MAR-93
APPROVED BY: Ruth Volk

TEST CODE	#	DETERMINATION	RESULT	UNITS
[illegible]	1	VOLATILES		
		1,1,1-trichloroethane	< 5	ug/L
		1,1,2,2-tetrachloroethane PCE	< 5	ug/L
		1,1,2-trichloroethane	< 5	ug/L
		1,1-dichloroethane	< 5	ug/L
		1,1-dichloroethene [1,1-dichloroethylene]	< 5	ug/L
		1,2-dichloroethane	< 5	ug/L
		1,2-dichloroethene (total)	< 5	ug/L
		1,2-dichloropropane	< 5	ug/L
		2-chloroethylvinyl ether	< 10	ug/L
		acrolein	< 100	ug/L
		acrylonitrile	< 100	ug/L
		benzene	< 5	ug/L
		bromodichloromethane [dichlorobromomethane]	< 5	ug/L
		bromomethane [methyl bromide]	< 10	ug/L
		carbon tetrachloride	< 5	ug/L
		chlorobenzene	< 5	ug/L
		chloroethane	33	ug/L
		chloroform	< 5	ug/L
		chloromethane [methyl chloride]	< 10	ug/L
		cis-1,3-dichloropropene	< 5	ug/L
		dibromochloromethane	< 5	ug/L
		dichloromethane [methylene chloride]	< 5	ug/L
		ethylbenzene	< 5	ug/L
		methylbenzene [toluene]	< 5	ug/L
		tetrachloroethene [tetrachloroethylene] .01 mg/l PCE	7	ug/L
		trans-1,3-dichloropropene	< 5	ug/L
		tribromomethane [bromoform]	< 5	ug/L
		trichloroethene [trichloroethylene]	-	ug/L
		vinyl chloride	< 10	ug/L

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

March 11, 1993
Report No.: 00013958
Section A Page 5

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
SAMPLE ID: WIPP 031
NUS SAMPLE NO: P0227353

LN	TEST CODE	DETERMINATION	RESULT	UNITS
3	OSVPPW	SEMIVOLATILE EXTRACTABLES		
		1,2,4-trichlorobenzene	< 10	ug/L
		1,2-dichlorobenzene [o-dichlorobenzene]	< 10	ug/L
		1,2-diphenylhydrazine (as azobenzene)	< 20	ug/L
		1,3-dichlorobenzene [m-dichlorobenzene]	< 10	ug/L
		1,4-dichlorobenzene [p-dichlorobenzene]	< 10	ug/L
		2,4,6-trichlorophenol	< 10	ug/L
		2,4-dichlorophenol	< 10	ug/L
		2,4-dimethylphenol	< 10	ug/L
		2,4-dinitrophenol	< 50	ug/L
		2,4-dinitrotoluene	< 10	ug/L
		2,6-dinitrotoluene	< 10	ug/L
		2-chloronaphthalene	< 10	ug/L
		2-chlorophenol	< 10	ug/L
		2-methyl-4,6-dinitrophenol [4,6-dinitro-o-cresol]	< 50	ug/L
		2-nitrophenol	< 10	ug/L
		3,3'-dichlorobenzidine	< 20	ug/L
		3,4-benzofluoranthene [benzo(b)fluoranthene]	< 10	ug/L
		4-bromophenyl phenyl ether	< 10	ug/L
		4-chloro-3-methylphenol [p-chloro-m-cresol]	< 10	ug/L
		4-chlorophenyl phenyl ether	< 10	ug/L
		4-nitrophenol	< 50	ug/L
		N-nitrosodi-n-propylamine	< 10	ug/L
		N-nitrosodimethylamine	< 10	ug/L
		N-nitrosodiphenylamine	< 10	ug/L
		acenaphthene	< 10	ug/L
		acenaphthylene	< 10	ug/L
		anthracene	< 10	ug/L
		benzidine	< 50	ug/L
		benzo(a)anthracene	< 10	ug/L
		benzo(a)pyrene	< 10	ug/L
		benzo(g,h,i)perylene	< 10	ug/L
		benzo(k)fluoranthene	< 10	ug/L
		benzyl butyl phthalate	< 10	ug/L
		bis(2-chloroethoxy)methane	< 10	ug/L
		bis(2-chloroethyl)ether	< 10	ug/L
		bis(2-chloroisopropyl)ether [2,2'-oxybis(1-chloropropane)]	< 10	ug/L
		bis(2-ethylhexyl)phthalate	< 10	ug/L
		chrysene	< 10	ug/L

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories
5350 Ca… Run Road
Pittsburgh … 15205
900 Gemini Avenue
Houston, TX 77058

March 11, 1993
Report No.: 00013956
Section A Page 5

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
SAMPLE ID: WIPP 031
NUS SAMPLE NO: P0227553

LN	TEST CODE	DETERMINATION	RESULT	UNITS
3	OSVPPU	SEMIVOLATILE EXTRACTABLES		
		1,2,4-trichlorobenzene	< 10	ug/L
		1,2-dichlorobenzene (o-dichlorobenzene)	< 10	ug/L
		1,2-diphenylhydrazine (as azobenzene)	< 20	ug/L
		1,3-dichlorobenzene (m-dichlorobenzene)	< 10	ug/L
		1,4-dichlorobenzene (p-dichlorobenzene)	< 10	ug/L
		2,4,6-trichlorophenol	< 10	ug/L
		2,4-dichlorophenol	< 10	ug/L
		2,4-dimethylphenol	< 10	ug/L
		2,4-dinitrophenol	< 50	ug/L
		2,4-dinitrotoluene	< 10	ug/L
		2,6-dinitrotoluene	< 10	ug/L
		2-chloronaphthalene	< 10	ug/L
		2-chlorophenol	< 10	ug/L
		2-methyl-4,6-dinitrophenol (4,6-dinitro-o-cresol)	< 50	ug/L
		2-nitrophenol	< 10	ug/L
		3,3'-dichlorobenzidine	< 20	ug/L
		3,4-benzofluoranthene (benzo(b)fluoranthene)	< 10	ug/L
		4-bromophenyl phenyl ether	< 10	ug/L
		4-chloro-3-methylphenol (p-chloro-m-cresol)	< 10	ug/L
		4-chlorophenyl phenyl ether	< 10	ug/L
		4-nitrophenol	< 50	ug/L
		N-nitrosodi-n-propylamine	< 10	ug/L
		N-nitrosodimethylamine	< 10	ug/L
		N-nitrosodiphenylamine	< 10	ug/L
		acenaphthene	< 10	ug/L
		acenaphthylene	< 10	ug/L
		anthracene	< 10	ug/L
		benzidine	< 50	ug/L
		benzo(a)anthracene	< 10	ug/L
		benzo(a)pyrene	< 10	ug/L
		benzo(g,h,i)perylene	< 10	ug/L
		benzo(k)fluoranthene	< 10	ug/L
		benzyl butyl phthalate	< 10	ug/L
		bis(2-chloroethoxy)methane	< 10	ug/L
		bis(2-chloroethyl)ether	< 10	ug/L
		bis(2-chloroisopropyl)ether (2,2'-oxybis(1-chloropropane))	< 10	ug/L
		bis(2-ethylhexyl)phthalate	< 10	ug/L
		chrysene	< 10	ug/L

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Ca[illegible]lls Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

March 11, 1993
Report No.: 00013956
Section A Page 6

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
SAMPLE ID: WIPP 031
NUS SAMPLE NO: P0227353

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		di-n-butyl phthalate	< 10	ug/L
		di-n-octyl phthalate	< 10	ug/L
		dibenz(a,h)anthracene	< 10	ug/L
		diethyl phthalate	< 10	ug/L
		dimethyl phthalate	< 10	ug/L
		fluoranthene	< 10	ug/L
		fluorene	< 10	ug/L
		hexachlorobenzene	< 10	ug/L
		hexachlorobutadiene	< 10	ug/L
		hexachlorocyclopentadiene	< 10	ug/L
		hexachloroethane	< 10	ug/L
		indeno(1,2,3-cd)pyrene	< 10	ug/L
		isophorone	< 10	ug/L
		naphthalene	< 10	ug/L
		nitrobenzene	< 10	ug/L
		pentachlorophenol	< 50	ug/L
		phenanthrene	< 10	ug/L
		phenol	< 10	ug/L
		pyrene	< 10	ug/L

COMMENTS:

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

March 11, 1993
Report No.: 00013956
Section A Page 6

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
SAMPLE ID: WIPP 031
NUS SAMPLE NO: P0227353

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		di-n-butyl phthalate	< 10	ug/L
		di-n-octyl phthalate	< 10	ug/L
		dibenz(a,h)anthracene	< 10	ug/L
		diethyl phthalate	< 10	ug/L
		dimethyl phthalate	< 10	ug/L
		fluoranthene	< 10	ug/L
		fluorene	< 10	ug/L
		hexachlorobenzene	< 10	ug/L
		hexachlorobutadiene	< 10	ug/L
		hexachlorocyclopentadiene	< 10	ug/L
		hexachloroethane	< 10	ug/L
		indeno(1,2,3-cd)pyrene	< 10	ug/L
		isophorone	< 10	ug/L
		naphthalene	< 10	ug/L
		nitrobenzene	< 10	ug/L
		pentachlorophenol	< 50	ug/L
		phenanthrene	< 10	ug/L
		phenol	< 10	ug/L
		pyrene	< 10	ug/L

COMMENTS:

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT

TELECOPIER/FACSIMILE COVER SHEET

TO: DAN RobERtsoN

OFFICE:

PHONE:

MESSAGE:

FROM: Bob GARCIA

OFFICE: GROUND WATER PROTECTION & REMEDIATION BUREAU

SECTION: GWS

PHONE: 827-0027

DATE: 4/6 TIME: 3:55

NUMBER OF PAGES 2 (Including Cover Sheet)

PAGE 1 OF 2

Bruce King
Governor

Judith M. Espinosa
Secretary

Ron Curry
Deputy Secretary

Harold Runnels Building

Dan Robertson

Bob Garcia

GW5
827-0027
7/6 3:55
2
1 2

Department of Energy
Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 2 2 1993

DP-831

Ms. Marcy Levitt, Program Manager
New Mexico Environment Department
Ground Water Bureau
1190 St. Francis Avenue
Santa Fe, New Mexico 87503

Dear Ms. Levitt:

The Department of Energy (DOE) requests an extension for the submittal of the first discharge monitoring report (DMR) for the Waste Isolation Pilot Plant (WIPP) sewage system until construction of the facility has been completed. The DOE requests that the submittal of the initial DMR be delayed 90 days. Construction delays were caused by difficulties with material procurement, and the completion of the competitive construction, and liner installation bids. The DOE is confident that the construction will be completed before June 30, 1993.

The DOE appreciates the assistance Mr. Garcia has provided in helping the WIPP with design suggestions for the facility. We appreciate your consideration of these requests. If you have any questions concerning this matter please feel free to contact Ms. M. E. Bennington of my staff at (505) 887-8132.

Sincerely,

Arlen Hunt, Manager
WIPP Project Site Office

cc w/o enclosure:
C&C File
J. Mewhinney, WPSO
M. Bennington, WPSO
B. Howard, WID

RECEIVED
MAR 3 0 1993
GROUND WATER BUREAU

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT

April 2, 1993

Mr. Arlen Hunt, Manager
WIPP Project Site Office
P.O. Box 3090
Carlsbad, NM 88221

RE: DP-831; Sewage system discharge monitoring report(DMR)

Dear Mr. Hunt:

The New Mexico Environment Department (NMED), Ground Water Section (GWS) has reviewed your March 22, 1993 letter requesting an extension for submittal of the first DMR.

Because of the reasons stated in your letter (construction delays, material procurement, liner bids, etc.) your request to delay submittal of the monitor requirements for the soon-to-be lined evaporation lagoons is hereby approved. However, you must submit the remaining information required as part of your approved discharge plan no later than May 3, 1993.

If you have any questions please call Bob Garcia at 827-0027 or myself at 827-2900.

Sincerely,

Marcy Leavitt, Manager
Ground Water Section

BG:BG

cc:
Dan Robertson, WIPP, Carlsbad
Garrison McCaslin, District 4 Manager, Roswell Office
Tom Burt, Program Manager, Carlsbad Office

Bruce King
Governor

Judith M. Espinosa
Secretary

Ron Curry
Deputy Secretary

Harold Runnels Building
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502
(505) 827-2850
FAX (505) 827-2836

DRUG FREE

Department of Energy
Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 2 2 1993

Ms. Marcy Levitt, Program Manager
New Mexico Environment Department
Ground Water Bureau
1190 St. Francis Avenue
Santa Fe, New Mexico 87503

Dear Ms. Levitt:

The Department of Energy (DOE) requests an extension for the submittal of the first discharge monitoring report (DMR) for the Waste Isolation Pilot Plant (WIPP) sewage system until construction of the facility has been completed. The DOE requests that the submittal of the initial DMR be delayed 90 days. Construction delays were caused by difficulties with material procurement, and the completion of the competitive construction, and liner installation bids. The DOE is confident that the construction will be completed before June 30, 1993.

The DOE appreciates the assistance Mr. Garcia has provided in helping the WIPP with design suggestions for the facility. We appreciate your consideration of these requests. If you have any questions concerning this matter please feel free to contact Ms. M. E. Bennington of my staff at (505) 887-8132.

Sincerely,

for Arlen Hunt, Manager
WIPP Project Site Office

cc w/o enclosure:
C&C File
J. Mewhinney, WPSO
M. Bennington, WPSO
B. Howard, WID

RECEIVED

MAR 2 9 1993

GROUND WATER BUREAU

WESTINGHOUSE ELECTRIC CORPORATION
WIPP SITE
FACSIMILE TRANSMITTAL SHEET

TELEFAX NUMBER (505)885-4362

PAGES INCLUDING COVER	2	DATE	3/19/93	TIME	7:35

TO: Mr Robert Garcia

LOCATION: NMED Ground Water Bureau

827-0027 (FAX) 827-2965

Dan Robertson

WIPP

(505) 887-8240

SPECIAL INSTRUCTIONS: Bob - here are the [illegible] TCN results you requested on the sewage [illegible] please give me a call to discuss disp[illegible] other option. Thanks

Dan

COMMITTED TO EXCELLENCE

Total Quality

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

800 Gemini Avenue
Houston, TX 77058

March 18, 1993
Report No.: 00014084
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. DAN ROBIRTSON

NUS CLIENT NO: 0827 0027
WORK ORDER NO: 55930
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP 026, 027, 028, 029 / TCLP LEACH (P226971)
NUS SAMPLE NO: P0228311
P.O. NO.: 50846

DATE SAMPLED: 24-FEB-93
DATE RECEIVED: 25-FEB-93
APPROVED BY: Chuck Kieda

LN	TEST CODE	DETERMINATION	RESULT	UNIT
1	I390	Nitrate (as N)	0.1	mg/L
2	I435	Nitrogen, Kjeldahl (as N)	8.4	mg/L

COMMENTS:

FEDERAL EXPRESS

QUESTIONS? CALL [redacted]238-5355 TOLL FREE.

AIRBILL
PACKAGE TRACKING NUMBER 1389302972

1267 1389302972

[redacted]

Date 8-13-92

RECIPIENT'S COPY

From (Your Name) Please Print	Your Phone Number (Very Important)	To (Recipient's Name) Please Print	Recipient's Phone Number (Very Important)
Judy Greenwood / Dept of Energy	(505) 887-8107	Mr. Robert J. Garcia	( )

Company: WESTINGHOUSE WIPP PROJECT	Department/Floor No.
Street Address: 401 CANAL	
City: CARLSBAD	State: NM
ZIP Required: 88220	

Company: New Mexico Environment Dept.	Department/Floor No.
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 1190 St. Francis Drive	
City: Santa Fe	State: New Mexico
ZIP Required: 87502	

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.) Faye Schulz

IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address
City State ZIP Required

PAYMENT 1 [x] Bill Sender 2 [ ] Bill Recipient's FedEx Acct No. 3 [ ] Bill 3rd Party FedEx Acct No. 4 [ ] Bill Credit Card
[ ] Cash/Check [redacted]

SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†)	Standard Overnight (Delivery by next business afternoon†)
11 [ ] YOUR PACKAGING	51 [ ] YOUR PACKAGING
16 [ ] FEDEX LETTER *	56 [ ] FEDEX LETTER *
12 [ ] FEDEX PAK *	52 [ ] FEDEX PAK *
13 [ ] FEDEX BOX	53 [ ] FEDEX BOX
14 [ ] FEDEX TUBE	54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day†)	Government Overnight
30 [ ] ECONOMY	46 [x] GOVT LETTER
	41 [ ] GOVT PACKAGE

Freight Service (for Extra Large or any package over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT ** 80 [ ] TWO-DAY FREIGHT **
† Delivery commitment may be later in some areas. * Declared Value Limit $100 ** Call for delivery schedule

DELIVERY AND SPECIAL HANDLING (Check services required)
1 [ ] HOLD FOR PICK-UP
2 [x] DELIVER WEEKDAY
3 [ ] DELIVER SATURDAY (Extra charge) (Not available to all locations)
4 [ ] DANGEROUS GOODS (Extra charge)
5 [ ]
6 [ ] DRY ICE
7 [ ] OTHER SPECIAL SERVICE
8 [ ]
9 [ ] SATURDAY PICK-UP (Extra charge)
10 [ ]

PACKAGES | WEIGHT In Pounds Only | YOUR DECLARED VALUE
Total Total Total

GROUND WATER BUREAU
AUG 14 1992
RECEIVED

DIM SHIPMENT (Chargeable Weight) ___ lbs.
L x W x H =

Emp. No. Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold
Street Address
City State Zip
Received By:
X
Date/Time Received FedEx Employee Number
Release
Date/Time

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 6/91
PART #137204 FXEM 8/91
FORMAT #099
099
© 1990-91 FEC PRINTED IN USA

Date 8/20

To Bob

Building/Room Dan Robertson

- [ ] For Your Attention
- [ ] For Your Information
- [ ] Please Comment
- [ ] Please See Me
- [ ] Please Handle
- [ ] Approved
- [ ] For Your Recommendation
- [ ] For Your Approval
- [ ] Please Return
- [ ] Please File
- [ ] Please Mail
- [ ] As Requested

[ ] Telephone Call: Number 887-8240 Time Called 3:15

MESSAGE

From

Building/Room

ADM 030 Issued 5/78

State of New Mexico
ENVIRONMENT DEPARTMENT

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

17 August 1992

Arlen Hunt
Department of Energy
Albuquerque Operations Office
WASTE ISOLATION PILOT PLANT PROJECT OFFICE
P. O. Box 3090
Carlsbad, NM 88221

RE: Waste water/Sludge Disposal, DP - 831

Dear Mr. Hunt:

The New Mexico Environment Department (NMED), Ground Water Section is in receipt of your August 13, 1992 notification of waste water/sludge disposal and is in agreement with the procedures as outlined therein as pertains to the conditions and requirements of your approved discharge plan, referenced above.

If you have any questions or desire further information, please contact me at 827-2703. Your discharge plan has been assigned to me and I look forward to a mutually rewarding association.

Sincerely,

Phillis Stevens
Water Resource Specialist
Ground Water Section

PS:mtf

e-file: 1090

cc: Tom Burt, Manager, NMED, Carlsbad
Garrison McCaslin, Manager, District IV, Roswell
Ernest Rebuck, Program Manager, Ground Water Section
Robert Garcia, Environmental Engineer, Ground Water Section
Dan Robertson, WIPP, Carlsbad

NEW ME) ENVIRONMENT DEPARTMENT

Bruce King
Governor
Judith Espinosa
Secretary
Ron Curry
Deputy Secretary

TELECOPIER TRANSMITTAL

DATE: 8/20/92 TIME: 3:33 PAGE 1 OF 2
(Include Transmittal)

PLEASE DELIVER THE FOLLOWING PAGES TO:

TO: Dan Robertson

LOCATION: WIPP

TELEPHONE NUMBER:

TELECOPIER NUMBER: 885-4562

FROM: Bob Garcia

LOCATION: Ground Water ~~CONSTRUCTION PROGRAMS~~ BUREAU

TELEPHONE NUMBER: 827-~~2810~~ 0027

TELECOPIER NUMBER: (505) 827-2837

COMMENTS:

Harold Runnels Building
1190 St. Francis Dr.
Santa Fe, New Mexico 87503

Department of Energy
Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221

DP-831

AUG 13 1992

RECEIVED
AUG 14 1992
GROUND WATER BUREAU

Mr. Robert J. Garcia, P.E.
Environmental Engineer Specialist
Ground Water Section
New Mexico Environment Department
1190 St. Francis Drive
Santa Fe, NM 87502

Dear Mr. Garcia:

This letter is to reiterate your telephone discussions with the Waste Isolation Pilot Plant (WIPP) today concerning the water collected in a chiller water pipe trench. The Department of Energy (DOE) would like to pump the water collected in the chiller water pipe trench into the WIPP sewage lagoon. The pipe trench is designed to provide maintenance access to insulated chiller piping which runs below the surface. Storm water has collected in the trench over the past eight years and has the potential to rust out the chiller piping.

As was discussed, analysis has shown that contaminant levels in this water are below state and federal regulatory limits. However, the sediments at the bottom of the trench exceed state groundwater regulatory limits for arsenic, barium, and possibly, selenium. Copies of the analyses for both the water (Enclosure 1) and sediments (Enclosure 2) are enclosed.

The DOE proposes to pump the non-regulated water to the WIPP sewage lagoon, leaving several inches of water in the trench so that the underlying sediments will not be disturbed. The DOE will then use a sump pump to transfer the sediments into drums. Those drums which meet Department of Transportation standards will subsequently be sent off-site for disposal at a licensed landfill in accordance with the applicable regulations.

AUG 1 3 1992

The DOE is requesting the New Mexico Environment Department's Groundwater Bureau provide confirmation that the disposal of the above referenced waters into the sewage lagoon is allowed under the provisions of the discharge plan for the WIPP sewage lagoon (DP-831).

If you have any questions regarding this proposal, please feel free to contact Hart M. Greenwood at (505) 887-8107.

Sincerely,

Arlen Hunt

Arlen Hunt

2 Enclosures

cc w/enclosures:
C&C File
P. McCasland, NMED/WIPP
H. Greenwood, DOE, WPSO

RECEIVED
AUG 14 1992
GROUND WATER BUREAU

ENCLOSURE 1

CLIENT ORIGINAL

HALLIBURTON NUS
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

6751-L Engle Road
Cleveland, OH 44130
216-891-4700

April 07, 1992
Report No.: 00006983
Section A Page 15

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-472 H_2O SAMPLE
NUS SAMPLE NO: P0193107
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	AASW	Arsenic, Total (As)	< 0.1	mg/L
2	ABAW	Barium, Total (Ba)	0.029	mg/L
3	ACDW	Cadmium, Total (Cd)	< 0.005	mg/L
4	ACRW	Chromium, Total (Cr)	< 0.01	mg/L
5	APBW	Lead, Total (Pb)	< 0.05	mg/L
6	AHGW	Mercury, Total (Hg)	< 0.0002	mg/L
7	ASEW	Selenium, Total (Se)	< 0.1	mg/L
8	AAGW	Silver, Total (Ag)	< 0.01	mg/L

COMMENTS:

CLIENT ORIGINAL

HALLIBURTON NUS
Environmental Laboratories

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April 07, 1992
Report No.: 00006983
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-473 H_2O SAMPLE
NUS SAMPLE NO: P0193108
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OSVPPW	SEMIVOLATILE EXTRACTABLES		
		1,4-Dichlorobenzene	< 10	ug/L
		2,4,5-Trichlorophenol	< 50	ug/L
		2,4,6-Trichlorophenol	< 10	ug/L
		2,4-Dinitrotoluene	< 10	ug/L
		Hexachlorobenzene	< 10	ug/L
		Hexachlorobutadiene	< 10	ug/L
		Hexachloroethane	< 10	ug/L
		Nitrobenzene	< 10	ug/L
		Pentachlorophenol	< 50	ug/L
		Pyridine	< 10	ug/L
		m-Cresol	< 10	ug/L
		o-Cresol	< 10	ug/L
		p-Cresol	< 10	ug/L

COMMENTS:

HALLIBURTON NUS
Environmental Laboratories

CLIE

5350 Campbells Run Road
Pittsburgh, PA 15205
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIEN
WORK ORDER
VENDOR

Carbon Copy:

SAMPLE ID: WIPP-474 H2O SAMPLE
NUS SAMPLE NO: P0193109
P.O. NO.: 50848

DATE SAMP
DATE RECEI
APPROVED B

LN	TEST CODE	DETERMINATION	RESUL
1	OVPPW	VOLATILES	
		1,1-Dichloroethene	<
		1,2-Dichloroethane	<
		2-Butanone (MEK)	< 1
		Benzene	<
		Carbon tetrachloride	<
		Chlorobenzene	<
		Chloroform	<
		Tetrachloroethene	< 5
		Trichloroethylene	< 5
		Vinyl chloride	< 10

COMMENTS:

00139

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CLIENT ORIGINAL

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Environmental Laboratories

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April 07, 1992
Report No.: 00006983

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-475 H_2O SAMPLE
NUS SAMPLE NO: P0193110
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OSVPPW	SEMIVOLATILE EXTRACTABLES		
		1,4-Dichlorobenzene	< 10	ug/L
		2,4,5-Trichlorophenol	< 50	ug/L
		2,4,6-Trichlorophenol	< 10	ug/L
		2,4-Dinitrotoluene	< 10	ug/L
		Hexachlorobenzene	< 10	ug/L
		Hexachlorobutadiene	< 10	ug/L
		Hexachloroethane	< 10	ug/L
		Nitrobenzene	< 10	ug/L
		Pentachlorophenol	< 50	ug/L
		Pyridine	< 10	ug/L
		m-Cresol	< 10	ug/L
		o-Cresol	< 10	ug/L
		p-Cresol	< 10	ug/L

COMMENTS:

CLIENT ORIGINAL

HALLIBURTON NUS
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April 07, 1992
Report No.: 00006983
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-476 H2O SAMPLE
NUS SAMPLE NO: P0193111
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	I685	Petroleum Hydrocarbons	< 0.2	mg/L

COMMENTS:

CLIENT ORIGINAL

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April 07, 1992
Report No.: 00006983
Section A Page 20

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-477 H_2O SAMPLE
NUS SAMPLE NO: P0193112
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OVPPH	VOLATILES		
		1,1-Dichloroethene	< 5	ug/L
		1,2-Dichloroethane	< 5	ug/L
		2-Butanone (MEK)	< 10	ug/L
		Benzene	< 5	ug/L
		Carbon tetrachloride	< 5	ug/L
		Chlorobenzene	< 5	ug/L
		Chloroform	< 5	ug/L
		Tetrachloroethene	< 5	ug/L
		Trichloroethylene	< 5	ug/L
		Vinyl chloride	< 10	ug/L

COMMENTS:

CLIENT ORIGINAL

HALLIBURTON NUS
Environmental Laboratories

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April 07, 1992
Report No.: 00006983
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-478 H2O SAMPLE
NUS SAMPLE NO: P0193113
P.O. NO.: 50848

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	AASW	Arsenic, Total (As)	< 0.1	mg/L
2	ABAW	Barium, Total (Ba)	0.029	mg/L
3	ACDW	Cadmium, Total (Cd)	< 0.005	mg/L
4	ACRW	Chromium, Total (Cr)	< 0.01	mg/L
5	APBW	Lead, Total (Pb)	< 0.05	mg/L
6	AHGW	Mercury, Total (Hg)	< 0.0002	mg/L
7	ASEW	Selenium, Total (Se)	< 0.1	mg/L
8	AAGW	Silver, Total (Ag)	< 0.01	mg/L

COMMENTS:

CLIENT ORIGINAL

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April 07, 1992
Report No.: 00006983
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-479 H_2O SAMPLE
NUS SAMPLE NO: P0193114
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OSVPPW	SEMIVOLATILE EXTRACTABLES		
		1,4-Dichlorobenzene	< 10	ug/L
		2,4,5-Trichlorophenol	< 50	ug/L
		2,4,6-Trichlorophenol	< 10	ug/L
		2,4-Dinitrotoluene	< 10	ug/L
		Hexachlorobenzene	< 10	ug/L
		Hexachlorobutadiene	< 10	ug/L
		Hexachloroethane	< 10	ug/L
		Nitrobenzene	< 10	ug/L
		Pentachlorophenol	< 50	ug/L
		Pyridine	< 10	ug/L
		m-Cresol	< 10	ug/L
		o-Cresol	< 10	ug/L
		p-Cresol	< 10	ug/L

COMMENTS:

HALLIBURTON NUS
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-480 H_2O SAMPLE
NUS SAMPLE NO: P0193294
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OVPPW	VOLATILES		
		1,1-Dichloroethene	< 5	ug/L
		1,2-Dichloroethane	< 5	ug/L
		2-Butanone (MEK)	< 10	ug/L
		Benzene	< 5	ug/L
		Carbon tetrachloride	< 5	ug/L
		Chlorobenzene	< 5	ug/L
		Chloroform	< 5	ug/L
		Tetrachloroethene	< 5	ug/L
		Trichloroethylene	< 5	ug/L
		Vinyl chloride	< 10	ug/L

COMMENTS:

CLIENT ORIGINAL

HALLIBURTON NUS
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April 07, 1992
Report No.: 00006983
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-481 H2O SAMPLE
NUS SAMPLE NO: P0193295
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OSVPPW	SEMIVOLATILE EXTRACTABLES		
		1,4-Dichlorobenzene	< 10	ug/L
		2,4,5-Trichlorophenol	< 50	ug/L
		2,4,6-Trichlorophenol	< 10	ug/L
		2,4-Dinitrotoluene	< 10	ug/L
		Hexachlorobenzene	< 10	ug/L
		Hexachlorobutadiene	< 10	ug/L
		Hexachloroethane	< 10	ug/L
		Nitrobenzene	< 10	ug/L
		Pentachlorophenol	< 50	ug/L
		Pyridine	< 10	ug/L
		m-Cresol	< 10	ug/L
		o-Cresol	< 10	ug/L
		p-Cresol	< 10	ug/L

COMMENTS:

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April 07, 1992
Report No.: 00006983
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-462 SLUDGE SAMPLE
NUS SAMPLE NO: P0193095
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNIT
1	I685S	Petroleum Hydrocarbons	< 20	mg/kg

COMMENTS: Result is not corrected for percent moisture.

CLIENT ORIGINAL

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April 07, 1992
Report No.: 00006983
Section A Page 2

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-463 / TCLP LEACH SLUDGE SAMPLE
NUS SAMPLE NO: P0193098
P.O. NO.: 50848

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	S903	TCLP Leaching Procedure	DONE	
2	AASL	Arsenic, Leachable (As)	0.1	mg/L
3	ABAL	Barium, Leachable (Ba)	1.4	mg/L
4	ACDL	Cadmium, Leachable (Cd)	0.007	mg/L
5	ACRL	Chromium, Leachable (Cr)	< 0.01	mg/L
6	APBL	Lead, Leachable (Pb)	< 0.05	mg/L
7	AHGL	Mercury, Leachable (Hg)	< 0.0002	mg/L
8	ASEL	Selenium, Leachable (Se)	< 0.1	mg/L
9	AAGL	Silver, Leachable (Ag)	< 0.01	mg/L
10	OTCLP	SEMIVOLATILES - TCLP/PART 261		
		1,4-Dichlorobenzene	< 0.1	mg/L
		2,4,5-Trichlorophenol	< 0.1	mg/L
		2,4,6-Trichlorophenol	< 0.1	mg/L
		2,4-Dinitrotoluene	< 0.05	mg/L
		Hexachlorobenzene	< 0.05	mg/L
		Hexachlorobutadiene	< 0.1	mg/L
		Hexachloroethane	< 0.1	mg/L
		Nitrobenzene	< 0.1	mg/L
		Pentachlorophenol	< 0.1	mg/L
		Pyridine	< 0.1	mg/L
		m-Cresol	< 0.1	mg/L
		o-Cresol	< 0.1	mg/L
		p-Cresol	< 0.1	mg/L
12	G121L	ORGANOCHLORINE PESTICIDES		
		Chlordane	< 0.5	ug/L
		Endrin	< 0.1	ug/L
		Heptachlor	< 0.05	ug/L
		Lindane	< 0.05	ug/L
		Methoxychlor	< 0.5	ug/L
		Toxaphene	< 1	ug/L

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April 07, 1992
Report No.: 00006983
Section A Page 4

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-463 / ZHE EXT SLUDGE SAMPLE
NUS SAMPLE NO: P0193097
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	S904	Zero Headspace Leaching Procedure	DONE	
2	OVZHE	VOLATILES - ZHE/PART 261		
		1,1-Dichloroethene	< 50	ug/L
		1,2-Dichloroethane	< 50	ug/L
		2-Butanone (MEK)	< 100	ug/L
		Benzene	< 50	ug/L
		Carbon tetrachloride	< 50	ug/L
		Chlorobenzene	< 50	ug/L
		Chloroform	< 50	ug/L
		Tetrachloroethene	< 50	ug/L
		Trichloroethylene	< 50	ug/L
		Vinyl chloride	< 100	ug/L

COMMENTS:

CLIENT ORIGINAL

HALLIBURTON NUS
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April 07, 1992
Report No.: 00006983
Section A Page 5

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-464 SLUDGE SAMPLE
NUS SAMPLE NO: P0193098
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OVPPS	VOLATILES		
		1,1-Dichloroethene	< 5	ug/kg
		1,2-Dichloroethane	< 5	ug/kg
		2-Butanone (MEK)	< 10	ug/kg
		Benzene	< 5	ug/kg
		Carbon tetrachloride	< 5	ug/kg
		Chlorobenzene	< 5	ug/kg
		Chloroform	< 5	ug/kg
		Tetrachloroethene	< 5	ug/kg
		Trichloroethylene	< 5	ug/kg
		Vinyl chloride	< 10	ug/kg

COMMENTS: The results have not been corrected for % moisture.

CLIENT ORIGINAL

HALLIBURTON NUS
Environmental Laboratories

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April 07, 1992
Report No.: 00006983
Section A Page 6

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-465 SLUDGE SAMPLE
NUS SAMPLE NO: P0193099
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: R Volk

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OSVPPS	SEMIVOLATILE EXTRACTABLES		
		1,4-Dichlorobenzene	< 330	ug/kg
		2,4,5-Trichlorophenol	< 1700	ug/kg
		2,4,6-Trichlorophenol	< 330	ug/kg
		2,4-Dinitrotoluene	< 330	ug/kg
		Hexachlorobenzene	< 330	ug/kg
		Hexachlorobutadiene	< 330	ug/kg
		Hexachloroethane	< 330	ug/kg
		Nitrobenzene	< 330	ug/kg
		Pentachlorophenol	< 1700	ug/kg
		Pyridine	< 330	ug/kg
		m-Cresol	< 330	ug/kg
		o-Cresol	< 330	ug/kg
		p-Cresol	< 330	ug/kg

COMMENTS: The results have not been corrected for % moisture.

CLIENT ORIGINAL

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April 07, 1992
Report No.: 00006983
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-466 Sludge Sample
NUS SAMPLE NO: P0193100
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	I685S	Petroleum Hydrocarbons	< 20	mg/kg

COMMENTS: Result is not corrected for percent moisture.

CLIENT ORIGINAL

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April 07, 1992
Report No.: 00006983
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LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-467 / TCLP LEACH SLUDGE SAMPLE
NUS SAMPLE NO: P0193101
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	S903	TCLP Leaching Procedure	DONE	
2	AASL	Arsenic, Leachable (As)	0.2	mg/L
3	ABAL	Barium, Leachable (Ba)	1.4	mg/L
4	ACDL	Cadmium, Leachable (Cd)	< 0.005	mg/L
5	ACRL	Chromium, Leachable (Cr)	< 0.01	mg/L
6	APBL	Lead, Leachable (Pb)	< 0.05	mg/L
7	AHGL	Mercury, Leachable (Hg)	< 0.0002	mg/L
8	ASEL	Selenium, Leachable (Se)	< 0.1	mg/L
9	AAGL	Silver, Leachable (Ag)	< 0.01	mg/L
10	OTCLP	SEMIVOLATILES - TCLP/PART 261		
		1,4-Dichlorobenzene	< 0.1	mg/L
		2,4,5-Trichlorophenol	< 0.1	mg/L
		2,4,6-Trichlorophenol	< 0.1	mg/L
		2,4-Dinitrotoluene	< 0.05	mg/L
		Hexachlorobenzene	< 0.05	mg/L
		Hexachlorobutadiene	< 0.1	mg/L
		Hexachloroethane	< 0.1	mg/L
		Nitrobenzene	< 0.1	mg/L
		Pentachlorophenol	< 0.1	mg/L
		Pyridine	< 0.1	mg/L
		m-Cresol	< 0.1	mg/L
		o-Cresol	< 0.1	mg/L
		p-Cresol	< 0.1	mg/L
12	G121L	ORGANOCHLORINE PESTICIDES		
		Chlordane	< 0.5	ug/L
		Endrin	< 0.1	ug/L
		Heptachlor	< 0.05	ug/L
		Lindane	< 0.05	ug/L
		Methoxychlor	< 0.5	ug/L
		Toxaphene	< 1	ug/L

HALLIBURTON NUS
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

CLIENT ORIGINAL

6751-L Engle Road
Cleveland, OH 44130
216-891-4700

April 07, 1992
Report No.: 00006983
Section A Page 9

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
SAMPLE ID: WIPP-467 / TCLP LEACH Sludge Sample
NUS SAMPLE NO: P0193101

LN	TEST CODE	DETERMINATION	RESULT	UNITS
14	G130L	CHLORINATED HERBICIDES		
		2,4,5-TP(Silvex)	< 0.05	ug/L
		2,4-D	< 0.5	ug/L

COMMENTS:

CLIENT ORIGINAL

HALLIBURTON NUS
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

6751-L Engle Road
Cleveland, OH 44130
216-891-4700

April 07, 1992
Report No.: 00006983
Section A Page 10

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-467 / ZHE EXT Sludge Sample
NUS SAMPLE NO: P0193102
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	S904	Zero Headspace Leaching Procedure	DONE	
2	OVZHE	VOLATILES - ZHE/PART 261		
		1,1-Dichloroethene	< 50	ug/L
		1,2-Dichloroethane	< 50	ug/L
		2-Butanone (MEK)	< 100	ug/L
		Benzene	< 50	ug/L
		Carbon tetrachloride	< 50	ug/L
		Chlorobenzene	< 50	ug/L
		Chloroform	< 50	ug/L
		Tetrachloroethene	< 50	ug/L
		Trichloroethylene	< 50	ug/L
		Vinyl chloride	< 100	ug/L

COMMENTS:

CLIENT ORIGINAL

HALLIBURTON NUS
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

6751-L Engle Road
Cleveland, OH 44130
216-891-4700

April 07, 1992
Report No.: 00006983
Section A Page 11

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-468 Sludge Sample
NUS SAMPLE NO: P0193103
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OVPPS	VOLATILES		
		1,1-Dichloroethene	< 5	ug/kg
		1,2-Dichloroethane	< 5	ug/kg
		2-Butanone (MEK)	< 10	ug/kg
		Benzene	< 5	ug/kg
		Carbon tetrachloride	< 5	ug/kg
		Chlorobenzene	< 5	ug/kg
		Chloroform	< 5	ug/kg
		Tetrachloroethene	< 5	ug/kg
		Trichloroethylene	< 5	ug/kg
		Vinyl chloride	< 10	ug/kg

COMMENTS: The results have not been corrected for % moisture.

HALLIBURTON NUS
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

Rep
S

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CL
WORK (
VE

Carbon Copy:

SAMPLE ID: WIPP-469 SLUDGE SAMPLE
NUS SAMPLE NO: P0193104
P.O. NO.: 50846

DATE
DATE I
APPRO

LN	TEST CODE	DETERMINATION
1	OSVPPS	SEMIVOLATILE EXTRACTABLES
		1,4-Dichlorobenzene
		2,4,5-Trichlorophenol
		2,4,6-Trichlorophenol
		2,4-Dinitrotoluene
		Hexachlorobenzene
		Hexachlorobutadiene
		Hexachloroethane
		Nitrobenzene
		Pentachlorophenol
		Pyridine
		m-Cresol
		o-Cresol
		p-Cresol

COMMENTS: The results have not been corrected for % moisture.

HALLIBURTON NUS
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

6751-L Engle Road
Cleveland, OH 44130
216-891-4700

CLIENT ORIGINAL

April 07, 1992
Report No.: 00006983
Section A Page 13

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-470 Sludge Sample
NUS SAMPLE NO: P0193105
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	I685	Petroleum Hydrocarbons	< 0.2	mg/L

COMMENTS:

CLIENT ORIGINAL

HALLIBURTON NUS
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205
800-228-6870

6751-L Engle Road
Cleveland, OH 44130
216-891-4700

April 07, 1992
Report No.: 00006983
Section A Page 14

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. JOHN F. GRAN

NUS CLIENT NO: 0527 0029
WORK ORDER NO: 55830
VENDOR NO: 01830782

Carbon Copy:

SAMPLE ID: WIPP-471 SLUDGE SAMPLE
NUS SAMPLE NO: P0193106
P.O. NO.: 50846

DATE SAMPLED: 17-MAR-92
DATE RECEIVED: 19-MAR-92
APPROVED BY: J Simanic

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OVPPH	VOLATILES		
		1,1-Dichloroethene	< 5	ug/L
		1,2-Dichloroethane	< 5	ug/L
		2-Butanone (MEK)	< 10	ug/L
		Benzene	< 5	ug/L
		Carbon tetrachloride	< 5	ug/L
		Chlorobenzene	< 5	ug/L
		Chloroform	< 5	ug/L
		Tetrachloroethene	< 5	ug/L
		Trichloroethylene	< 5	ug/L
		Vinyl chloride	< 10	ug/L

COMMENTS:

Department of Energy
Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221

APR 10 1992

RECEIVED
APR 13 1992
GROUND WATER BUREAU

Mr. Robert J. Garcia, P.E.
Environmental Engineering Specialist
Ground Water Protection and Remediation Bureau
New Mexico Environment Department
1190 St. Francis Drive
Santa Fe, NM 87502

Dear Mr. Garcia:

On March 26, 1992, the Waste Isolation Pilot Plant (WIPP) Project Site Office (WPSO) requested approval from the New Mexico Environment Department (NMED) to dispose nonhazardous brines, generated by the cleaning of WIPP observation wells, through discharge into the WIPP salt pile evaporation basin. NMED approved the disposal in its March 27, 1992, letter under the provisions of WIPP Discharge Plan DP-831. In the approval letter, NMED requested the following documentation at the end of the disposal activity: (1) a copy of the analysis of the waters discharged, (2) the amount of disposed brines, and (3) the date(s) of disposal.

Results of the March 24, 1992, WIPP laboratory analysis of a composite sample of the subject brines are enclosed. Prior to discharge, the subject brines were stored in steam-cleaned frac tanks. A total of 46,578 gallons of brine were hauled by truck to the evaporation basin for disposal. On March 31, 1992, 25,368 gallons were hauled to the evaporation pond. On April 3, 1992, 21,210 gallons were hauled to the evaporation pond.

If you have any questions or require any additional information, please contact Hart M. Greenwood at 887-8107.

Sincerely,

for Arlen Hunt
Project Site Manager

Enclosure

cc w/enclosure:
C&C File
P. McCasland, NMED/WIPP

cc w/o enclosure:
K. Sisneros, NMED
B. Garcia, NMED
N. Weber, NMED
M. Frei, DOE, HQ
J. Arthur, DOE, WPIO
J. Mewhinney, DOE, WPSO
H. Greenwood, DOE, WPSO
G. Venable, ASI, WPSO
R. Farrell, WID

WPSO:JAM I92-0041

Larry J. Madl
Manager, WID
Environmental Monitoring
Waste Isolation Pilot Project

April 6, 1992

Larry,

As per request of the New Mexico Environmental Department letter dated March 27, 1992 the dates and quantities of water disposed of in the WIPP salt pile evaporation pond are as follows.

On March 24, 1992 a sample of waters to be disposed were taken and analyzed in the WIPP environmental on site laboratory. The results were TDS 49,300, Specific Gravity 1.0466, Specific Conductivity 71,800 and total Iron 3.84 mg/l. A copy of the laboratory analysis work sheet is attached.

On March 31, 1992 Rowland trucking disposed of 604 barrels (42 gallons per barrel) and again on April 3, 1992 Rowland trucking Disposed of 505 barrels. Both discharges were made to the WIPP salt evaporation pond and in each instance the tank used to transport the water from the well site to the evaporation pond was steamed cleaned prior to transporting the water. Affidavits of steam cleaning for the trucks are also attached.

Sincerely

Ron Richardson

Ron Richardson
Principle Investigator
Ground Water Programs

WIPP WATER Q_ALITY SAMPLING PROGRAM

WELL : #6b DATE TESTED: 3-24-92

ZONE : Culebra #1 15:30 -3-23-92

Total Dissolved Solids (TDS)

VWR TDS METER READINGS 49,300 PPMs

Specific Gravity

HYDROMETER READING 1.0466

Specific Conductivity

VWR CONDUCTIVITY METER READING 71,800 MICROMHOS

TOTAL IRON TEST	READINGS	UNITS
Fe Total	Dilution 1:4 0.96 x 4=	mg / l 3.84
STD 1 1mg/l	1.04	mg / l

STANDARD Fe 1000 ppm: Mfg. VWR Lot A1-03

DILUTION FACTOR 1 ml into 1000 ml = 1 mg Fe Std

RECOVERY of 1.04 mg. Fe Std.= READING/CALCUTATED STD = 104%

COMMENTS

State of New Mexico
ENVIRONMENT DEPARTMENT

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

BRUCE KING
GOVERNOR

March 27, 1992

Mr. Arlen Hunt
Project Site Manager
Department of Energy
Waste Isolation Pilot Plant Project Office
P.O. Box 3090
Carlsbad, NM 88221

Re: DP-831

Dear Mr. Hunt:

On March 23, 1992 NMED was contacted by your staff requesting permission to dispose of circulation waters used in the cleaning of the observation well casings at the WIPP. This request was followed in writing with your March 26, 1992 letter. Your letter stated analysis results indicate that no applicable standard will be approached or exceeded, with only slight elevations in Total Suspended Solids (TSS), Chloride (CL), and Iron (Fe). This discharge with slight elevations of TSS, CL, and Fe, should not pose a problem with the existing salt pile evaporation pond. Accordingly, your request is acceptable and approved.

For our files please submit a copy of the analysis of this water, the amount and the dates this water is disposed of in the WIPP salt pile evaporation pond.

If you have any questions please call me or Phillis Stevens at 827-2919 or 827-2703.

Sincerely,

Robt M. Gallegos

for Steven J. Cary, Chief
Ground Water Protection and
Remediation Bureau

cc: Garrison McCaslin, NMED District IV Manager
G. Venable, ASI-WPSO
Larry Madl, WPSO

New Mexico DRUG FREE It's a State of Mind!

Harold Runnels Building • 1190 St. Francis Drive • P.O. Box 26110 • Santa Fe, New Mexico 87502
(505) 827-2850 FAX (505) 827-2836

Department of Energy
Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221
MAR 26 1992

RECEIVED
APR 01 1992
GROUND WATER BUREAU

Mr. Robert J. Garcia, P.E.
Environmental Engineer Specialist
Ground Water Section
New Mexico Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Dear Mr. Garcia:

As my staff recently discussed with you, the Waste Isolation Pilot Plant (WIPP) requests permission to discharge circulation waters generated from the cleaning of observation well casings at the WIPP. The accumulation of solids on the walls of the well casings makes it impossible to obtain a seal with well packers used to sample water from different levels in our observation wells. Therefore, the well casings have been cleaned, resulting in production of associated circulation waters which are presently being stored in a truck-borne tank. The WIPP proposes to dispose of these circulation waters in the WIPP salt pile evaporation pond. Analysis results indicate that no applicable standard will be approached or exceeded, with only slight elevations in Total Suspended Solids (TSS), Chloride (Cl), and Iron (Fe) from this one-time procedure.

If you have any questions regarding this procedure, please feel free to contact Trey Greenwood of my staff at 887-8107. Thank you for your consideration on this matter.

Sincerely,

for Arlen Hunt
Project Site Manager

cc;
C&C File
G. Gonzales, NMED
P. McCasland, NMED/WIPP
J. Arthur, DOE/WPIO
K. Sisneros, NMED
B. Garcia, NMED
M. Frei, DOE-HQ
M. McFadden, DOE-WPSO
J. Mewhinney, DOE-WPSO
R. Farrell, DOE-WPSO
G. Venable, ASI-WPSO

NEW ME NVIRONMENT DEPARTMENT

Bruce King
Governor
Judith Espinosa
Secretary
Ron Curry
Deputy Secretary

TELECOPIER TRANSMITTAL

DATE: 3/27 TIME: 14:58 PAGE 1 OF 2
(Include Transmittal)

PLEASE DELIVER THE FOLLOWING PAGES TO:

TO: G. VENABLE

LOCATION: ESA WIPP

TELEPHONE NUMBER:

TELECOPIER NUMBER: 887-0707

FROM: B. GARCIA

LOCATION: NMED

TELEPHONE NUMBER: 827-0027

TELECOPIER NUMBER: (505) 827-

COMMENTS:

Harold Runnels Building
1190 St. Francis Dr.
Santa Fe, New Mexico 87503

State of New Mexico
ENVIRONMENT DEPARTMENT

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

February 26, 1992

Dan Robertson
Environmental Coordinator
P.O. Box 3090
Carlsbad, NM 882211

Re: DP-831

Dear Mr. Robertson:

As we discussed on the phone I have corrected the typo's on your Discharge Plan Listing. I have enclosed a corrected copy for your records. If you have any questions please call me at 827-0027.

Sincerely,

Robert J. Garcia
Environmental Engineer

enclosure

cc: Garrison McCaslin, Manager, District IV, Roswell

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(505) 827-2850 FAX (505) 827-2836

DEPARTMENT OF ENERGY
WIPP PROJECT
FACSIMILE TRANSMITTAL ROUTING SHEET
TELEFAX NUMBER 887-0707

Pages: (including cover) 2 Date: 03/26/92 Time: 14.33 hrs MST

To: Bob Garcia

Location: NMED

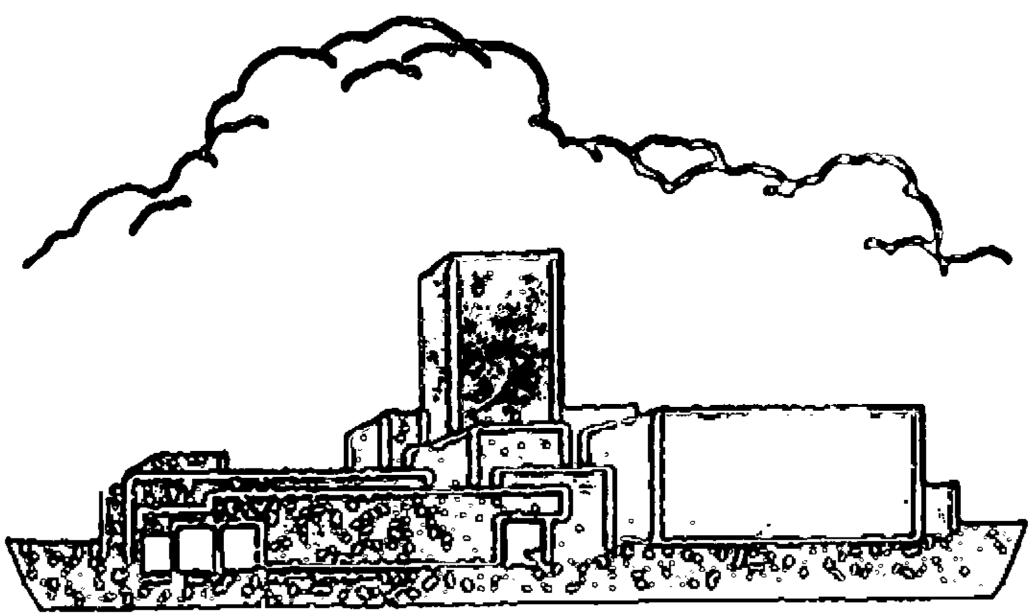
Phone #: 827-2965

From: G Venable

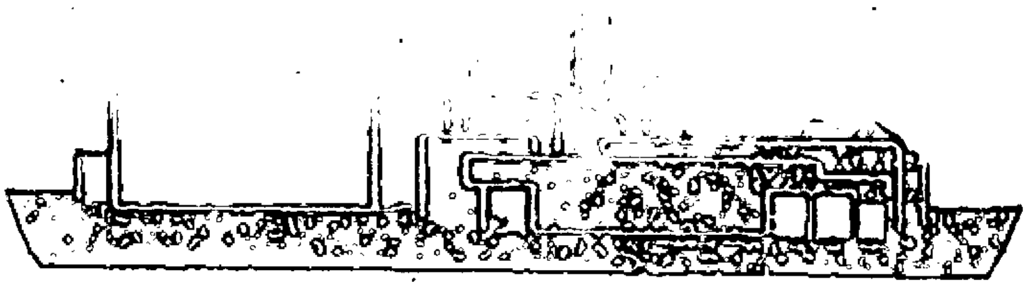
Location: ESH WIPP

Phone/FAX #: 887 8632

Special Instructions: Thanks!



WASTE ISOLATION PILOT PLANT



Department of Energy
Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 26 1992

Mr. Robert J. Garcia, P.E.
Environmental Engineer Specialist
Ground Water Section
New Mexico Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Dear Mr. Garcia:

As my staff recently discussed with you, the Waste Isolation Pilot Plant (WIPP) requests permission to discharge circulation waters generated from the cleaning of observation well casings at the WIPP. The accumulation of solids on the walls of the well casings makes it impossible to obtain a seal with well packers used to sample water from different levels in our observation wells. Therefore, the well casings have been cleaned, resulting in production of associated circulation waters which are presently being stored in a truck-borne tank. The WIPP proposes to dispose of these circulation waters in the WIPP salt pile evaporation pond. Analysis results indicate that no applicable standard will be approached or exceeded, with only slight elevations in Total Suspended Solids (TSS), Chloride (Cl), and Iron (Fe) from this one-time procedure.

If you have any questions regarding this procedure, please feel free to contact Trey Greenwood of my staff at 887-8107. Thank you for your consideration on this matter.

Sincerely,

for Arlen Hunt
Project Site Manager

cc:
C&C File
G. Gonzales, NMED
P. McCasland, NMED/WIPP
J. Arthur, DOE/WPIO
K. Sisneros, NMED
B. Garcia, NMED
M. Frei, DOE-HQ
M. McFadden, DOE-WPSO
J. Mewhinney, DOE-WPSO
R. Farrell, DOE-WPSO
G. Venable, ASI-WPSO

State of New Mexico

ENVIRONMENT DEPARTMENT

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

P 904 057 892

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Sent to	Arlen E. Hunt
Street & No.	
P.O., State & ZIP Code	
Postage	$

January 16, 1992

Mr. Arlen E. Hunt, Manager
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, NM 88221

RE: Discharge Plan Approval, DP-831

Dear [illegible]nt:

Pursuant to Water Quality Control Commission (WQCC) Reg. 3-109, the discharge plan application for DP-831, submitted by the U.S. Department of Energy, Waste Isolation Pilot Plant (WIPP) Project Site Office for the discharge of 23,000 gallons per day (GPD) of sewage effluent and up to 1500 GPD of nonhazardous brine water from the Waste Isolation Pilot Plant is hereby approved, subject to any conditions listed below. The facility is located approximately 30 miles east of Carlsbad in the NE1/4, SE1/4, NW1/4 of Section 29, T22S, R31E, Eddy County. In approving this discharge plan, the New Mexico Environment Department (NMED) has determined that the requirements of WQCC Reg. 3-109.C have been met.

The approved WIPP sewage treatment is briefly described as follows:

An average of 23,000 GPD of sewage effluent is being discharged into an existing lagoon system. The existing sewage facilities at the WIPP site are made up of two settling and polishing cells, operated in parallel, and a single evaporation lagoon. The present system is approximately 3.9 surface acres, or 12.59 acre/feet in size. The proposed evaporation lagoon expansion will enlarge the facility by approximately 1.5 surface acres, or 5.25 acre/feet. These new lagoons will be lined with a 30-mil synthetic liner. A maximum of 1500 GPD of nonhazardous brine water will be hauled by tank truck and pumped into the existing Salt Pile evaporation pond, until the proposed new evaporation lagoons are constructed. After the new lagoons are completed, flow from the existing lagoon system will be diverted to the new lagoons. The existing North Cell evaporation lagoon will be lined prior to being brought back into service.

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(505) 827-2850 FAX (505) 827-2836

The approved discharge plan consists of the materials submitted by Westinghouse Electric Corporation dated November 14, 1991 and January 8, 1992. However, approval of this discharge plan does not relieve you of your responsibility to comply with any other applicable local laws and regulations, such as zoning requirements and nuisance ordinances.

SPECIFIC REQUIREMENTS

The terms and conditions of this approval contain specific requirements which are summarized below.

1. The applicant shall monitor the quantity of brine water pumped into the evaporation ponds monthly and submit a quarterly report to the Ground Water Section's office.

2. A Water Quality analysis of the inflow to the lagoon system shall be submitted with the quarterly report mentioned above. This report shall include the analysis for Nitrate, TKN, Radium 226 & 228. (See attached Discharge Plan Listing and Summary).

3. Each evaporation lagoon shall be sampled for TDS quarterly and the results submitted in the quarterly report.

4. Berms protecting the lagoon system shall be maintained to protect from precipitation runoff and runon.

5. The applicant has 18 months from date of approval to complete construction of the proposed evaporation ponds. The applicant can discharge brine waters into the existing Salt Pile evaporation pond until the new evaporation ponds are completed.

GENERAL DISCHARGE PLAN REQUIREMENTS

In addition to any other requirements provided by law, the approval of DP-831 is subject to the following general requirements:

Monitoring and Reporting

Monitoring and reporting shall be as specified in the discharge plan and supplements thereto. These requirements are summarized on the attached sheet(s). Any inadvertent omissions from this summary of a discharge plan monitoring or reporting requirement shall not relieve you of responsibility for compliance with that requirement.

Record Keeping

1. The discharger shall maintain at the facility, a written record of ground water and wastewater quality analyses.

The following information shall be recorded and shall be made available to the NMED upon request.

a. The dates, exact place and times of sampling or field measurements.

b. The name and job title of the individuals who performed the sampling or measurements.

c. The dates the analyses were performed.

d. The name and job title of the individuals who performed the analyses.

e. The analytical techniques or methods used.

f. The results of such analyses, and

g. The results of any split sampling, spikes or repeat sampling.

2. The discharger shall maintain a written record of any spills, seeps, and/or leaks of effluent, leachate and/or process fluids not authorized by this discharge plan.

3. The discharger shall maintain a written record of the operation, maintenance and repair of facilities/equipment used to treat, store and/or dispose of wastewater; to measure flow rates; and/or to monitor water quality. This will include repairs, replacement or calibration of flow meters or repairs or replacement of pond liners.

Inspection and Entry

In accordance with Sections 74-6-9.B & E NMSA 1978 and WQCC Reg. 3-107.D., the discharger shall allow the Secretary or her authorized representative, upon the presentation of credentials, to:

1. Enter at regular business hours or at other reasonable times upon the discharger's premises or where records must be kept under the conditions of this discharge plan.

2. Inspect and copy, during regular business hours or at other reasonable times, any records required to be kept under the conditions of the discharge plan.

3. Inspect, at regular business hours or at other reasonable times, any facility, equipment (including monitoring, and control equipment), practices or operations regulated or required under this discharge plan.

4. Sample or monitor, at reasonable times for the purpose of assuring discharge plan compliance or as otherwise authorized by the New Mexico Water Quality Act, any effluent at any location before or after discharge.

Duty to Provide Information

In accordance with Section 74-6-9.B NMSA 1978 and WQCC Reg. 3-107.D., the discharger shall furnish to the NMED, within a reasonable time frame specified by NMED, any relevant information which it may request to determine whether cause exists for modifying, terminating and/or renewing this discharge plan or to determine compliance with this plan. The discharger shall furnish to the NMED, upon request, copies of records required to be kept by this discharge plan.

Spills, Leaks and Other Unauthorized Discharges

This approval authorizes only those discharges specified in the discharge plan. Any unauthorized discharges violate WQCC Reg. 3-104, and must be reported to the NMED and remediated as required by WQCC Reg. 1-203. This requirement applies to all seeps, spills, and/or leaks discovered from the sewage lagoons or that may directly or indirectly leave the boundaries of the WIPP site.

Retention of Records

The discharger shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by this discharge plan, and records of all data used to complete the application for this discharge plan, for a period of at least five years from the date of the sample collection, measurement, report or application. This period may be extended by request of the Secretary at any time. This requirement does not supercede any other requirements for records retention.

Enforcement

Failure to grant the Secretary or her authorized representative access to the records required to be kept by this discharge plan or to allow an inspection of the discharge facilities or to the collection of samples is a violation of this discharge plan and the WQCC Regulations. Such violations as well as other violations of the discharge plan, may subject the discharger to civil penalties and injunctive relief pursuant to Sections 74-6-5.P and 74-6-10 NMSA 1978, and/or modification or termination of this discharge plan pursuant to Section 74-6-5.J NMSA 1978. In addition, anyone who knowingly makes any false statement, representation or certification in any record, report or other document required to be kept by this discharge plan shall, upon conviction, be punished by a fine of not less than $300 or more than $10,000 per day or by imprisonment for not more than one year or both, pursuant to Section 74-6-5.O NMSA 1978.

Modifications and/or Amendments

The discharger shall notify NMED, pursuant to WQCC Regs. 3-107.C, of any modifications or additions to the applicant's wastewater disposal system, including any increase in wastewater flow rate and wastewater storage and disposal management changes to the system as approved under this discharge plan. The discharger shall obtain NMED's approval, as a discharge plan modification, prior to any increase in the quantity or concentration of constituents in the waste water above those approved in this plan. Please note that WQCC Regs. 3-109.E and F provide for possible future amendment of the plan.

Other Requirements

Please be advised that the approval of this plan does not relieve WIPP of liability should your operation result in actual pollution of surface or ground water which may be actionable under other laws and/or regulations.

RIGHT TO APPEAL

If the applicant is dissatisfied with this action taken by NMED, the applicant may file a petition for hearing before the WQCC. This petition shall be in writing to the Secretary of NMED at:

P.O. Box 26110 - Runnels Bldg.
1190 St. Francis Drive
Santa Fe, NM 87502

within thirty (30) days of the receipt of this letter. Unless a timely request for hearing is made, the decision of the NMED shall be final.

PERIOD OF APPROVAL

This approval is good for five years and will expire on January 16, 1997.

We would like to thank Mr. Dan Robertson for his cooperation throughout this discharge plan review and approval process.

Sincerely,

Steven J. Cary, Chief
Ground Water Protection &
Remediation Bureau

SJC:RJG:RJG

Enclosures

cc: Garrison McCaslin, District Manager, NMED District IV
Tom Bert, Health Program Manager, NMED Carlsbad Office

'ISCHARGE PLAN LISTING

[Printed 16-JAN-92]

DP Number: 831

Facility Name: WIPP - SEWAGE LAGOON
Facility Type:
Waste Type: DOMESTIC WASTE
Discharge / Treatment: EVAPORATION LAGOON / LAGOON

County: EDDY
ED District: 4 22S 31E Sec. 29.000
Location: 30 MILES EAST OF CARLSBAD
Nearest city: CARLSBAD
Lat: 32 22 30 Lon: 103 47 30
Quad Coord:

Responsible Person:
ARLEN E. HUNT
Title: MANAGER
Address: P.O. BOX 3090
City, zip: CARLSBAD NM 88221
Phone: 887-8143

Contact or consultant person:
DAN ROBERTSON
ENV. COORD.
P.O. BOX 3090
CARLSBAD NM 88221
887-8240

SIC Number: Gal/day: 23000 Depth to water: 608 ft. TDS: 10500 mg/l.

Pre-1977 discharger? NO
Monitoring requirements? YES
Other Permits:

DISCHARGE PLAN STATUS

Staff Reviewer: BOB GARCIA

-- STATUS SUMMARY: --
Under Review
Operation Active

NOI received: 15-JUL-91
DP or mod applic. recvd: 14-NOV-91
DP-required letter sent:
DP Approved: 16-JAN-92
Expires: 16-JAN-97
Operational Status: Active
Last site inspection: 19-DEC-92

Public Notice published: 05-DEC-91
Public Hearing:
Original DP approval: 16-JAN-92
Last Modification:
Last info request letter:
DP or Mod. complete:

Enforcement: NO
Remarks:

MONITORING REQUIREMENTS

No. of monitoring reports required annually: 4
Next report due: 16-APR-93

Due	Received	Standards exceeded?	Report complete?
16-APR-93			
16-JAN-93			
16-OCT-92			
16-JUL-92			

Sampling required	Annual freq.	No of sites	Comments, description
TDS	4	1	AT EVAPORATION LAGOONS
Disch. Vols	4	1	VOL. OF ANN. BRINE DISH. INTO EVAP. LAGOONS
Nitrate, TKN	4	1	AT INFLOW TO SET. PONDS (N03 & TKN)
Radionuclide	4	1	AT INFLOW TO SET PONDS (RADIUM 226 & 228)

GROUND WATER SECTION
Groundwater Bureau
Environment Department
Santa Fe, N.M. 87503
(505) 827-2900

SUMMARY OF DISCHARGE PLAN

January 16, 1992

DP number: 831

Facility Name: WIPP - SEWAGE LAGOON
Facility Type:
Waste Type: DOMESTIC WASTE
Discharge / Treatment: EVAPORATION LAGOON / LAGOON

County: EDDY   ED District: 4   22S   31E   Sec. 29.000

Location: 30 MILES EAST OF CARLSBAD   Nearest City: CARLSBAD

	Responsible Person:	Contact or Consultant Person
	ARLEN E. HUNT	DAN ROBERTSON
Title:	MANAGER	ENV. COORD.
Address:	P.O. BOX 3090	P.O. BOX 3090
City, zip:	CARLSBAD NM 88221	CARLSBAD NM 88221
Phone:	887-8143	887-8240

The Ground Water Section staff reviewer is BOB GARCIA .
Application was received 14-NOV-91 and Public Notice published 05-DEC-91 .
The plan was approved 16-JAN-92 and expires 16-JAN-97 .
(Application for renewal should be submitted in ample time before expiration.)

MONITORING REQUIREMENTS SUMMARY

No. of monitoring reports required annually: 4

Sampling required	Annual freq.	No of sites	Comments, description
TDS	4	1	AT EVAPORATION LAGOONS
Disch. Vols	4	1	VOL. OF ANN. BRINE DISH. INTO EVAP. LAGOONS
Nitrate, TKN	4	1	AT INFLOW TO SET. PONDS (N03 & TKN)
Radionuclide	4	1	AT INFLOW TO SET PONDS (RADIUM 226 & 228)

____ If this space is checked, monitoring requirements are summarized or explained in more detail on the attached sheet. Any inadvertent omission from this summary does not relieve the discharger of responsibility for compliance with that requirement.

Send monitoring reports to the address at top, "Attention: BOB GARCIA re: DP - 831 ."

Department of Energy
Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JAN 07 1992

Dr. Ernest C. Rebuck, Program Manager
Groundwater Bureau
New Mexico Environment Department
1190 St. Francis Dr.
Santa Fe, New Mexico 87503

Dear Dr. Rebuck:

Please find enclosed the revised Discharge Plan Application, and the engineering design drawings for the expansion of the sewage lagoon system at the Waste Isolation Pilot Plant (WIPP). In addition, please find enclosed the five year discharge permit fee ($1,150). Please note that the WIPP Project Site Office (WPSO) is submitting the engineering design drawings by January 6, 1992, as required by the New Mexico Environment Department (NMED). In addition, the WPSO is submitting a revised Discharge Plan Application as requested by Robert J. Garcia of your staff on December 18, 1991. The original Discharge Plan Application was submitted on November 14, 1991. The WPSO understands that this submittal completes the permit application package requirements for a NMED groundwater discharge permit.

The expansion of the sewage lagoon will include the construction of a new, lined, evaporation lagoon, to be located "downstream" from the existing sewage lagoon, and the installation of a liner in the existing sewage lagoon. The liner for the existing sewage lagoon will be installed after the new lagoon is put "on-line".

The new lagoon will store and evaporate sewage effluent flowing from the existing sewage lagoon. In addition, the new lagoon will store and evaporate brine waters generated from mine dewatering activities and the pumping of groundwater observation wells around the site. A truck will be used to transport the brine to the new lagoon. It is important to note that brine waters will only be introduced into the north cell of the new sewage lagoon.

The WPSO will submit the certified "as-built" engineering drawings upon completion of the expansion of the sewage lagoon. These drawings will detail the "as-built" berms, fence, and synthetic liner construction. The sewage lagoon expansion will begin after the NMED groundwater discharge permit has been received, and after the National Environmental Policy Act (NEPA) requirements have been met.

If you have any questions regarding this submittal, please contact James A. Mewhinney at (505) 887-8143.

Sincerely,

For Arlen Hunt
Project Manager

Enclosure

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Ecological Services
Suite D, 3530 Pan American Highway, NE
Albuquerque, New Mexico 87107

December 23, 1991

Mr. Ernest Rebuck
Ground Water Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Dear Mr. Rebuck:

This responds to the Public Notice dated November 25, 1991, regarding the effects of granting State of New Mexico groundwater discharge permits on fish, shellfish, and wildlife resources in New Mexico.

The U.S. Fish and Wildlife Service (Service) has determined there is no wetland or other environmentally sensitive habitat that will be adversely affected by the following discharge plans.

> **DP-48 Karler Packing Company**, 10 miles south of Albuquerque, Bernalillo County, New Mexico.

> **DP-213 Chino Mines Company**, Santa Rita and Hurley, Grant County, New Mexico.

The Service is providing the following comments regarding these additional permit applications.

> **DP-831 Waste Isolation Pilot Plant - Sewage Lagoon**, 30 miles east of Carlsbad, Eddy County, New Mexico. Two sewage ponds are proposed to be added to five existing ponds to treat sewage effluent, brine waters generated from mine dewatering activities, and groundwater pumped from observation wells around the site. The Service recommends that steps be taken to preclude migratory bird access to the ponds such as the installation of netting or screens over the ponds.

> **DP-832 Olex Spice, Inc.**, 2 miles east of Radium Springs, Dona Ana County, New Mexico, plans to store effluent composed of recovered condensed steam (water) and hexane in a poured concrete lagoon for evaporation of hexane and reuse in the operation or for irrigation of landscape areas at the plant. The Service also recommends such measures as the installation of netting or screens over the lagoon to preclude migratory bird contact with the effluents. Furthermore, the potential for groundwater contamination exists if recovered water with residual hexane is applied to the ground during irrigation procedures. Tests should be performed before application to ensure no hexane remains in any water to be used for this purpose.

Section 703 of the Migratory Bird Treaty Act (Act) prohibits anyone at any time or in any manner to capture, transport, or kill any migratory birds unless permitted by regulations promulgated under it. If migratory birds become exposed and/or accumulate harmful levels of contaminants, this may constitute "take" under the Act. The courts have stated the Act can be constitutionally applied to impose penalties to persons, associations, partnerships, or corporations which did not intend to "kill" migratory birds, and that the Act includes poisoning by any means. The unlawful killing of even one migratory bird is an offense.

If we can be of further assistance, please leave a message for Todd Adornato or phone Richard Roy at (505) 883-7877.

Sincerely,

Jennifer Fowler-Propst
Field Supervisor

cc:
Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico
Regional Administrator, U.S. Environmental Protection Agency, Dallas, Texas
Regional Director, U.S. Fish and Wildlife Service, Fish and Wildlife Enhancement, Albuquerque, New Mexico

State of New Mexico
ENVIRONMENT DEPARTMENT
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

P 327 271 811
RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED,
NOT FOR INTERNATIONAL MAIL
(See Reverse)
Arlen E. Hunt
WIPP-Sewage Lagoon
P.O. Box 2078
Jal Highway
Carlsbad, NM 88220
Certified Fee
☆U.S.G.P.O. 1989-234-555

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DP-831 (BG)

December 2, 1991

Arlen E. Hunt
WIPP-Sewage Lagoon
P.O. Box 2078
Jal Highway
Carlsbad, NM 88220

Dear Mr. Hunt:

Enclosed is a copy of the public notice pertaining to your proposed discharge(s) which is being published by the New Mexico Environment Department in a newspaper of general circulation.

If you have any questions, please do not hesitate to contact me at the address listed below or at 827-2900.

Sincerely,

Ernest C. Rebuck
Program Manager
Ground Water Section

ECR:mar

Enclosure

State of New Mexico
ENVIRONMENT DEPARTMENT
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502

BRUCE KING
GOVERNOR

P 327 271 616
RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)
The Hon. Bob Forrest
Mayor, City of Carlsbad
P.O. Box 1569
Carlsbad, NM 88220
★U.S.G.P.O. 1989-234-555

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DP-831 (BG)

December 2, 1991

The Honorable Bob Forrest
Mayor
City of Carlsbad
P.O. Box 1569
Carlsbad, NM 88220

Dear Mayor Forrest:

Enclosed is a copy of the public notice which includes notice of a proposed discharge plan(s) for one or more operations in or near your city which is being published by the New Mexico Environment Department in a newspaper of general circulation.

If you have any questions, please do not hesitate to contact me at the address listed below or at 827-2900.

Sincerely,

Ernest C. Rebuck
Program Manager
Ground Water Section

ECR:mar

Enclosures

State of New Mexico
ENVIRONMENT DEPARTMENT
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502

BRUCE KING
GOVERNOR

P 327 271 606
RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)
Board of Co. Commissioners
Eddy County
Eddy Co. Courthouse
Carlsbad, NM 88220
Certified Fee

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DP-831 (BG)

December 2, 1991

Board of County Commissioners
Eddy County
Eddy County Courthouse
Carlsbad, NM 88220

Board of County Commissioners:

Enclosed is a copy of the public notice for one or more operations located in your county which is being published by the New Mexico Environment Department in a newspaper of general circulation.

If you have any questions, please do not hesitate to contact me at the address listed below or at 827-2900.

Sincerely,

Ernest C. Rebuck
Program Manager
Ground Water Section

ECR:mar

Enclosure

November 25, 1991

TO BE PUBLISHED ON OR BEFORE DECEMBER 6, 1991

PUBLIC NOTICE

NEW MEXICO ENVIRONMENT DEPARTMENT

Notice is hereby given that, pursuant to New Mexico Water Quality Control Commission Regulations, the following proposed discharge plans have been submitted for approval to the New Mexico Environment Department. The information in this notice generally has been supplied by the applicant and may or may not have been confirmed by the Environment Department.

DP-48 KARLER PACKING COMPANY, Jess Karler, President, P.O. Box 1005, Albuquerque, NM 87103, proposes to renew its discharge plan for the discharge of 60,000 gallons per day of meat processing waste water to a concrete lagoon followed by land application. The facility is located 10 miles south of Albuquerque in Section 31, T9N, R3E, Bernalillo County. The meat processing waste water is routed to a concrete lagoon for preliminary treatment. The waste water is then trucked to the west mesa for land application. Ground water below the site is at a depth greater than 100 feet and has a total dissolved solids concentration of approximately 500 milligrams per liter.

DP-213 CHINO MINES COMPANY, D.P. Milovich, Manager, Hurley, NM 88043, proposes to modify its discharge plan for its copper and molybdenum concentrator facility located at Santa Rita, NM and pipelines associated with the concentrator. The concentrator has a capacity of 50,000 tons of ore per day. The concentrator is connected to the tailings area at Hurley by a set of three buried pipelines which traverse the seven mile distance. There is also a concentrate slurry line and a process water return line associated with the concentrator. The concentrator and pipelines are located in T17S, R12W; T18S, R12W; T18S, R13W; T19S, R12W and T19S, R13W. The concentrator is located at Santa Rita, NM and the pipelines are between Santa Rita and Hurley, NM, Grant County. The modification proposes methods to improve leak detection of pipeline ruptures and proposes corrective actions for addressing tailings spills. Ground water below the site is at a depth of approximately 19 to approximately 100 feet and has a total dissolved solids concentration of approximately 375 to 3,630 milligrams per liter.

DP-831 WASTE ISOLATION PILOT PLANT - SEWAGE LAGOON, Mr. Arlen E. Hunt, P.O. Box 2078, Jal Highway, Carlsbad, NM 88220, proposes to discharge about 23,000 gallons per day of sewage effluent and about 1,500 gallons per day of brine water into lined evaporation ponds. The facility is located approximately 30 miles east of Carlsbad in the SE 1/4, NE 1/4, NW 1/4 of Section 29, T22S, R31E, Eddy County. Lined lagoons will be used to treat sewage effluent, brine waters generated from mine detwatering activities and ground water pumped from observation wells around the site. Ground water below the site is at a depth of approximately 608 feet and has a total dissolved solids concentration of approximately 10,500 milligrams per liter.

DP-832 OLEX SPICE, INC., Lloyd Anderson, Star Route Box 314, Rincon, NM 87940, proposes to discharge 2,800 gallons per day of condensate containing a maximum of five pounds of hexane per hour from an Oleo resin extraction plant. The facility is located approximately two miles due east of Radium Springs in the E 1/2, NW 1/4, SW 1/4 of Section 12, T21S, R1W, Dona Ana County. Effluent is to be stored in a poured concrete lagoon for evaporation of hexane and reuse in the operation or for irrigation of landscape areas at the plant. Ground water below the site is at a depth of approximately 65 feet and has a total dissolved solids concentration of approximately 2,160 milligrams per liter.

Any interested person may obtain further information from the Ground Water Section of the Environment Department, telephone (505) 827-2900, and may submit written comments to the Ground Water Section, Environment Department, P.O. Box 26110, Santa Fe, NM 87502. Prior to ruling on any proposed discharge plan or its modification, the Environment Department will allow thirty (30) days after the date of publication of this notice to receive written comments and during which a public hearing may be requested by any interested person. Requests for public hearing shall set forth the reasons why the hearing should be held. A hearing will be held if the Environment Department determines that there is significant public interest.

12/16/90

Bob,

Westinghouse Electric Corpor[illegible], Waste Isolation Pilot Plant Project
P. O. Box 2078, Carlsbad, NM 8[illegible]21

CHECK NO.	YOUR INVOICE OR FREIGHT PRO. No.	INVOICE DATE	OUR REF. No.	GROSS AMOUNT	DISCOUNT AMOUNT	NET AMOUNT
061671	NMED DISCHG	12261	DJ34 ZZC004	1,150.00	0.00	:1,150.00
	M000000090		TOTALS	:1,150.00	0.00	1,150.00

The notice went out w/

SE 1/4, NE 1/4, NW 1/4 section 29.

Their error.

DP-831

Department of Energy
Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221

NOV 14 1991

RECEIVED
NOV 15 1991
GROUND WATER BUREAU

Dr. Ernest C. Rebuck, Program Manager
Groundwater Bureau
New Mexico Environment Department
1190 St. Francis Dr.
Santa Fe, New Mexico 87503

Dear Dr. Rebuck:

Please find enclosed the completed Discharge Plan Application for the expansion of the sewage lagoon system at the Waste Isolation Pilot Plant (WIPP). The expansion includes the construction of a new, lined, evaporation lagoon, to be located "downstream" from the existing sewage lagoon, and the installation of a liner in the existing sewage lagoon. The liner for the existing sewage lagoon will be installed after the new lagoon is put "on-line."

The new lagoon is designed to store and evaporate brine waters generated from mine dewatering activities and the pumping of groundwater observation wells around the site. The new lagoon will also be used as an additional storage and evaporation basin for sewage effluent flowing from the existing sewage lagoon. A truck will be used to transport the brine to the new lagoon. It is important to note that brine waters will not be introduced into the other cells of the existing sewage lagoon system.

This discharge plan application is being submitted as part of the requirements of the New Mexico Environment Department (NMED) temporary 120-day discharge permit for the disposal of brine waters in the salt pile evaporation pond. The WIPP Project Office understands that the NMED must receive the final engineering design drawings and construction cost estimates by January 6, 1992. This January submittal will complete the permit application package.

If you have any questions regarding this submittal, please contact James A. Mewhinney at 887-8143.

Sincerely,

Thomas J. Reese
for Arlen Hunt
Project Manager

Enclosure

cc w/enclosure:
C&C File

cc w/o enclosure:
G. Gonzales, NMED
K. Sisneros, NMED
B. Garcia, NMED
P. McCasland, NMED/WIPP
S. Schneider, DOE-HQ
J. Arthur, DOE-AL
L. Gage, DOE-AL
D. Mercer, DOE-AL
R. Wise, DOE-WPO
M. McFadden, DOE-WPO
J. Mewhinney, DOE-WPO
H. Greenwood, DOE-WPO
S. Cooper, WID
D. Robertson, WID
W. Bodily, WID
R. Farrell, WID

WIPP:MHM I91-0124

Carlsbad Current-Argus

A-8—Thursday, December 5, 1991

December 5, 1991

PUBLIC NOTICE

NEW MEXICO ENVIRONMENT DEPARTMENT

Notice is hereby given that, pursuant to New Mexico Water Quality Control Commission Regulations, the following proposed discharge plans have been submitted for approval to the New Mexico Environment Department. The information in this notice generally has been supplied by the applicant and may or may not have been confirmed by the Environment Department.

DP-831 WASTE ISOLATION PILOT PLANT - SEWAGE LAGOON, Mr. Arlen E. Hunt, P.O. Box 2078, Jal Highway, Carlsbad, NM 88220, proposes to discharge about 23,000 gallons per day of sewage effluent and about 1,500 gallons per day of brine water into lined evaporation ponds. The facility is located approximately 30 miles east of Carlsbad in the SE 1/4, NE 1/4, NW 1/4 of Section 29, T22S, R31E, Eddy County. Lined lagoons will be used to treat sewage effluent, brine waters generated from mine detwatering activities and ground water below the site is at a depth of approximately 608 feet and has a total dissolved solids concentration of approximately 10,500 milligrams per liter.

Any interested person may obtain further information from the Ground Water Section of the Environment Department, telephone (505) 827-2900, and may submit written comments to the Ground Water Section, Environment Department, P.O. Box 26110, Santa Fe, NM 87502. Prior to ruling on any proposed discharge plan or its modification, the Environment Department will allow thirty (30) days after the date of publication of this notice to receive written comments and during which a public hearing shall set forth the reasons why the hearing should be held. A hearing will be held if the Environment Department determines that there is significant public interest.

GROUND W.. .R OBSERVATION W●LL REPORT 9932

PROJECT WIPP	Page 1 of 1
LOCATION PLANT SITE VICINITY	Well No. B-1
Date Completed 29 DEC 1978 Original Depth 57.7' OPEN	Aquifer SANTA ROSA
Inspected By C T Scott Date 12/28/78 REQUIRES ADDL. BACKFILL	FORMATION
Checked By ______ Date ______	Depth Interval 48.7-53'

DISTANCE FROM TOP OF PVC TO BOTTOM MOST SLOT OF SCREEN IS 54.87'

Ground Elevation 3412.2

Generalized Stratigraphy and Water Level

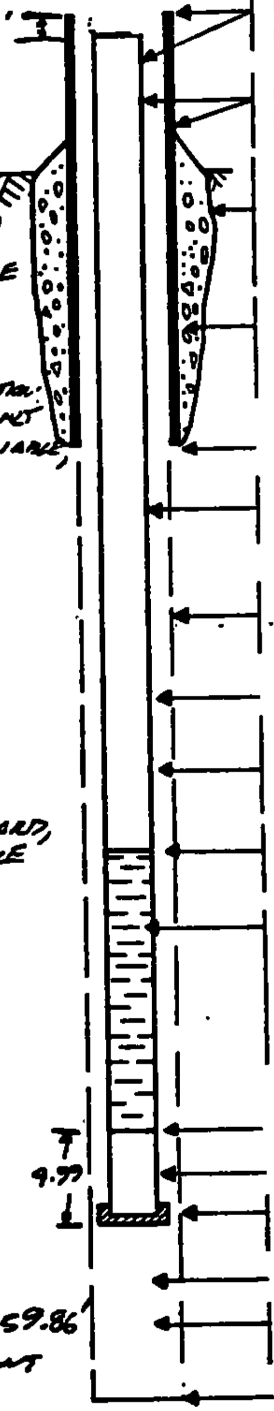
0.0-9.9': SAND

9.9-15': CALICHE

15.0-37.6': GATUNA FORMATION: SANDSTONE, LIGHT WEATHERED, FRIABLE, OXIDIZED.

37.6-58.2': SANTA ROSA FORMATION: SANDSTONE, MODERATELY HARD, FRESH, FRIABLE

TOTAL PVC: 59.86'
10 BAGS CEMENT



Elevation of top of surface casing / riser pipe. 3414.3/3413.9

Height of top of surface casing / riser pipe above ground surface 2.1/1.7'

Depth of surface seal below ground surface 42'

Type of surface seal: 1:1 CEMENT GROUT

I.D. of surface casing. 6"

Type of surface casing: 5' LONG STEEL PIPE WITH THREADED/VENTED CAP

Depth of surface casing below ground 3.3'

I.D. of riser pipe. 2"

Type of riser pipe: SWANSON 2" PVC 1120; ASTM 2241

Diameter of borehole 6½"

Depth of borehole 58.2'

Type of backfill: 1:1 CEMENT GROUT

Elev./depth top of seal. 3370.2/42'

Type of seal: CLAYEY DRILL CUTTINGS

Elev./depth bottom of seal. 3369.2/43'

Type of sand pack 3/8" GRAVEL

Depth of top of sand pack. 3369.2/43'

Elev./depth top of screened section. 3363.5/48.7

Type of screened section: SLOTTED

Discribe openings 0.2' SPACED HACKSAW SLOTS, TWO SIDES OF PVC

I.D. of screened section. 2"

Elev./depth bottom of screened section. 3359.2/53'

Length of blank section. 4.99'

Elev./depth bottom of plugged blank section. 3354.2/58'

Elev./depth bottom of sand column. NA

Type of backfill below observation pipe. 0.2' CAVE

Elev./depth of hole. 3354/58.2'

59.7
1.7

009932

GROUND WATER OBSERVATION WELL REPORT

PROJECT WIPP

LOCATION Plant Site Vicinity

Date Completed 29 DEC 1978 Original Depth 12.9'

Inspected By T.T. Scott Date 29 DEC 1979

Checked By ______ Date ______

Page 1 of 1

Well No. B-1A

Aquifer Sand Dunes

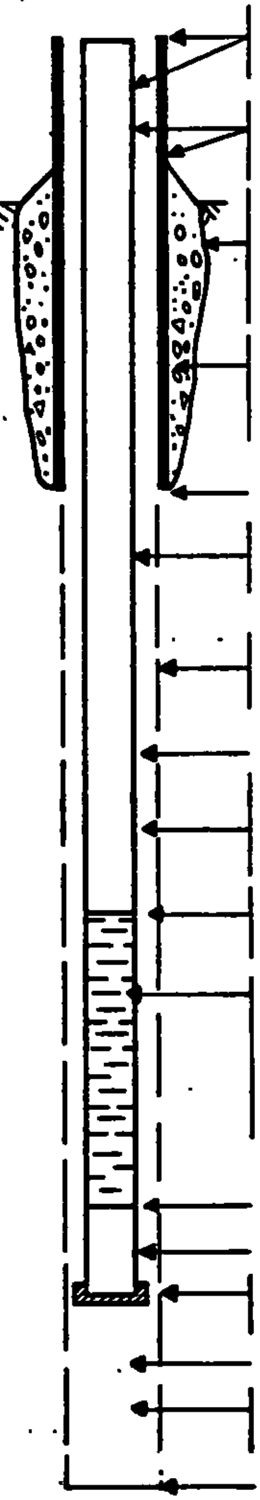
Depth Interval 8.9-10.9

Ground Elevation 3412.5

0-11.1': SAND DUNES

11.1-12.9': CALICHE

Generalized Stratigraphy and Water Level



Elevation of top of surface casing / riser pipe. ~3415 / 3414.8

Height of top of surface casing / riser pipe above ground surface. 2' / 1.9

Depth of surface seal below ground surface ~3'

Type of surface seal: 1:1 CEMENT GROUT

I.D. of surface casing. 6"

Type of surface casing: 5' LONG, STEEL PIPE

Depth of surface casing below ground --

I.D. of riser pipe. 2"

Type of riser pipe: SWANSON PVC 1120; ASTM 2241

Diameter of borehole 6"

Depth of borehole 12.9'

Type of backfill: Sand (native)

Elev./depth top of seal. 3407/5.5'

Type of seal: Cement (1:1)

Elev./depth bottom of seal. 3406.5/6.0'

Type of sand pack. Gravel (3/8")

Depth of top of sand pack. 8.9

Elev./depth top of screened section. 3403.6/8.9'

Type of screened section: Slotted PVC

Discribe openings sawed slots 1" apart staggered on apposit sides

I.D. of screened section. 2"

Elev./depth bottom of screened section. 3401.6/10.9'

Length of blank section. 2.0'

Elev./depth bottom of plugged blank section. 3399.6/12.9

Elev./depth bottom of sand column. 3399.6 12.9'

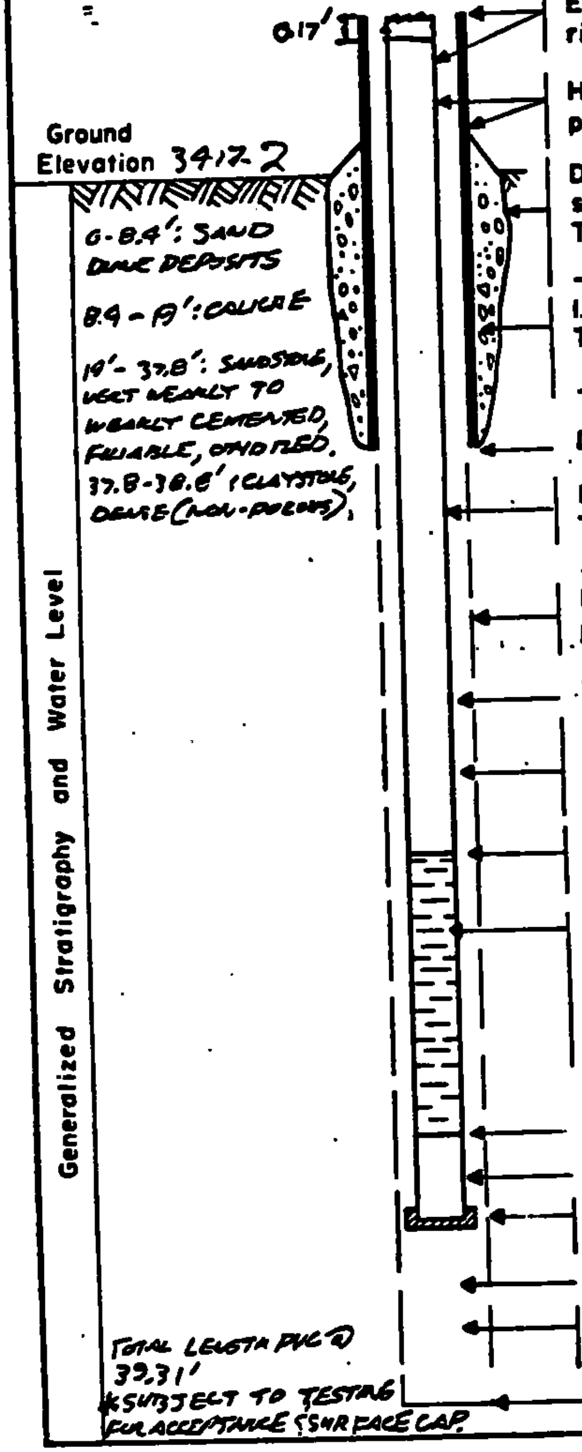
Type of backfill below observation pipe. NONE

Elev./depth of hole. 3399.6/12.9'

003125

GROUND W[illegible] R OBSERVATION [illegible] L REPORT

PROJECT: WIPP 12484 [illegible]5	Page 1 of 1
LOCATION: PLANT SITE	Well No. R-4
Date Completed: 18 DEC 1978* Original Depth 39.1' (INSIDE OF PVC)	Aquifer: GATUNA FORMATION
Inspected By: C T [illegible] Date 12/18/78	
Checked By: [illegible] Date	Depth Interval: 27.1-32.1'



Elevation of top of surface casing / riser pipe.	3418.95/3418.78
Height of top of surface casing / riser pipe above ground surface.	1.8'/1.63'
Depth of surface seal below ground surface	22.5'
Type of surface seal: 1:1 CEMENT GROUT	
I.D. of surface casing.	6"
Type of surface casing: 5' PIPE WITH SCREW-ON CAP	
Depth of surface casing below ground	3.2'
I.D. of riser pipe.	2"
Type of riser pipe: 2" PVC, SCH 40 ASTM D2665	
Diameter of borehole	6½"
Depth of borehole	38.8'
Type of backfill: 1:1 GROUT	
Elev./depth top of seal.	3394.7/22.5'
Type of seal: CLAYEY DRILL CUTTING	
Elev./depth bottom of seal.	3394.2/23'
Type of sand pack. 7/8" GRAVEL	
Depth of top of sand pack.	3394.2/23'
Elev./depth top of screened section.	3390.1/27.1
Type of screened section: PVC AS ABOVE	
Discribe openings HACKSAW SLOTS AT 2" SPACING	
I.D. of screened section.	2"
Elev./depth bottom of screened section.	3385.1/32.1
Length of blank section.	5.62'
Elev./depth bottom of plugged blank section.	3379.5/37.7
Elev./depth bottom of sand column.	NA
Type of backfill below observation pipe. NONE	
Elev./depth of hole.	3378.18/38.8'

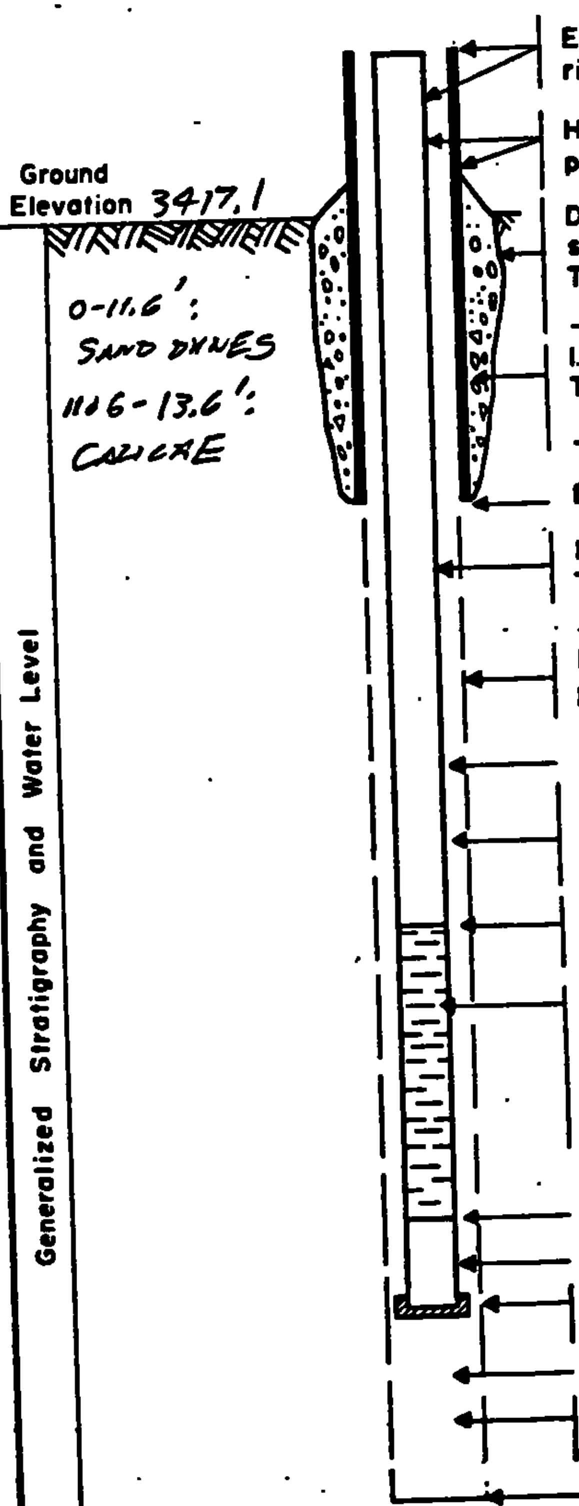
TOTAL LENGTH PVC = 39.31'
*SUBJECT TO TESTING FOR ACCEPTANCE & SURFACE CAP.

009932

GROUND WATER OBSERVATION WELL REPORT

PROJECT: WIPP Plant Site Vicinity
LOCATION:
Date Completed: 19 DEC 78 Original Depth: 13.6'
Inspected By: C. L. Scott Date: 12/19/78
Checked By: Date:

Page 1 of 1
Well No. B-4A
Aquifer: Sand Dunes
Depth Interval: 9.7-11.7



Elevation of top of surface casing / riser pipe.	3419.1/3418.4
Height of top of surface casing / riser pipe above ground - surface	2.0/1.3
Depth of surface seal below ground surface	7.7'
Type of surface seal: 1:1 Cement grout	
I.D. of surface casing.	6"
Type of surface casing: STEEL PIPE	
Depth of surface casing below ground	3'
I.D. of riser pipe.	2"
Type of riser pipe: Swanson PVC 1120, ASTM 2241	
Diameter of borehole	6"
Depth of borehole	13.7
Type of backfill: Cement (1:1)	
Elev./depth top of seal.	3409.4/7.7'
Type of seal: Cement (1:1)	
Elev./depth bottom of seal.	3408.4/8.7'
Type of sand pack. 3/8" gravel	
Depth of top of sand pack.	8.7'
Elev./depth top of screened section.	3407.4/9.7'
Type of screened section: Slotted PVC	
Discribe openings: Sawed slots 1" apart staggered on apposit sides.	
I.D. of screened section.	2"
Elev./depth bottom of screened section.	3405.4/11.7'
Length of blank section.	2 ft
Elev./depth bottom of plugged blank section.	3403.4/13.7'
Elev./depth bottom of sand column.	3403.4/13.7
Type of backfill below observation pipe. None	
Elev./depth of hole.	3403.4/13.7

009932

GROUND WATER OBSERVATION WELL REPORT

PROJECT WIPP

LOCATION PLANT SITE

Date Completed 16 DEC. 1978 Original Depth 29.3' (INSIDE PVC-TOP PVC)

Inspected By C T Scott Date 12/16/78

Checked By R.P. Bosio Date 12/19/78

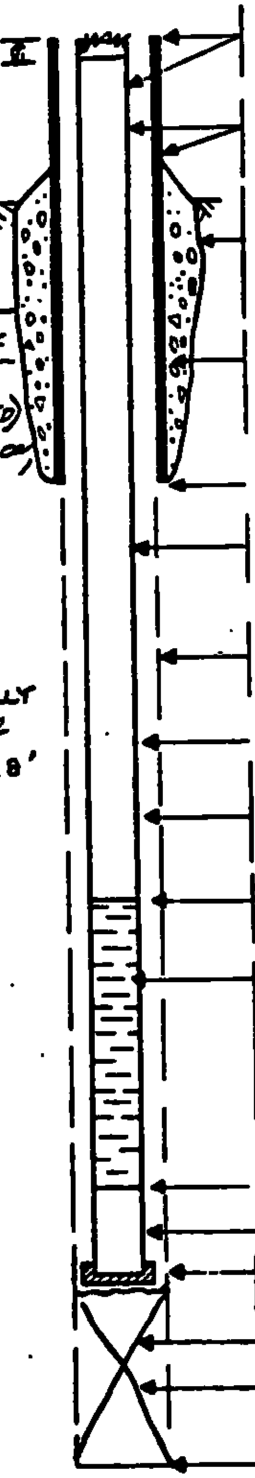
Page 1 of 1

Well No. B-13

Aquifer GATUNA FORMATION

Depth Interval 12.5 - 28.0

28.76' FROM TOP OF PVC TO BOTTOM MOST SLIT IN SCREEN.



.23'

Ground Elevation 3403.86

0-7': SAND DUNE DEPOSITS

7-12.5': CALICHE

12.5-28.3*: (CORED) GATUNA FORMATION SANDSTONE.

* HOLE ORIGINALLY 28.3', 6½" AUGER REAMED TO 28.8'

Generalized Stratigraphy and Water Level

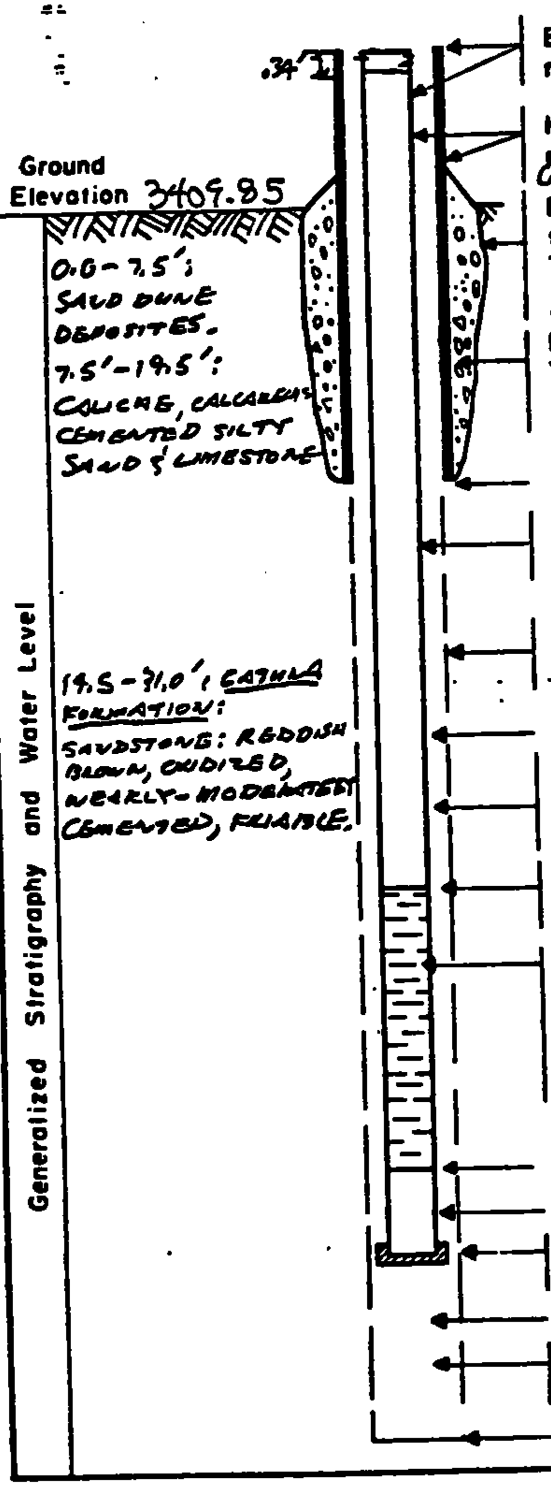
Elevation of top of surface casing / riser pipe.	3406.13/3405.9
Height of top of surface casing / riser pipe above ground surface.	2.23/2.0'
Depth of surface seal below ground surface	16.5'
Type of surface seal: 1:1 CEMENT GROUT	
I.D. of surface casing.	6"
Type of surface casing: STEEL PIPE, 5' LONG WITH SCREW-ON CAP (VENTED)	
Depth of surface casing below ground	2.77'
I.D. of riser pipe.	2"
Type of riser pipe: 2" PVC : SCH 40 PVC 1120 ASTM D-1785, DWV ASTM D2665	
Diameter of borehole	6½"
Depth of borehole	AUGERED TO 29'
Type of backfill: 1:1 GROUT	
Elev./depth top of seal.	3387.4/16.5'
Type of seal: CLAYEY DRILL CUTTINGS	
Elev./depth bottom of seal.	3386.9/17.0'
Type of sand pack. 3/8" GRAVEL	
Depth of top of sand pack.	3386.9/17.0'
Elev./depth top of screened section.	3382.1/21.76
Type of screened section: PVC AS ABOVE	
Discribe openings HACKSAW SLOTS AT 2" SPACING ON 2 SIDES OF PVC.	
I.D. of screened section.	2"
Elev./depth bottom of screened section.	3377.1/26.76
Length of blank section.	2.04'
Elev./depth bottom of plugged blank section. 29.3' (PVC-BOTTOM AFTER INSTALLATION)	3375.1/28.8
Elev./depth bottom of sand column.	NA
Type of backfill below observation pipe. NONE	
Elev./depth of hole.	NA

GROUND WA[illegible]R OBSERVATION W[illegible]L REPORT

669932

PROJECT: WIPP	Page 1 of 1
LOCATION: PLANT SITE	Well No. B-16
Date Completed: 12/15/78 — Original Depth: 32.65' (INSIDE PVC)	Aquifer: GATUNA FORMATION
Inspected By: C T [illegible] — Date: 12/15/78	
Checked By: R. P. Blair — Date: 12/18/78	Depth Interval: 14.5-31.0'

DISTANCE FROM TOP OF PVC TO BOTTOM MOST SLOT IN PVC SCREEN IS 30.63'



Elevation of top of surface casing / riser pipe.	3412.08/3411.74
Height of top of surface casing / riser pipe above ground surface. (ELEV. USED FOR DRILLING)	2.2'/1.85'
Depth of surface seal below ground surface	17.1'
Type of surface seal: 1:1 CEMENT GROUT	
I.D. of surface casing.	6"
Type of surface casing: STEEL PIPE 5' LONG WITH SCREW-ON TOP	
Depth of surface casing below ground	2.8'
I.D. of riser pipe.	2"
Type of riser pipe: PVC: ASTM D2665, SCH 40	
Diameter of borehole	6.5"
Depth of borehole	31.0'
Type of backfill: 1:1 GROUT	
Elev./depth top of seal.	3392.8/17.1'
Type of seal: CLAYEY DRILL CUTTINGS	
Elev./depth bottom of seal.	3391.4/18.5'
Type of sand pack: 3/8" GRAVEL	
Depth of top of sand pack.	18.5'
Elev./depth top of screened section.	3386.1/23.75
Type of screened section: PVC-SLOTED-5'	
Discribe openings: HACKSAW SLOTS AT 2" INTERVALS STAGGERED ON BOTH SIDES OF PVC.	
I.D. of screened section.	2"
Elev./depth bottom of screened section.	3381.1/28.75
Length of blank section.	2.03'
Elev./depth bottom of plugged blank section.	3379.1/30.78
Elev./depth bottom of sand column.	3378.9/31.0'
Type of backfill below observation pipe: NONE	
Elev./depth of hole.	3378.9/31.0'

GROUND WATER OBSERVATION WELL REPORT

PROJECT: WIPP

LOCATION: PLANT SITE

Date Completed: 12/15/78 Original Depth: 37.3' (INSIDE OF PVC)

Inspected By: C.T. Scott Date: 12/15/78

Checked By: R. P. Besio Date: 12/18/78

Page 1 of 1

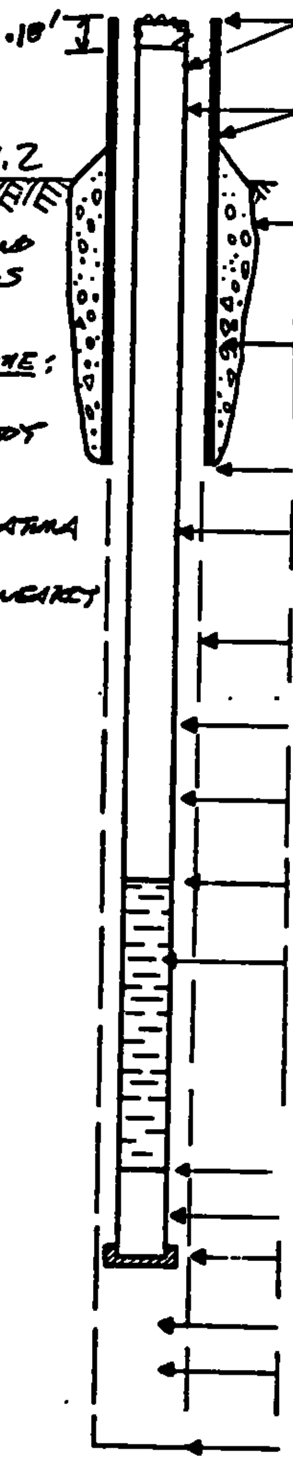
Well No. B-18

Aquifer: GATUNA FORMATION

Depth Interval: 14.0 - 37.7

009932

Distance from top of PVC, to bottom most slot in screen is 37.50'



Ground Elevation 3419.2

0.0-7.0': SAND DUNE DEPOSITS

7.0-14': CALICHE: CALCAREOUS CEMENT SANDY SILT,

14'-37.7': GATUNA FORMATION: SANDSTONE, WEAKLY CEMENTED.

Generalized Stratigraphy and Water Level

Elevation of top of surface casing / riser pipe.	3421.11 / 3420.93
Height of top of surface casing / riser pipe above ground surface.	1.9' / 1.72'
Depth of surface seal below ground surface	16.7'
Type of surface seal: 1:1 CEMENT GROUT	
I.D. of surface casing.	6"
Type of surface casing: STEEL PIPE, 5' LONG WITH SCREW-ON TOP.	
Depth of surface casing below ground	3.1
I.D. of riser pipe.	2"
Type of riser pipe: PVC, SCH 40 ASTM D2665	
Diameter of borehole	6.5"
Depth of borehole	3381.5 / 37.7'
Type of backfill: 1:1 GROUT	
Elev./depth top of seal.	3402.5 / 16.7'
Type of seal: CLAYEY DRILL CUTTINGS	
Elev./depth bottom of seal.	3400.2 / 19.0'
Type of sand pack. 3/8 GRAVEL	
Depth of top of sand pack.	3400.2 / 19.0'
Elev./depth top of screened section.	3393.6 / 25.6'
Type of screened section: SLOTTED PVC	
Discribe openings HACKSAW SLOTS AT 2" SPACING BOTH SIDES SCREEN, STAGGERED	
I.D. of screened section.	2"
Elev./depth bottom of screened section.	3383.6 / 35.6'
Length of blank section.	2.07'
Elev./depth bottom of plugged blank section.	3381.5 / 37.67
Elev./depth bottom of sand column.	—
Type of backfill below observation pipe. NONE	
Elev./depth of hole.	3381.5 / 37.7

GROUND WATER OBSERVATION WELL REPORT

PROJECT: WIPP
LOCATION: PLANT SITE
Date Completed: 12/16/78 Original Depth:
Inspected By: C T [illegible] Date: 12/16/78
Checked By: R. P. Bisio Date: 12/18/78

Page 1 of 1 009932
Well No. B20/B20A
Aquifer: SEE GENERAL STRATIGRAPHY COLUMN
Depth Interval:

Generalized Stratigraphy and Water Level

B20 B20A
.82 .35

Ground Elevation

0-10': SAND DUNE DEPOSITS.

10-19.2' CALICHE

19.2-34.2': GATUNA FORMATION: SANDSTONE WEAKLY-MODERATELY CEMENTED, FRIABLE

NOTES: DISTANCE FROM TOP OF PVC TO BOTTOM MOST SLOT IN SCREEN: B20A = 31.87', B20 = 13.65'

B20A IS LOCATED 70" N17E OF B20.

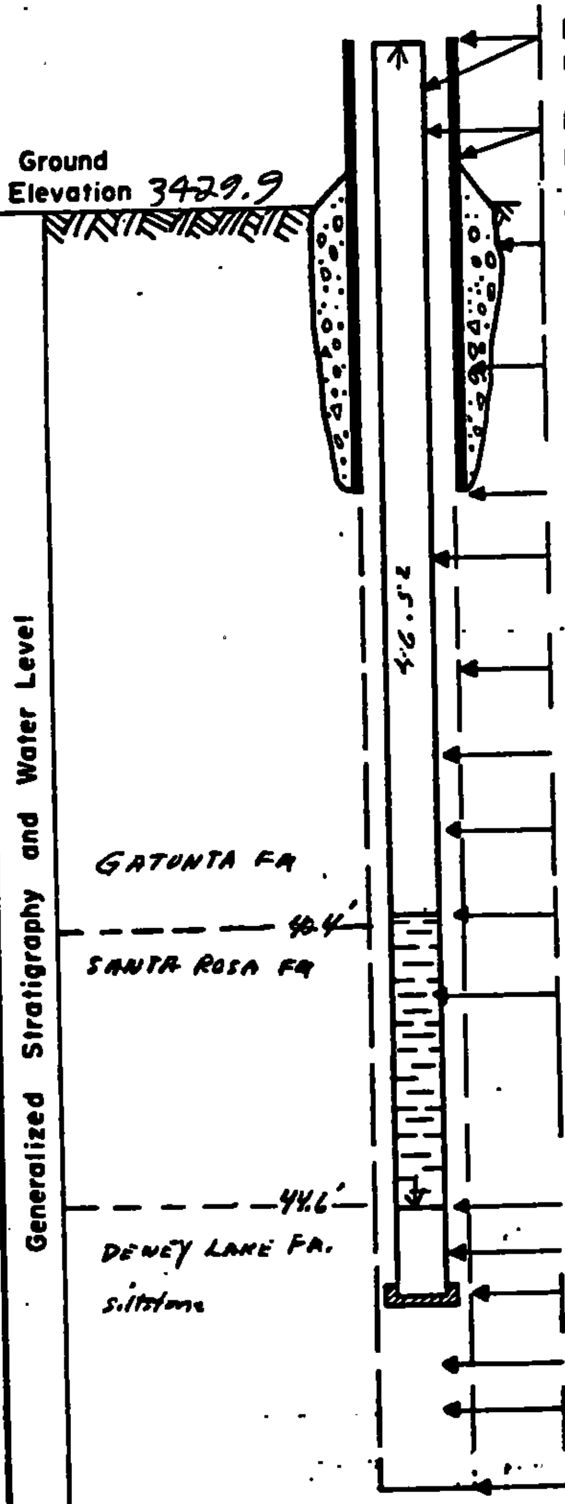
	B20	B20A
Elevation of top of surface casing / riser pipe.	3405.86 / 3405.64	3405.63 / 3405.25
Height of top of surface casing / riser pipe above ground surface.	2.2/2.0'	1.9/1.65'
Depth of surface seal below ground surface	4.5'	22.5'
Type of surface seal: 1:1 CEMENT GROUT		
I.D. of surface casing.	2"	2"
Type of surface casing: STEEL PIPE, 5' LONG WITH SCREW-ON CAP (VENTED)		
Depth of surface casing below ground	2.8'	3.1'
I.D. of riser pipe.	2"	2"
Type of riser pipe: 2" PVC: SCH 40 ASTM 2665		
Diameter of borehole	6"	6"
Depth of borehole	13.7	34.1
Type of backfill: 1:1 GROUT		
Elev./depth top of seal.	4.5'	22.5'
Type of seal: CLAYEY DRILL CUTTINGS		
Elev./depth bottom of seal.	5.0'	23.0'
Type of sand pack. 3/8" GRAVEL		
Depth of top of sand pack.	5.0'	23.0'
Elev./depth top of screened section.	7.83	35.6
Type of screened section: PVC		
Discribe openings HACKSAW SLOTS AT 2" SPACING, 2 SIDES OF PIPE		
I.D. of screened section.	2"	2"
Elev./depth bottom of screened section.	9.83	30.59'
Length of blank section.	3.77'	1.95'
Elev./depth bottom of plugged blank section.	13.6'	34.1'
Elev./depth bottom of sand column.	—	—
Type of backfill below observation pipe. NONE		
Elev./depth of hole.	13.7'	34.1'

006932

GROUND WATER OBSERVATION WELL REPORT

PROJECT WIPP (12484)
LOCATION WIPP PLANT SITE
Date Completed Jan 23, 1979 Original Depth 50.0'
Inspected By ________ Date ________
Checked By ________ Date ________

Page 1 of 1
Well No. B-38
Aquifer SANTA ROSA
Depth Interval 40'-45'



Elevation of top of surface casing / riser pipe.	3431.7/3431.5
Height of top of surface casing / riser pipe above ground surface	1.8'/1.6'
Depth of surface seal below ground surface	38.08'
Type of surface seal: Grout 1:1 mix	
I.D. of surface casing.	6"
Type of surface casing: STEEL	
Depth of surface casing below ground	3.2'
I.D. of riser pipe.	0.2'
Type of riser pipe: PVC	
Diameter of borehole	6"
Depth of borehole	50.0'
Type of backfill: Cement 1:1 mix	
Elev./depth top of seal.	3391.8/38.08'
Type of seal: Sand	
Elev./depth bottom of seal.	3389.3/40.58'
Type of sand pack. Gravel	
Depth of top of sand pack.	3389.3/40.58'
Elev./depth top of screened section.	3388.9/41.0'
Type of screened section: PVC flush-joint JTS	
Discribe openings Alternated both sides 18 apart .166 PVC	
I.D. of screened section. .166	2"
Elev./depth bottom of screened section.	3384.9/45.0'
Length of blank section.	3379.9/50'
Elev./depth bottom of plugged blank section.	3379.9/50.0'
Elev./depth bottom of sand column.	3379.9/50.0'
Type of backfill below observation pipe. NONE	
Elev./depth of hole.	3379.9/50.0'

— TENATIVE —

OGS932

GROUND WATER OBSERVATION WELL REPORT

PROJECT WIPP (12484)

LOCATION

Date Completed 15 FEB 1979 Original Depth 210.0 FT

Inspected By R.M. Bernhard Date

Checked By [illegible] Date 5-17-79

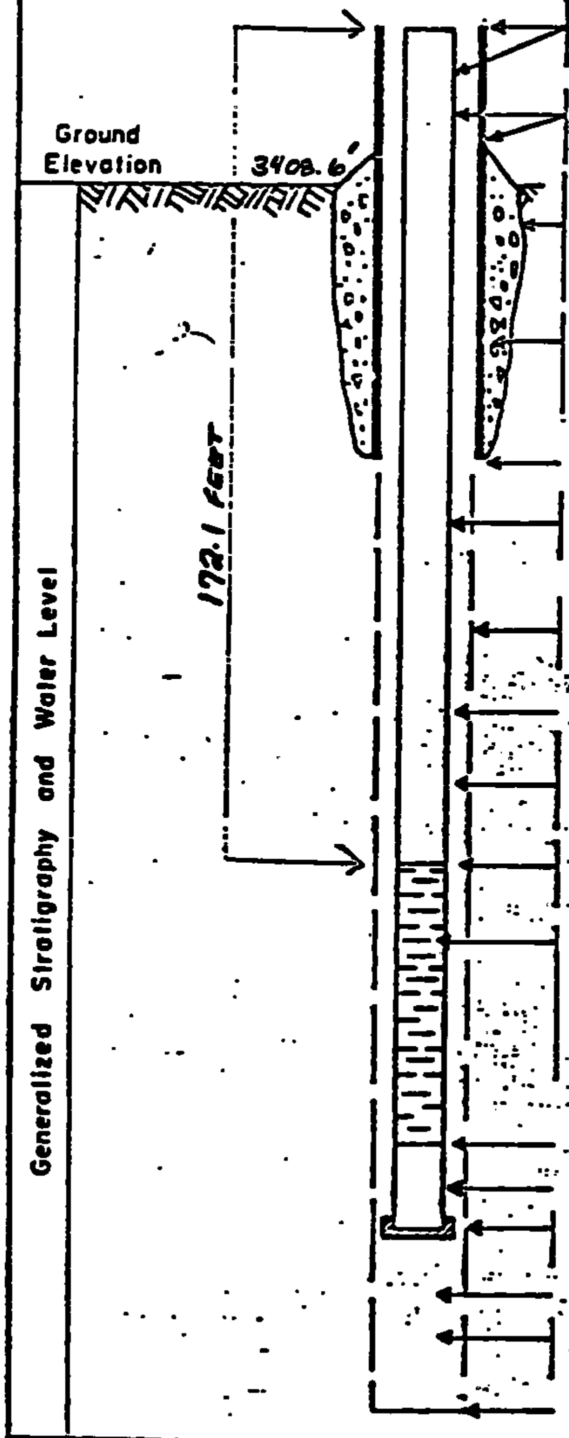
Page 1 of 1

Well No. B-54

Aquifer

Sheet 4 of 5

Depth Interval



Elevation of top of ~~surface casing~~/ riser pipe.	3410.66'
Height of top of ~~surface casing~~/ riser pipe above ground surface	2.1 FT
Depth of surface seal below ground surface	
Type of surface seal:	
I.D. of surface casing.	6 IN
Type of surface casing: 6½" OD STEEL PIPE	
Depth of surface casing below ground	2.8 FT
I.D. of riser pipe.	2 1/16 IN
Type of riser pipe: PVC	
Diameter of borehole	6 ¼ IN
Depth of borehole	210.0 FT
Type of backfill:	
Elev./depth top of seal	G.L.
Type of seal: CEMENT	
Elev./depth bottom of seal	3269.1/139.5 FT
Type of sand pack GRAVEL, INC. 1.5' SAND BUFFER AT TOP.	
Depth of top of sand pack.	139.5 FT
Elev./depth top of screened section.	3238.6/170.0 FT BRAW GL
Type of screened section: SLOTTED PVC	
Discribe openings SAWED SLOTS 1" APART, STAGGERED ON OPPOSITE SIDES	
I.D. of screened section.	2 1/16 IN
Elev./depth bottom of screened section.	3213.6/195.0 FT BRAW GL
Length of blank section.	5.0 FT
Elev./depth bottom of plugged blank section.	3208.6/200.0 FT
Elev./depth bottom of sand column.	3208.6/200.0 FT
Type of backfill below observation pipe. CAVINGS	
Elev./depth of hole.	3198.6/210.0 FT

State of New Mexico
ENVIRONMENT DEPARTMENT

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 18, 1991

James A. Mewhinney
Program Manager, Environment,
Safety and Health
Waste Isolation Pilot Project Office
Dept. of Energy, Albuquerque Operations O.
P. O. Box 3090
Carlsbad, NM 88221

RE: Temporary Permission for Disposal of Brine Waters

Dear Mr. Mewhinney:

Your letter dated August 22, 1991 requested permission to temporarily discharge approximately 1500 gallons per day of brine waters from mine dewatering and the pumping of monitor wells to an unlined one-acre basin. The basin is located within the Waste Isolation Pilot Plant site and is approximately 26 miles east of Loving in the SE 1/4 of Section 20, T22S, R31E, Eddy County.

Pursuant to Section 3-106. B. of the NM Water Quality Control Commission (WQCC) Regulations, the above referenced discharge hereby is allowed without an approved discharge plan until January 16, 1992.

This approval is contingent on your discharging as described in your letter of August 22, 1991 and the following condition:

> A discharge plan application will be submitted to the NM Environment Department (NMED), Ground Water Section within 60 days of the date of this letter. A blank application form is enclosed.

New Mexico DRUG FREE It's a State of Mind!

The reason for this requirement is that the temporary permission is restricted by the WQCC Regulations to a maximum of 120 days. Any discharges after the 120 days must be pursuant to an approved discharge plan, and the NMED requires 60 days in order to process a discharge plan application.

Further, this approval does not relieve you of your responsibility to comply with any other applicable local laws and regulations, such as zoning requirements and nuisance ordinances.

Also this approval does not relieve you of liability should your operation result in actual pollution of surface or ground waters which may be actionable under other laws and/or regulations.

If you have any questions, please contact Ernest Rebuck of the Ground Water Section at the above address or phone 827-2900.

Sincerely,

/S/

Kathleen M. Sisneros
Director, Water and Waste
Management Division

KMS:ECR:ecr

cc: Garrison McCaslin, District Manager, NMED Dist. 4

ACKNOWLEDGEMENT OF RECEIPT
OF CHECK/CASH

95-108

I hereby acknowledge receipt of Check No. 1122 dated 11/14/91,

or cash, received — in the amount of $ 50.00 from

A. Rodriguez for WIPP - Carlsbad - DOE
(Facility Name) (Discharge Plan No.)

Submitted by: Kim La Cuesta Date: 11/15/91

Submitted to ASD by: ______ Date: ______

Received in ASD by: ______ Date: ______

Filing Fee [ ] New Facility [X] Renewal [ ]

Modification [ ] Other [ ] (Explain) ______

Organization Code 543080 Applicable FY 80

To be deposited in the Water Quality Management Fund.

Full Payment [ ] or Annual Increment [ ]

Westinghouse Electric Corporation
Waste Isolation Pilot Plant Project
P. O. Box 2078
Carlsbad, NM 88221

Under U.S. Department of Energy Contract

Western Commerce Bank
P.O. Drawer 1358
Carlsbad, NM 88221

95-108
1122

NOVEMBER 14, 1991

Pay To Order Of

N.M. ENVIRONMENTAL DEPARTMENT
1190 ST. FRANCIS AVE.
SANTA FE, NEW MEXICO 87504

Amount of Check
$50.00

Disbursement Account

Adin V Rodriguez

⑈060589⑈ ⑆112201085⑆ 2 10 094 0⑈

State of New Mexico
ENVIRONMENT DEPARTMENT
Harold Runnels Building
1190 St. Francis Drive. P.O. Box 26110
Santa Fe. New Mexico 87502
(505) 827-2850

Bruce King
Governor

Judith M. Espinosa
Secretary

Ron Curry
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

P 757 743 865
Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)
United States Postal Service
Sent to James A. Mewhinney
Street & No.
P.O., State & ZIP Code
Postage $

September 18, 1991

James A. Mewhinney
Program Manager, Environment,
Safety and Health
Waste Isolation Pilot Project Office
Dept. of Energy, Albuquerque Operations O.
P. O. Box 3090
Carlsbad, NM 88221

RE: Temporary Permission for Disp[...]
Waters

Dear Mr. Mewhinney:

Your letter dated August 22, 1991 requested permission to temporarily discharge approximately 1500 gallons per day of brine waters from mine dewatering and the pumping of monitor wells to an unlined one-acre basin. The basin is located within the Waste Isolation Pilot Plant site and is approximately 26 miles east of Loving in the SE 1/4 of Section 20, T22S, R31E, Eddy County.

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This approval is contingent on your discharging as described in your letter of August 22, 1991 and the following condition:

> A discharge plan application will be submitted to the NM Environment Department (NMED), Ground Water Section within 60 days of the date of this letter. A blank application form is enclosed.

The reason for this requirement is that the temporary permission is restricted by the WQCC Regulations to a maximum of 120 days. Any discharges after the 120 days must be pursuant to an approved discharge plan, and the NMED requires 60 days in order to process a discharge plan application.

Further, this approval does not relieve you of your responsibility to comply with any other applicable local laws and regulations, such as zoning requirements and nuisance ordinances.

Also this approval does not relieve you of liability should your operation result in actual pollution of surface or ground waters which may be actionable under other laws and/or regulations.

If you have any questions, please contact Ernest Rebuck of the Ground Water Section at the above address or phone 827-2900.

Sincerely,

Kathleen M. Sisneros

Kathleen M. Sisneros
Director, Water and Waste
Management Division

KMS:ECR:ecr

cc: Garrison McCaslin, District Manager, NMED Dist. 4

Department of Energy
Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221

AUG 2 2 1991

RECEIVED
AUG 2 3 1991
GROUND WATER BUREAU

Ernest C. Rebuck, Ph.D.
Program Manager, Ground Water Bureau
New Mexico Environment Department
1190 St. Francis Drive
Santa Fe, N.M. 87504

Dear Dr. Rebuck,

The purpose of this letter is to request an emergency permit to temporarily dispose of brine waters generated by mine dewatering and observation well pumping activities at the Waste Isolation Pilot Plant (WIPP). On August 13, 1991, the trucking and disposal contractors responsible for off-site brine water disposal at the WIPP announced that they could no longer honor their contract to haul brines from the WIPP.

Loss of service resulted when the Oil Conservation Department (OCD) conducted a review of permits issued to regional trucking companies. This review found that the permits issued to the hauling and disposal companies contracted to the WIPP, allowed for the disposal of waste waters generated by oil and gas exploration and production (e&p) only. Waters from WIPP shaft dewatering and observation well pumping are not classifed as E&P waste waters.

This announcement has put the WIPP in a difficult position of finding a properly permitted alternative disposal site or to immediately develop and obtain a permit for an on-site brine disposal facilities. The WIPP is presently developing plans for an on-site lined evaporation pond. Additionally, the WIPP is preparing to conduct due diligence at several off-site disposal facilities. However, the time required to complete either of these activities far exceeds the time it will take to fill the WIPP brine storage tank.

Mine dewatering produces approximately 21,000 gallons of brine waters every 14 calendar days. The storage capacity of the WIPP brine tank is 21,000 gallons; it will be filled by August 27, 1991. Arrangements are underway to obtain additional storage tanks. However, until permanent solutions are found, the WIPP requests an emergency permit to dispose of brine waters in the WIPP salt pile rainwater catchment/evaporation basin. This one-acre basin is unlined but sits on top of a compacted caliche pad. The depth to the nearest water-bearing stratum is approximately 800 feet. The evaporation rate at the site is 12 inches per year; thus, any potential for brines to impact ground water is essentially zero.

To assist with an emergency permit application, I have enclosed representative copies of sampling analysis results which are representative of WIPP brines, a copy of the WIPP site plan, and a drawing of the salt pile evaporation basin. If a temporary permit is granted, the WIPP will provide New Mexico Environment Department (NMED) with analyses of brine waters as part of our routine sampling program.

The WIPP is presently evaluating long term disposal options. The WIPP will keep your office apprised of its decision to obtain a permit for a permanent on-site evaporation facility, issue a contract for off-site injection well disposal, or determine if it is possible to sell process brine waters as an alternative to disposal.

We appreciate your quick attention on this matter. If you require any further information regarding this request, please contact Mr. Dan Robertson at 887-8240.

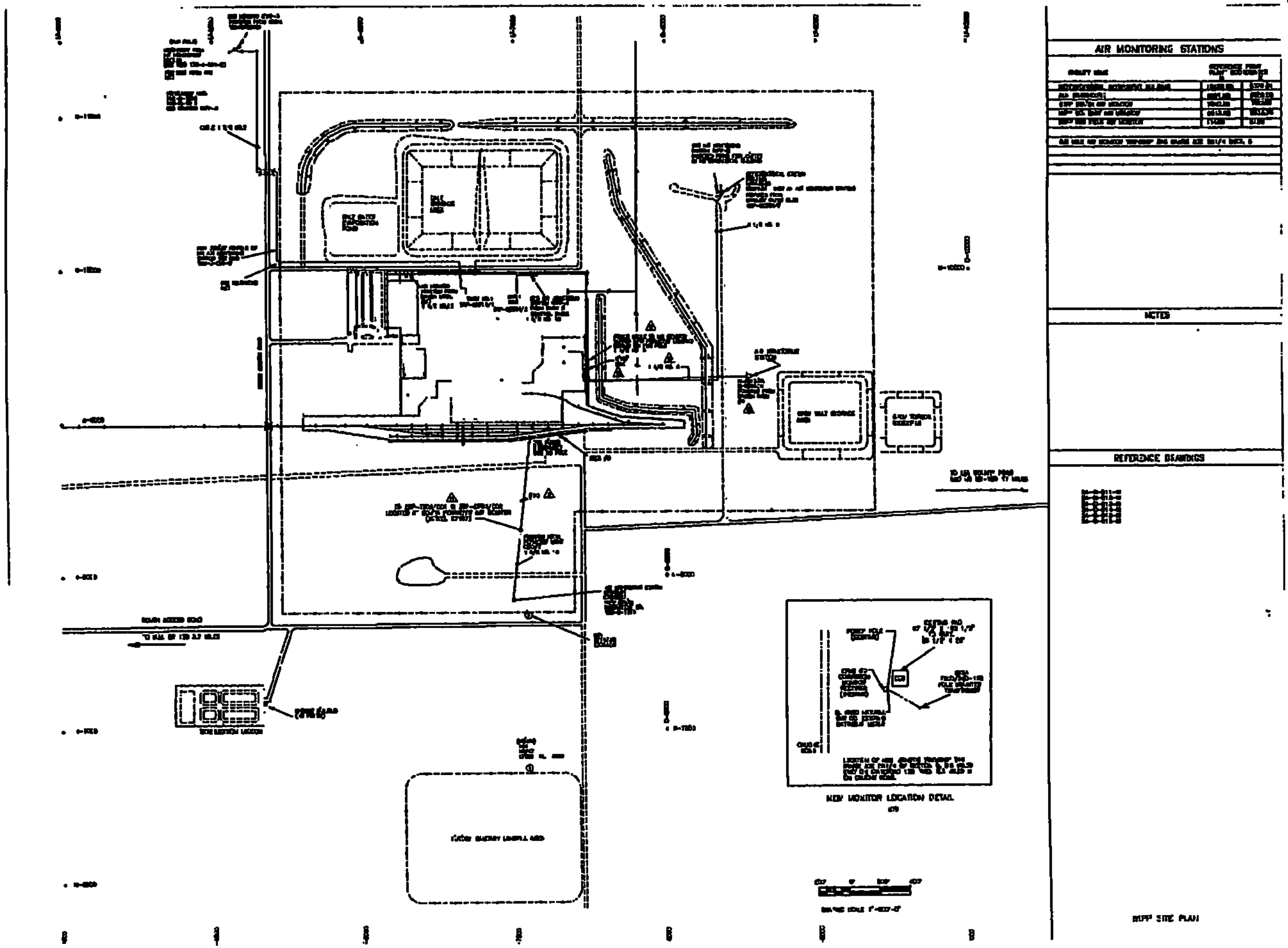
Sincerely,

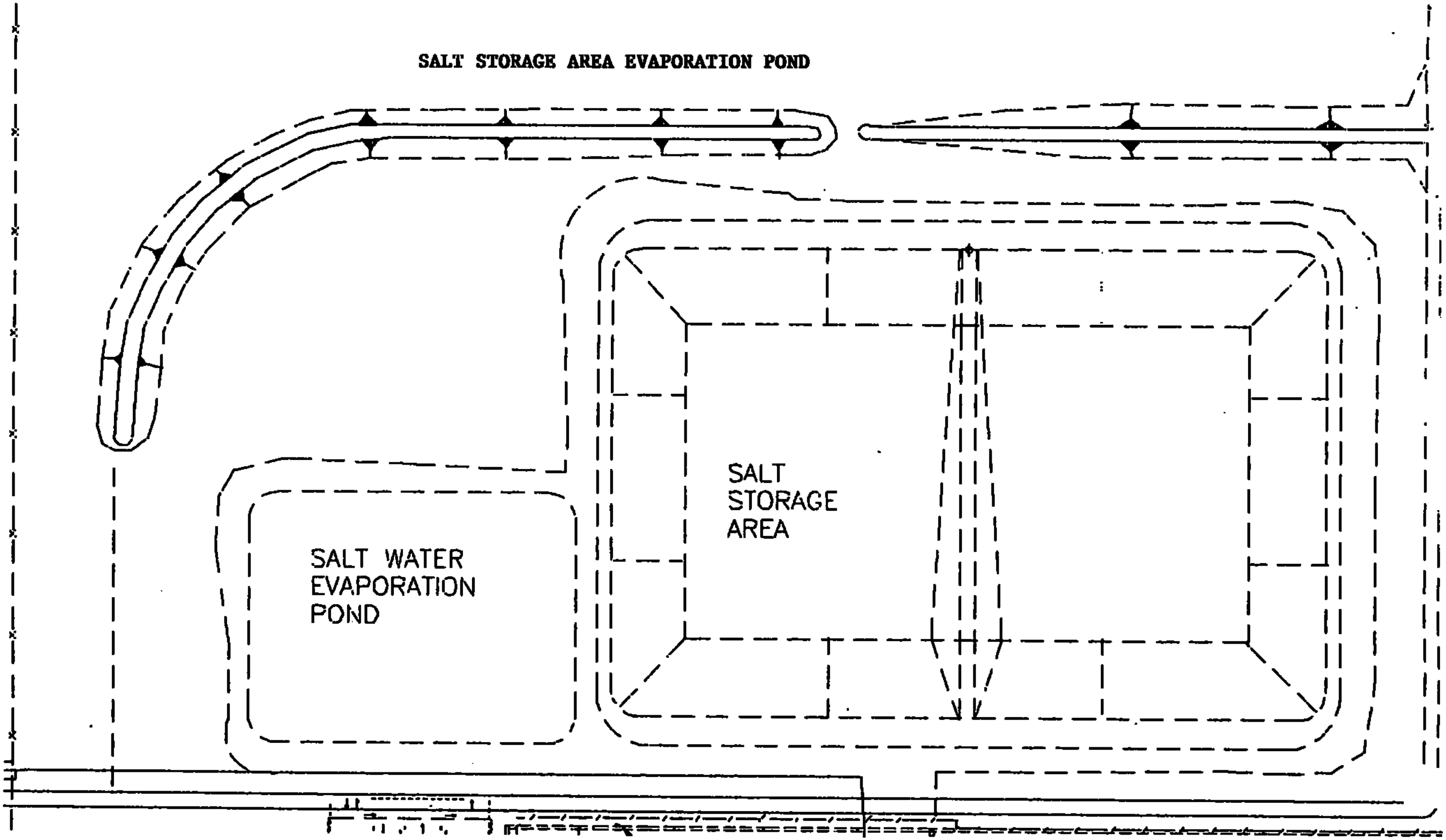
James A. Mewhinney

James A. Mewhinney
Program Manager
Environment, Safety and Health

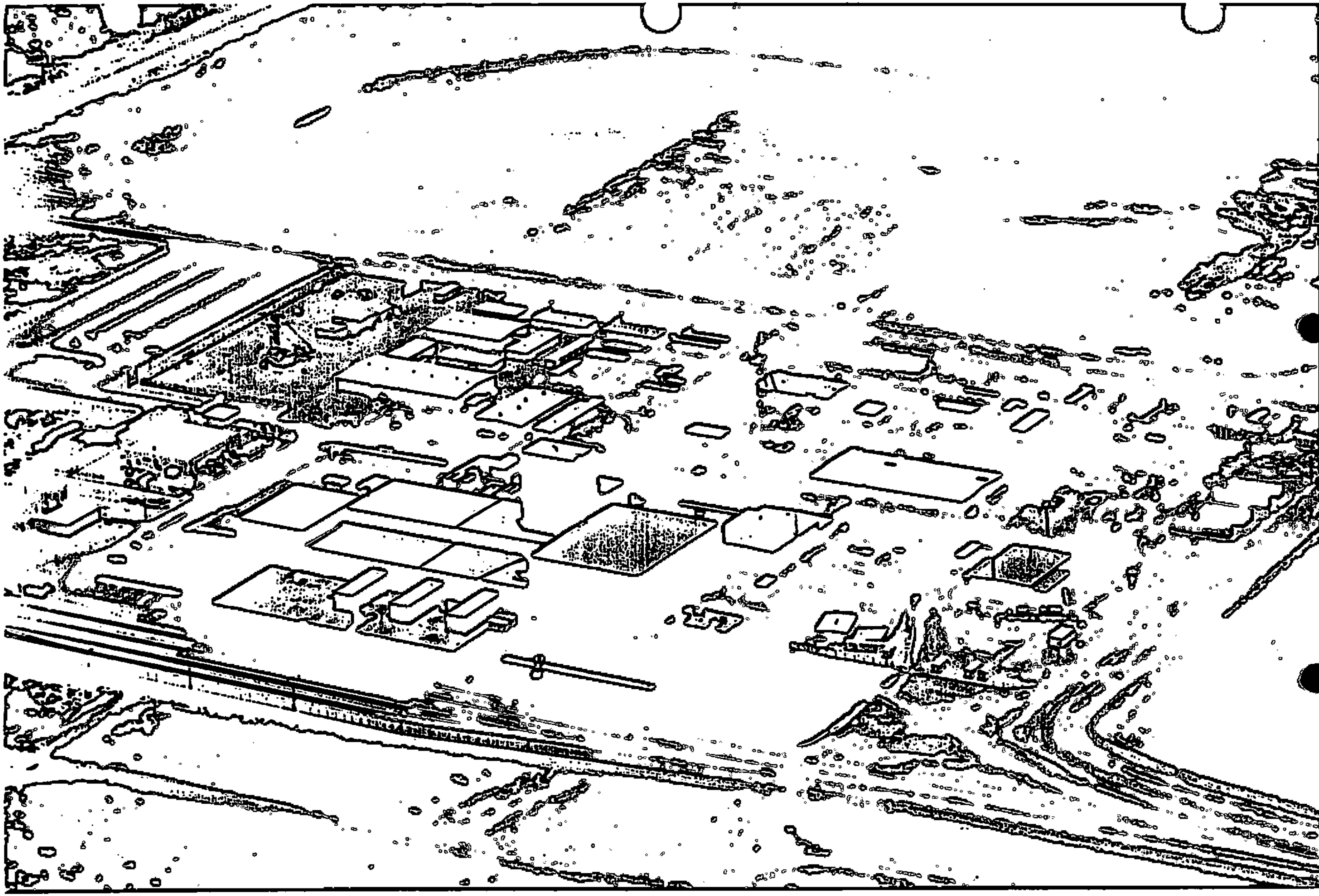
Enclosure

WIPP SITE PLAN





APPROXIMATE SCALE 1" = 200'



AERIAL PHOTOGRAPH OF THE WASTE ISOLATION PILOT PLANT

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205

NUS CORPORATION
P.O. Box 630832
Baltimore, MD 21263-0832
412-747-2500

CHARACTORISTIC MINE WATER ANALYSIS REPORT

June 12, 1991
Report No.: 00000577
Section A Page 1

LABORATORY ANALYSIS REPORT

ENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
TTENTION: MR. BRYAN HOWARD

NUS CLIENT NO: 0527 0021
WORK ORDER NO: 55830
VENDOR NO: 01830782

AMPLE ID: WASTEWATER WIPP 390
AMPLE NO: P0162868
.O. NO.: 37109

DATE SAMPLED: 08-MAY-91
DATE RECEIVED: 15-MAY-91
APPROVED BY: R Volk

TEST CODE	DETERMINATION	RESULT	UNIT
AASW	Arsenic, Total (As)	< 0.003	mg/L
ABAW	Barium, Total (Ba)	< 0.01	mg/L
ACDW	Cadmium, Total (Cd)	< 0.005	mg/L
ACRW	Chromium, Total (Cr)	< 0.01	mg/L
APBW	Lead, Total (Pb)	< 0.1	mg/L
AHGW	Mercury, Total (Hg)	0.0004	mg/L
ASEW	Selenium, Total (Se)		
	Selenium. Total (Se)	< 0.004	mg/L
AAGW	Silver, Total (Ag)	< 0.01	mg/L
OSVPPW	SEMIVOLATILE EXTRACTABLES		
	1,4-Dichlorobenzene	< 100	ug/L
	2,4,5-Trichlorophenol	< 500	ug/L
	2,4,6-Trichlorophenol	< 100	ug/L
	2,4-Dinitrotoluene	< 100	ug/L
	Hexachlorobenzene	< 100	ug/L
	Hexachlorobutadiene	< 100	ug/L
	Hexachloroethane	< 100	ug/L
	Nitrobenzene	< 100	ug/L
	Pentachlorophenol	< 500	ug/L
	Pyridine	< 100	ug/L
	m-Cresol	< 100	ug/L
	o-Cresol	< 100	ug/L
	p-Cresol	< 100	ug/L
OVPPW	VOLATILES		
	1,1-Dichloroethene	< 5	ug/L
	1,2-Dichloroethane	< 5	ug/L
	2-Butanone (MEK)	< 10	ug/L
	Benzene	< 5	ug/L
	Carbon tetrachloride	< 5	ug/L
	Chlorobenzene	< 5	ug/L

ORIGINAL

TABLE 7.1.14
ITAS LABORATORY RESULTS
H-03b3, CULEBRA, ROUND 5
(CONTINUED)
CATION AND TRACE METALS

PARAMETER		VALUE		DUPLICATE VALUE	ACID BLANK	DI WATER BLANK	UNITS	DATE COLLECTED
Aluminum	<	2.0000	<	2.0000			mg/l	08-15-90
Antimony	<	0.6000	<	0.6000			mg/l	08-15-90
Arsenic	<	0.1000	NA	0.0000			mg/l	08-15-90
Barium	<	2.0000	<	2.0000			mg/l	08-15-90
Beryllium	<	0.0500	<	0.0500			mg/l	08-15-90
Boron		22.0000		22.0000			mg/l	08-15-90
Cadmium	<	0.0500	<	0.0500			mg/l	08-15-90
Calcium		1300.0000		1300.0000			mg/l	08-15-90
Cesium	<	0.2000	<	0.2000			mg/l	08-15-90
Chromium		0.1000		0.2000			mg/l	08-15-90
Cobalt	<	0.5000	<	0.5000			mg/l	08-15-90
Copper	<	0.2500	<	0.2500			mg/l	08-15-90
Iron	<	1.0000	<	1.0000			mg/l	08-15-90
Lead	<	0.5000	<	0.5000			mg/l	08-15-90
Lithium		0.4000		0.4000			mg/l	08-15-90
Magnesium		700.0000		710.0000			mg/l	08-15-90
Manganese	<	0.1500	<	0.1500			mg/l	08-15-90
Mercury	<	0.0002	<	0.0002			mg/l	08-15-90
Molybdenum	<	0.2000	<	0.2000			mg/l	08-15-90
Nickel	<	0.4000	<	0.4000			mg/l	08-15-90
Potassium		450.0000		450.0000			mg/l	08-15-90
Selenium	<	0.5000	NA	0.0000			mg/l	08-15-90
Silver	<	0.1000	<	0.1000			mg/l	08-15-90
Sodium		16000.0000		16000.0000			mg/l	08-15-90
Strontium		23.0000		23.0000			mg/l	08-15-90
Thallium	<	10.0000	NA	0.0000			mg/l	08-15-90
Titanium	<	0.1000	<	0.1000			mg/l	08-15-90
Vanadium	<	0.5000	<	0.5000			mg/l	08-15-90
Zinc	<	0.2000	<	0.2000			mg/l	08-15-90

CHARACTORISTIC OBSERVATION WELL ANALYSIS REPORT

TABLE 7.1.14
ITAS LABORATORY RESULTS
H-03b3, CULEBRA, ROUND 5

GENERAL CHEMISTRY

PARAMETER		VALUE		DUPLICATE VALUE	ACID BLANK	DI WATER BLANK	UNITS	DATE COLLECTED
pH		7.1600		7.1600				08-15-90
Specific Conductance		66000.0000		66000.0000			uMhos/cm@25C	08-15-90
Alkalinity (HCO3)		49.0000	NA	0.0000			mg/l	08-15-90
Bromide		27.0000		27.0000			mg/l	08-15-90
Chloride		27000.0000		27000.0000			mg/l	08-15-90
Alkalinity (CO3)		0.0000	NA	0.0000			mg/l	08-15-90
Cyanide	<	0.0100		0.0000			mg/l	08-15-90
Fluoride		1.5000		0.0000			mg/l	08-15-90
Iodide	<	2.0000	<	2.0000			mg/l	08-15-90
Nitrate	<	0.0200		0.0000			mg/l	08-15-90
Total Phenolics	<	0.0050	<	0.0100			mg/l	08-15-90
Phosphorus	<	0.0100		0.0000			mg/l	08-15-90
Residue, Filterable @ 180 c		55000.0000		0.0000			mg/l	08-15-90
Residue, Nonfilterable @ 105 c		100.0000		0.0000			mg/l	08-15-90
Silica		4.5000		0.0000			mg/l	08-15-90
Sulfate		4700.0000		0.0000			mg/l	08-15-90
Total Organic Carbon	<	1.0000		1.0000			mg/l	08-15-90
Total Organic Halides		0.1300		0.1400			mg/l	08-15-90

ENVIRONMENT DEPARTMENT ROUTING SLIP

LETTER TO: James A. Mewhinney

FOR: Steven Cary's SIGNATURE

DRAFTED BY: E.C. Rebuck DATE 9/13/91

SUBJECT: Temporary Permission for brine dis. at WIPP

FINAL DECISION NEEDED BY: ASAP REASON

WIPP is calling daily

REVIEW:

		DATE INITIAL	DATE REC'D	APPROVED
Ernest C. Rebuck	PROGRAM MANAGER	ECR	9/13	9/13
Steven J. Cary	BUREAU CHIEF	SC	9/16	
	DISTRICT MGRS.			
	GRANTS			
	ACCOUNTING			
	BUDGETS			
	LEGAL REVIEW			
	ASD DIRECTOR			
Kathleen Sisneros	WWM DIRECTOR	KMS	9/18	9/18/91
	ERD DIRECTOR			
	DEPUTY SECRETARY			
	SECRETARY			
	OTHER			

COMMENTS BY DRAFTER OR REVIEWER(S):

see comment on p.2

State of New Mexico
ENVIRONMENT DEPARTMENT
Harold Runnels Building
1190 St. Francis Drive
Santa Fe, New Mexico 87503

BRUCE KING
GOVERNOR

JUDITH M. ESPINOSA
SECRETARY

RON CURRY
DEPUTY SECRETARY

TELECOPIER TRANSMITTAL

DATE: 9/23 TIME: 11:15 PAGE 1 OF 3
(Include Transmittal)

PLEASE DELIVER THE FOLLOWING PAGES TO:

TO: Dan Robertson

LOCATION:

TELEPHONE NUMBER: 887-8240

TELECOPIER NUMBER: 885-4567

FROM: Ernest Rebuck

LOCATION: ED / Ground Water Section

TELEPHONE NUMBER: 827-2900

TELECOPIER NUMBER: (505) 827-2836

COMMENTS:

Department of Energy
Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221

AUG 22 1991

RECEIVED
AUG 26 1991
GROUND WATER BUREAU

Ernest C. Rebuck, Ph.D.
Program Manager, Ground Water Bureau
New Mexico Environment Department
1190 St. Francis Drive
Santa Fe, N.M. 87504

Dear Dr. Rebuck,

The purpose of this letter is to request an emergency permit to temporarily dispose of brine waters generated by mine dewatering and observation well pumping activities at the Waste Isolation Pilot Plant (WIPP). On August 13, 1991, the trucking and disposal contractors responsible for off-site brine water disposal at the WIPP announced that they could no longer honor their contract to haul brines from the WIPP.

Loss of service resulted when the Oil Conservation Department (OCD) conducted a review of permits issued to regional trucking companies. This review found that the permits issued to the hauling and disposal companies contracted to the WIPP, allowed for the disposal of waste waters generated by oil and gas exploration and production (e&p) only. Waters from WIPP shaft dewatering and observation well pumping are not classifed as E&P waste waters.

This announcement has put the WIPP in a difficult position of finding a properly permitted alternative disposal site or to immediately develop and obtain a permit for an on-site brine disposal facilities. The WIPP is presently developing plans for an on-site lined evaporation pond. Additionally, the WIPP is preparing to conduct due diligence at several off-site disposal facilities. However, the time required to complete either of these activities far exceeds the time it will take to fill the WIPP brine storage tank.

Mine dewatering produces approximately 21,000 gallons of brine waters every 14 calendar days. The storage capacity of the WIPP brine tank is 21,000 gallons; it will be filled by August 27, 1991. Arrangements are underway to obtain additional storage tanks. However, until permanent solutions are found, the WIPP requests an emergency permit to dispose of brine waters in the WIPP salt pile rainwater catchment/evaporation basin. This one-acre basin is unlined but sits on top of a compacted caliche pad. The depth to the nearest water-bearing stratum is approximately 800 feet. The evaporation rate at the site is 12 inches per year; thus, any potential for brines to impact ground water is essentially zero.

To assist with an emergency permit application, I have enclosed representative copies of sampling analysis results which are representative of WIPP brines, a copy of the WIPP site plan, and a drawing of the salt pile evaporation basin. If a temporary permit is granted, the WIPP will provide New Mexico Environment Department (NMED) with analyses of brine waters as part of our routine sampling program.

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We appreciate your quick attention on this matter. If you require any further information regarding this request, please contact Mr. Dan Robertson at 887-8240.

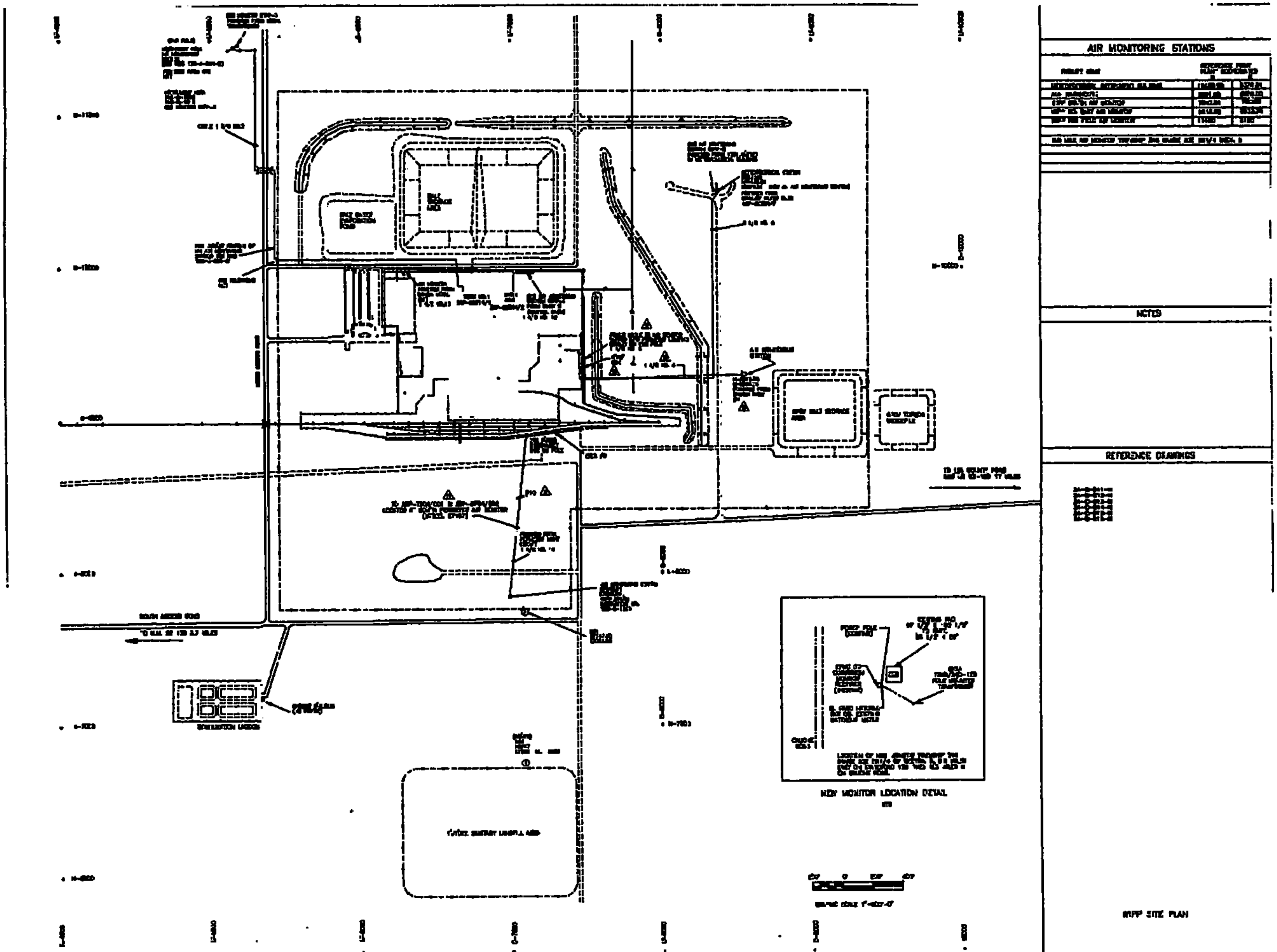
Sincerely,

James A. Mewhinney

James A. Mewhinney
Program Manager
Environment, Safety and Health

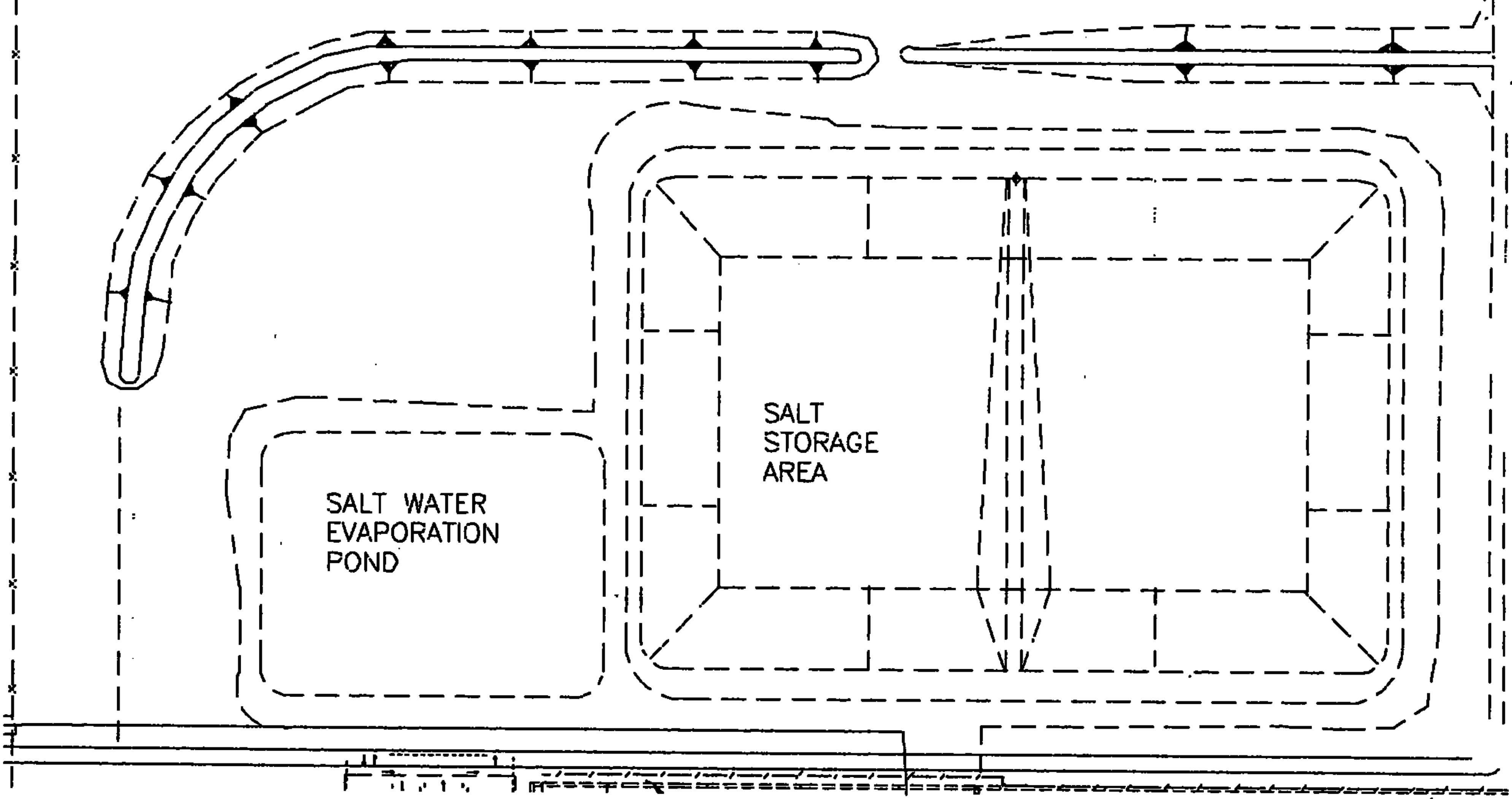
Enclosure

WIPP SITE PLAN

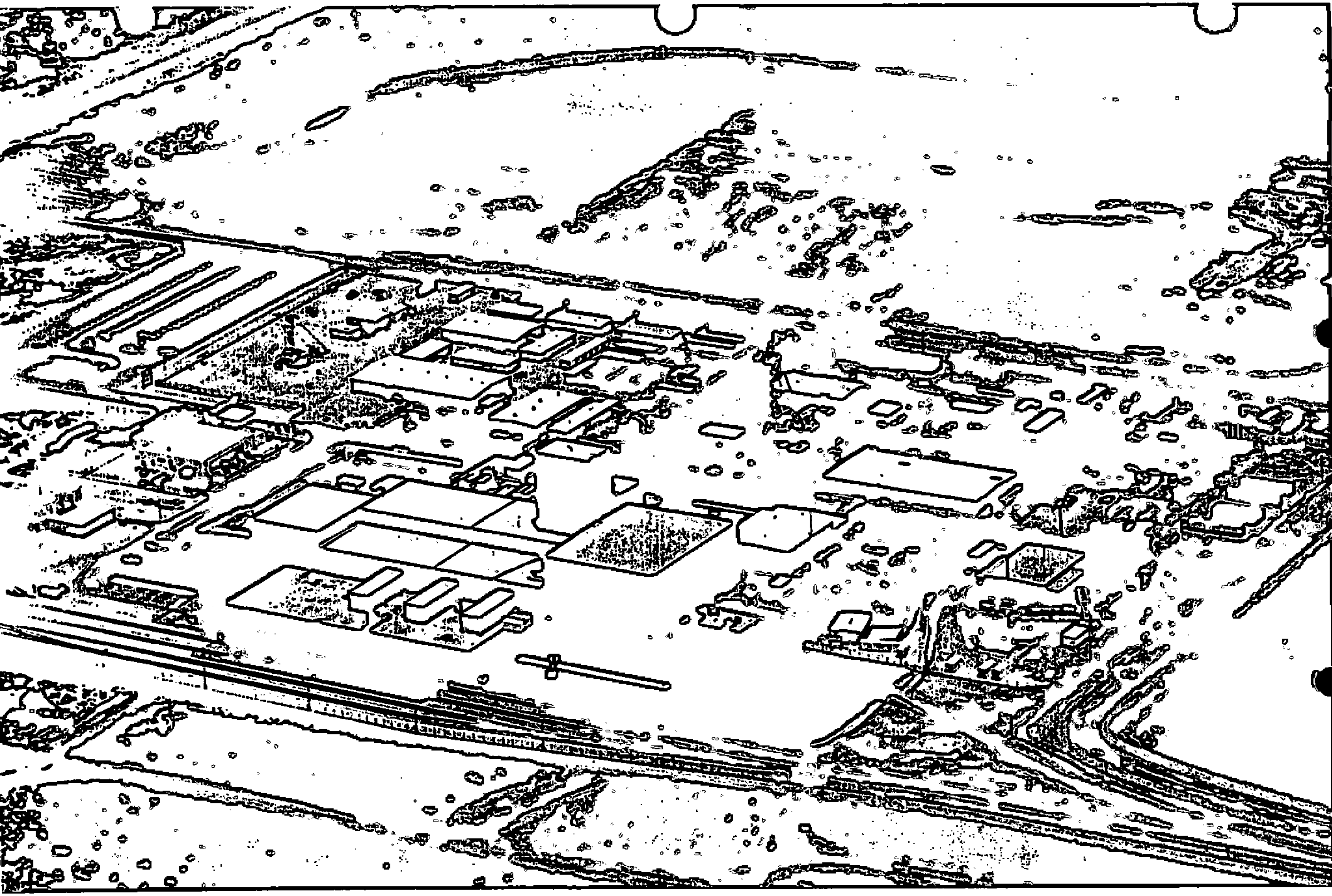


00223

SALT STORAGE AREA EVAPORATION POND



APPROXIMATE SCALE 1" = 200'



AERIAL PHOTOGRAPH OF THE WASTE ISOLATION PILOT PLANT

NUS CORPORATION

Laboratory Services Group
5350 Campbells Run Road
Pittsburgh, PA 15205

NUS CORPORATION
P.O. Box 630832
Baltimore, MD 21263-0832
412-747-2500

CHARACTORISTIC MINE WATER ANALYSIS REPORT

June 12, 1991
Report No.: 00000577
Section A Page 1

LABORATORY ANALYSIS REPORT

IENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: WASTE ISO. PILOT PL/P.O.BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MR. BRYAN HOWARD

NUS CLIENT NO: 0527 0021
WORK ORDER NO: 55830
VENDOR NO: 01830782

SAMPLE ID: WASTEWATER WIPP 390
SAMPLE NO: P0162868
P.O. NO.: 37109

DATE SAMPLED: 08-MAY-91
DATE RECEIVED: 15-MAY-91
APPROVED BY: R Volk

TEST CODE	DETERMINATION	RESULT	UNIT
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ABAW	Barium, Total (Ba)	< 0.01	mg/L
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	Hexachlorobenzene	< 100	ug/L
	Hexachlorobutadiene	< 100	ug/L
	Hexachloroethane	< 100	ug/L
	Nitrobenzene	< 100	ug/L
	Pentachlorophenol	< 500	ug/L
	Pyridine	< 100	ug/L
	m-Cresol	< 100	ug/L
	o-Cresol	< 100	ug/L
	p-Cresol	< 100	ug/L
OVPPW	VOLATILES		
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	1,2-Dichloroethane	< 5	ug/L
	2-Butanone (MEK)	< 10	ug/L
	Benzene	< 5	ug/L
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	Chlorobenzene	< 5	ug/L

ORIGINAL

TABLE 7.1.14
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H-03b3, CULEBRA, ROUND 5
(CONTINUED)
CATION AND TRACE METALS

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Aluminum	< 2.0000	< 2.0000			mg/L	08-15-90
Antimony	< 0.6000	< 0.6000			mg/L	08-15-90
Arsenic	< 0.1000	NA 0.0000			mg/L	08-15-90
Barium	< 2.0000	< 2.0000			mg/L	08-15-90
Beryllium	< 0.0500	< 0.0500			mg/L	08-15-90
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Cesium	< 0.2000	< 0.2000			mg/L	08-15-90
Chromium	0.1000	0.2000			mg/L	08-15-90
Cobalt	< 0.5000	< 0.5000			mg/L	08-15-90
Copper	< 0.2500	< 0.2500			mg/L	08-15-90
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Lead	< 0.5000	< 0.5000			mg/L	08-15-90
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Magnesium	700.0000	710.0000			mg/L	08-15-90
Manganese	< 0.1500	< 0.1500			mg/L	08-15-90
Mercury	< 0.0002	< 0.0002			mg/L	08-15-90
Molybdenum	< 0.2000	< 0.2000			mg/L	08-15-90
Nickel	< 0.4000	< 0.4000			mg/L	08-15-90
Potassium	450.0000	450.0000			mg/L	08-15-90
Selenium	< 0.5000	NA 0.0000			mg/L	08-15-90
Silver	< 0.1000	< 0.1000			mg/L	08-15-90
Sodium	16000.0000	16000.0000			mg/L	08-15-90
Strontium	23.0000	23.0000			mg/L	08-15-90
Thallium	< 10.0000	NA 0.0000			mg/L	08-15-90
Titanium	< 0.1000	< 0.1000			mg/L	08-15-90
Vanadium	< 0.5000	< 0.5000			mg/L	08-15-90
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CHARACTORISTIC OBSERVATION WELL ANALYSIS REPORT

TABLE 7.1.14
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H-03b3, CULEBRA, ROUND 5

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Chloride		27000.0000		27000.0000			mg/l	08-15-90
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Cyanide	<	0.0100		0.0000			mg/l	08-15-90
Fluoride		1.5000		0.0000			mg/l	08-15-90
Iodide	<	2.0000	<	2.0000			mg/l	08-15-90
Nitrate	<	0.0200		0.0000			mg/l	08-15-90
Total Phenolics	<	0.0050	<	0.0100			mg/l	08-15-90
Phosphorus	<	0.0100		0.0000			mg/l	08-15-90
Residue, Filterable @ 180 c		55000.0000		0.0000			mg/l	08-15-90
Residue, Nonfilterable @ 105 c		100.0000		0.0000			mg/l	08-15-90
Silica		4.5000		0.0000			mg/l	08-15-90
Sulfate		4700.0000		0.0000			mg/l	08-15-90
Total Organic Carbon	<	1.0000		1.0000			mg/l	08-15-90
Total Organic Halides		0.1300		0.1400			mg/l	08-15-90

DP-831

New Mexico Health and Environment Department

GARREY CARRUTHERS
Governor

DENNIS BOYD
Secretary

MICHAEL J. BURKHART
Deputy Secretary

RICHARD MITZELFELT
Director

MEMORANDUM

TO: Stuart P. Castle, Bureau Chief, Ground Water Bureau

FROM: Ernest C. Rebuck, Program Manager, Ground Water Section

DATE: June 15, 1990

SUBJ: WIPP WWTP Discharge Plan Application

As per your request I've reviewed the discharge plan file referenced above. I support the type of letter which has been drafted; however, I recommend that the second paragraph be revised to include specific questions on the geology of the site, with no mention that we are considering exempting the facility from having to obtain a discharge plan. I find the information in the file at present to be extremely brief in regard to the underlying hydrogeology. I believe that it would be very helpful to meet with the WIPP technical staff and review the geology/hydrogeology with them.

Another alternative would be to quickly draft a policy memorandum for Richard Mitzelfelt's signature stating that where background water quality is demonstrated to exceed 10,000 mg/l, the facility is exempt from discharge plan requirements. In practice we would require that such facilities only register with EID via an NOI, however there would be no discharge plan.

The WQCC regulations exempt facilities from having to meet standards if the background water quality exceeds 10,000 mg/l, but the regulations stop short of exempting such from the discharge plan process itself. The intent seems to be that we automatically approve such discharge plans, which does seem terribly logical. The end result would be a discharge plan approval without EID being unable to take any enforcement action. Not only would the recommended poilicy be appropriate to WIPP, but it would a reasomable regulation change for all other facilities where background water quality exceeds 10,000 mg/l.

cc: Mark E. Miller, Water Resource Spec., Ground Water Section
Doug Jones, Water Resource Spec., Ground Water Section

— ENVIRONMENTAL IMPROVEMENT DIVISION —
Harold Runnels Building
1190 St. Francis Dr.
Santa Fe, New Mexico 87503

New Mexico Health and Environment Department

CARLA L. MUTH
Secretary

MICHAEL J. BURKHART
Deputy Secretary

RICHARD MITZELFELT
Director

April 18, 1989

Garrison McCaslin

District Manager, EID District 4

315 North Atkinson

Roswell, NM 88201

RE: Discharge Plan DP - ____ or NOI

Dear Gary:

Enclosed is a copy of the latest notice of intent which the EID Ground Water Section has received for your district. It is for US DOE WIPP sewage effluent pond.

Please call me at 827-2900 if you would like additional information on this facility.

Sincerely,

Ernest C. Rebuck
Program Manager
Ground Water Section

Enclosure(s)

cc: Jon F. Thompson, Deputy Director, EID
Stuart P. Castle, Bureau Chief, Ground Water Bureau
Glenn Saums, Program Manager, Surface Water Section
Discharge Plan or NOI File
Reading File

Department of Energy
Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221

APR 17 1989

RECEIVED
APR 18 1989
GROUND WATER BUREAU

Mr. Ernest Rebuck
Groundwater Bureau
New Mexico Environmental Improvement Division
P.O. Box 968
Santa Fe, NM 87504

Dear Mr. Rebuck:

The purpose of this letter is to transmit the enclosed Notice of Intent. The U.S. Department of Energy seeks approval for the discharge of approximately 500,000 gallons of treated sewage effluent from the sewage effluent drying pond at the Waste Isolation Pilot Plant in Carlsbad. Analytical results for samples taken from the pond are included with the notice.

The three samples taken from the evaporation pond were analyzed for volatile organics, semi-volatile organics, and metals. All parameters tested for were below the detection limits, except for Barium (0.5 mg/L) and Mercury (0.0007mg/L). These two metals are below the human standards for groundwater as identified in part 3 of the New Mexico Water Quality Control Commission Regulations.

If you have any questions concerning this matter, please contact Tom Lukow of my staff at 887-8108.

Sincerely,

for Jack B. Tillman
Project Manager

Enclosure

NOTICE OF INTENT

RECEIVED
APR 1 8 1989
GROUND WATER BUREAU

1. Name and address of the person making the discharge.

U. S. Department of Energy

P. O. Box 3090

Carlsbad, NM 88221

Telephone: (505) 887-8100

2. Location of the discharge (in Township, Range and Section, ¼,¼,¼, if available).

T. 22 S., R. 31 E., Sec 29, NW 1/4, SW 1/4, NE 1/4

3. The means of discharge (To a lagoon, Flowing Stream, Water Course, Arroyo, Septic Tank-Leach field, Other - Specify. Discharge to surface south of pond

4. The estimated concentration of contaminants in the discharge. See attached analytical results. (Samples WIPP-63 through WIPP-65)

5. The type of operation from which the discharge is derived. Evaporation pond of sewage lagoon system.

6. The estimated flow to be discharged per day. Total discharge of approximately 500,000 gallons

7. The estimated depth to ground water (if available). Greater than 500 feet to non-potable groundwater.

Signed: Michael H. McFadden Date: 4/14/89

00232

DP-831

Department of Energy

Albuquerque Operations Office
Waste Isolation Pilot Plant Project Office
P. O. Box 3090
Carlsbad, New Mexico 88221

AUG 4 1989

RECEIVED
AUG 07 1989
GROUND WATER BUREAU

Mr. Ernest Rebuck
Program Manager
Ground Water Section
Environmental Improvement Division
P. O. Box 968
Santa Fe, NM 87504

Dear Mr. Rebuck:

The purpose of this letter is to transmit the enclosed Notice of Intent. This Notice is being filed for discharge of sanitary sewage effluent to the sewage lagoon system at the Waste Isolation Pilot Plant in Carlsbad. The sewage lagoon system consists of two Hypalon-lined stabilization ponds, two Hypalon-lined polishing ponds, a chlorinator, and an unlined evaporation pond.

Based on previous communications with the Ground Water Section, it was believed that it was not necessary to file a Notice of Intent to discharge to the sewage lagoon (Attachment 1). However, based on a recent review of this matter with Greg Lewis of your section, the U.S. Department of Energy has decided to file a Notice of Intent for discharge of effluent to the sewage lagoon system (Attachment 2).

Copies of analytical results for samples recently taken from each of three operating ponds have been enclosed for your information. Please note that although the sample taken from the lined stabilization pond exceeds the 10 mg/l limit for nitrates, the sample taken from the unlined evaporation pond is well below the limit.

Please advise us as soon as possible if a discharge plan is required.

If you have any questions concerning this matter, please contact Tom Lukow of my staff at 887-8108.

Sincerely,

Jack B. Tillman
Project Manager

Enclosure

cc w/enclosure:
R. R. Kehrman, WID
T. Burt, EID

cc w/o enclosure:
V. C. Ybarra, WID

ATTACHMENT 1

HEALTH
ENVIRONMENT
department

STATE OF NEW MEXICO

ENVIRONMENTAL IMPROVEMENT DIVISION
P.O. Box 968, Santa Fe, New Mexico 87504-0968
(505) 984-0020

TONEY ANAYA
GOVERNOR

DENISE D. FORT
DIRECTOR

AUG 07 1989
GROUND WATER BUREAU

RECEIVED
WIPP PROJECT
JUL 1 1985
TECHNOLOGY DEVELOPMENT & ENVIRONMENTAL PROGRAMS

June 28, 1985

Dr. Robert Eastmond
Waste Isolation Pilot Project
PO Box 2078
Carlsbad, NM 88221

Dear Dr. Eastmond:

In response to your telephoned request on June 27th for a confirmation that a discharge plan is not required for the sewage disposal activities at the WIPP site, I enclose copies of several letters:

1) A memorandum from EID scientific staff recommending that a discharge plan not be required for construction at the WIPP site;

2) A letter from the then-director of EID, Russell Rhoades, advising the WIPP Project Manager that a discharge plan was not required;

3) A letter from the WIPP Project Manager to EID, referring EID to portions of the plans and specs of the Waste Handling Building which related to sewage disposal.

According to Maxine Goad, when those plans and specs were received she simply forwarded them to the District Engineer for review, since it had been determined earlier that no discharge plan would be required. The final enclosure, ---

4) --- is a letter from Percy Blair, District Engineer, indicating that the plans appeared satisfactory.

I hope that these materials satisfy your concerns. Thank you for being so scrupulous in complying with the State ground water protection regulations.

Sincerely,

Paige Grant Morgan

Paige Grant Morgan
Water Resource Specialist
PGM:pgm

cc:John Guinn, EID District IV Manager.

EQUAL OPPORTUNITY EMPLOYER

HEALTH ENVIRONMENT Department

Working Copy

STATE OF NEW MEXICO

ENVIRONMENTAL IMPROVEMENT DIVISION
P.O. Box 968, Santa Fe, New Mexico 87504-0968
(505) 984-0020
Russell F. Rhoades, MPH, Director

TONEY ANAYA
GOVERNOR

ROBERT McNEILL
SECRETARY

ROBERT L. LOVATO, M.A.P.
DEPUTY SECRETARY

JOSEPH F. JOHNSON
DEPUTY SECRETARY

WATER POLLUTION CONTROL BUREAU

M E M O R A N D U M

RECEIVED
AUG 07 1989
GROUND WATER BUREAU

TO: Charlie Nylander, Chief, WPCB

THROUGH: Bruce Gallaher and Randy Hicks

FROM: Dennis McQuillan D. McQ.

SUBJECT: U.S. Department of Energy (USDOE), Notice of Intent to Discharge for Construction Activities at the Waste Isolation Pilot Plant (WIPP)

DATE: May 11, 1983

We have reviewed the USDOE document WTSD-TME-005, Notice of Intent to Discharge Water Contaminants, WIPP, which was sent to R.F. Rhoades in a letter from J.M. McGough dated April 20, 1983. This Notice addresses construction-related discharges only; geohydrologic issues pertaining to the operation of the proposed repository are being dealt with by the Environmental Evaluation Group.

In term of specific discharges of water contaminants, this proposal is not very different from the Site and Preliminary Design Validation program. However, one difference is that a larger quantity of salt will be removed from the Salado Formation and stored at the surface. Potential discharges covered by this Notice include salt-pile runoff and possibly 26,000 gallons of a brine-based drilling fluid.

Based upon Mercer 1983, page 67, the shallowest saturated zone at the site is in lenticular Dewey Lake sandstone at depths on the order of 185 feet. These "minor" saturated zones do not appear to be continuous or capable of producing enough water to be considered an aquifer. In any case, Figure 2 of Register 1980 indicates that surface discharges would have to penetrate more than 100 feet of the Dewey Lake Redbeds (predominantly siltstone and claystone) to reach a 185-foot-deep saturated zone. Therefore, we recommend that a ground-water discharge plan not be required for the proposed construction activities.

00235

RECEIVED
AUG 07 1989
GROUND WATER BUREAU

References Cited

Mercer, J.W., 1983, Geohydrology of the Proposed Waste Isolation Pilot Plant Site, Los Medanos Area, Southeastern New Mexico: U.S. Geological Survey, Water-Resources Investigations Report 83-4016

Register, J.K., 1980, Subsurface Hydrology of Strata Overlying the Salado Formation at the Waste Isolation Pilot Plant Site, Eddy County, New Mexico: USDOE document TME 3059.

Working Copy

HEALTH
ENVIRONMENT
department

STATE OF NEW MEXICO

ENVIRONMENTAL IMPROVEMENT DIVISION
P.O. Box 968, Santa Fe, New Mexico 87504-0968
(505) 984-0020
Russell F. Rhoades, MPH, Director

TONEY ANAYA
GOVERNOR

ROBERT McNEILL
SECRETARY

ROBERT L. LOVATO, M.A.P
DEPUTY SECRETARY

JOSEPH F. JOHNSON
DEPUTY SECRETARY

May 16, 1983

Mr. J. M. McGough
Project Manager
WIPP Project Office
Department of Energy
Albuquerque Operations Office
P. O. Box 5400
Albuquerque, NM 87115

Dear Mr. McGough:

Please be advised that this Division has received and reviewed both your air quality permit application and Notice of Intent to Discharge for the second phase of the Waste Isolation Pilot Plant which is located approximately 26 miles east of Carlsbad, T22S, R31E, in Eddy County, New Mexico.

We have determined that neither an air quality permit for construction nor a ground water discharge plan is required for the proposed activities. If at sometime in the future you intend to change the amount, the character or the location of either air pollution emission levels or water discharges, or if observation and monitoring indicate the situation is not as described, you should notify this office.

We appreciate your cooperation in following State procedures in regard to your project. If you should have any questions, please contact this office.

Sincerely,

Russell F. Rhoades
Director

cc: EEG Office
District IV

00237

Department of Energy
Albuquerque Operations Office
P.O. Box 5400
Albuquerque, New Mexico 87115

RECEIVED
AUG 17 1984
GROUND WATER BUREAU
JAN 19 1984
GROUND WATER/HAZARDOUS WASTE BUREAU

Working Copy

JAN 17 1984

Mr. Charles Nylander
Chief, Water Pollution Control Bureau
Environmental Improvement Division
P. O. Box 968
Santa Fe, NM 87504

Dear Mr. Nylander:

In his letter of May 16, 1983, Mr. Russell Rhoades advised the Department of Energy that a ground water discharge plan would not be required for construction of the Waste Isolation Pilot Plant (WIPP) facilities near Carlsbad, NM. However, in a March 1983 meeting with you and Ms. Maxine Goad, we agreed to make the plans and specifications for the WIPP Waste Handling Building [Construction Contract Package 14 (CCP-14)] available to your office when they were completed.

Please be advised that plans and specifications for the Waste Handling Building are now complete. Copies of the plans and specifications have been forwarded to Mr. Robert Neill, Director of the WIPP Environmental Evaluation Group (EEG) in Santa Fe for their review in accordance with the terms of the Consultation and Cooperation Agreement. Because the CCP-14 design package is quite large and only a portion is of specific interest to the EID, we request that you coordinate your review with that of the EEG. Mr. Neill may be reached at 827-8280.

In regard to the containment and handling of any contaminated liquids in the Waste Handling Building, we suggest that you review the following drawings in particular:

1. 41-F-087 Revision 5, Page 2-205

2. 41-E-003 Revision 4, Page 2-27

3. 41-E-005 Revision 4, Page 2-28

Please contact us if you have any questions or comments or if we can provide any assistance during your review.

Sincerely,

Roger Dentons

W. R. Cooper
Project Manger
WIPP Project Office

WIPP:JMM 83-1182

cc:
R. Neill, EEG, Santa Fe, NM
C&C File, IM, TSC, AL

Working Copy

HEALTH ENVIRONMENT department

STATE OF NEW MEXICO

ENVIRONMENTAL IMPROVEMENT DIVISION
District IV 200 E. Fifth
Roswell, NM 88201
STEVEN ASHER, DIRECTOR

TONEY ANAYA
GOVERNOR

ROBERT McNEILL
SECRETARY

ROBERT L. LOVATO, M.A.P.
DEPUTY SECRETARY

JOSEPH F. JOHNSON
DEPUTY SECRETARY

May 28, 1984

RECEIVED
MAY 31 1984
GROUND WATER, HAZARDOUS WASTE
BUREAU

Mr. Robert H. Neill
Environmental Evaluation Group
P. O. Box 968
Santa Fe, NM 87504-0968

SUBJECT: Sewage Disposal Plans, WIPP Site

Dear Mr. Neill:

The plans and specifications for the sewage disposal plant for the WIPP Site have been received from Maxine Goad. After a review of them we feel no need to comment on them and they are accepted for filing.

Sincerely,

Percy F. Blair

Percy F. Blair, P.E.
District IV Engineer

PFB/jw

cc: John E. Guinn, District Manager
Thomas A. Burt, Jr., District Supervisor
Maxine Goad, HPM I
File

Clint

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 761-4525 Fax: (505) 761-4542

February 12, 1997

RECEIVED
FEB 13 1997
GROUNDWATER BUREAU

Ms. Dale Doremus
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Dear Ms. Doremus:

This responds to the New Mexico Environment Department's (Department) public notice dated January 15, 1997, proposing to approve discharge plans for the applicants listed below. The U.S. Fish and Wildlife Service (Service) has provided technical comments to assist the Department in developing permit stipulations and conditions to assure protection of fish and wildlife resources in New Mexico.

Permit #	Applicant	County / Location NMPM
DP- 27	Phelps Dodge Tyrone, Inc.	Grant/Sections 18-20, T18S R15W
DP- 362	Quivira Ambrosia Lake Old Stope	McKinley/various sections, T14N, R10W
DP- 375	Artesia Golf and Country Club	Eddy / Section 12, T17S, R25E
DP- 408	Truog Dairy	Chaves/Section 15&16, T14S, R25E
DP- 519	Inhalation Toxicology Res. Institute	Bernalillo / Section 3, T8N, R4E
DP- 831	Waste Isolation Pilot Plant	Eddy/Sections 28&29, T22S, R31E
DP-1051	Rhino Environmental Services	Otero / Section 22, T26S, R6E
DP-1078	Santa Fe Southern Railway Wetland	Santa Fe / Section 10, T15N, R10E
DP-1129	DLD Resources	Lea / Section 35, T19S, R36E
DP-1140	McAnally Enterprises, Inc.	Doña Ana / Section 3, T26S, R3E

Discharge plans that use lagoons, ponds, or constructed wetlands for disposal of waste waters should not create an attractive nuisance that is harmful to any threatened or endangered species or migratory birds. The Service is primarily concerned with the quality of the ponded water, because inevitably, migratory birds are attracted to these lagoons, ponds, and constructed wetlands to drink, rest, and perhaps feed on the algae and invertebrates associated with these ponded waste waters. Lagoons, ponds, and constructed wetlands might contain water, sediment, and biota with the potential for elevated concentrations of trace elements, nutrients, heavy metals, organic chemicals, antibiotics, veterinary chemicals, and even pathogenic microorganisms that may pose a risk to the health of migratory birds and other wildlife. We recommend that the applicant demonstrate that any pond, lagoon, or constructed wetland will be "bird safe" (e.g., meets New Mexico general water quality standards 1102B, 1102F, and 3101K or 3101L). Where necessary, we recommend the use of wildlife exclusion technology (e.g., nets, fences, enclosed tanks) to prevent migratory birds and other wildlife from reaching any ponds or lagoons that contain toxic chemicals. In the discharge plan (DP-831) for the Waste Isolation Pilot Project, not only should toxic chemicals be considered, but also the evaporation and accumulation of excess salts, as these pose risks to the waterfowl in this region.

Our intent is to inform and intercede before any migratory bird deaths occur as migratory birds are beneficial (e.g., they hold pest populations in check) and are protected by law. The Migratory Bird Treaty Act (MBTA) makes it unlawful for anyone at anytime or in any manner to take (i.e., pursue, hunt, take, capture, kill, transport, or possess) any migratory bird unless authorized by a permit issued by the Department of the Interior. The courts have interpreted "illegal take" to include accidental poisoning or accumulation of harmful concentrations of contaminants by migratory birds, even if the contamination event was accidental or the perpetrator was unaware of the fact that his or her actions (or failure to take action) could ultimately prove harmful to migratory birds. Therefore, if the creation and operation of a pond or lagoon results in migratory bird deaths and the problems are not addressed, the operators may be held liable under the enforcement provisions of the MBTA. If migratory birds are dying around a lagoon, pond, or wetland, please contact either the Service (800-299-0196) or the New Mexico Department of Game and Fish.

In the discharge plan (DP-27) for Phelps Dodge Tyrone in Silver City, the applicant proposes the combination of remediating hydrocarbon-contaminated soils for use as a soil substitute or tailing cover. If this is a pilot project, additional monitoring should be carried out to learn the success of this remediation strategy. Does the mine's reclamation plan need to be amended to include this new procedure for obtaining a soil substitute? One concern we have is that during precipitation events, ponding may occur in the concrete-lined tailings thickeners, which could present a potentially hydrocarbon-contaminated drinking water source to migratory birds.

In discharge plans DP-1051 and DP-1129, the applicants have recommended large expanses of land be used for the disposal of hydrocarbon-contaminated soils and to pivot-spray wastewater from a hydrochloric acid plant of a pH of 4. These discharge plans have the potential to affect many wildlife species (e.g., reptiles, cacti, prairie dog towns, predators, and migratory birds) of the Plains and Chihuahuan Desert Ecosystems. Spraying an acidic solution on 39 acres of rangeland certainly has the potential to have the same type of adverse effects to the environment as does acid rain and has the potential to injure plants and animals directly. We suggest you contact the New Mexico Department of Game and Fish and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry and Resources Conservation Division for information concerning fish, wildlife, and plants of State concern in these areas before approval of these discharge plans.

In the discharge plan DP-1140, the applicant proposed to discharge chicken manure and process water to the alluvium in the Rio Grande Valley. Over time, this may present groundwater concerns. Perhaps these nutrient-rich waters can be delivered through irrigation canals during peak flow to agricultural businesses in order to supplement their reliance on fertilizers.

If you have any questions about these comments, please contact Joel D. Lusk at (505) 761-4525.

Sincerely,

Sonja Jahrsdoerfer

for Jennifer Fowler-Propst
Field Supervisor

cc:
Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico
Chief, Surface Water Quality Bureau, New Mexico Environment Department, Santa Fe, New Mexico
Geographic Manager, New Mexico Ecosystems, U.S. Fish and Wildlife Service, Albuquerque, New Mexico

GARY E. JOHNSON
GOVERNOR

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DP-831 (CM)

January 13, 1997

Mr. George Dials, Manager
U.S. Department of Energy
Waste Isolation Pilot Plant (WWTP)
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

Dear Mr. Dials:

Enclosed is a copy of the public notice pertaining to your proposed discharge plan(s) which is being published by the New Mexico Environment Department in a newspaper of general circulation.

If you have any questions, please do not hesitate to contact me at the address listed below or at 827-2900.

Sincerely,

Dale M. Doremus
Program Manager
Ground Water Pollution Prevention Section

DMD:cjm

Enclosure

P 201 605 875

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to	Mr. George Dials, Manager
Street & Number	US Department of Energy Waste Isolation Pilot Plant (WWTP
Post Office, State, & ZIP Code	PO Box 3090 Carlsbad, NM 88221-3090
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form 3800, April 1995

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DP-831 (CM)

January 13, 1997

The Honorable Gary Perkowski
Mayor
P.O. Box 1569
Carlsbad, New Mexico 88221-1569

Dear Mayor Perkowski:

Enclosed is a copy of the public notice which includes notice of a proposed discharge plan(s) for one or more operations in or near your city which is being published by the New Mexico Environment Department in a newspaper of general circulation.

If you have any questions, please do not hesitate to contact me at the address listed below or at 827-2900.

Sincerely,

Dale M. Doremus

Dale M. Doremus
Program Manager
Ground Water Pollution Prevention Section

DMD:cjm

Enclosures

P 201 605 855

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to	The Honorable Gary Perkowski Mayor
Street & Number	PO Box 1569
Post Office, State, & ZIP Code	Carlsbad, New Mexico 88221-1569
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form 3800, April 1995

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GREAT SEAL OF THE STATE OF NEW MEXICO 1912

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

DP-375 (KC)
DP-831 (CM)

January 13, 1997

Board of County Commissioners
Eddy County
Eddy County Courthouse
Carlsbad, New Mexico 88221

Board of County Commissioners:

Enclosed is a copy of the public notice for one or more operations located in your county which is being published by the New Mexico Environment Department in a newspaper of general circulation.

If you have any questions, please do not hesitate to contact me at the address listed below or at 827-2900.

Sincerely,

Dale M. Doremus

Dale M. Doremus
Program Manager
Ground Water Pollution Prevention Section

DMD:cjm

Enclosure

P 201 605 862

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to
Board of County Commissioners
Street & Number
Eddy County
Eddy County Courthouse
Post Office, State, & ZIP Code
Carlsbad, New Mexico 88221

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form 3800, April 1995

TO BE PUBLISHED ON OR BEFORE JANUARY 15, 1996

PUBLIC NOTICE

NEW MEXICO ENVIRONMENT DEPARTMENT

Notice is hereby given that, pursuant to New Mexico Water Quality Control Commission Regulations, the following proposed discharge plans have been submitted for approval to the New Mexico Environment Department. The information in this notice generally has been supplied by the applicant and may or may not have been confirmed by the NM Environment Department.

DP-27, PHELPS DODGE TYRONE, INC., H.M. Conger, President, proposes to modify its discharge plan to landfarm approximately 25 cubic yards per month of hydrocarbon contaminated soils at the existing tailings thickeners at the inactive mill facility and dispose of remediated soil on the No. 3 Tailings Impoundment. The landfarm facility and tailings impoundment are located approximately 10 miles southwest of Silver City in Sections 18, 19, and 20, T18S, R15W and Section 11, T19S, R15W, Grant County. Contaminated soils resulting from minor spills of kerosene and organic product at the SX/EW plant and of diesel, motor oil, and gasoline at the Tyrone Mine fuel docks, lube shop, and truck stop will be treated by bioremediation in the concrete-lined tailings thickeners. Remediated soil will be placed on the No. 3 Tailings Impoundment for site closure purposes. Ground water below the site is at a depth of approximately 50 to 70 feet and has a total dissolved solids concentration of approximately 200 to 400 milligrams per liter.

DP-362, QUIVIRA AMBROSIA LAKE OLD STOPE, LEACHING, Peter Luthiger, Supervisor Radiation Safety, and Environmental Affairs, proposes to renew and modify its discharge plan which currently allows the injection of up to 1,440,000 gallons per day of lixiviant into the workings of 8 underground uranium mines. The facility is located in the Amborosia Lake area approximately 15 miles north of Grants. Lixiviant injection is currently approved for underground uranium mines located in Sections 17, 19, 30, 30W, 33, and 35, T14N, R9W, and Sections 22 and 24, T14N, R10W, McKinley Co. The modification will allow lixiviant injection into 4 additional mines located in Sections 13, 15, 23, and 25, T14N, R10W, McKinley County. Up to 1,440,000 gallons per day of lixiviant composed of ground water fortified with sodium bicarbonate and/or sulfuric acid and recirculated mine water will be injected into 12 underground uranium mines for secondary recovery of uranium. Injectate is collected in the mine workings via drains and pumped to Quivira's Ambrosia Lake Uranium Mill for processing. Ground water below the land surface is at a depth of approximately 800 feet and has a total dissolved solids concentration approximately 1,200 milligrams per liter.

DP-375, ARTESIA GOLF AND COUNTRY CLUB, Mr. Joe Smith, Facility Representative, proposes to renew its discharge plan which allows the land application of 126,000 gallons per day of treated domestic wastewater effluent to the Artesia Golf and Country Club grounds. The facility is located approximately one mile northwest of Artesia in the NE 1/4 of Section 12, T17S, R25E, Eddy County. Treated wastewater effluent from the wastewater treatment plant is discharged to four bentonite-lined storage lagoons (one main storage reservoir and ponds) at the golf and country club. Stored wastewater is used as needed to irrigate the golf course grounds. Ground water below the site is at a depth of approximately 165 feet and has a total dissolved solids concentration of approximately 764 milligrams per liter.

DP-408, TRUOG DAIRY, Arlene Truog, Owner, proposes to modify its discharge plan to discharge up to 40,000 gallons per day of dairy washwater from the Truog Dairy facility. The facility is located four miles west of Hagerman, NM, in Sections 15 & 16, T14S, R25E, Chaves County. Truog Dairy had previously been approved to discharge up to 24,000 gallons per day. Effluent is discharged to a solids separator, then to a lined concrete tank where it is discharged to irrigation ditches, mixed with irrigation water and used to irrigate 540 acres of cropland. Ground water below the site is at a depth of 170 feet and has a total dissolved solids concentration of approximately 608 milligrams per liter.

DP-519, INHALATION TOXICOLOGY RESEARCH INSTITUTE, Joe Mauderly, proposes to renew its discharge plan to oversee closure and post-closure monitoring of the former lagoon site. The facility is located in Section 3, T8N, R4E, Bernalillo County. Ground water below the site is at a depth of approximately 100 feet and has a total dissolved solids concentration of approximately 1,600 milligrams per liter.

DP-831, WASTE ISOLATION PILOT PLANT (WIPP), Mr. George Dials, Manager, U.S. Department of Energy, proposes to renew and modify its discharge plan for the discharge of 32,000 gallons per day of sewage effluent and brine waters from a nuclear waste storage facility. The facility is located 26 miles east of Carlsbad in Sections 28 and 29, T22S, R31E, Eddy County. Up to 23,000 gallons per day of sewage effluent is discharged to a series of synthetically lined ponds for settling and evaporation. Up to 2,000 gallons per day of non-hazardous brine is discharged to a synthetically lined evaporation cell. The modification consists of discharging up to 8,000 gallons per day of non-hazardous brine water generated from mine dewatering activities, pumping of groundwater wells and from other non-hazardous sources to a synthetically lined evaporation pond. Ground water below the site is at a depth of approximately 608 feet and has a total dissolved solids concentration from approximately 3,920 to 218,000 milligrams per liter.

DP-1051 RHINO ENVIRONMENTAL SERVICES-OTERO II, Mr. Steve Dyer, President, proposes to modify the volume and location for treatment of hydrocarbon contaminated soils derived from leaking underground storage tanks and/or spills at the Otero II facility. The facility is located approximately 1 mile NW of Newman, New Mexico in Section 22, T26S, R6E, Otero County. Rhino proposes to increase the total volume of soil treated at any one time from 12,090 cubic yards to 80,804 cubic yards. Area of the treatment site will increase from Section 22.3, T26S, R6E, to the entire Section 22, T26S, R6E. Contaminated soils are spread in six inch layers and rotated to maximize aeration and volatilization of contaminants. Ground water below the site is at a depth of approximately 350 feet and has a total dissolved solids concentration of approximately 1,000 milligrams per liter.

DP-1078, SANTA FE SOUTHERN RAILWAY WETLAND, Robert A. Sarr, proposes to modify its discharge permit to include use of treated wastewater for fire control. The facility is located in Lamy in Section 10, T15N, R10E, Santa Fe County. The modification consists of allowing treated wastewater from the lined holding pond to be used in fire control as long as the fecal coliform count in the wastewater meets 200 counts/100 milliliters of water. Ground water below the site is at a depth of approximately 30 feet and has a total dissolved solids concentration of approximately 750 milligrams per liter.

DP-1129, DLD RESOURCES, Mr. Darrel Bearden, President, proposes to discharge up to 144,000 gallons per day of neutralized acid production wastewater from a hydrochloric acid production plant. The facility is located 1 mile west of Monument, NM in Section 35, T19S, R36E, Lea County. DLD Resources will discharge up to 144,000 gallons per day of acid production effluent that has been neutralized to at least a pH of 4 to a pivot spray irrigation system irrigating 39 acres of range land. Ground water below the site is at a depth of approximately 50 feet and has a total dissolved solids concentration ranging from 1500 milligrams per liter to 60,000 milligrams per liter.

DP-1140, MCANALLY ENTERPRISES, INC., Carlton R. Lofgren, proposes to discharge up to 2,188 gallons per day of process water and up to 112.5 tons per day of chicken manure from the McAnally Enterprises egg production facility. The facility is located in Section 3, T26S, R3E, Dona Ana County. Up to 2,188 gallons per day of process water from the egg production plant will be discharged to a septic tank/leachfield system. Up to 112.5 gallons per day of chicken manure will be discharged to a 900,000 square foot unlined pad where it is dried, stacked and then sold as fertilizer. Ground water below the site is at a depth of approximately 54 feet and has a total dissolved solids concentration of approximately 633 milligrams per liter.

Any interested person may obtain further information from the Ground Water Pollution Prevention Section of the NM Environment Department, telephone (505) 827-2900, and may submit written comments to the Ground Water Section, NM Environment Department, P.O. Box 26110, Santa Fe, NM 87502. Prior to ruling on any proposed discharge plan or its modification, the NM Environment Department will allow thirty (30) days after the date of publication of this notice to receive written comments and during which a public hearing may be requested by any interested person. Requests for public hearing shall set forth the reasons why the hearing should be held. A hearing will be held if the NM Environment Department determines that there is significant public interest.

Westinghouse Electric Corporation, Waste Isolation Pilot Plant Project
P.O. Box 2078, Carlsbad, NM 88221

CHECK No. 038116

P.O. No.	YOUR INVOICE OR FREIGHT PRO. No.	INVOICE DATE	OUR REF. No.	GROSS AMOUNT	DISCOUNT AMOUNT	NET AMOUNT
	DP-831 APPLICA	11/25/96	44303	50.00	0.00	50.00

RECEIVED
DEC 19 1996
GROUND WATER BUREAU

Lunt

ACKNOWLEDGEMENT OF RECEIPT
OF CHECK/CASH

I hereby acknowledge receipt of Check No. 038116 dated 12/19/96
or cash, received in the amount of $ 50.00 from ________
________ for Waste Isolation Pilot Plant (Facility Name) 831 (DP No.)

Submitted to ASD by: [signature] Date: 12/19/96

Received in ASD by: ________________ Date: ________

Filing Fee ☐ New Facility ☐ Renewal ☒
Modification ☒ Other ☐ (Explain) ________
Organization Code 530340 Applicable FY 97
To be deposited in the Ground Water Section Discharge Plan Fees.

Full Payment ☐ or Annual Increment ☐

Westinghouse Electric Corporation
Waste Isolation Pilot Plant Project
P.O. Box 2078
Carlsbad, NM 88221

Under U.S. Department of Energy Contract

The Carlsbad National Bank
P.O. Box 1359
Carlsbad, N M 88220

95-179/1122

12/05/96

Check Number: 38116

Amount of Check

************************50.00

Pay To Order Of

New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Authorized Signature

DP 831

⑈038116⑈ ⑆112201797⑆ 51225⑈

00252

DISCHARGE PLAN PROCESSING

DP # 831 Reviewer Clint	Date **	Initial
Notice of Intent		
NOI Received		
DP Required Letter Sent		

Discharge Plan Application		
*DP Application Received N M R	12/19/96	la
*Filing Fee Received	12/19/96	la
*Copy Transmitted to District Manager	12-19-96	cgm
Additional Information Requested		
*DP Application Complete per Completeness Checklist		
*Application Information Entered into Oracle Database		

Public Notice		
*Public Notice Published		
Public Notice Corrected		

Plans and Specifications		
*Plans and Specifications Received	12/19/96	la
*Copy Sent to District Engineer		
*Comments Received from District Engineer		

Other Technical Requirements		
*Field Inspection		
Hydrogeologic Assessment Reviewed		
*Operational Plan Reviewed		
*Monitoring Plan Reviewed		
*Contingency Plan Reviewed		
*Closure Plan Reviewed		
Additional Information Requested		
Additional Information Requested		
*Technical Review Complete		
*Computer Database Updated		
*Correspondence Transferred to Discharge Plan and Correspondence Public Drawers		

Public Hearing/Meeting		
Public Hearing/Meeting Requested		
Public Meeting Held		
Public Hearing Held		
Public Hearing/Meeting Denied		

Discharge Plan Decision		
*Approval/Disapproval Letter Drafted		
*Discharge Fee Received		
*Approval/Disapproval Letter Sent		
Appeal of Discharge Plan Decision		
WQCC Hearing Scheduled		
Appeal Resolved		

* Must be Completed

** Date is Date Received, Sent, Published, Approved or Completed.

WZ:96:03344
DA:96:2502

Westinghouse Electric Corporation

Government Operations

Waste Isolation Division

Box 2078
Carlsbad New Mexico 88221

RECEIVED
DEC 19 1996
GROUNDWATER BUREAU

December 16, 1996

Mr. Dale Doremus, Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: RENEWAL AND MODIFICATION OF DISCHARGE PLAN – DP-831

Dear Mr. Doremus:

Enclosed are three (3) copies of the completed Discharge Plan Application and $50.00 filing fee for the renewal and modification of Discharge Plan DP–831 for the Waste Isolation Pilot Plant (WIPP).

The volumes and character of the discharges to the existing sewage lagoon facilities described in DP–831 remain the same. The modification to DP–831 is the addition of a separate evaporation pond to be used for the storage and evaporation of non–hazardous brine waters generated at the WIPP. The additional evaporation pond, known as the H–19 Evaporation Pond, was originally used as part of the Culebra Transport Test Program conducted by Sandia National Laboratories for the U. S. Department of Energy at the WIPP. The pond was used to store and evaporate returned drilling fluids and brines produced from construction and hydrologic testing for the Culebra Transport Test Program. A Notice of Intent to discharge drilling fluids and brines from hydrologic testing was submitted to your office on May 18, 1995. Your response on June 16, 1995, was that a discharge plan was not required. At this time we are requesting the H–19 Evaporation Pond be included in our discharge plan.

With the completion of the test program, the H–19 Evaporation Pond will be used to store and evaporate non–hazardous waters generated at the WIPP. These waters include brine waters generated from mine dewatering activities, pumping of groundwater observation wells, and from miscellaneous non-hazardous sources.

If you have any questions or comments please contact Mr. Jim Hollen at (505) 234–8271.

Sincerely,

K. S. Donovan

K. S. Donovan, Manager
Environment, Safety, and Health

JRH:clw

cc: M. E. Bennington, DOE/CAO

RECEIVED

DEC 19 1996

GROUND WATER BUREAU

RENEWAL

NEW MEXICO

ENVIRONMENT DEPARTMENT

GROUND WATER DISCHARGE

PERMIT APPLICATION

RECEIVED

1 9 1996

GROUND WATER BUREAU

DECEMBER 16, 1996

RENEWAL
New Mexico Environment Department
Ground Water Discharge Permit Application

RECEIVED
DEC 1 9 1996
GROUND WATER BUREAU

Name of Facility: Waste Isolation Pilot Plant (WIPP)

Name, title and address of person(s) legally responsible for discharge:	**Owner of Facility** **Owners Address:**
George Dials, Manager	U.S. Department of Energy
Carlsbad Area Office	Carlsbad Area Office
U.S. Department of Energy	George Dials, Manager
P. O. Box 3090	P. O. Box 3090
Carlsbad, New Mexico 88221-3090	Carlsbad, New Mexico 88221-3090
Telephone No.: (505) 234-7300	Telephone No.: (505) 234-7300
Fax: (505) 887-1855	Fax: (505) 887-1855

Name, title, and address of local representative or contact person at the facility (if different than the responsible person), and consultant if consultant used:

Facility Representative	**Consultant**
J. R. Hollen, Senior Engineer	N/A
Westinghouse Electric Corp.	
Environmental Compliance and Support	
P. O. Box 2078 MS-170	
Carlsbad, New Mexico 88221-2078	
Telephone No.: (505) 234-8271	
Fax: (505) 885-4562	

1. **Type of facility or operation (dairy, municipality, mining, etc.):**

   The Waste Isolation Pilot Plant (WIPP) is designed to permanently dispose of transuranic waste left from the research and production of nuclear weapons. Located in southeastern New Mexico, 26 miles east of Carlsbad, project facilities included disposal items contaminated with trace amounts of radioactive elements mostly plutonium. The WIPP is scheduled to open for waste receipt in November 1997.

   The WIPP employs a facultative lagoon system for waste water treatment and a series of evaporation ponds for storage and evaporation of various waters generated at the site.

   The WIPP proposes to renew its Discharge Plan, DP-831, with a modification that will expand the storage and evaporation capabilities for various non-hazardous waters generated at the site.

The sewage and evaporation facilities (Attachment 1) currently permitted under DP-831 will remain the same with regard to the physical description, volumes, and character of the discharges as described in DP-831.

The proposed permit modification is to expand our storage and evaporation facilities by including the H-19 Evaporation Pond in our current discharge plan (Attachments 2 and 2a). The addition of the H-19 Evaporation Pond will reduce the load on the currently permitted sewage lagoon evaporation pond thus extending the life of the facility.

2. **Proposed method(s) of treatment, storage, and/or disposal of effluent or leachate (Package plant - lagoon - leachfield, wetlands - infiltration gallery, air stripper - injection well, etc.):**

The H-19 Evaporation Pond facility was constructed in July, 1995, for the storage and evaporation of returned drilling fluids and brines produced from hydrologic testing for the Culebra Transport Test Program. The test program was conducted by Sandia National Laboratories for the WIPP. A Notice of Intent to discharge to the H-19 Evaporation Pond was submitted to the Ground Water Protection and Remediation Bureau of the New Mexico Environment Department (NMED) on May 18, 1995. Response from the NMED on June 16, 1995, was that a discharge plan was not required. The Culebra Transport Test Program was completed in April, 1996. The H-19 Evaporation Pond was sampled on August 7, 1996. The analysis results (Attachment 3) indicate the pond contains no hazardous constituents from the previous use.

The H-19 Evaporation Pond will be used for the storage and evaporation of various non-hazardous waters generated at the WIPP. These waters include brine waters generated from mine dewatering activities, pumping of ground water observation wells, and from miscellaneous non-hazardous sources. These represent the same waters currently permitted for disposal into the existing synthetically lined domestic wastewater lagoons.

Discharge Characteristics

3. **Quantity:**

   a. **Design discharge rate in gallons per day (gpd):**

   The existing sewage lagoon and evaporation facility are currently permitted for 23,000 gpd sewage effluent and 2,000 gpd non-hazardous brine discharged to the north evaporation cell.

   Up to 8,000 gpd of brine waters generated from mine dewatering activities, pumping of ground water observation wells, and from miscellaneous non-hazardous sources may be discharged into the H-19 Evaporation Pond. These waters will be transported by truck or portable tank to the H-19 facility.

b. Gallons per day computed on an annual basis:

Sewage Lagoon - 8,395,000 gallons
(365 days per year x 23,000 gpd)

North Evaporation Cell - 520,000 gallons
(260 days per year [5 days/week] x 2,000 gpd)

H-19 Evaporation Pond - 2,080,000 gallons
(260 days per year [5 days/week] x 8,000 gpd)

c. Number of days per year facility will be discharging:

Sewage Lagoon - 365 days per year

North Evaporation Cell - 260 days per year (5 days per week)

H-19 Evaporation Pond - 260 days per year (5 days per week)

4. Method used to meter or calculate the discharge rate:

Sewage Lagoon - The discharge volume is approximately equal to the total WIPP facility domestic water usage. Water flow into the site is metered.

North Evaporation Cell - The requested volume of waters to be discharged to the North Evaporation Cell is 2,000 gallons per day. Volumes are calculated by a time/volume method or by volumetric measurement in the portable tanks used to transport the water from the point of generation to the North Evaporation Cell. Small volumes of water may also be estimated. For example, ½ of a 55 gallon drum ≈ 25 gallons.

H-19 Evaporation Pond - The requested volume of waters to be discharged to the H-19 Evaporation Pond is 8,000 gallons per day. Volumes are calculated by a time/volume method or by volumetric measurement in the portable tanks used to transport the water from the point of generation to the H-19 Evaporation Pond. Small volumes of water may also be estimated. For example, ½ of a 55 gallon drum ≈ 25 gallons.

5. Flow characteristics. Describe if flow is:

a. Daily (five or seven days per week) or seasonal (give months):

Sewage Lagoon - Daily, seven days per week, 365 days per year.

North Evaporation Cell - Daily, five days per week, Monday through Friday, 260 days per year.

H-19 Evaporation Pond - Daily, five days per week, Monday through Friday, 260 days per year.

b. **Continuous or intermittent:**

Sewage Lagoon - Continuous.

North Evaporation Cell - Intermittent.

H-19 Evaporation Pond - Intermittent.

6. **Discharge Quality. List the concentrations of contaminants and toxic pollutants generally associated with the type of facility or operation. The contaminants of concern are those listed in Section 3-103 of the NM Water Quality Control Commission (WQCC) Regulations and total nitrogen (nitrate + total Kjeldahl nitrogen). The toxic pollutants are listed in WQCC Regulations 1-101-1.UU.**

Attached is Discharge Monitoring Report Number 11 for the third quarter of 1996 as was reported to the Ground Water Section of the NMED on September 27, 1996. This represents the latest analytical data required by the current DP-831. (Attachment 4)

Attached are the analytical data from the H-19 Evaporation Pond. The data indicates no hazardous constituents are present in the evaporation pond. (Attachment 3)

Each discharge to the evaporation ponds is characterized and determined to be non-hazardous prior to discharge approval. This process is controlled by WIPP Procedure *WP 02-EM1001 Sewage System Discharge Monitoring and Compliance*. (Attachment 5)

Location Information

7. **Location of discharge site:**

County: Eddy

Township: 22S Range: 31E Section: 29

Latitude/Longitude: 32.22.30N Latitude, 103.47.30W Longitude

Please provide a copy of a State of New Mexico road map with the property clearly outline. (Attachment 6)

8. **Location of any water supply wells, injection wells, seeps, springs, bodies of water or water courses within one mile of the outside perimeter of the discharge site. These items must be plotted on a copy of the pertinent USGS topographic map(s) or an aerial photograph. Include the name(s) of the USGS topographic map(s).**

There are no water supply wells, injection wells, seeps, springs, bodies of water, or water courses within one mile of the outside perimeter of the discharge site. The nearest water supply well is located at the Mills Ranch. This windmill produces water of marginal quality, and is used for livestock watering. The windmill is located approximately 3¼ miles from the WIPP site and approximately five miles from the H-19 Evaporation Pond.

9. **Give the location of any proposed or existing wells to be used for monitoring the ground water quality.**

Well ID	Township	Range	Section
WQSP-1	22S	31E	20
WQSP-2	22S	31E	20
WQSP-3	22S	31E	16
WQSP-4	22S	31E	28
WQSP-5	22S	31E	29
WQSP-6	22S	31E	29
WQSP-6a	22S	31E	29

The Water Quality Sampling Program (WQSP) well locations are shown in Attachment 2.

Ground Water Conditions

10. **a. The depth (feet) to ground water below the discharge site:**

The approximate depth is 608 feet.

b. The flow direction of ground water below the site:

The flow direction is generally North to South.

c. The gradient of the ground water below the site:

The gradient of the ground water below the site is approximately 0.00013°. This is based upon water level elevation readings taken at the DOE-1 well and the H-11 well. These wells are approximately one mile apart and in line with the H-19 Evaporation Pond. The calculation is done with the assumption that the water densities are the same at both wells.

d. Reference or source of information for 10. a, b, c, above:

The information was gathered during the Culebra Transport Test Program conducted at the H-19 Hydropad. The test program report has yet to be issued by Sandia National Laboratories.

11. a. The Total Dissolved Solids (TDS) concentration (mg/l) of the ground water:

TDS ranges are from 3,920 mg/l found at the WQSP-6a well, to 218,000 mg/l found at the WQSP-3 well.

b. Reference or source of information:

The WIPP water quality sampling program. Analysis of the WQSP wells. (Attachment 7).

Flooding Potential

12. Describe the flooding potential of the discharge site based on the latest Federal Emergency Management Agency flood plain information or site specific analysis:

The 1996 WIPP Safety Analysis Report (DOE/WIPP-2065, Rev. 1) page 4-1 states: "The WIPP facility does not lie within a 100-year floodplain. There are no major surface-water bodies within 5 mi. (8 km) of the site, and the nearest river, the Pecos River, is approximately 12 mi. (19 km) away. The general ground elevation in the vicinity of the surface facilities (approximately 3,400 ft. [1,036m]) above mean sea level is about 500 ft. (152 m) above the riverbed and 400 ft. (122 m) above the 100-year floodplain." The potential for flash flooding is minimal around the facility because the site is constructed on the sand dunes of the Los Medaños plateau. Considering this information, the flooding potential is minimal.

13. Describe the methods used to control flooding of the discharge site (berms, diversion channel, etc.):

If flash flooding was to occur in the immediate area of the sewage facility and the North Evaporation Pond, flooding is controlled by a series of diversion berms that surround the facility. The berms are constructed to divert a WIPP site maximum storm event of 5.9 in. which is greater in magnitude than the site 100-year/24-hour storm event of 4.9 in. Details of diversion berms and outflow channels are provided in Attachment 8.

The H-19 Evaporation Pond is constructed on a raised crushed caliche pad. The pond berm walls are approximately 1 ft. 6 in. above the caliche pad. Given the topography, the raised pad and the height of the pond walls, the flood potential of the facility is minimal.

Soil and Geologic Information

14. Attach a copy of the USDA Soil Conservation Service soil survey map and descriptive information for soil(s) associated with the discharge site:

Attached is a copy of the USDA Soil Conservation Service soil survey aerial and associated soil contour maps Number 122 for Eddy Area, New Mexico. (Attachment 9)

The 1996 WIPP Safety Analysis Report (DOE/WIPP-2065, Rev. 1) page 2-41 described the soil in the central dune plains as "...deep and sandy."

15. Describe the lithology and thickness of each geologic unit below the discharge site. Please indicate which units are water bearing. This information may be obtained from driller's logs or geologic reports.

Thickness (feet)	Description
0 - 78	Surficial Deposits / Santa Rosa Formation
78 - 588	Dewey Lake Redbeds *(water bearing)*
588 - 652	Forty-Niner Member of the Rustler Formation
652 - 672	Magenta Member of the Rustler Formation *(water bearing)*
672 - 770	Tamarisk Member of the Rustler Formation
770 - 790	Culebra Member of the Rustler Formation *(water bearing)*
790 - 802 (partial)	Lower unnamed member of the Rustler Formation (partial)

This information was obtained from the Basic Data Report for the WQSP wells (DOE/WIPP-95-2154). Specifically, WQSP-4 well which is adjacent to the discharge site. (Attachment 10)

Attachments 11 and 11a show generalized site stratigraphy and is obtained from the WIPP Safety Analysis Report (DOE/WIPP-2065).

Operational Plan

16. An operational plan must be attached which describes how the system(s) for the collection, treatment, distribution, and disposal of waste waters or other discharges will be operated and maintained.

WIPP Procedure *WP 02-EM1001, Sewage System Discharge Monitoring and Compliance.* (Attachment 5)

Contingency Plan

17. A contingency plan must be attached which describes actions to be taken in the event that spills or failures occur or ground water standards are threatened.

A visible inspection for damaged liners is conducted daily. In the event of a significant tear in a liner that results in a release to the environment, an effluent spill or unauthorized discharge of hazardous constituents, the Ground Water Section of the NMED will be notified. The WIPP Environmental Compliance and Support Section and the Operations Department will asses damages and attempt to isolate any discharge. Samples will be taken to determine the extent and severity of contamination. A remediation plan will be developed based on sampling data and communications with the NMED Ground Water Section.

Monitoring Plan

18. A monitoring plan must be attached which outlines the proposed sampling point locations (monitoring wells, outfalls, etc.), sampling protocols (bailers, pumps, etc.), sampling frequency (monthly, yearly, etc.), chemical parameters to be analyzed for (TDS, nitrate, etc.), static water levels, discharge rates (gpd), etc.

a. The quantity of waters discharged to the evaporation ponds will be monitored and that quantity will be submitted in a quarterly report to the Ground Water Section of the NMED.

b. A water quality analysis of the inflow to the lagoon system will be submitted in the quarterly report. The report will include analysis for Nitrate, total Kjeldahl nitrogen (TKN), and Radium 226 and 228.

c. Each evaporation pond will be sampled for total dissolved solids (TDS) quarterly and the results submitted in the quarterly report.

Closure Plan

19. A closure plan must be attached for system components that are likely to be discontinued during the term of the permit. The closure plan must address the reclamation and post-operational monitoring of ground water at the site, as appropriate. Also the plan shall provide for plugging and abandonment of all monitoring wells, after ground water quality meets the WQCC Regulations.

At the time the WIPP facility is decommissioned, the sewage facility and the evaporation ponds will be closed using closure plans discussed in the *Waste Isolation Pilot Plant (WIPP), Final Supplement Environmental Impact Statement (SEIS)* (DOE/EIS 0026-FS, January, 1990). Although a detailed closure plan has not been completed, the SEIS states that all surface facilities will be decommissioned, all hazardous materials removed from the site, surface soils will be re-contoured to approximate original features, and native vegetation will be planted.

Closure plans for the sewage facility and evaporation ponds will specifically require that all lagoons and ponds will be pumped or evaporated and that all sludges be sampled to determine if hazardous constituents exist as defined by the Resource Conservation and Recovery Act (RCRA - 40 CFR 261). If hazardous constituents are detected, the sludges will be managed accordingly.

Signature(s)

20.a. I certify that I am the legal owner of the property in which all discharges will occur.

George E. Dials — 12/16/96

George Dials, Manager, Carlsbad Area Office
U.S. Department of Energy

Date

21. I certify that I am familiar with the information contained in the application and that to the best of my knowledge and belief such information is true, complete, and accurate.

Signature of person legally responsible for the discharge.

George E. Dials — 12/16/96

George Dials, Manager, Carlsbad Area Office
U.S. Department of Energy

Date

ATTACHMENTS

1. WIPP Drawing, 25-C-004-W, Stabilization Lagoon with Added Evaporation Pond
2. WIPP Drawing, 23-C-007-W, Land Withdrawal Area, Location of Facilities

2a. H-19 Evaporation Pond, Plan, Sections, Details, and Specifications

3. H-19 Evaporation Pond, Laboratory Analysis
4. WIPP Discharge Monitoring Report Number 11 for the Third Quarter, 1996
5. WIPP Procedure, WP 02-EM1001, Sewage System Discharge Monitoring and Compliance
6. WIPP Site Location Map
7. Water Quality Sampling Program Analytical Results
8. WIPP Drawing, 24-C-072-010, Stabilization Lagoon, Grading and Fencing, Plan and Sections
9. USDA Soil Conservation Service aerial and associated soil contour maps
10. Basic Data Report, Water Quality Sampling Program, WQSP-4 Well
11. Site Stratigraphic Column

11a. Generalized Site Stratigraphy

Clint

Department of Energy
Carlsbad Area Office
P.O. Box 3090
Carlsbad, New Mexico 88221

December 4, 1996

RECEIVED
DEC 12 1996
GROUND WATER BUREAU

Dear Stakeholder:

I am pleased to provide you with the enclosed *Citizens' Guide to the Compliance Certification Application.* As you may know, the Carlsbad Area Office (CAO) submitted the Compliance Certification Application to the Environmental Protection Agency at the end of October 1996. We know this 21-volume, 24,000-page document is a formidable reading task; thus, we have prepared a "reader friendly" *Citizens' Guide* so that stakeholders can understand what the application is about, ask questions, and seek further information.

The *Citizens' Guide* provides newcomers to the Waste Isolation Pilot Plant (WIPP) with an overview of the national problem of transuranic waste storage at Department of Energy (DOE) facilities nationwide, the solution that the WIPP provides to this problem, and a review of regulatory and oversight agencies that have monitored the Carlsbad Area Office's activities and will continue to do so. This document summarizes the four key requirements the CAO must meet so that the EPA can certify that the WIPP complies with environmental regulations. Finally, the document provides an overview of the next steps in the process, the role citizens play, and sources for additional information. In the document's margins, we have provided a brief summary of chapters in the application relevant to the sections in the *Citizens' Guide* -- in case you would like to read parts of the application for more detail.

Please call our Information Center at 1-800-336-WIPP (9477) if you have any questions or comments about the *Citizens' Guide* or our progress towards disposal operations at the WIPP.

Sincerely,

George E. Dials

George E. Dials
Manager

Enclosure

MEMORANDUM OF MEETING OR PHONE CONVERSATION

☑ Telephone	☐ Meeting	Time 9:10	Date 11/7/96

Individuals Involved

Jim Hollen — Clint Marshall

Subject DP Renewal for WIPP

Discussion Told Jim that they need to get a letter to me requesting renewal of their DP or we may not be ~~ag~~ able to get the public notice period over before the expiration date on 1/16/97. He said they may want to modify also ~~which~~ ~~was~~ and ~~we~~ will call me next week.

Conclusions Wait for call + letter.

Distribution

Initialed Clm

3.89

MEMORANDUM OF MEETING OR PHONE CONVERSATION

☐ Telephone ☑ Meeting | Time 10:00 | Date 8/20/96

Individuals Involved

Dan Robertson — Clint Marshall
Jim Hollen

Subject DP Renewal + Modification – WIPP

Discussion Jim + Dan came up to discuss renewal + modification of DP-831. They want to add a synthetically-lined evaporation pond to the discharge plan. Miscellaneous waters will be disposed there intermittently. All water will be analysed to ~~[illegible]~~ insure they are non-hazardous before disposal.

Conclusions

Distribution

Initialed CM

3.89

00268

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

February 14, 1996

K.S. Donovan, Manager
Environment, Safety, Health
and Regulatory Compliance
Westinghouse Electric Corporation
P.O. Box 2078
Carlsbad, NM 88221

RE: Response to Notice of Intent to discharge an additional tracer chemical and increased alcohol usage at the WIPP Site

Dear Mr. Donovan:

The New Mexico Environment Department (NMED) has received your Notice of Intent for the discharge of an additional tracer chemical and to increase alcohol usage for the Culebra Transport Test Program at the Waste Isolation Pilot Plant in accordance with Section 1201. of the NM Water Quality Control Commission (WQCC) Regulations. The facility is located approximately 30 miles east of Carlsbad in Section 29, T22S, R31E, Eddy County. The application satisfies the requirements of Section 1201 of the WQCC Regulations.

Based on the presently available information in your letter, dated December 27, 1995, a discharge plan is not being required for this discharge as long as the discharge is as described.

A discharge plan is not being required because it appears that the discharge conforms to the numerical ground water standards in WQCC Reg. 3103 and does not contain any toxic pollutants as defined in WQCC Reg. 1101.TT, and therefore is exempt from the discharge plan requirement under WQCC Reg. 3105.A.

The exempt discharge is briefly described as follows:

NMED issued three letters dated January 31, 1995, June 12, 1995 and November 16, 1995 stating that a discharge plan was not required for a group of chemical tracers and alcohols to be used in the Culebra Transport Test Program. Since that time, the discharger has submitted another request for an additional chemical constituent to be added to the original group and to increase the quantity of alcohols used in the test.

The Culebra Transport Test Program consists of injecting tracer solutions into the Culebra Formation at the H-19 well at the WIPP site hydropad. Movement of the tracers will be achieved by pumping approximately 10 hydrologic test wells located along the principle flow path of the Culebra aquifer. Monitoring will take place in seven additional wells at the site.

In addition to the constituents approved in the letters dated January 31, 1995, June 12, 1995 and November 16, 1995, as possible tracers for the tests, the following tracer chemical has been added:

2,3,5-TRIFLUOROBENZOIC ACID

Quantities of the following alcohols will be increased from a combined total of 7 liters to no more than 100 liters for any one approved alcohol, or a combined total not to exceed 180 liters.

METHANOL
ETHANOL
ISOPROPYL ALCOHOL

Although a discharge plan is not being required for this discharge, you are not relieved of liability should your operation result in actual pollution of surface or ground waters. Further, this decision by the NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, such as zoning requirements, plumbing codes and nuisance ordinances.

If at some time in the future you intend to change the amount, the character, or location of your discharge so that it will not be as described, or if observation or monitoring shows that the discharge is not as described, you must file a new request for exemption with the Ground Water Section.

If you have any questions, please contact either Clint Marshall of the Ground Water Section staff at 827-0027 or the Program Manager of the Ground Water Section at 827-2900.

Sincerely,

Marcy Leavitt, Chief
Ground Water Quality Bureau

ML:CLM

xc: Garrison McCaslin, District Manager, NMED Dist. 4
Dan Robertson, Consultant, DOE - WIPP Site, P.O. Box 3090, Carlsbad, NM 88221

P 594 831 549

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

K.S. Donovan, Manager
Environment, Safety, Health
and Regulatory Compliance
Westinghouse Electric Corp.
PO ~~Box 2078~~
Carlsbad, NM 88221

Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form 3800, April 1995

WZ:95:03350
DA:95:3180

Westinghouse Electric Corporation **Government Operations**

Waste Isolation Division

Box 2078
Carlsbad New Mexico 88221

December 27, 1995

RECEIVED
JAN 02 1996
GROUND WATER BUREAU

Mr. Clint L. Marshall, Geologist III
New Mexico Environment Department
Ground Water Bureau
P. O. Box 26110
1190 St. Francis Drive
Santa Fe, New Mexico 87502

Subject: REQUEST FOR USE OF ADDITIONAL TRACER CHEMICAL AND INCREASED ALCOHOL USAGE

Dear Mr. Marshall:

The Westinghouse Waste Isolation Division (WID) requests your approval for the use of the following tracer chemical in the Culebra Transport Test Programs under development by Sandia National Laboratories at the Waste Isolation Pilot Plant. Material Safety Data Sheets are attached.

- 2,3,5-Trifluorobenzoic acid - CAS Number 654-87-5

The amount of 2,3,5-Trifluorobenzoic acid used through the remainder of the Culebra Transport Test Program is approximately five kilograms.

The WID also requests an increase in the quantity of alcohols that may be injected as part of the Culebra Transport Test Program. The alcohols previously approved by you are methanol, ethanol and isopropyl alcohol, in combined total of seven liters. The amount now requested for injection is no more than 100 liters of any one approved alcohol, and no more than 180 liters combined total for all three approved alcohols. The increase in alcohol use is required because it is necessary to dissolve some approved tracer compounds in water soluble organic solvents.

Additionally, the U. S. Department of Energy, Carlsbad Area Office (DOE-CAO) is requesting written concurrence that a Discharge Plan will not be required for the proposed Culebra Transport Test Programs. The Culebra Transport Test Program is designed to collect additional hydrogeologic characterization data from the Culebra aquifer to test hydrological models for the WIPP Performance Assessment.

The DOE-CAO believes that this project should be exempted from the discharge plan requirements because the existing concentration of Total Dissolved Solids (TDS) in ground water in adjacent wells exceeds 10,000 mg/l. Additionally, neither the proposed tracer nor the chemical solvents are listed in Title 20, Chapter 6, Part 2, Subpart I, Section 1101, *Toxic Pollutants*, or Section 3103; *Standards for Ground Water of 10,000 mg/l TDS Concentration or Less*.

If you have any questions about this proposed project or require any additional information, please contact Mr. Jim Hollen at (505) 234-8271.

Sincerely,

Kurt Donovan

K. S. Donovan, Manager
Environment, Safety, and Health

JRH:paa

Attachments

cc: R. D. Kaiser, CAO
A. R. Sattler, SNL

LIMITED

Wesley Street, Old Glossop, Derbyshire SK13 9RY England
Tel. (01457) 868921 (4 lines) Telefax: (01457) 869360 & (01457) 860927

Safety Data Sheet

Date of issue November 14, 1995

2,3,5-Trifluorobenzoic acid

1. Identification of the substance/preparation and company

2,3,5-Trifluorobenzoic acid

2. Composition/Information on ingredients

2,3,5-Trifluorobenzoic acid

CAS No.: 654-87-5 — Hazard symbol: XR

EINECS No.: *** — R-phrases: 36/37/38

3. Hazards identification

Irritating to eyes, respiratory system and skin

4. First-aid measures

Skin contact: Remove all contaminated clothing and wash affected skin immediately with plenty of soap and water

Eye contact: Wash eyes thoroughly with water for ten minutes with the eyelids held open. Obtain medical advice immediately.

Ingestion: If chemical is confined to mouth give large quantities of water as mouth wash. Ensure mouth wash is not swallowed. If chemical has been swallowed drink plenty of water immediately, and then again at frequent intervals. Rinse the mouth with plenty of water. DO NOT induce vomiting. Obtain medical advice

Inhalation: After inhalation move patient to uncontaminated area for fresh air, keep patient calm and warm. If the casualty is unconscious place in a face downwards position and watch to see if breathing stops. If breathing has stopped apply artificial respiration. Obtain medical advice.

5. Fire-fighting measures

Extinguishing media: CO_2, foam, dry powder; in event of larger fires, water spray should be used. Never use direct water jet.

Fire-fighters should wear self contained breathing apparatus

6. Accidental release measures

Wear suitable protective clothing. Transfer to labelled container and arrange for disposal observing all local regulations.

7. Handling and storage

Avoid contact with skin, eyes and clothing. Use only in adequately ventilated fume hood, and ensure this material is handled only by suitably trained personnel.

When not in use keep original container closed and store in a cool, dry well ventilated place.

8. Exposure controls/personal protection

Respiratory protection: Use suitable dust mask. For larger releases a self-contained breathing apparatus should be used.

Eye protection: Use closely fitting goggles.

Hand protection: Wear suitable chemical resistant gloves (e.g. nitrile rubber).

Other protective equipment: Wear protective clothing.

Avoid contact with skin and eyes and the inhalation of vapour. Take off immediately all contaminated clothing. Keep working clothes separate. Wash hands before breaks and at end of work.

9. Physical and chemical properties

Appearance:	White powder or crystalline solid
Odour	***
Melting Point:	***
Boiling Point:	***
Flash Point:	***
Auto-ignition temperature:	***
Solubility:	Soluble in most organic solvents. Soluble in basic aqueous solutions. Sparingly soluble in water and petrol.

10. Stability and reactivity

Thermal decomposition:	No thermal decomposition when stored and used correctly
Hazardous decomposition products:	May evolve carbon monoxide, carbon dioxide, hydrogen fluoride and other toxic gases in case of fire or during thermal decomposition
Hazardous reactions.	No hazardous reaction when used as directed Reacts vigorously with strong base May react with oxidising materials

11. Toxicological information

No information is available but risk assessment should be based on data for other fluorinated benzoic acids.

12. Ecological information

Do not allow to escape into waters, wastewater or soil.
Ecological data not yet available.

13. Disposal considerations

Observe all local toxic waste regulations. Contaminated empty containers should be treated in the same way as the contents. When contaminated empty containers are passed on, the recipient must be informed of the possible risks. Where large quantities are involved consult the supplier

14. Transport information

UN No.: NR
Class ***
PG: ***
RID/ADR: ***
ICAO/IATA: ***

Declaration for land shipment.	2,3,5-TRIFLUOROBENZOIC ACID
Declaration for sea shipment:	2,3,5-TRIFLUOROBENZOIC ACID
Declaration for air shipment.	2,3,5-TRIFLUOROBENZOIC ACID

Other information:
Keep dry. Keep away from foodstuffs.

15. Regulatory information

Classification and labelling for supply in accordance with the Chemicals (Hazard Information and Packaging for Supply) Regulations 1994 (CHIP 2) in line with European Community Directive. 93/21/EEC.

Symbol	NR
Hazard description:	NR

2,3,5-Trifluorobenzoic acid
Caution! Substance not yet fully tested.

Safety Data Sheet

Date of is: November 14, 1995

2,3,5-Trifluorobenzoic acid

15. Regulatory information (Continued)

R 36/37/38:	Irritating to eyes, respiratory system and skin.
S 26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S 37/39:	Wear suitable gloves and eye/face protection.

The current Health and Safety at Work etc. Act (HSWA) and Control of Substances Hazardous to Health Regulations (COSHH) must be observed when handling this material. Relevant overseas legislation must be observed where appropriate.

16. Other Information

Prepared in accordance with Directives 91/155/EEC & 93/12/EC

The information given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the product in terms of its safety requirements. It does not signify warranty with regard to the product's properties or use to which it may be put.

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediat
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 2611
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

Z 091 151 880

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse) K.S. Donovan

Sent to Westinghouse Elec. Corp	
Street and No. P.O. Box 2078	
P.O., State and ZIP Code Carlsbad NM 88221	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form 3800, March 1993

CERTIFIED MAIL - RETURN RECE

November 16, 1995

K.S. Donovan, Manager
Environment, Safety, Health
and Regulatory Compliance
Westinghouse Electric Corporation
P.O. Box 2078
Carlsbad, NM 88221

RE: Response to Notice of Intent to discha
and alcohols at the WIPP Site

Dear Mr. Donovan:

The New Mexico Environment Department (NMED) has received your Notice of Intent for the discharge of an additional tracer chemical and alcohols to be used for the Culebra Transport Test Program at the Waste Isolation Pilot Plant in accordance with Section 1-201. of the NM Water Quality Control Commission (WQCC) Regulations. The facility is located approximately 30 miles east of Carlsbad in Section 29, T22S, R31E, Eddy County. The application satisfies the requirements of Section 1-201 of the WQCC Regulations.

Based on the presently available information in your letter, dated October 11, 1995, a discharge plan is not being required for this discharge as long as the discharge is as described.

A discharge plan is not being required because it appears that the discharge conforms to the numerical ground water standards in WQCC Reg. 3-103 and does not contain any toxic pollutants as defined in WQCC Reg.1-101.ZZ, and therefore is exempt from the discharge plan requirement under WQCC Reg.3-105.A.

The exempt discharge is briefly described as follows:

NMED issued two letters dated January 31, 1995 and June 12, 1995, stating that a discharge plan was not required for a group of chemical tracers to be used in the Culebra Transport Test Program. Since that time, the discharger has submitted another request for an additional chemical constituent to be added to the original group as well as three alcohols.

The Culebra Transport Test Program consists of injecting tracer solutions into the Culebra Formation at the H-19 well at the WIPP site hydropad. Movement of the tracers will be achieved by pumping approximately 10 hydrologic test wells located along the principle flow path of the Culebra aquifer. Monitoring will take place in seven additional wells at the site.

In addition to the constituents approved in the letters, dated January 31, 1995 and June 12, 1995, as possible tracers for the tests, the following tracer chemical and alcohols have been added:

POTASSIUM IODIDE

METHANOL
ETHANOL
ISOPROPYL ALCOHOL

Although a discharge plan is not being required for this discharge, you are not relieved of liability should your operation result in actual pollution of surface or ground waters. Further, this decision by the NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, such as zoning requirements, plumbing codes and nuisance ordinances.

If at some time in the future you intend to change the amount, the character, or location of your discharge so that it will not be as described, or if observation or monitoring shows that the discharge is not as described, you must file a new request for exemption with the Ground Water Section.

If you have any questions, please contact either Clint Marshall of the Ground Water Section staff at 827-0027 or the Program Manager of the Ground Water Section at 827-2900.

Sincerely,

Marcy Leavitt, Chief
Ground Water Protection &
Remediation Bureau

ML:CLM

xc: Garrison McCaslin, District Manager, NMED Dist. 4
Dan Robertson, Consultant, DOE - WIPP Site, P.O. Box 3090, Carlsbad, NM 88221

Westinghouse Electric Corporation
Government Operations

WZ:95:03340
DA:95:3101

Waste Isolation Division
Box 2078
Carlsbad New Mexico 88221

RECEIVED
OCT 19 1995
GROUND WATER BUREAU

October 11, 1995

Mr. Clint Marshall, Geologist III
New Mexico Environment Department
Ground Water Bureau
P. O. Box 26110
1190 St. Francis Drive
Santa Fe, New Mexico 87502

Subject: REQUEST FOR USE OF ADDITIONAL TRACER CHEMICALS

Dear Mr. Marshall:

Approval is requested for the use of the following tracer chemical in the Culebra Transport Test Programs under development by Sandia National Laboratories at the Waste Isolation Pilot Plant (WIPP). Material Safety Data Sheets (MSDS) are attached.

Potassium Iodide - CAS Number 7681-11-0

The amount of potassium iodide used through the remainder of the Culebra Transport Test Program is approximately six kilograms.

Approval is also requested for the following alcohols:

Methanol - CAS Number 67-56-1
Ethanol - CAS Number 64-17-5
Isopropyl Alcohol - CAS Number 67-63-0

These may be deployed to enhance the solubility of other previously approved tracer chemicals. The combined total amount of these alcohols would not exceed seven liters.

As with our previous requests, the U. S. Department of Energy, Carlsbad Area Office (DOE-CAO) is requesting written concurrence that a Part 3-100 Discharge Plan will not be required for the proposed Culebra Transport Test Programs. The Culebra Transport Test Program is designed to collect additional hydrogeologic characterization data from the Culebra aquifer to test hydrological models for the WIPP Performance Assessment.

The DOE-CAO believes that this project should be exempted from the discharge plan requirements because the existing concentration of ground water in adjacent wells exceeds 10,000 mg/l Total Dissolved Solids (TDS). Additionally, neither the proposed tracer nor the alcohols are listed in the New Mexico Water Quality Control Regulations, Part 1-101(2ZZ), *Toxic Pollutants*, or Part 3-103, *Standards for Ground Water of 10,000 mg/l TDS Concentration or Less*.

If you have any questions about this proposed project or require any additional information, please contact Mr. J. R. Hollen at (505) 234-8271.

Sincerely,

Chuan-Fu Wu for

K. S. Donovan, Manager
Environment, Safety, and Health

JRH:lwg

Attachment

cc: R. D. Kaiser, CAO
A. R. Sattler, SNL

Mr. C. Marshall October 10, 1995 WZ:95:03340

bcc: WID Distribution

G. J. Barnes	MS-120
J. L. Lee	MS-115

(without attachments)

D. C. Robertson	MS-170
M. E. Whatley	MS-170

MATERIAL SAFETY DATA SHEET

Product Name: POTASSIUM IODIDE REAGENT - 1077

Part #:NO DATA SUPPLIED

SECTION I SUPPLIER INFORMATION

Common Name: HANDWRITTEN NOTE: SAF F.O. / CATALOG NUMBER: 1077
Chemical Name/Formula: FORMULA: NOT APPLICABLE / CHEMICAL FAMILY: NOT APPLICABLE / CHEMICAL NAME: NOT APPLICABLE
Product CAS#: NO DATA SUPPLIED

Supplier: HACH COMPANY Supplier #:247
P.O. Box: P.O. BOX 907
Address:
City, St, Zip: AMES IA 50010 Phone: 515-232-2533

************************ EMERGENCY PHONE #: 515-232-2533 ************************

Date Issued: 12/16/86 Date Entered: 03/30/93

Date Revised:

SECTION II INGREDIENT INFORMATION

INGREDIENT	%MIN	%MAX	CAS	PEL-OSHA	TLV-ACGIH	313
POTASSIUM IODIDE	NO DATA	>99	7681-11-0	NO DATA SUPPLIED	NO DATA SUPPLIED	
OTHER COMPONENT	NO DATA	<1	NO DATA	NO DATA SUPPLIED	NO DATA SUPPLIED	

************************ INGREDIENT HAZARD STATEMENT ************************

INGREDIENTS

INGREDIENTS	TWA	NATURE OF HAZARD	RCRA
POTASSIUM IODIDE	NOT LISTED	MAY CAUSE IRRITATION	NONE
OTHER COMPONENT	NOT APPLICABLE	NOT APPLICABLE	NA

SECTION III PHYSICAL/CHEMICAL CHARACTERISTICS

SECTION III PHYSICAL/CHEMICAL DATA is continued on the next page.

SECTION III PHYSICAL/CHEMICAL DATA is continued from the previous page.

Boiling Point: NA
Specific Gravity (H2O = 1): 3.07
Melting Point: 680C
Vapor Pressure (mm Hg): NOT APPLICABLE
Vapor Density (Air=1): NA
Evaporation Rate (Butyl Acetate=1): NA
Solubility/Water: SOLUBLE
pH Level: OF 5% SOLN = 6.7
Percent Volatile: NO DATA SUPPLIED

***************************** APPEARANCE AND ODOR *****************************

STATE: SOLID APPEARANCE: WHITE CRYSTALLINE POWDER ODOR: NOT DETERMINED

**************************** ADDITIONAL INFORMATION ****************************

PHYSICAL DATA

SOLUBILITY IN ACID: NOT DETERMINED
IN OTHER: NOT DETERMINED
METAL CORROSIVITY - ALUMINUM: NONE STEEL: NONE
STABILITY: STABLE
STORAGE PRECAUTIONS: STORE IN A COOL, DRY PLACE.

FOR ASSISTANCE, CONTACT
REGULATORY AFFAIRS DEPT.
P.O. BOX 907 AMES, IA

EMERGENCY TELEPHONE #
(515) 232-2633

CAS. NO: NOT APPLICABLE

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method): NOT APPLICABLE / METHOD: NA
LEL: FLAMMABLE LIMITS: NA
UEL: FLAMMABLE LIMITS: NA
Auto-Ignition: PT.: ND

************************ NFPA HAZARD CLASSIFICATION ************************

Flammable: 0 Health: 1
Reactivity: 0 Special: NO DATA SUPPLIED

SECTION IV FIRE & EXPLOSION HAZARD DATA is continued on the next page.

SECTION IV FIRE & EXPLOSION HAZARD DATA is continued from the previous page.

************************ HMIS HAZARD CLASSIFICATION ************************

Flammable: NO DATA SUPPLIED Health: NO DATA SUPPLIED
Reactivity: NO DATA SUPPLIED Special: NO DATA SUPPLIED

************************* EXTINGUISHING MEDIA ********************************

DRY CHEMICAL, ALCOHOL FOAM OR CARBON DIOXIDE

********************* SPECIAL FIRE FIGHTING PROCEDURES *********************

NO DATA SUPPLIED

******************** UNUSUAL FIRE AND EXPLOSION HAZARDS *********************

SUSCEPTIBILITY TO SPONTANEOUS HEATING: NONE
SHOCK SENSITIVITY: NONE
FIRE/EXPLOSION HAZARDS: MAY EMIT TOXIC FUMES
OXIDIZER: NO

SECTION V REACTIVITY DATA

Stability? PRODUCT IS STABLE

Avoid: CONDITIONS TO AVOID: HEAT, FLAMES; MOISTURE, EXCESS EXPOSURE TO AIR; CONTACT WITH BRF3, CLF3, OR FC104

******************* INCOMPATIBILITY (Materials to Avoid) *******************

OXIDIZER: NO

******************* HAZARDOUS DECOMPOSITION OR BY-PRODUCTS ******************

TOXIC FUMES OF IODINE AND IODINE COMPOUNDS

Hazardous Polymerization? NO DATA SUPPLIED

Avoid: NO DATA SUPPLIED

SECTION VI HEALTH HAZARD DATA is continued on the next page.

SECTION VI HEALTH HAZARD DATA is continued from the previous page.

SECTION VI HEALTH HAZARD DATA

****************************** ROUTES OF ENTRY ******************************

Inhalation? SEE BELOW
Skin? SEE BELOW
Ingestion? SEE BELOW
Eyes? SEE BELOW

**************************** ADDITIONAL INFORMATION ****************************

ACUTE TOXICITY: MODERATELY TOXIC
ROUTE OF MOST DETRIMENTAL EXPOSURE: INGESTION, INHALATION, INTRAVENOUS
TARGET ORGANS: NOT DETERMINED

CHRONIC TOXICITY: SLIGHTLY TOXIC
ROUTES OF MOST DETRIMENTAL EXPOSURE: INGESTION, INHALATION, CONTACT
TARGET ORGANS: NOT DETERMINED

LONG-TERM EFFECTS: NOT APPLICABLE
ROUTE OF EXPOSURE: NOT APPLICABLE
TARGET ORGANS: NOT APPLICABLE

******************************* CARCINOGENICITY *******************************

NTP? NO DATA SUPPLIED IARC? NO DATA SUPPLIED OSHA? NO DATA SUPPLIED

**************** ADDITIONAL INFORMATION (CARCINOGENICITY) ****************

NO DATA SUPPLIED

********************* ACUTE AND CHRONIC HEALTH HAZARDS *********************

THIS PRODUCT IS IRRITATING TO EYES AND SKIN.

OVEREXPOSURE: SKIN RASH, RUNNY NOSE, HEADACHE, IODINE POISONING.

********************* SIGNS AND SYMPTOMS OF EXPOSURE *********************

PLEASE REFER TO ACUTE AND CHRONIC HEALTH HAZARDS DATA.

************ MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE ************

NO DATA SUPPLIED

SECTION VI HEALTH HAZARD DATA is continued on the next page.

SECTION VI HEALTH HAZARD DATA is continued from the previous page.

******************** EMERGENCY AND FIRST AID PROCEDURES ***********************

EYE AND SKIN CONTACT: IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES. CALL PHYSICIAN. WASH SKIN WITH SOAP AND PLENTY OF WATER.

INGESTION: GIVE LARGE QUANTITIES OF WATER OR MILK. CALL PHYSICIAN IMMEDIATELY.

INHALATION: REMOVE TO FRESH AIR.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

DOT Classification: NO DATA SUPPLIED

********* STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED *********

SCOOP INTO A BEAKER AND DISSOLVE IN WATER. POUR DOWN THE DRAIN WITH EXCESS WATER.

************************** WASTE DISPOSAL METHOD ****************************

DISPOSE OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS.

****** PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE/REGULATORY DATA ******

PRECAUTIONARY MEASURES

WASH THOROUGHLY AFTER HANDLING.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.
DO NOT BREATHE CHEMICALS.

TRANSPORTATION DATA

PROPER SHIPPING NAME: NOT CURRENTLY REGULATED
HAZARD CLASS: NOT APPLICABLE
ID: NA

REFERENCES

1) IN-HOUSE INFORMATION
2) TECHNICAL JUDGMENT

SECTION VII SAFE HANDLING AND USE is continued on the next page.

SECTION VII SAFE HANDLING AND USE is continued from the previous page.

***************************** OTHER PRECAUTIONS ******************************

NO DATA SUPPLIED

SECTION VIII CONTROL MEASURES

************************* RESPIRATORY PROTECTION ******************************

NO DATA SUPPLIED

********************************** VENTILATION **********************************

Local Exhaust: NO DATA SUPPLIED
Special Exhaust: NO DATA SUPPLIED
Mechanical Exhaust: NO DATA SUPPLIED
Other: ADEQUATE VENTILATION

******************************** OTHER PROTECTION ******************************

Gloves: DISPOSABLE GLOVES
Eye Protection: SAFETY GLASSES

********************************* CLOTHING *************************************

PROTECTIVE EQUIPMENT: ADEQUATE VENTILATION, SAFETY GLASSES, DISPOSABLE GLOVES, LAB COAT

*************************** WORK/HYGIENE PRACTICES ***************************

NO DATA SUPPLIED

**** SARA HAZARD CATEGORIES ****

IS PRODUCT SARA EXEMPT?:
FIRE HAZARD:
SUDDEN RELEASE OF PRESSURE:
IMMEDIATE (ACUTE) HEALTH HAZARD:
DELAYED (CHRONIC) HEALTH HAZARD:
REACTIVITY HAZARD:

Conversion Value to Pounds:
Chemical Descriptor: MIXTURE SOLID
RQ (Reportable Quantity):

THIS IS THE END OF THE MSDS Id #694

MATERIAL SAFETY DATA SHEET

Product Name: METHANOL

Part #:NO DATA SUPPLIED

SECTION I SUPPLIER INFORMATION

Common Name: COMMON NAMES/SYNONYMS: METHYL ALCOHOL, WOOD ALCOHOL, CARBINOL, WOOD NAPHTHA, METHYL HYDROXIDE
Chemical Name/Formula: FORMULA: C H4 O
Product CAS#: 67-56-1

Supplier: ALLTECH ASSOCIATES, INC. Supplier #:145
Address: 2051 WAUKEGAN ROAD
City, St, Zip: DEERFIELD IL 60015 Phone: 708-948-8600

*********************** EMERGENCY PHONE #: 708-948-8600 ***********************

Date Issued: 02/05/90 Date Entered: 06/16/93

Date Revised:

SECTION II INGREDIENT INFORMATION

INGREDIENT	%MIN	%MAX	CAS	PEL-OSHA	TLV-ACGIH	313
METHANOL	NO DATA	>99	67-56-1	200	200 (SKIN)	Y
HEAVY METALS	NO DATA	0.2 PPM	NO DATA	NO DATA SUPPLIED	NO DATA SUPPLIED	
LEAD	NO DATA	0.01 PPM	7439-92-1	NO DATA SUPPLIED	NO DATA SUPPLIED	
CADMIUM	NO DATA	1.0 PPM	7440-43-9	NO DATA SUPPLIED	NO DATA SUPPLIED	
CHROMIUM	NO DATA	0.5 PPM	7440-47-3	NO DATA SUPPLIED	NO DATA SUPPLIED	
NICKEL	NO DATA	0.1 PPM	7440-02-0	NO DATA SUPPLIED	NO DATA SUPPLIED	

SECTION II INGREDIENT INFORMATION is continued on the next page.

SECTION II INGREDIENT INFORMATION is continued from the previous page.

************************ INGREDIENT HAZARD STATEMENT *************************

COMPONENT	EXPOSURE LIMITS, PPM OTHER LIMIT	HAZARD
METHANOL	250 (STEL, SKIN)	FLAMMABLE; TOXIC

PLEASE REFER TO SECTION VII FOR ADDITIONAL INGREDIENTS INFORMATION.

THIS PRODUCT CONTAINERS THE FOLLOWING TOXIC CHEMICAL(S) SUBJECT TO THE REPORTIN REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

NAME	CAS NO.	% WT
METHANOL	67-56-1	>99%

SECTION III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: DEG F: 148-148.5
Specific Gravity (H2O = 1): 0.79
Melting Point: DEG F: -144
Vapor Pressure (mm Hg): 20 DEG C: 96-100
Vapor Density (Air=1): 1.1
Evaporation Rate (Butyl Acetate=1): >2
Solubility/Water: %: 100
pH Level: NO DATA SUPPLIED
Percent Volatile: NO DATA SUPPLIED

***************************** APPEARANCE AND ODOR *****************************

CLEAR, COLORLESS LIQUID; MILD ALCOHOL ODOR

**************************** ADDITIONAL INFORMATION ****************************

PHONE: 708-948-8600
FAX: 708-948-1078

PLEASE REFER TO HARDCOPY MSDS FOR INTERNATIONAL ADDRESSES AND PHONE NUMBERS.

STOCK NO: 166170
ALSO APPLIES TO: 166171, 166172, 6617A, 166170

01/90: ADDED: HMIS RATING, AUTO IGNITION TEMPERATURE, UNUSUAL FIRE AND EXPLOSION HAZARDS, % VOLATILE, PH, OTHER REGULATORY INFORMATION (5,7,8,9), VOC, VAPOR PRESSURE.
REVISED: MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE.

SECTION III PHYSICAL/CHEMICAL DATA is continued on the next page.

SECTION III PHYSICAL/CHEMICAL DATA is continued from the previous page.

HEALTH RATING (NFPA 704)
HEALTH = 1
FIRE = 3
REACTIVITY = 0
SPECIAL = NONE

HAZARD RATING SCALE
0 = MINIMAL
1 = SLIGHT
2 = MODERATE
3 = SERIOUS
4 = SEVERE

ATTENTION: THIS PRODUCT IN TERMS OF CHEMICAL IDENTITY AND THE UNIT AMOUNT PROVIDED IS INTENDED FOR USE IN CHEMICAL ANALYSIS AND NOT FOR HUMAN CONSUMPTION, NOR ANY OTHER PURPOSE.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method): DEG F: 52-53 - METHOD USED: TCC
LEL: FLAMMABLE LIMITS IN AIR, %: 6
UEL: FLAMMABLE LIMITS IN AIR, %: 36.5
Auto-Ignition: NO DATA SUPPLIED

************************ NFPA HAZARD CLASSIFICATION ************************

Flammable: 3 Health: 1
Reactivity: 0 Special: NONE

************************ HMIS HAZARD CLASSIFICATION ************************

Flammable: NO DATA SUPPLIED Health: NO DATA SUPPLIED
Reactivity: NO DATA SUPPLIED Special: NO DATA SUPPLIED

************************* EXTINGUISHING MEDIA ********************************

USE WATER SPRAY, DRY CHEMICAL, CO2, OR ALCOHOL FOAM. DO NOT USE A DIRECT WATER STREAM.

********************** SPECIAL FIRE FIGHTING PROCEDURES **********************

FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

******************** UNUSUAL FIRE AND EXPLOSION HAZARDS ********************

EXTINGUISH ALL NEARBY SOURCES OF IGNITION. THIS PRODUCT MAY BURN WITH A FLAME WHICH IS INVISIBLE IN DAYLIGHT. MIXTURES WITH WATER AND AS LITTLE AS 21% METHANOL ARE FLAMMABLE. VAPORS FORMED FROM THIS PRODUCT ARE HEAVIER THAN AIR AND MAY TRAVEL ALONG THE SURFACE TO A DISTANT SOURCE OF IGNITION AND FLASHBACK. EXPLOSIVE VAPOR-AIR MIXTURES MAY BE FORMED ABOVE THE FLASH POINT OR BETWEEN THE LOWER AND UPPER FLAMMABLE LIMITS.

SECTION IV FIRE & EXPLOSION HAZARD DATA is continued on the next page.

SECTION IV FIRE & EXPLOSION HAZARD DATA is continued from the previous page.

SECTION V REACTIVITY DATA

Stability? PRODUCT IS STABLE

Avoid: CONDITIONS TO AVOID: HEAT, SPARKS, AND OPEN FLAMES.

******************** INCOMPATIBILITY (Materials to Avoid) ********************

STRONG OXIDIZING AGENTS, ALUMINUM, ZINC, ANY METAL THAT DISPLACES HYDROGEN, ACIDS, AND ALKALIS.

******************** HAZARDOUS DECOMPOSITION OR BY-PRODUCTS ******************

MAY LIBERATE CARBON MONOXIDE, CARBON DIOXIDE, FORMALDEHYDE AND UNIDENTIFIED ORGANIC COMPOUNDS IN BLACK SMOKE.

Hazardous Polymerization? POLYMERIZATION: WILL NOT OCCUR.

Avoid: CONDITIONS TO AVOID: HEAT, SPARKS, AND OPEN FLAMES.

SECTION VI HEALTH HAZARD DATA

****************************** ROUTES OF ENTRY *********************************

Inhalation? YES
Skin? YES
Ingestion? YES
Eyes? YES

**************************** ADDITIONAL INFORMATION ****************************

PRIMARY ROUTES OF EXPOSURE: SWALLOWING, SKIN OR EYE CONTACT, INHALATION.

TOXICITY DATA:

ORAL: HUMAN LDLO = 340 MG/KG; RAT LD50 = 5628 MG/KG
DERMAL: RABBIT LD50 = 20 G/KG
INHALATION: HUMAN TCLO = 86 G/M3 (IRRITATION); RAT LC50 = 64,000 PPM/4H

OTHER DATA: NONE

SECTION VI HEALTH HAZARD DATA is continued on the next page.

SECTION VI HEALTH HAZARD DATA is continued from the previous page.

******************************** CARCINOGENICITY ********************************

NTP? NO IARC? NO OSHA? NO

***************** ADDITIONAL INFORMATION (CARCINOGENICITY) *******************

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.

********************** ACUTE AND CHRONIC HEALTH HAZARDS **********************

CHRONIC EFFECTS OF EXPOSURE: PROLONGED OR REPEATED EXPOSURE MAY RESULT IN CNS DAMAGE, BLINDNESS, DAMAGE TO PANCREAS, OR DEATH.

********************** SIGNS AND SYMPTOMS OF EXPOSURE *************************

INHALATION: PROLONGED OR REPEATED EXPOSURE OR BREATHING VERY HIGH CONCENTRATIONS MAY CAUSE HEADACHES, NAUSEA, VOMITING, DIZZINESS, VISUAL DISTURBANCES, GIDDINESS, INTOXICATION, SLEEPINESS, UNCONSCIOUSNESS, AND DEATH. INITIAL SYMPTOMS OF INHALATION MAY ONLY BE MILD INTOXICATION BUT MAY BECOME MORE SEVERE AFTER 12-18 HOURS. TOXIC EFFECTS ARE EXERTED ON THE CENTRAL NERVOUS SYSTEM, ESPECIALLY THE OPTIC NERVE.

EYE CONTACT: VAPORS WILL IRRITATE THE EYES. LIQUID AND MISTS WILL IRRITATE AND MAY BURN THE EYES.

SKIN CONTACT: BRIEF CONTACT MAY DRY THE SKIN. PROLONGED OR REPEATED CONTACT MAY IRRITATE THE SKIN, CAUSING DERMATITIS. METHANOL MAY BE ABSORBED THROUGH INTACT SKIN TO PRODUCE SYSTEMIC EFFECTS.

SWALLOWED: SWALLOWING 100-250 ML OF METHANOL CAN BE FATAL. SWALLOWING LESSER QUANTITIES CAN CAUSE BLINDNESS, DIZZINESS, HEADACHES, OR NAUSEA. ABSORPTION OF METHANOL IS RAPID BUT EXCERTION IS SLOW, RESULTING IN DELAYED EFFECTS OR COMPOUNDING EFFECTS OF REPEATED EXPOSURE. INITIAL SYMPTOMS MAY ONLY BE MILD INTOXICATION BUT THESE MAY BECOME MORE SEVERE 12-18 HOURS LATER. TOXIC EFFECTS ARE EXERTED ON THE CENTRAL NERVOUS SYSTEM, ESPECIALLY THE OPTIC NERVE.

************* MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE *************

PRE-EXISTING EYE, SKIN OR RESPIRATORY DISORDERS MAY BE AGGRAVATED OR IMPAIRED LIVER OR KIDNEY FUNCTION MAY BE MORE SUSCEPTIBLE TO THE EFFECT OF THE SUBSTANCE.

SECTION VI HEALTH HAZARD DATA is continued on the next page.

SECTION VI HEALTH HAZARD DATA is continued from the previous page.

******************** EMERGENCY AND FIRST AID PROCEDURES ***********************

IF INHALED: REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF EYE CONTACT: IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF SKIN CONTACT: IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

IF SWALLOWED: IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING BY GIVING 2 GLASSES OF WATER AND STICKING A FINGER DOWN THE THROAT. GET IMMEDIATE MEDICAL ATTENTION. AFTER PATIENT HAS VOMITED HAVE PATIENT DRINK MILK, WATER, OR SOLUTION OF SODIUM BICARBONATE IN WATER (1 TSP/1 QT). DO NOT GIVE ANYTHING TO AN UNCONSCIOUS OR CONVULSING PERSON.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

DOT Classification: NO DATA SUPPLIED

********* STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED *********

ACTION TO TAKE FOR SPILLS OR LEAKS:
WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. EXTINGUISH ALL IGNITION SOURCES AND ENSURE THAT ALL HANDLING EQUIPMENT IS ELECTRICALLY GROUNDED. FOR SMALL SPILLS OR DRIPS, MOP OR WIPE UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, CONTAIN BY DIKING WITH SOIL OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIALS AND THEN PUMP INTO DOT-APPROVED WASTE CONTAINERS; OR ABSORB WITH NON-COMBUSTIBLE ABSORBENT MATERIAL, PLACE RESIDUE IN DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOIL.
COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

*************************** WASTE DISPOSAL METHOD *****************************

DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES. NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO

SECTION VII SAFE HANDLING AND USE is continued on the next page.

SECTION VII SAFE HANDLING AND USE is continued from the previous page.

PROPER WASTE DISPOSAL AS ABOVE.

****** PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE/REGULATORY DATA ******

KEEP AWAY FROM HEAT, SPARKS, AND FLAMES. STORE IN A COOL, DRY, WELL-VENTILATED PLACE AWAY FORM INCOMPATIBLE MATERIALS. VENT CONTAINER FREQUENTLY, AND MORE OFTEN IN WARM WEATHER, TO RELIEVE PRESSURE. ELECTRICALLY GROUND ALL EQUIPMENT WHEN HANDLING THIS PRODUCT AND USE ONLY NON-SPARKING TOOLS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT USE PRESSURE TO EMPTY CONTAINER. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING.

REPAIR AND MAINTENANCE PRECAUTIONS: DO NOT CUT, GRIND, WELD, OR DRILL ON OR NEAR THIS CONTAINER.

OTHER REGULATORY INFORMATION:

DO NOT DETACH THIS SECTION FROM THE MSDS AND BE SURE TO INCLUDE THIS SECTION WHEN COPYING THE MSDS.

THIS PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICAL(S) SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

NAME	CAS NO.	% WT
METHANOL	67-56-1	> 99%

THIS PRODUCT CONTAINS THE FOLLOWING CHEMICAL(S) CONSIDERED BY THE STATE OF CALIFORNIA'S SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (PROPOSITION 65) AS CAUSING CANCER OR REPRODUCTIVE TOXICITY AND FOR WHICH WARNINGS ARE NOW REQUIRED:

CHEMICAL	CAS NO.	% WT.
HEAVY METALS		0.2 PPM
LEAD	7439-92-1	0.01 PPM
CADMIUM	7440-43-9	1.0 PPM
CHROMIUM	7440-47-3	0.5 PPM
NICKEL	7440-02-0	0.1 PPM

THE COMPONENTS OF THIS PRODUCT ARE ON THE TSCA INVENTORY OF CHEMICAL SUBSTANCES.

UNDER MASSACHUSETTS RIGHT-TO-KNOW LAW, HAZARDOUS SUBSTANCES AND EXTRORDINARILY HAZARDOUS SUBSTANCES COMPONENTS PRESENT IN THIS PRODUCT WHICH REQUIRE REPORTING ARE:

EXTRORDINARILY HAZARD SUBSTANCES

CHEMICAL	CAS NO.	CONCENTRATION (=> 0.0001%)
METHYL ALCOHOL	67-56-1	>99

UNDER THE PENNSYLVANIA RIGHT-TO-KNOW LAW, HAZARDOUS SUBSTANCES AND SPECIAL

SECTION VII SAFE HANDLING AND USE is continued on the next page.

SECTION VII SAFE HANDLING AND USE is continued from the previous page.

HAZARDOUS SUBSTANCES COMPONENTS PRESENT IN THIS PRODUCT WHICH REQUIRE REPORTING ARE:

HAZARDOUS SUBSTANCES

CHEMICAL	CAS NO.	CONCENTRATION (=> 1%)
METHYL ALCOHOL	67-56-1	>99

CALIFORNIA SCAQMD RULE 443.1 VOC'S
VOC: NO DATA AVAILABLE VAPOR PRESSURE: 97 MMHG AT 68 DEG. F

***************************** OTHER PRECAUTIONS ******************************

CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

SECTION VIII CONTROL MEASURES

************************* RESPIRATORY PROTECTION ******************************

WEAR A NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR IF USE CONDITIONS GENERATE VAPORS OR MISTS.

********************************** VENTILATION **********************************

Local Exhaust: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MAINTAINING EMISSIONS AT THE POINT OF USE BELOW THE PEL.

Special Exhaust: NO DATA SUPPLIED

Mechanical Exhaust: NO DATA SUPPLIED

Other: NO DATA SUPPLIED

******************************** OTHER PROTECTION ******************************

Gloves: SEE BELOW

Eye Protection: CHEMICAL GOGGLES UNLESS A FULL FACEPIECE RESPIRATOR IS ALSO WORN. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

********************************* CLOTHING *************************************

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, SAFETY SHOES, RUBBER GLOVES, AND RUBBER APRON.

*************************** WORK/HYGIENE PRACTICES ***************************

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NEARBY AND

SECTION VIII CONTROL MEASURES is continued on the next page.

SECTION VIII CONTROL MEASURES is continued from the previous page.

READY FOR USE.

**** SARA HAZARD CATEGORIES ****

IS PRODUCT SARA EXEMPT?:
FIRE HAZARD: SUDDEN RELEASE OF PRESSURE:
IMMEDIATE (ACUTE) HEALTH HAZARD: DELAYED (CHRONIC) HEALTH HAZARD:
REACTIVITY HAZARD:

Conversion Value to Pounds:
Chemical Descriptor: MIXTURE LIQUID
RQ (Reportable Quantity):

THIS IS THE END OF THE MSDS Id #594.2

MATERIAL SAFETY DATA SHEET

Product Name: ETHANOL CDA 19, 200 PROOF - P1552003

Part #:NO DATA SUPPLIED

SECTION I SUPPLIER INFORMATION

Common Name: ETHANOL CDA-19 / COMMON NAMES/SYNONYMS: COMPLETELY DENATURED ALCOHOL; DENATURED ETHANOL; GOVERNMENT FORMULA 19 / ORDER NO: 471500810 / PROD NO: 04235538 / VW&R CODE: P1552003
Chemical Name/Formula: FORMULA: MIXTURE / CAS NO.: MIXTURE
Product CAS#: NO DATA SUPPLIED

Supplier: VAN WATERS & ROGERS INC. Supplier #:942
P.O. Box: SUBSID. OF UNIVARVAR
Address: 1600 NORTON BLDG.
City, St, Zip: SEATTLE WA 98104-1564 Phone: 408-435-8700

************************ EMERGENCY PHONE #: 800-424-9300 ************************

Date Issued: 01/25/90 Date Entered: 01/12/94

Date Revised:

SECTION II INGREDIENT INFORMATION

INGREDIENT	%MIN	%MAX	CAS	PEL-OSHA	TLV-ACGIH	313
ETHANOL	NO DATA	95	64-17-5	1000 PPM	1000 PPM	
METHANOL ISOBUTYL KETONE	NO DATA	4	108-10-1	100 PPM	50 PPM	Y
GASOLINE	NO DATA	1	8006-61-9	NONE	300 PPM	

************************ INGREDIENT HAZARD STATEMENT ************************

HAZARDOUS INGREDIENTS

COMPONENT	EXPOSURE LIMITS, PPM OSHA PEL	ACGIH TLV	OTHER LIMIT	HAZARD

SECTION II INGREDIENT INFORMATION is continued on the next page.

SECTION II INGREDIENT INFORMATION is continued from the previous page.

ETHANOL	1000	1000	NONE	FLAMMABLE
METHANOL ISOBUTYL KETONE	100	50	75 STEL	FLAMMABLE; IRRITANT
GASOLINE	NONE	300	500 STEL	FLAMMABLE; IRRITANT

SECTION III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: , DEG F: 174
Specific Gravity (H2O = 1): .81
Melting Point: , DEG F: -121
Vapor Pressure (mm Hg): MM HG/20 DEG C: 50
Vapor Density (Air=1): 1.5
Evaporation Rate (Butyl Acetate=1): 1.4 (EST)
Solubility/Water: , %: 100
pH Level: NO DATA SUPPLIED
Percent Volatile: NO DATA SUPPLIED

****************************** APPEARANCE AND ODOR ******************************

CLEAR, COLORLESS LIQUID; NON-RESIDUAL ODOR

***************************** ADDITIONAL INFORMATION *****************************

VAN WATERS & ROGERS INC., SUBSIDIARY OF UNIVAR
(408) 435-8700

EMERGENCY ASSISTANCE:
FOR EMERGENCY ASSISTANCE INVOLVING CHEMICALS CALL CHEMTREC (800) 424-9300

FOR PRODUCT AND SALES INFORMATION:
CONTACT YOUR LOCAL VAN WATERS & ROGERS BRANCH OFFICE

HAZARD RATING (NFPA 704 CRITERIA)	HAZARD RATING SCALE:	
HEALTH: 1	0=MINIMAL	3=SERIOUS
FIRE: 3	1=SLIGHT	4=SEVERE
REACTIVITY: 0	2=MODERATE	
SPECIAL: NONE		

CUST: 47100362

SHIP TO:

47100362

SECTION III PHYSICAL/CHEMICAL DATA is continued on the next page.

SECTION III PHYSICAL/CHEMICAL DATA is continued from the previous page.

DEL NORTE CHEMICAL
3011 DURAZNO
P O BOX 10032
EL PASO TX 79991

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method): , DEG.F: 54 - METHOD USED: TCC
LEL: FLAMMABLE LIMITS IN AIR, % LOWER: 3.3
UEL: FLAMMABLE LIMITS IN AIR, % UPPER: 19
Auto-Ignition: NO DATA SUPPLIED

************************ NFPA HAZARD CLASSIFICATION ************************

Flammable: 3	Health: 1
Reactivity: 0	Special: NONE

************************ HMIS HAZARD CLASSIFICATION ************************

Flammable: NO DATA SUPPLIED	Health: NO DATA SUPPLIED
Reactivity: NO DATA SUPPLIED	Special: NO DATA SUPPLIED

************************* EXTINGUISHING MEDIA ******************************

USE WATER SPRAY, DRY CHEMICAL, CO2, OR ALCOHOL FOAM. DO NOT USE A DIRECT WATER STREAM.

********************* SPECIAL FIRE FIGHTING PROCEDURES *********************

FIRE FIGHTERS SHOULD WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL NEARBY CONTAINERS AND STRUCTURES EXPOSED TO FIRE.

******************** UNUSUAL FIRE AND EXPLOSION HAZARDS ********************

VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL TO OTHER IGNITION SOURCES. CONTAINERS EXPOSED TO INTENSE HEAT FROM FIRES SHOULD BE COOLED WITH WATER TO PREVENT VAPOR PRESSURE BUILDUP WHICH COULD RESULT IN CONTAINER RUPTURE. CONTAINER AREAS EXPOSED TO DIRECT FLAME CONTACT SHOULD BE COOLED WITH LARGE QUANTITIES OF WATER AS NEEDED TO PREVENT WEAKENING OF CONTAINER STRUCTURE.

SECTION V REACTIVITY DATA

Stability? PRODUCT IS STABLE

Avoid: CONDITIONS TO AVOID: HEAT, SPARKS, AND OPEN FLAMES.

SECTION V REACTIVITY DATA is continued on the next page.

SECTION V REACTIVITY DATA is continued from the previous page.

******************* INCOMPATIBILITY (Materials to Avoid) *******************

ACIDS, OXIDIZING MATERIALS.

******************* HAZARDOUS DECOMPOSITION OR BY-PRODUCTS ******************

MAY LIBERATE CARBON MONOXIDE AND CARBON DIOXIDE.

Hazardous Polymerization? POLYMERIZATION: WILL NOT OCCUR

Avoid: CONDITIONS TO AVOID: HEAT, SPARKS, AND OPEN FLAMES.

SECTION VI HEALTH HAZARD DATA

***************************** ROUTES OF ENTRY ********************************

Inhalation? YES
Skin? NO DATA SUPPLIED
Ingestion? YES
Eyes? NO DATA SUPPLIED

*************************** ADDITIONAL INFORMATION ****************************

PRIMARY ROUTES OF EXPOSURE: SWALLOWED AND INHALATION

TOXICITY DATA:

FOR ABSOLUTE ETHANOL:
ORAL: RAT LD50 = 14 GM/KG; HUMAN TDLO = 1430 MG/KG:CNS
HUMAN TDLO = 50 MG/KG:GIT

DERMAL: RABBIT LD50 => 9.4 ML/KG

INHALATION: RAT LC50 = 20000 PPM/10 HR.

OTHER DATA: NONE

****************************** CARCINOGENICITY ******************************

NTP? NO IARC? NO OSHA? NO

**************** ADDITIONAL INFORMATION (CARCINOGENICITY) *******************

CARCINOGENICITY: THIS MATERIAL IS NOT CONSIDERED TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM, THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER,

SECTION VI HEALTH HAZARD DATA is continued on the next page.

SECTION VI HEALTH HAZARD DATA is continued from the previous page.

OR THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.

********************** ACUTE AND CHRONIC HEALTH HAZARDS **********************

CHRONIC EFFECTS OF EXPOSURE:
NO SPECIFIC INFORMATION AVAILABLE.

********************** SIGNS AND SYMPTOMS OF EXPOSURE ************************

INHALATION:
VAPORS AND MISTS IRRITATE THE NOSE AND THROAT. INHALATION OF HIGHER CONCENTRATIONS MAY CAUSE HEADACHES, NAUSEA, VOMITING, AND COMA. INHALATION OF VERY HIGH CONCENTRATIONS OR PROLONGED EXPOSURE MAY CAUSE UNCONSCIOUSNESS OR DEATH.

EYE CONTACT:
VAPORS WILL IRRITATE THE EYES. LIQUID AND MISTS WILL IRRITATE AND MAY BURN THE EYES.

SKIN CONTACT:
BRIEF CONTACT MAY DRY THE SKIN. PROLONGED OR REPEATED CONTACT MAY IRRITATE THE SKIN, CAUSING DERMATITIS.

SWALLOWED:
SWALLOWING LARGE QUANTITIES CAUSES DRUNKENESS FOLLOWED BY SEVERE SYSTEMIC ILLNESS, AND PERHAPS BLINDNESS AND DEATH. BASED ON METHYL ISOBUTYL KETONE, INGESTION MAY PRODUCE CNS DEPRESSION AND LIVER DAMAGE.

************ MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE *************

PRE-EXISTING EYE, SKIN, AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. IMPAIRED LIVER FUNCTION FROM PRE-EXISTING DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. PERSONS ON DISULFIRAM (ANTABUSE*) THERAPY, SHOULD BE AWARE THAT THE ETHYL ALCOHOL IN THIS PRODUCT IS HAZARDOUS TO THEM JUST AS IS ALCOHOL FROM ANY SOURCE. DISULFIRAM REACTIONS (VOMITING, HEADACHE AND EVEN COLLAPSE) MAY FOLLOW SMALL AMOUNTS OF ALCOHOL BY INGESTION, AND HAVE BEEN DESCRIBED FROM SKIN CONTACT.

STUDIES IN LABORATORY ANIMALS INVOLVING PROLONGED AND REPEATED EXPOSURES TO ETHYL ALCOHOL, HAVE RESULTED IN SUCH EFFECTS AS LIVER DAMAGE, EMBRYO-TOXICITY, FETOTOXICITY, AND TERATOGEENICITY(SIC). A TRANSIENT MUTAGENIC EFFECT HAS BEEN REPORTED IN RATS.

ALTHOUGH THE SIGNIFICANCE TO HUMANS IS UNKNOWN, IN MALE RATS EXPOSED BY INHALATION TO MIBK VAPORS (UP TO 1000 PPM) FOR 90 DAYS, EVIDENCE OF SLIGHT KIDNEY DAMAGE WAS OBSERVED.

*DATA ENTRY NOTE:

SECTION VI HEALTH HAZARD DATA is continued on the next page.

SECTION VI HEALTH HAZARD DATA is continued from the previous page.

ANTABUSE IS A REGISTERED TRADEMARK

******************** EMERGENCY AND FIRST AID PROCEDURES ***********************

IF INHALED:
REMOVE TO FRESH AIR. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF EYE CONTACT:
IMMEDIATELY FLUSH EYES WITH LOTS OF RUNNING WATER FOR 15 MINUTES, LIFTING THE UPPER AND LOWER EYELIDS OCCASIONALLY. GET IMMEDIATE MEDICAL ATTENTION.

IN CASE OF SKIN CONTACT:
IMMEDIATELY WASH SKIN WITH LOTS OF SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND SHOES; WASH BEFORE REUSE. GET MEDICAL ATTENTION IF IRRITATION PERSISTS AFTER WASHING.

IF SWALLOWED:
IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING BY GIVING 2 GLASSES OF WATER AND STICKING A FINGER DOWN THE THROAT. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING TO AN UNCONSCIOUS OR CONVULSING PERSON.

NOTE TO PHYSICIAN:
IF VICTIM IS A CHILD, GIVE NO MORE THAN 1 GLASS OF WATER AND 15CC (1 TABLESPOON) SYRUP OF IPECAC. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMISIS, GASTRIC LAVAGE SHOULD BE CONSIDERED FOLLOWING INTUBATION WITH A CUFFED ENDOTRACHEAL TUBE.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

DOT Classification: NO DATA SUPPLIED

********* STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED *********

ACTION TO TAKE FOR SPILLS OR LEAKS: WEAR PROTECTIVE EQUIPMENT INCLUDING RUBBER BOOTS, RUBBER GLOVES, RUBBER APRON, AND A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE OR A SUPPLIED-AIR RESPIRATOR. IF THE SPILL OR LEAK IS SMALL, A FULL FACEPIECE AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ORGANIC VAPORS MAY BE SATISFACTORY. IN ANY EVENT, ALWAYS WEAR EYE PROTECTION. EXTINGUISH ALL IGNITION SOURCES AND ENSURE THAT ALL HANDLING EQUIPMENT IS ELECTRICALLY GROUNDED. FOR SMALL SPILLS OR DRIPS, MOP OR WIPE UP AND DISPOSE OF IN DOT-APPROVED WASTE CONTAINERS. FOR LARGE SPILLS, CONTAIN BY DIKING WITH SOIL OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIALS AND THEN PUMP INTO DOT-APPROVED WASTE CONTAINERS; OR ABSORB WITH NON-COMBUSTIBLE SORBENT MATERIAL, PLACE RESIDUE IN DOT-APPROVED WASTE CONTAINERS. KEEP OUT OF SEWERS, STORM DRAINS, SURFACE WATERS, AND SOIL.

SECTION VII SAFE HANDLING AND USE is continued on the next page.

SECTION VII SAFE HANDLING AND USE is continued from the previous page.

COMPLY WITH ALL APPLICABLE GOVERNMENTAL REGULATIONS ON SPILL REPORTING, AND HANDLING AND DISPOSAL OF WASTE.

************************** WASTE DISPOSAL METHOD ****************************

DISPOSAL METHODS:
DISPOSE OF CONTAMINATED PRODUCT AND MATERIALS USED IN CLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE AND LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER DISPOSAL PROCEDURES. NOTE: EMPTY CONTAINERS CAN HAVE RESIDUES, GASES AND MISTS AND ARE SUBJECT TO PROPER WASTE DISPOSAL, AS ABOVE.

****** PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE/REGULATORY DATA ******

KEEP AWAY FROM HEAT, SPARKS, AND FLAMES. STORE IN A COOL, DRY PLACE. VENT CONTAINER FREQUENTLY, AND MORE OFTEN IN WARM WEATHER, TO RELIEVE PRESSURE. ELECTRICALLY GROUND ALL EQUIPMENT WHEN HANDLING THIS PRODUCT AND USE ONLY NON-SPARKING TOOLS. KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE. DO NOT USE PRESSURE TO EMPTY CONTAINER. WASH THOROUGHLY AFTER HANDLING. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING.

REPAIR AND MAINTENANCE PRECAUTIONS:
DO NOT CUT, GRIND, WELD, OR DRILL ON OR NEAR THIS CONTAINER.

FOR ADDITIONAL INFORMATION:
CONTACT MSDS COORDINATOR, VAN WATERS & ROGERS INC.
DURING BUSINESS HOURS, PACIFIC TIME (408) 435-8700

OTHER REGULATORY INFORMATION:
DO NOT DETACH THIS SECTION FROM THE MSDS AND BE SURE TO INCLUDE THIS SECTION WHEN COPYING THE MSDS.

THIS PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICAL(S) SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372:

NAME	CAS NO.	%, WT
METHYL ISOBUTYL KETONE	108-10-1	4%

NOTICE:

ALL INFORMATION APPEARING HERIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, VW&R MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VW&R'S CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND

SECTION VII SAFE HANDLING AND USE is continued on the next page.

SECTION VII SAFE HANDLING AND USE is continued from the previous page.

THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

REVISION:

01/90: ADDED NOTE TO PHYSICIAN FOR SWALLOWING FIRST AID, HEALTH HAZARD IF SWALLOWED, AGGRAVATED MEDICAL CONDITIONS, UNUSUAL FIRE AND EXPLOSION INFORMATION.
REVISED EVAPORATION RATE, HEALTH HAZARDS FOR INHALATION, EYE CONTACT, SKIN CONTACT AND AGGRAVATED MEDICAL CONDITIONS.

***************************** OTHER PRECAUTIONS ******************************

CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, WILL RETAIN PRODUCT RESIDUE AND VAPORS. ALWAYS OBEY HAZARD WARNINGS AND HANDLE EMPTY CONTAINERS AS IF THEY WERE FULL.

SECTION VIII CONTROL MEASURES

************************ RESPIRATORY PROTECTION ******************************

IF USE CONDITIONS GENERATE VAPORS OR MISTS, WEAR A NIOSH-APPROVED RESPIRATOR APPROPRIATE FOR THOSE EMISSION LEVELS. APPROPRIATE RESPIRATORS MAY BE A FULL FACEPIECE OR A HALF MASK AIR-PURIFYING CARTRIDGE RESPIRATOR EQUIPPED FOR ORGANIC VAPORS/MISTS, A SELF-CONTAINED BREATHING APPARATUS IN THE PRESSURE DEMAND MODE, OR A SUPPLIED-AIR RESPIRATOR.

********************************** VENTILATION **********************************

Local Exhaust: VENTILATION: LOCAL MECHANICAL EXHAUST VENTILATION CAPABLE OF MAINTAINING EMISSIONS AT THE POINT OF USE BELOW THE PEL.
Special Exhaust: NO DATA SUPPLIED
Mechanical Exhaust: SEE LOCAL EXHAUST.
Other: NO DATA SUPPLIED.

****************************** OTHER PROTECTION ******************************

Gloves: NEOPRENE GLOVES.
Eye Protection: CHEMICAL GOGGLES UNLESS A FULL FACEPIECE RESPIRATOR IS ALSO WORN. IT IS GENERALLY RECOGNIZED THAT CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH CHEMICALS BECAUSE CONTACT LENSES MAY CONTRIBUTE TO THE SEVERITY OF AN EYE INJURY.

SECTION VIII CONTROL MEASURES is continued on the next page.

SECTION VIII CONTROL MEASURES is continued from the previous page.

******************************** CLOTHING **************************************

PROTECTIVE CLOTHING: LONG-SLEEVED SHIRT, TROUSERS, SAFETY SHOES, NEOPRENE GLOVES, AND RUBBER APRON.

************************** WORK/HYGIENE PRACTICES ***************************

OTHER PROTECTIVE MEASURES: AN EYEWASH AND SAFETY SHOWER SHOULD BE NERABY AND READY FOR USE.

**** SARA HAZARD CATEGORIES ****

IS PRODUCT SARA EXEMPT?:
FIRE HAZARD: SUDDEN RELEASE OF PRESSURE:
IMMEDIATE (ACUTE) HEALTH HAZARD: DELAYED (CHRONIC) HEALTH HAZARD:
REACTIVITY HAZARD:

Conversion Value to Pounds:
Chemical Descriptor: MIXTURE LIQUID
RQ (Reportable Quantity):

THIS IS THE END OF THE MSDS Id #1406
Page 9

10 OCT 1995 MSDS Id #: 1025.1

MATERIAL SAFETY DATA SHEET

Product Name: ISOPROPYL ALCOHOL

Part #:NO DATA SUPPLIED

SECTION I SUPPLIER INFORMATION

Common Name: SYNONYMS: 2-PROPANOL; SEC-PROPYL ALCOHOL; ISOPROPANOL
Chemical Name/Formula: CHEMICAL FORMULA: (CH3)2CHOH / MOLECULAR WEIGHT: 60.10 / FORMULA CAS NO.: 67-63-0
Product CAS#: 67-63-0

Supplier: MALLINCKRODT, INC., Supplier #:109
P.O. Box: P.O. BOX M
Address: SCIENCE PRODUCTS DIVISION
City, St, Zip: PARIS KY 43061 Phone: 314-982-5000

*********************** EMERGENCY PHONE #: 314-982-5000 ************************

Date Issued: 04/06/89 Date Entered: 12/07/93

Date Revised:

SECTION II INGREDIENT INFORMATION

INGREDIENT	%MIN	%MAX	CAS	PEL-OSHA	TLV-ACGIH	313
ISOPROPYL ALCOHOL	NO DATA	100	67-63-0	NO DATA SUPPLIED	NO DATA SUPPLIED	

*********************** INGREDIENT HAZARD STATEMENT *************************

ISOPROPYL ALCOHOL

HAZARDOUS INGREDIENTS: ISOPROPYL ALCOHOL

PLEASE REFER TO SECTION VI FOR OCCUPATIONAL EXPOSURE LIMITS.

SECTION III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: 82 DEGREES C (180 DEGREES F)
Specific Gravity (H2O = 1): 0.79
Melting Point: -89 DEGREES C (-128 DEGREES F)
Vapor Pressure (mm Hg): 33 @ 20 DEGREES C (68 DEGREES F)

SECTION III PHYSICAL/CHEMICAL DATA is continued on the next page.

SECTION III PHYSICAL/CHEMICAL DATA is continued from the previous page.

Vapor Density (Air=1): 2.1
Evaporation Rate (Butyl Acetate=1): (N-BUAC=1): 2.83
Solubility/Water: INFINITE IN WATER
pH Level: NO DATA SUPPLIED
Percent Volatile: NO DATA SUPPLIED

***************************** APPEARANCE AND ODOR *****************************

APPEARANCE: CLEAR, COLORLESS LIQUID
ODOR: RUBBING ALCOHOL

**************************** ADDITIONAL INFORMATION ****************************

EMERGENCY PHONE NUMBER: 314-982-5000

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method): 12 DEGREES C (53 DEGREES F). (CLOSED CUP)
LEL: FLAMMABLE LIMITS IN AIR, % BY VOLUME: 2.0
UEL: FLAMMABLE LIMITS IN AIR, % BY VOLUME: 12.0
Auto-Ignition: TEMPERATURE: 399 DEGREES C (750 DEGREES F)

************************* NFPA HAZARD CLASSIFICATION *************************

Flammable: 3	Health: 1
Reactivity: 0	Special: NO DATA SUPPLIED

************************* HMIS HAZARD CLASSIFICATION *************************

Flammable: NO DATA SUPPLIED	Health: NO DATA SUPPLIED
Reactivity: NO DATA SUPPLIED	Special: NO DATA SUPPLIED

************************** EXTINGUISHING MEDIA ********************************

WATER SPRAY, DRY CHEMICAL, ALCOHOL FOAM, OR CARBON DIOXIDE. WATER SPRAY MAY BE USED TO KEEP FIRE EXPOSED CONTAINERS COOL.

********************** SPECIAL FIRE FIGHTING PROCEDURES **********************

IN THE EVENT OF A FIRE, WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN THE PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE. WATER MAY BE USED TO FLUSH SPILLS AWAY FROM EXPOSURES AND TO DILUTE SPILLS TO NON-FLAMMABLE MIXTURES. VAPORS CAN FLOW ALONG SURFACES TO DISTANT IGNITION SOURCES AND FLASH BACK.

SECTION IV FIRE & EXPLOSION HAZARD DATA is continued on the next page.

SECTION IV FIRE & EXPLOSION HAZARD DATA is continued from the previous page.

******************** UNUSUAL FIRE AND EXPLOSION HAZARDS ********************

EXPLOSION:
ABOVE FLASH POINT, VAPOR-AIR MIXTURES ARC EXPLOSIVE WITHIN FLAMMABLE LIMITS NOTED ABOVE. CONTACT WITH STRONG OXIDIZERS MAY CAUSE FIRE OR EXPLOSION.

FLAMMABLE LIQUID.

SECTION V REACTIVITY DATA

Stability? STABLE UNDER ORDINARY CONDITIONS OF USE AND STORAGE. HEAT AND SUNLIGHT CAN CONTRIBUTE TO INSTABILITY

Avoid: HEAT AND SUNLIGHT CAN CONTRIBUTE TO INSTABILITY.

******************** INCOMPATIBILITY (Materials to Avoid) ********************

INCOMPATIBILITIES:CAN CONTRIBUTE TO INSTABILITY.
HEAT, FLAME, STRONG OXIDIZERS, ACETADEHYDE, CHLORINE, ETHYLENE OXIDE, HYDROGEN-PALLADIUM COMBINATION, HYDROGEN PEROXIDE-SULFURIC ACID COMBINATION, POTASSIUM TERT-BUTOXIDE, HYPOCHLOROUS ACID, ISOCYANATES, NITROFORM, PHOSGEN, OLEUM AND PERCHLORIC ACID.

******************** HAZARDOUS DECOMPOSITION OR BY-PRODUCTS ******************

TOXIC GASES AND VAPORS SUCH AS CARBON MONOXIDE MAY BE RELEASED IN A FIRE INVOLVING ISOPROPYL ALCOHOL.

Hazardous Polymerization? HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

Avoid: NO DATA SUPPLIED

SECTION VI HEALTH HAZARD DATA

****************************** ROUTES OF ENTRY **********************************

Inhalation? YES
Skin? YES
Ingestion? YES
Eyes? YES

SECTION VI HEALTH HAZARD DATA is continued on the next page.

SECTION VI HEALTH HAZARD DATA is continued from the previous page.

**************************** ADDITIONAL INFORMATION *****************************

DATA ENTRY NOTE: PLEASE REFER TO ACUTE AND CHRONIC HEALTH HAZARDS FOR INFORMATION.

OCCUPATIONAL CONTROL MEASURES:
AIRBORNE EXPOSURE LIMITS:
OSHA PERMISSIBLE EXPOSURE LIMIT (PEL): 400 PPM (TWA), 500 PPM (STEL)

ACGIH THRESHOLD LIMIT VALUE (TLV): 400 PPM (TWA), 500 PPM (STEL).

TOXICITY DATA (RTECS, 1986)
ORAL RAT LD50: 5840 MG/KG. SKIN RABBIT LD50: 13 GM/KG.
INHALATION RAT LC50: 16000 PPM/8H. MUTATION REFERENCES CITED AQUATIC TOXICITY RATING TLM 96: 1000-10 PPM.

******************************* CARCINOGENICITY *******************************

NTP? NO DATA SUPPLIED IARC? NO DATA SUPPLIED OSHA? NO DATA SUPPLIED

**************** ADDITIONAL INFORMATION (CARCINOGENICITY) *******************

NO DATA SUPPLIED

********************* ACUTE AND CHRONIC HEALTH HAZARDS **********************

EXPOSURE/HEALTH EFFECTS

INHALATION:
MAY CAUSE IRRITATION OF THE NOSE AND THROAT. EXPOSURE TO HIGH CONCENTRATIONS HAS A NARCOCTIC EFFECT, PRODUCING SYMPTOMS OF DROWSINESS, HEADACHE, STAGGERING, UNCONSCIOUSNESS AND POSSIBLY DEATH.

INGESTION:
MAY CAUSE DROWSINESS, UNCONSCIOUSNESS, AND DEATH. GASTROINTESTINAL PAIN, CRAMPS, NAUSEA, VOMITING, AND DIARRHEA MAY ALSO RESULT. THE SINGLE LETHAL DOSE FOR A HUMAN ADULT - ABOUT 250 MIS (SAX SIXTH EDITION).

SKIN CONTACT:
HAS A DEFATING ACTION OF THE SKIN THAT CAN CAUSE IRRITATION. MAY CAUSE IRRITATION WITH A STINGING EFFECT AND BURNING SENSATION.

EYE CONTACT:
VAPORS MAY IRRITATE THE EYES. SPLASHES MAY CAUSE SEVERE IRRITATION, POSSIBLE CORNEAL BURNS AND EYE DAMAGE.

CHRONIC EXPOSURE:

SECTION VI HEALTH HAZARD DATA is continued on the next page.

SECTION VI HEALTH HAZARD DATA is continued from the previous page.

PROLONGED CONTACT WITH SKIN MAY CAUSE MILD IRRITATION, DRYING CRACKING OR CONTACT DERMATITIS MAY DEVELOP.

********************** SIGNS AND SYMPTOMS OF EXPOSURE ************************

PLEASE REFER TO ACUTE AND CHRONIC HEALTH HAZARDS.

************* MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE *************

PERSONS WITH PRE-EXISTING SKIN DISORDERS OR EYE PROBLEMS OR IMPAIRED RESPIRATORY FUNCTION MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THE SUBSTANCE.

******************** EMERGENCY AND FIRST AID PROCEDURES ***********************

EMERGENCY/FIRST AID:
IF SWALLOWED, GIVE WATER TO DRINK. INDUCE VOMITING IF MEDICAL HELP IS NOT IMMEDIATELY AVAILABLE. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. IN CASE OF CONTACT, IMMEDIATELY FLUSH SKIN OR EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. IN ALL CASES CALL A PHYSICIAN.

PLEASE SEE INFORMATION BELOW.

INHALATION:
REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

INGESTION:
GIVE WATER TO DRINK. INDUCE VOMITING. IF MEDICAL HELP NOT IS(SIC) IMMEDIATELY AVAILABLE. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN EXPOSURE:
REMOVE ANY CONTAMINATED CLOTHING. WASH SKIN WITH SOAP OR MILD DETERGENT AND WATER FOR AT LEAST 15 MINUTES. GET MEDICAL ATTENTION IF IRRITATION DEVELOPS OR PERSISTS.

EYE EXPOSURE:
WASH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, LIFTING LOWER AND UPPER EYELIDS OCCASIONALLY. GET MEDICAL ATTENTION IMMEDIATELY.

SECTION VII PRECAUTIONS FOR SAFE HANDLING AND USE

DOT Classification: DOT HAZARD CLASS: FLAMMABLE LIQUID

SECTION VII SAFE HANDLING AND USE is continued on the next page.

SECTION VII SAFE HANDLING AND USE is continued from the previous page.

********* STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED *********

REMOVE ALL SOURCES OF IGNITION. VENTILATE AREA OF LEAK OR SPILL. CLEAN-UP PERSONNEL REQUIRE PROTECTIVE CLOTHING AND RESPIRATORY PROTECTION FROM VAPORS. SMALL SPILLS MAY BE ABSORBED ON PAPER TOWELS AND EVAPORATED IN A FUME HOOD. ALLOW ENOUGH TIME FOR FUMES TO CLEAR HOOD, THEN IGNITE PAPER IN A SUITABLE LOCATION AWAY FROM COMBUSTIBLE MATERIALS. CONTAIN AND RECOVER LIQUID FROM RECLAMATION WHEN POSSIBLE. LARGER SPILLS AND LOT SIZES CAN BE COLLECTED AS HAZARDOUS WASTE AND ATOMIZED IN A SUITABLE RCRA APPROVED COMBUSTION CHAMBER, OR ABSORBED WITH VERMICULITE, DRY SAND, EARTH OR SIMILAR MATERIAL FOR DISPOSAL AS HAZARDOUS WASTE IN A RCRA APPROVED FACILITY.

ENSURE COMPLIANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

*************************** WASTE DISPOSAL METHOD *****************************

PLEASE REFER TO SPILL AND LEAK ABOVE.

****** PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE/REGULATORY DATA ******

STORAGE AND SPECIAL INFORMATION:
PROTECT AGAINST PHYSICAL DAMAGE. STORE IN A COOL, DRY WELL-VENTILATED LOCATION, AWAY FROM ANY AREA WHERE THE FIRE HAZARD MAY BE ACUTE. OUTSIDE OR DETACHED STORAGE IS PREFERRED. SEPARATE FROM OXIDIZING MATERIALS. CONTAINERS SHOULD BE BONDED AND GROUNDED FOR TRANSFERS TO AVOID STATIC SPARKS. STORAGE AND USE AREAS SHOULD BE NO SMOKING AREAS. USE NON-SPARKING TYPE TOOLS AND EQUIPMENT.

PRECAUTIONARY MEASURES:
WARNING! FLAMMABLE LIQUID. HARMFUL IF SWALLOWED OR INHALED. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION.

KEEP AWAY FROM HEAT, SPARKS AND FLAME.
KEEP CONTAINER CLOSED.
USE WITH ADEQUATE VENTILATION.
AVOID BREATHING VAPOR.
WASH THOROUGHLY AFTER HANDLING.
AVOID CONTACT WITH EYES, SKIN AND CLOTHING.

***************************** OTHER PRECAUTIONS ******************************

NO DATA SUPPLIED

SECTION VIII CONTROL MEASURES is continued on the next page.

SECTION VIII CONTROL MEASURES is continued from the previous page.

SECTION VIII CONTROL MEASURES

RESPIRATORY PROTECTION

PERSONAL RESPIRATORS: (NIOSH APPROVED)
IF THE TLV IS EXCEEDED A FULL FACEPIECE CHEMICAL CARTRIDGE RESPIRATOR MAY BE WORN, IN GENERAL, UP TO THE MAXIMUM USE CONCENTRATION SPECIFIED BY THE RESPIRATOR SUPPLIER. ALTERNATIVELY, A SUPPLIED AIR FULL FACEPIECE RESPIRATOR OR AIRLINED HOOD MAY BE WORN.

VENTILATION

Local Exhaust: SEE BELOW
Special Exhaust: NO DATA SUPPLIED
Mechanical Exhaust: NO DATA SUPPLIED
Other: VENTILATION SYSTEM:
A SYSTEM OF LOCAL AND/OR GENERAL EXHAUST IS RECOMMENDED TO KEEP EMPLOYEE EXPOSURES BELOW THE AIRBORNE EXPOSURE LIMITS. LOCAL EXHAUST VENTILATION IS GENERALLY PREFERRED BECAUSE IT CAN CONTROL THE EMISSIONS OF THE CONTAMINANT AT ITS SOURCE, PREVENTING DISPERSION OF IT INTO THE GENERAL WORK AREA. PLEASE REFER TO THE ACGIH DOCUMENT, "INDUSTRIAL VENTILATION, A MANUAL OF RECOMMENDED PRACTICES", MOST RECENT EDITION, FOR DETAILS.

OTHER PROTECTION

Gloves: PLEASE REFER TO SKIN PROTECTION BELOW.
Eye Protection: USE CHEMICAL SAFETY GOGGLES AND/OR A FULL FACE SHIELD WHERE SPLASHING IS POSSIBLE. CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS MATERIAL. MAINTAIN EYE WASH FOUNTAIN AND QUICK-DRENCH FACILITIES IN WORK AREA.

CLOTHING

SKIN PROTECTION: WEAR IMPERVIOUS PROTECTIVE CLOTHING INCLUDING BOOTS, GLOVES, LAB COAT, APRON OR COVERALLS TO PREVENT SKIN CONTACT.

WORK/HYGIENE PRACTICES

SEE PRECAUTIONARY MEASURES IN SECTION VII.

SARA HAZARD CATEGORIES

IS PRODUCT SARA EXEMPT?:
FIRE HAZARD:
SUDDEN RELEASE OF PRESSURE:
IMMEDIATE (ACUTE) HEALTH HAZARD:
DELAYED (CHRONIC) HEALTH HAZARD:
REACTIVITY HAZARD:

Conversion Value to Pounds:
Chemical Descriptor: PURE LIQUID
RQ (Reportable Quantity):

THIS IS THE END OF THE MSDS Id #1025.1

Dme

Department of Energy
Carlsbad Area Office
P. O. Box 3090
Carlsbad, New Mexico 88221

OCT 2 7 1995

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ROUND WATER BURF

Dear Colleague:

In response to stakeholder interest, the U.S. Department of Energy has extended until October 16, 1995 the public scoping period for the second Supplemental Environmental Impact Statement. This study will evaluate the potential impacts of the Disposal Phase of the Waste Isolation Pilot Plant in southeastern New Mexico.

The Carlsbad Area Office also will hold an additional scoping meeting for the Denver Metro Area from 7 p.m. to 9 p.m., October 11, at the Broomfield Recreation Center, 300 Community Park Drive, Broomfield, CO. Members of the public are invited to attend the meeting.

All comments should be sent to:

Harold Johnson
DOE NEPA Compliance Officer
c/o Battelle
2000 Randolph Road SE, #105
Albuquerque, NM 87106

Comments should be postmarked no later than October 16, 1995. Comments may be faxed to 505-224-8030. If you have any questions about the scoping period extension, the Supplemental Environmental Impact Statement, or the WIPP, please call the WIPP Information Center at 1-800-336-9477 (toll-free).

Sincerely,

for Robert Wise, Manager
Supplemental Environmental Impact Statement

Printed on recycled paper

★★★ For Your Information ★★★

October 1995

WIPP SEIS Public Scoping Period Extended

In response to stakeholder interest, the Carlsbad Area Office has extended the scoping period for the second Supplemental Environmental Impact Statement for the Waste Isolation Pilot Plant to October 16, 1995. Comments should be sent by that date to Harold Johnson, DOE NEPA Compliance Officer, c/o of Battelle, 2000 Randolph Road SE, #105, Albuquerque, NM 87106. Comments may be telefaxed to him at 505-224-8030.

Second Scoping Meeting Scheduled for Denver

The Carlsbad Area Office has scheduled one additional public scoping meeting, near Denver, for the second WIPP Supplemental Environmental Impact Statement for the Waste Isolation Pilot Plant. It will be held from 7 to 9 p.m. October 11, at the Broomfield Recreation Center, 300 Community Park Drive, Broomfield, Colorado.

Remote-Handled Transuranic Waste Study Nearing Completion

The WIPP Remote-Handled Transuranic Waste Study will be completed by the end of October 1995. The study, which is a requirement of the WIPP Land Withdrawal Act, examines the effects of remote-handled waste on the performance assessment of the WIPP and compares remote-handled with contact-handled transuranic waste. It will evaluate such factors as gas generation, flammability, explosiveness, solubility, and brine and geochemical interactions. Additional information will be published in a Federal Register Notice.

For further information on any WIPP topic, please call our Information Center, 1-800-336-WIPP (800-336-9477) 7:30 a.m. until 4:30 p.m. mountain time. At other hours, please leave a message and we'll return your call on the next work day.

U.S. Department of Energy
Carlsbad Area Office
P.O. Box 3090
Carlsbad, New Mexico 88221

Printed on recycled paper

CARLSBAD AREA OFFICE

Upcoming 1995-1996 Stakeholder Involvement Opportunities

January 1995

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February 1995

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March 1995

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April 1995

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May 1995

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June 1995

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October

11 Wednesday

SEIS-II Scoping meeting near Denver, CO, at the Broomfield Recreation Center, 300 Community Park Drive, Broomfield, CO, 7 pm - 9 pm

16 Monday

Last date to mail comments on SEIS-II scoping

18 Wednesday

WIPPTREX Transportation Exercise 95-2, Ogden, UT

19 Thursday

52nd WIPP Quarterly Meeting - Albuquerque, NM

23 Monday

Radioactive and Hazardous Materials Committee, New Mexico State University-Carlsbad, NM, Rm 150, Instructional Center, 10:00 am - 4:30 pm

24 Tuesday

Radioactive and Hazardous Materials Committee Tour of the WIPP, 8:00 am - 11:30 am

31 Tuesday

☆ ***Milestone: Complete Remote-Handled Study***

☆ ***Milestone: Publish Sealing Systems Design Report***

December

29 Friday

☆ ***Milestone: Provide Supplemental Inventory Data to Performance Assessment on Waste Characterization Plan***

January 1996

☆ ***Milestone: Nuclear Regulatory Commission approval of Remote-Handled Safety Analysis Report for Packaging***

March

☆ ***Milestone: Final Data Input to Models for 9/96 CCDF***

☆ Milestones (in italics) are key dates shown on the Disposal Decision Plan

For additional information, call Patty Baratti-Sallani (505) 234-7313

July 1995

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August 1995

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September 1995

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October 1995

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November 1995

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December 1995

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State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT R

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Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Sent to Mr. George Dials	
Street and No. PO Box 3090	
P.O., State and ZIP Code Carlsbad, NM 88221	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form 3800, March 1993

October 4, 1995

Mr. George Dials, Manager
Waste Isolation Pilot Plant
Department of Energy
P.O. Box 3090
Carlsbad, NM 88221

RE: AMENDMENT APPROVAL, DISCHARGE PLAN, DP-8
PILOT PLANT

Dear Mr. Dials:

Pursuant to Water Quality Control Commission (W
application for discharge plan amendment for
K.S. Donovan for the changes to the approved tr
system of the Waste Isolation Pilot Plant
approved. The discharge plan was approved on Ja
facility is located approximately 30 miles
Section 29, T22S, R31E, Eddy County. In appr
plan amendment, the New Mexico Environment Department (NMED) has determined that the requirements of WQCC Reg. 3-109.C have been met.

The approved amendment to the treatment and disposal system at WIPP is briefly described as follows:

WIPP is currently permitted to discharge 23,000 gallons per day (GPD) of domestic wastewater and 1500 GPD of nonhazardous brine water into their existing synthetically-lined domestic wastewater lagoons. The modification consists of increasing the daily allowable discharge of nonhazardous brine water from 1500 to 2000 gallons. Depth to water below the site is approximately 608 feet and contains a total dissolved concentration of approximately 10,500 milligrams per liter.

However, approval of this amendment to your discharge plan does not relieve you of your responsibility to comply with any other conditions or requirements of the approved discharge plan, DP-831, or any other applicable federal, state, and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

The following statement shall replace the first sentence in the first paragraph on page one of the January 16, 1992 approval letter:

Pursuant to the Water Quality Control Commission (WQCC) Reg. 3-109, the discharge plan application for DP-831, submitted by the U.S. Department of Energy, Waste Isolation Pilot Plant (WIPP) Project Site Office for the discharge of 23,000 gallons per day (GPD) of sewage effluent and up to 2000 GPD of nonhazardous brine water from the WIPP is hereby approved.

OTHER REQUIREMENTS

Please be advised that the approval of this discharge plan amendment does not relieve the Department of Energy (DOE) of liability should your operation result in actual pollution of surface or ground water which may be actionable under other laws and/or regulations.

PERIOD OF APPROVAL

This amendment approval expires on January 16, 1997, the same date as the original discharge plan, and you should submit an application for new approval in ample time for that date.

If you have any questions, please contact Clint Marshall of the Ground Water Section staff at 827-0027.

Sincerely,

Marcy Leavitt, Chief
Ground Water Protection &
Remediation Bureau

ML:CLM/clm

cc: Garrison McCaslin, District Manager, NMED District 4
NMED Hobbs Field Office
Dan Robertson, Westinghouse, P.O. Box 2078 MS170, Carlsbad, NM, 88221

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
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GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Z 766 602 991

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Sent to DP-831	
Street and No. 10/4/95	
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Postage	$
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Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form 3800, March 1993

October 4, 1995

Mr. Arlen Hunt, Manager
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, NM 88221

RE: AMENDMENT APPROVAL, DISCHARGE PLAN, DP-8 PILOT PLANT

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Sincerely,

Marcy Leavitt, Chief
Ground Water Protection &
Remediation Bureau

ML:CLM/clm

cc: Garrison McCaslin, District Manager, NMED District 4
NMED Hobbs Field Office

Doe

Waste Isolation Pilot Plant
Supplemental Environmental Impact Statement
Scoping Meetings

RECEIVED

SEP 01 1995

...ND WATER BU...

The U.S. Department of Energy, Carlsbad Area Office will hold scoping meetings for its second Supplemental Environmental Impact Statement. The SEIS-II will examine DOE's proposed action to operate the WIPP as a nuclear waste disposal facility.

Your participation is needed to assure all appropriate topics in the SEIS-II will be addressed.

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September 14, 1995	Santa Fe, NM, High Mesa Inn, 3347 Cerrillos Rd., 2-5 p.m./7-10 p.m.
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September 20, 1995	Boise, ID, Red Lion Inn Riverside, 2900 Chinden Blvd., 7-10 p.m.

For SEIS-II factsheets or more information, call 1-800-336-WIPP (1-800-336-9477)

CARLSBAD AREA OFFICE

Upcoming 1995-1996 Stakeholder Involvement Opportunities

August

23 Wednesday

Notice of Intent to prepare a second Supplemental Environmental Impact Statement

September

7 Thursday

SEIS-II meetings, Carlsbad, NM, Holiday Inn, 2-5 p.m. and 7-10 p.m.

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30 Saturday

Last day to mail comments on SEIS-II

October

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☆ ***Milestone: Complete Remote-Handled Study***

☆ ***Milestone: Publish Sealing Systems Design***

December

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January 1996

☆ ***Milestone: Nuclear Regulatory Commission approval of Remote-Handled Safety Analysis Report for Packaging***

☆ Milestones (in italics) are key dates shown on the Disposal Decision Plan

For additional information, call Patty Baratti-Sallani (505) 234-7313

January 1995

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★★★ *For Your Information* ★★★

September 1995

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U.S. Department of Energy
Carlsbad Area Office
P.O. Box 3090
Carlsbad, New Mexico 88221

4

Waste Isolation Pilot Plant
Supplemental Environmental Impact Statement
Scoping Meetings

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SEP 01 1995

ND WATER B

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U.S. Department of Energy
Carlsbad Area Office
P.O. Box 3090
Carlsbad, New Mexico 88221

WZ:95:03331
DA:95:2461

Westinghouse Electric Corporation
Government Operations
Waste Isolation Division
Box 2078
Carlsbad NM 88221

August 28, 1995

SEP 1995
RECEIVED

Ms. Marcy Leavitt, Manager
New Mexico Environment Department
Groundwater Protection and Remediation Bureau
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

REQUEST FOR MINOR MODIFICATION TO DISCHARGE PLAN DP-831 FOR THE WASTE ISOLATION PILOT PLANT (WIPP)

Dear Ms. Leavitt:

This letter requests a minor modification to the Waste Isolation Pilot Plant (WIPP) Discharge Plan, DP-831. If approved this request would allow the discharge of an additional 500 gallons per day to the WIPP sewage system evaporation ponds. The WIPP discharge plan currently allows for the discharge of 23,000 gallons per day of sewage effluent, and 1500 gallon per day of non-hazardous brines. The U.S. Department of Energy, Carlsbad Area Office (DOE-CAO) requests that the discharge plan be modified to increase the brine discharge volume to 2000 gallons per day to accommodate peak monitoring well pumping volumes. Increasing the evaporative discharge by 500 gallons per day will significantly reduce the number of trips made by WIPP personnel to transport brine to the evaporation ponds.

This proposed increase will have a minimum effect on the total volume of brine water discharged into the WIPP sewage system. The primary source of brine waters discharged to the evaporation ponds are generated by the periodic pumping of monitoring wells at the site. This activity is seasonal, and is performed approximately 80 days per year. The total volume of sewage and brine waters currently discharged to the evaporation basins represents approximately 60 percent of total evaporative design capacity of the system. An increase of 500 gallons per day represents a less than one percent increase in the effluent directed to the evaporation basins, and will have no impact on the total capacity of the system.

If you have any questions regarding this requested modification, or require any additional information please contact Mr. D. C. Robertson of my staff at (505) 234-8240.

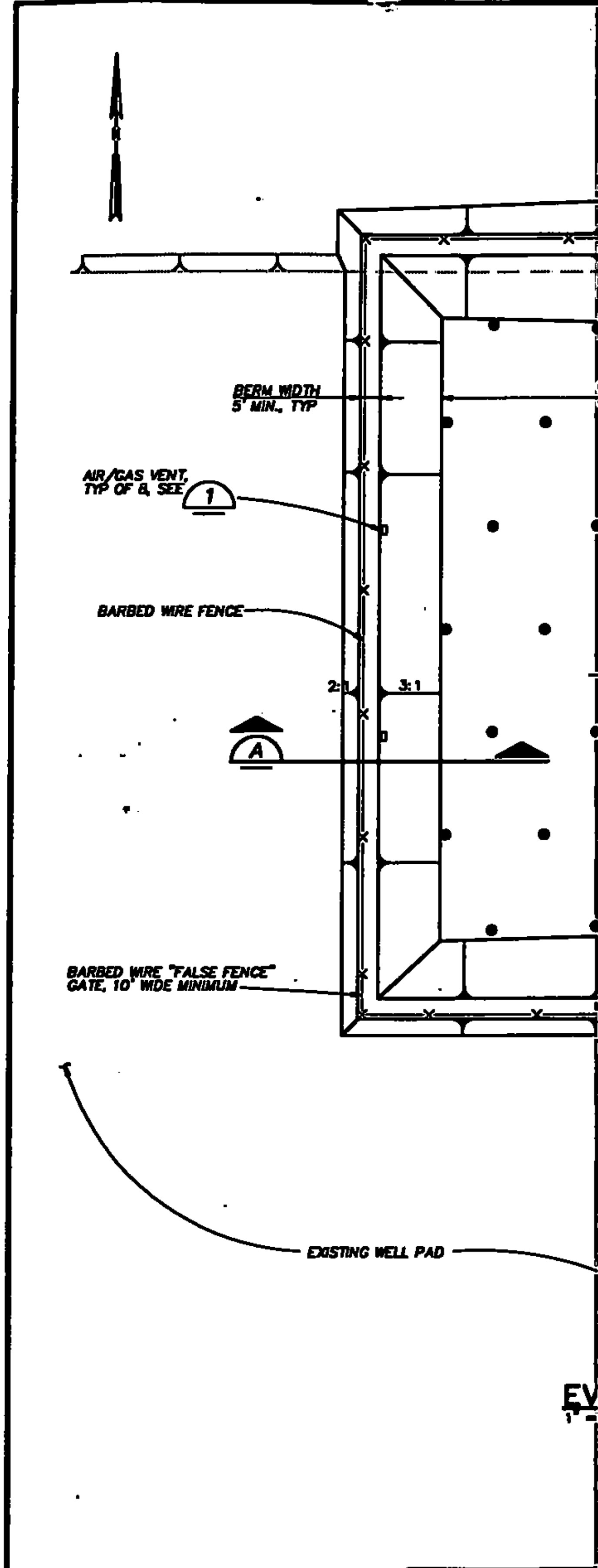
Sincerely,

K. S. Donovan, Manager
Environment, Safety, and Health

DCR:lwg

cc: E. K. Hunter, DOE-CAO
C. L. Marshall, NMED Groundwater
W. A. Walker, DOE-CAO

25-MAY-1995



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SAFETY

CONTRACTOR shall be solely responsible for working in a safe manner. CONTRACTOR shall support or brace excavation sideslopes to ensure that persons working in or near excavations are protected.

CONTRACTORS shall comply with all applicable codes, ordinances, statutes, and bear sole responsibility for the penalties imposed for noncompliance.

WASTE

At all times during the course of work remove from the site all accumulations of waste material caused by the work, and maintain and leave the site in good order and condition. Waste shall be removed and disposed as specified, and in accordance with all federal, state, and local regulations at the expense of CONTRACTOR.

Dispose excess or unsuitable excavation on site in OWNER designated stockpiles. No other materials shall be disposed on site without prior approval by OWNER.

ROADS

Continuously maintain access roads and well pad surfacing during construction. Maintain drainage features to prevent disruption of surface water flow and flooding. If gravel surfacing deteriorates by traffic of construction equipment, repair and/or replace gravel and crown, as directed by OWNER, prior to CONTRACTOR's departure, at no additional cost to OWNER.

GUARANTEES

CONTRACTOR shall guarantee that materials furnished conform to the requirements set forth herein and to the specified codes, standards and regulations, and that all specified tests have been satisfactorily completed and passed.

The foregoing shall not be construed in any way to limit or negate any other standard guarantee or portion thereof, which may provide a more comprehensive guarantee than those required by these Specifications.

SEQUENCE OF WORK

CONTRACTOR shall develop and submit a work schedule for OWNER's approval. In preparing the work schedule, the CONTRACTOR shall consider the necessity and importance of preconstruction submittals and importing/ordering of construction materials.

CONTRACTOR shall submit the work schedule concurrently with his bid. The work schedule must clearly identify critical path activities necessary to complete the required work. The work schedule shall be detailed to identify all work activities, critical milestones, and float times. At a minimum, all activities addressed by the Specifications shall be incorporated into the work schedule. The work schedule shall become part of the project's contract documents.

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EMBANKMENT, POND PLAN AND SPECIFICATIONS

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PROJ NO.	RME70153.SN

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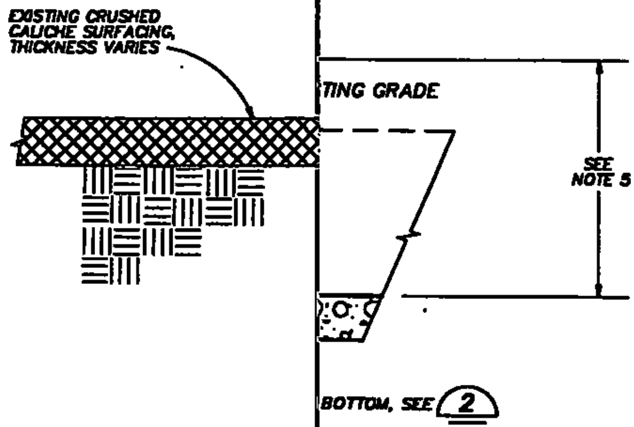
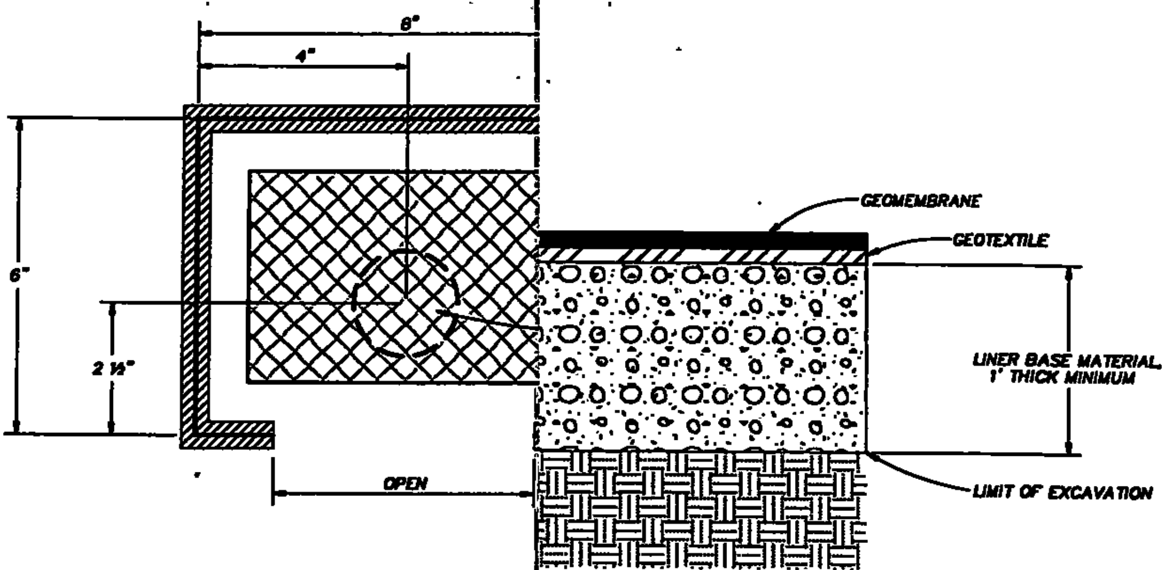
C1.DWG

25-MAY-1995





PLAN

BOTTOM DETAIL 2 C-2

ALE

CH2M HILL

DSGN	
DR	M. BREWER
CHK	M. BROOKS
APVD	

NO.

SECTIONS AND DETAILS

SHEET	2 OF 3
DWG NO.	C-2
DATE	5-25-95
PROJ NO.	RME70153.SN

1=1.0
C2.DWG

WZ:95:03331
DA:95:2461

Westinghouse Electric Corporation **Government Operations**

Waste Isolation Division

Box 2078
Carlsbad NM 88221

August 28, 1995

SEP 1995
RECEIVED

Ms. Marcy Leavitt, Manager
New Mexico Environment Department
Groundwater Protection and Remediation Bureau
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

REQUEST FOR MINOR MODIFICATION TO DISCHARGE PLAN DP-831 FOR THE WASTE ISOLATION PILOT PLANT (WIPP)

Dear Ms. Leavitt:

This letter requests a minor modification to the Waste Isolation Pilot Plant (WIPP) Discharge Plan, DP-831. If approved this request would allow the discharge of an additional 500 gallons per day to the WIPP sewage system evaporation ponds. The WIPP discharge plan currently allows for the discharge of 23,000 gallons per day of sewage effluent, and 1500 gallon per day of non-hazardous brines. The U.S. Department of Energy, Carlsbad Area Office (DOE-CAO) requests that the discharge plan be modified to increase the brine discharge volume to 2000 gallons per day to accommodate peak monitoring well pumping volumes. Increasing the evaporative discharge by 500 gallons per day will significantly reduce the number of trips made by WIPP personnel to transport brine to the evaporation ponds.

This proposed increase will have a minimum effect on the total volume of brine water discharged into the WIPP sewage system. The primary source of brine waters discharged to the evaporation ponds are generated by the periodic pumping of monitoring wells at the site. This activity is seasonal, and is performed approximately 80 days per year. The total volume of sewage and brine waters currently discharged to the evaporation basins represents approximately 60 percent of total evaporative design capacity of the system. An increase of 500 gallons per day represents a less than one percent increase in the effluent directed to the evaporation basins, and will have no impact on the total capacity of the system.

If you have any questions regarding this requested modification, or require any additional information please contact Mr. D. C. Robertson of my staff at (505) 234-8240.

Sincerely,

K. S. Donovan, Manager
Environment, Safety, and Health

DCR:lwg

cc: E. K. Hunter, DOE-CAO
C. L. Marshall, NMED Groundwater
W. A. Walker, DOE-CAO

W TE ISOLATION DIVISI

ENVIRONMENT, SAFETY, & HEALTH

FACSIMILE TRANSMITTAL ROUTING SHEET

TELEFAX NUMBER (505) 885-4562

Pages: ~~4~~ 5 DCR 8/25/95 (including cover) Date: 8/25/95 Time: 3:20

To: CLINT MARSHALL

Location: NMED GROUNDWATER REMEDIATION BUREAU

Fax: (505) 827-2965

From: DAN ROBERTSON

Location: WIPP SITE

Phone/Fax #: (505) ~~88~~ 234-8240 FAX (505) 885-4562

Special Instructions: CLINT - PLEASE REVIEW AND SIGN IF YOU APPROVE AND FAX BACK TO ME AT THE ABOVE LISTED NUMBER

HAVE A GOOD WEEKEND DAN

WASTE ISOLATION PILOT PLANT WIPP

00334

Authorization to Discharge Unpermitted, Non-Hazardous Effluent Into the WIPP Sewage Treatment Facility

Name: DAN ROBERTSON

Signature: [signature]

Date: 8/25/95

Department/Section: EC&S

Origin of Effluent: H-11 DRILL HOLE · PUMPING

Type of Effluent: 55 GALLONS
(in gallons)

Restrictions on Discharge: N EVAPORATION CELL

A ☐ Effluent has been characterized and the generation process has not changed: (Attach analytical results to the discharge form and submit to Environmental Compliance and Support for signature.)

B ☑ Effluent Characterization is Required: (Attach sampling results to the discharge request form and return to Environmental Compliance and Support for submittal to NMED for discharge authorization signature.)

Authorization Signatures

1. Authorization Signature: [signature] Date: 8/25/95
(Environmental Compliance and Support (EC&S))

2. Authorization Signature: N/A DCW Date: 8/25/95
(DOE Environmental, Safety and Health)

3. Authorization Signature: Clint Marshall Date: 8/31/95
(NMED Groundwater Bureau) Must be signed if box B is checked above

4. Authorization Signature: Date:
(Environmental Monitoring (EM) Section, review discharge permit prior to signing)

894B:1640

WP Form 2444; 06/21/94
Page 1 of 1

Halliburton NUS
CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559
April 08, 1995
Report No.: 00025401

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION, WID/WIPP
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MS. KAREN CARGNEL

NUS CLIENT NO: 1783 0001
WORK ORDER NO: 55830
VENDOR NO: 01830727

Carbon Copy:

SAMPLE ID: WST-95-081 TCLP
NUS SAMPLE NO: P0305140
P.O. NO.: 67763

DATE SAMPLED: 23-MAR-95
DATE RECEIVED: 24-MAR-95
APPROVED BY: Kieda, Chuck

Waste water from Sandia Well H11

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	S903	TCLP Bottle Extraction		
		Final Leachate pH	7.4	
2	AAGL	Silver, Leachable (Ag)	< 0.01	mg/L
3	AASL	Arsenic, Leachable (As)	0.4	mg/L
4	ABAL	Barium, Leachable (Ba)	0.24	mg/L
5	ACDL	Cadmium, Leachable (Cd)	< 0.005	mg/L
6	ACRL	Chromium, Leachable (Cr)	< 0.01	mg/L
7	AHGL	Mercury, Leachable (Hg)	< 0.0002	mg/L
8	APBL	Lead, Leachable (Pb)	< 0.05	mg/L
9	ASEL	Selenium, Leachable (Se)	< 0.1	mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559
April 08, 1995
Report No.: 00025401
Section A Page 8

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION, WID/WIPP
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MS. KAREN CARGNEL

NUS CLIENT NO: 1783 0001
WORK ORDER NO: 55830
VENDOR NO: 01830727

Carbon Copy:

SAMPLE ID: WST-95-082 TCLP
NUS SAMPLE NO: P0303141
P.O. NO.: 67763

DATE SAMPLED: 23-MAR-95
DATE RECEIVED: 24-MAR-95
APPROVED BY: Kieda, Chuck

Waste water from Sandia Well H11

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	S903	TCLP Bottle Extraction		
		Final Leachate pH	7.3	
2	OTCLP	SEMIVOLATILES - TCLP		
		1,4-dichlorobenzene [p-dichlorobenzene]	< 0.10	mg/L
		2,4,5-trichlorophenol	< 0.50	mg/L
		2,4,6-trichlorophenol	< 0.10	mg/L
		2,4-dinitrotoluene	< 0.10	mg/L
		2-methylphenol [o-cresol]	< 0.10	mg/L
		3-methylphenol [m-cresol]	< 0.10	mg/L
		4-methylphenol [p-cresol]	< 0.10	mg/L
		hexachlorobenzene	< 0.10	mg/L
		hexachlorobutadiene	< 0.10	mg/L
		hexachloroethane	< 0.10	mg/L
		nitrobenzene	< 0.10	mg/L
		pentachlorophenol	< 0.50	mg/L
		pyridine	< 0.10	mg/L
4	G130L	CHLORINATED HERBICIDES - TCLP		
		2,4,5-TP [silvex]	< 0.5	ug/L
		2,4-D	< 5	ug/L
6	G121L	ORGANOCHLORINE PESTICIDES - TCLP		
		chlordane	< 0.1	ug/L
		endrin	< 0.05	ug/L
		gamma-BHC [lindane]	< 0.02	ug/L
		heptachlor	< 0.02	ug/L
		methoxychlor	< 0.5	ug/L
		toxaphene	< 1.0	ug/L
8	S904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time	03/27(1000)	
		End Date/Time	03/27(1000)	
9	OVZHE	VOLATILES - TCLP/ZHE		
		1,1-dichloroethene [1,1-dichloroethylene]	< 0.05	mg/L

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

April 08, 1995
Report No.: 00025401

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION, WID/WIPP
SAMPLE ID: WST-95-082 TCLP
NUS SAMPLE NO: P0305141

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		1,2-dichloroethene	< 0.05	mg/L
		2-butanone (methylethyl ketone) (MEK)	< 0.50	mg/L
		benzene	< 0.05	mg/L
		carbon tetrachloride	< 0.05	mg/L
		chlorobenzene	< 0.05	mg/L
		chloroform	< 0.05	mg/L
		tetrachloroethene (tetrachloroethylene)	< 0.05	mg/L
		trichloroethene (trichloroethylene)	< 0.05	mg/L
		vinyl chloride	< 0.10	mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.
8 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

Authorization to Discharge Unpermitted, Non-Hazardous Effluent into the WIPP Sewage Treatment Facility

Name: LEROY BOSTICK

Signature:

Date: 7/29/95

Department/Section: OPERATIONS

Origin of Effluent: COMPRESSOR CONDENSATE

Type of Effluent (in gallons): CONDENSATE WATER 660 GALLONS.

Restrictions on Discharge: N

A ☐ Effluent has been characterized and the generation process has not changed: (Attach analytical results to the discharge form and submit to Environmental Compliance and Support for signature.)

B ☑ Effluent Characterization is Required: (Attach sampling results to the discharge request form and return to Environmental Compliance and Support for submittal to NMED for discharge authorization signature.)

Authorization Signatures:

1. Authorization Signature: [signature] Date: 7/28/95
   (Environmental Compliance and Support (EC&S))
2. Authorization Signature: N/A DC Date: 7/28/95
   (DOE Environmental, Safety and Health)
3. Authorization Signature: Clint Marshall Date: 8/4/95
   (NMED Groundwater Bureau) Must be signed if box B is checked above
4. Authorization Signature: Date:
   (Environmental Monitoring (EM) Section, review discharge permit prior to signing)

July 27, 1995
Report No.: UnAvail
Section A Page 1

PRELIMINARY LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MS. KAREN GAYDOSH

NUS CLIENT NO: 1783 0001
WORK ORDER NO: 53830
VENDOR NO: 01830727

SAMPLE ID: WST-95-142
NUS SAMPLE NO: P0315365
P.O. NO.: 67763

DATE SAMPLED: 07-JUL-95
DATE RECEIVED: 08-JUL-95

LN	TEST CODE	DETERMINATION	RESULT	UNIT
1	AHGW	Mercury, Total (Hg)	< 0.0002	mg/L
2	AASW	Arsenic, Total (As)	< 0.1	mg/L
3	ABAW	Barium, Total (Ba)	< 0.005	mg/L
4	ACDW	Cadmium, Total (Cd)	< 0.005	mg/L
5	ACRW	Chromium, Total (Cr)	< 0.02	mg/L
6	APBW	Lead, Total (Pb)	0.26	mg/L
7	ASEW	Selenium, Total (Se)	< 0.1	mg/L
8	AAGW	Silver, Total (Ag)	< 0.01	mg/L

COMMENTS:

July 27, 1995
Report No.: UnAvail
Section A Page 2

PRELIMINARY LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MS. KAREN GAYDOSH

NUS CLIENT NO: 1783 0001
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: WST-95-143
NUS SAMPLE NO: P0315366
P.O. NO.: 67763

DATE SAMPLED: 17-JUL-95
DATE RECEIVED: 18-JUL-95

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	AHGW	Mercury, Total (Hg)	0.0002	mg/L
2	AASW	Arsenic, Total (As)	< 0.1	mg/L
3	ABAW	Barium, Total (Ba)	< 0.005	mg/L
4	ACDW	Cadmium, Total (Cd)	< 0.005	mg/L
5	ACRW	Chromium, Total (Cr)	0.02	mg/L
6	APBW	Lead, Total (Pb)	0.48	mg/L
7	ASEW	Selenium, Total (Se)	< 0.1	mg/L
8	AAGW	Silver, Total (Ag)	< 0.01	mg/L

COMMENTS:

July 27, 1995
Report No.: UnAvail
Section A Page 3

PRELIMINARY LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MS. KAREN GAYDOSH

NUS CLIENT NO: 1785 0001
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: WST-95-144
NUS SAMPLE NO: P0315367
P.O. NO.: 67763

DATE SAMPLED: 17-JUL-95
DATE RECEIVED: 18-JUL-95

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OVTCW	TCL - VOLATILES		
		1,1,1-trichloroethane	< 5	ug/L
		1,1,2,2-tetrachloroethane	< 5	ug/L
		1,1,2-trichloroethane	< 5	ug/L
		1,1-dichloroethane	< 5	ug/L
		1,1-dichloroethene [1,1-dichloroethylene]	< 5	ug/L
		1,2-dichloroethane	< 5	ug/L
		1,2-dichloroethene (total)	< 5	ug/L
		1,2-dichloropropane	< 5	ug/L
		2-butanone [methylethyl ketone] (MEK)	< 50	ug/L
		2-hexanone	< 50	ug/L
		4-methyl-2-pentanone [methyl isobutyl ketone] (MIBK)	< 50	ug/L
		acetone	< 50	ug/L
		benzene	< 5	ug/L
		bromodichloromethane [dichlorobromomethane]	< 5	ug/L
		bromomethane [methyl bromide]	< 10	ug/L
		carbon disulfide	< 5	ug/L
		carbon tetrachloride	< 5	ug/L
		chlorobenzene	< 5	ug/L
		chloroethane	< 10	ug/L
		chloroform	< 5	ug/L
		chloromethane [methyl chloride]	< 10	ug/L
		cis-1,3-dichloropropene	< 5	ug/L
		dibromochloromethane	< 5	ug/L
		dichloromethane [methylene chloride]	< 5	ug/L
		ethylbenzene	< 5	ug/L
		methylbenzene [toluene]	< 5	ug/L
		styrene	< 5	ug/L
		tetrachloroethene [tetrachloroethylene]	< 5	ug/L
		trans-1,3-dichloropropene	< 5	ug/L
		tribromomethane (bromoform)	< 5	ug/L
		trichloroethene [trichloroethylene]	< 5	ug/L
		vinyl chloride	< 10	ug/L

July 27, 1995
Report No.: UnAvail
Section A Page 4

PRELIMINARY LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: WST-95-144
NUS SAMPLE NO: P0315367

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		xylenes (total)	< 5	ug/L

COMMENTS:

July 27, 1995
Report No.: UnAvail
Section A Page 5

PRELIMINARY LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MS. KAREN GAYDOSH

NUS CLIENT NO: 1783 0001
WORK ORDER NO: 55830
VENDOR NO: 01830727

SAMPLE ID: WBT-95-145
NUS SAMPLE NO: P0315368
P.O. NO.: 67763

DATE SAMPLED: 17-JUL-95
DATE RECEIVED: 18-JUL-95

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OSVTCW	TCL - SEMIVOLATILE EXTRACTABLES		
		1,2,4-trichlorobenzene	< 10	ug/L
		1,2-dichlorobenzene (o-dichlorobenzene)	< 10	ug/L
		1,3-dichlorobenzene (m-dichlorobenzene)	< 10	ug/L
		1,4-dichlorobenzene (p-dichlorobenzene)	< 10	ug/L
		2,4,5-trichlorophenol	< 50	ug/L
		2,4,6-trichlorophenol	< 10	ug/L
		2,4-dichlorophenol	< 10	ug/L
		2,4-dimethylphenol	< 10	ug/L
		2,4-dinitrophenol	< 50	ug/L
		2,4-dinitrotoluene	< 10	ug/L
		2,6-dinitrotoluene	< 10	ug/L
		2-chloronaphthalene	< 10	ug/L
		2-chlorophenol	< 10	ug/L
		2-methyl-4,6-dinitrophenol (4,6-dinitro-o-cresol)	< 50	ug/L
		2-methylnaphthalene	< 10	ug/L
		2-methylphenol (o-cresol)	< 10	ug/L
		2-nitroaniline	< 50	ug/L
		2-nitrophenol	< 10	ug/L
		3,3'-dichlorobenzidine	< 20	ug/L
		3,4-benzofluoranthene (benzo(b)fluoranthene)	< 10	ug/L
		3-nitroaniline	< 50	ug/L
		3/4-methylphenol (m-cresol/p-cresol)	< 10	ug/L
		4-bromophenyl phenyl ether	< 10	ug/L
		4-chloro-3-methylphenol (p-chloro-m-cresol)	< 10	ug/L
		4-chloroaniline	< 10	ug/L
		4-chlorophenyl phenyl ether	< 10	ug/L
		4-nitroaniline	< 50	ug/L
		4-nitrophenol	< 50	ug/L
		N-nitroso-di-n-propylamine	< 10	ug/L
		N-nitrosodiphenylamine	< 10	ug/L
		acenaphthene	< 10	ug/L
		acenaphthylene	< 10	ug/L

July 27, 1995
Report No.: UnAvail
Section A Page 6

PRELIMINARY LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: WST-95-145
NUS SAMPLE NO: PC515368

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		anthracene	< 10	ug/L
		benzo(a)anthracene	< 10	ug/L
		benzo(a)pyrene	< 10	ug/L
		benzo(g,h,i)perylene	< 10	ug/L
		benzo(k)fluoranthene	< 10	ug/L
		benzyl butyl phthalate	< 10	ug/L
		bis(2-chloroethoxy)methane	< 10	ug/L
		bis(2-chloroethyl)ether	< 10	ug/L
		bis(2-chloroisopropyl)ether	< 10	ug/L
		[2,2'-oxybis(1-chloropropan		
		bis(2-ethylhexyl)phthalate	< 10	ug/L
		carbazole	< 10	ug/L
		chrysene	< 10	ug/L
		di-n-butylphthalate	< 10	ug/L
		di-n-octylphthalate	< 10	ug/L
		dibenz(a,h)anthracene	< 10	ug/L
		dibenzofuran	< 10	ug/L
		diethyl phthalate	< 10	ug/L
		dimethyl phthalate	< 10	ug/L
		fluoranthene	< 10	ug/L
		fluorene	< 10	ug/L
		hexachlorobenzene	< 10	ug/L
		hexachlorobutadiene	< 10	ug/L
		hexachlorocyclopentadiene	< 10	ug/L
		hexachloroethane	< 10	ug/L
		indeno(1,2,3-cd)pyrene	< 10	ug/L
		isophorone	< 10	ug/L
		naphthalene	< 10	ug/L
		nitrobenzene	< 10	ug/L
		pentachlorophenol	< 50	ug/L
		phenanthrene	< 10	ug/L
		phenol	< 10	ug/L
		pyrene	< 10	ug/L
3	G120W	ORGANOCHLORINE PESTICIDES AND PCB's		
		4,4'-DDD	< 0.1	ug/L
		4,4'-DDE	< 0.02	ug/L
		4,4'-DDT	< 0.1	ug/L
		PCB-1221	< 0.5	ug/L
		PCB-1232	< 0.5	ug/L
		PCB-1242/1016	< 0.5	ug/L

July 27, 1995
Report No.: UnAvail
Section A Page 7

PRELIMINARY LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: WST-95-145
NUS SAMPLE NO: P0319368

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		PCB-1248	< 0.5	ug/L
		PCB-1254	< 0.5	ug/L
		PCB-1260	< 0.5	ug/L
		aldrin	< 0.02	ug/L
		alpha-BHC	< 0.02	ug/L
		beta-BHC	< 0.05	ug/L
		chlordane	< 0.1	ug/L
		delta-BHC	< 0.05	ug/L
		dieldrin	< 0.02	ug/L
		endosulfan I	< 0.05	ug/L
		endosulfan II	< 0.02	ug/L
		endosulfan sulfate	< 0.1	ug/L
		endrin	< 0.03	ug/L
		endrin aldehyde	< 0.1	ug/L
		gamma-BHC (lindane)	< 0.02	ug/L
		heptachlor	< 0.02	ug/L
		heptachlor epoxide	< 0.05	ug/L
		methoxychlor	< 0.5	ug/L
		toxaphene	< 1	ug/L
5	G130W	CHLORINATED HERBICIDES		
		2,4,5-TP (silvex)	< 0.5	ug/L
		2,4-D	< 5	ug/L

COMMENTS:

Authorization to Discharge Unpermitted, Non-Hazardous Effluent Into the WIPP Sewage Treatment Facility

Name: JOE R. FRANCO

Signature: Joe R Franco

Date: 7/13/95

Department/Section: OPERATIONS / FACILITY OPERATIONS

Origin of Effluent: Condensation from INGersoll Compressors - EQUIPMENT # 41-G-021A AND 021B. Approximately 450 gallons

Type of Effluent: (In gallons) CONDENSATE 450 GALLONS

Restrictions on Discharge: INTO POND #4

A ☐ Effluent has been characterized and the generation process has not changed: (Attach analytical results to the discharge form and submit to Environmental Compliance and Support for signature.)

B ☑ Effluent Characterization is Required: (Attach sampling results to the discharge request form and return to Environmental Compliance and Support for submittal to NMED for discharge authorization signature.)

Authorization Signatures:

1. Authorization Signature: [signature] Date: 7/12/95
(Environmental Compliance and Support (EC&S))

2. Authorization Signature: Date:
(DOE Environmental, Safety and Health)

3. Authorization Signature: Clint Marshall Date: 7/13/95
(NMED Groundwater Bureau) Must be signed if box B is checked above

4. Authorization Signature: Date:
(Environmental Monitoring (EM) Section, review discharge permit prior to signing)

694B:1640

July 10, 1995
Report No.: UnAvail
Section A Page 11

PRELIMINARY LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MS. KAREN GAYDOSH

NUS CLIENT NO: 1783 0001
WORK ORDER NO: 95830
VENDOR NO: 01830727

SAMPLE ID: WST-95-114 TCLP
NUS SAMPLE NO: P0313837
P.O. NO.: 67763

DATE SAMPLED: 22-JUN-95
DATE RECEIVED: 23-JUN-95

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	8903	TCLP Bottle Extraction		
		Final Leachate pH	5.6	
2	AAGL	Silver, Leachable (Ag)	< 0.01	mg/L
3	AASL	Arsenic, Leachable (As)	< 0.1	mg/L
4	ABAL	Barium, Leachable (Ba)	0.24	mg/L
5	ACDL	Cadmium, Leachable (Cd)	0.007	mg/L
6	ACRL	Chromium, Leachable (Cr)	< 0.02	mg/L
7	AHGL	Mercury, Leachable (Hg)	< 0.0002	mg/L
8	APBL	Lead, Leachable (Pb)	< 0.05	mg/L
9	ASEL	Selenium, Leachable (Se)	< 0.1	mg/L

COMMENTS:
1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

July 10, 1995
Report No.: UnAvail
Section A Page 12

PRELIMINARY LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MS. KAREN GAYDOSH

NUS CLIENT NO: 1783 0001
WORK ORDER NO: 65830
VENDOR NO: 01830727

SAMPLE ID: WST-95-115 TCLP
NUS SAMPLE NO: P0313858
P.O. NO.: 67763

DATE SAMPLED: 22-JUN-95
DATE RECEIVED: 23-JUN-95

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	8903	TCLP Bottle Extraction		
		Final Leachate pH	5.8	
2	OYCLP	SEMIVOLATILES - TCLP		
		1,4-dichlorobenzene (p-dichlorobenzene)	< 0.1	mg/L
		2,4,5-trichlorophenol	< 0.5	mg/L
		2,4,6-trichlorophenol	< 0.1	mg/L
		2,4-dinitrotoluene	< 0.1	mg/L
		2-methylphenol (o-cresol)	< 0.1	mg/L
		3/4-methylphenol (m-cresol/p-cresol)	< 0.1	mg/L
		hexachlorobenzene	< 0.1	mg/L
		hexachlorobutadiene	< 0.1	mg/L
		hexachloroethane	< 0.1	mg/L
		nitrobenzene	< 0.1	mg/L
		pentachlorophenol	< 0.5	mg/L
		pyridine	< 0.1	mg/L
4	G130L	CHLORINATED HERBICIDES - TCLP		
		2,4,5-TP (silvex)	< 0.5	ug/L
		2,4-D	< 5	ug/L
6	G121L	ORGANOCHLORINE PESTICIDES - TCLP		
		chlordane	< 0.1	ug/L
		endrin	< 0.05	ug/L
		gamma-BHC (lindane)	< 0.02	ug/L
		heptachlor	< 0.02	ug/L
		methoxychlor	< 0.5	ug/L
		toxaphene	< 1	ug/L
8	8904	Zero Headspace Extraction (ZHE)		
		Begin Date/Time	06/28(1300)	
		End Date/Time	06/28(1300)	
9	OVZHE	VOLATILES - TCLP/ZHE		
		1,1-dichloroethene (1,1-dichloroethylene)	< 0.05	mg/L
		1,2-dichloroethane	< 0.05	mg/L
		2-butanone (methylethyl ketone) (MEK)	< 0.5	mg/L
		benzene	< 0.05	mg/L

July 10, 1995
Report No.: UnAvail
Section A Page 13

PRELIMINARY LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATIO
SAMPLE ID: WBT-95-115 TCLP
NUS SAMPLE NO: P0313858

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		carbon tetrachloride	< 0.05	mg/L
		chlorobenzene	< 0.05	mg/L
		chloroform	< 0.05	mg/L
		tetrachloroethene (tetrachloroethylene)	< 0.05	mg/L
		trichloroethene (trichloroethylene)	< 0.05	mg/L
		vinyl chloride	< 0.1	mg/L

COMMENTS:

1 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

8 This sample was less than 0.5% solid, thus the sample was filtered, not extracted.

WASTE ISOLATION DIVISION
ENVIRONMENT, SAFETY, & HEALTH
FACSIMILE TRANSMITTAL ROUTING SHEET
TELEFAX NUMBER (505) 885-4562

Pages: 7 Date: 6/29/95 Time: 12:20
(including cover)

To: CLINT MARSHALL
Location: NMED GROUNDWATER & REMEDIATION
Fax: 827-2965

From: DAN ROBERTSON
Location: WIPP
Phone/Fax #: 234-8290 885-4562

Special Instructions: CLINT - ALAN SATLER ~~[illegible]~~ (SNL) REQUESTS APPROVAL TO DISCHARGE UP TO 1500 GPD OF CULEBRA BRINE IN THE WIPP SEWAGE SYSTEM UNTIL THE EVAPORATION POND IS COMPLETED

WASTE ISOLATION PILOT PLANT
WIPP

Authorization to Discharge Unpermitted, Non-Hazardous Effluent into the WIPP Sewage Treatment Facility

Name: SANDIA NATIONAL LABORATORIES (CONTACT ALLAN SATTLER 234-8421 WIPP 844-1014 ALBUQUERQUE)

Signature: Allan R Sattler

Date: 6/28/95

Department/Section: SANDIA GEOHYDROLOGY DEPT 6115 P. DAVIES RIGR R. BEAUHEIM PROJ. LDR.

Origin of Effluent: CULEBRA BRINE WITH ≤ 10 PPM TRACER FROM PRELIMINARY TRACER TEST TRACER MSDS ON FILE W MIRIAM/DAN/JIM

Type of Effluent: 1500 GAL PER DAY THRU 8/15
(in gallons)

Restrictions on Discharge:

A ☐ Effluent has been characterized and the generation process has not changed: (Attach analytical results to the discharge form and submit to Environmental Compliance and Support for signature.)

B ☑ Effluent Characterization is Required: (Attach sampling results to the discharge request form and return to Environmental Compliance and Support for submittal to NMED for discharge authorization signature.)

Authorization Signatures:

1. Authorization Signature: [signature] Date: 6/29/95
(Environmental Compliance and Support (EC&S))

2. Authorization Signature: Date:
(DOE Environmental, Safety and Health)

3. Authorization Signature: Clint Marshall Date: 6/29/95
(NMED Groundwater Bureau) Must be signed if box B is checked above

4. Authorization Signature: Date:
(Environmental Monitoring (EM) Section, review discharge permit prior to signing)

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

April 08, 1995
Report No.: 00025401
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION, WID/WIPP
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MS. KAREN CARGNEL

NUS CLIENT NO: 1783 0001
WORK ORDER NO: 55830
VENDOR NO: 01830727

Carbon Copy:

SAMPLE ID: WST-95-077 TCLP
NUS SAMPLE NO: P0305136
P.O. NO.: 67763

DATE SAMPLED: 23-MAR-95
DATE RECEIVED: 24-MAR-95
APPROVED BY: Kieda, Chuck

LN	TEST CODE	DETERMINATION	RESULT	UNIT
1	S903	TCLP Bottle Extraction		
		Begin Date/Time	03/27(1240)	
		End Date/Time	03/28(0535)	
		Extraction Fluid	1	
		Final Leachate pH	5.5	
2	AAGL	Silver, Leachable (Ag)	< 0.01	mg/L
3	AASL	Arsenic, Leachable (As)	0.4	mg/L
4	ABAL	Barium, Leachable (Ba)	0.10	mg/L
5	ACDL	Cadmium, Leachable (Cd)	< 0.005	mg/L
6	ACRL	Chromium, Leachable (Cr)	< 0.01	mg/L
7	AHGL	Mercury, Leachable (Hg)	< 0.0002	mg/L
8	APBL	Lead, Leachable (Pb)	< 0.05	mg/L
9	ASEL	Selenium, Leachable (Se)	< 0.1	mg/L

COMMENTS:

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

May 14, 1995

Report No.: 00025899

Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION, WID/WIPP
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MS. KAREN GAYDOSH

NUS CLIENT NO: 1783 0001
WORK ORDER NO: 55830
VENDOR NO: 01830727

Carbon Copy:

SAMPLE ID: WST-95-077 (P305136)
NUS SAMPLE NO: P0309775
P.O. NO.: 67763

DATE SAMPLED: 23-MAR-95
DATE RECEIVED: 24-MAR-95
APPROVED BY: Kieda, Chuck

LN	TEST CODE	DETERMINATION	RESULT	UNIT
1	S090	Flash Point (Pensky-Martens)	> 200	F
2	S088	Bulk Density on Waste	1.40	g/cc

COMMENTS:

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559
April 08, 1995
Report No.: 00025401
Section A Page 2

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION, WID/WIPP
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MS. KAREN CARGNEL

NUS CLIENT NO: 1783 0001
WORK ORDER NO: 55830
VENDOR NO: 01830727

Carbon Copy:

SAMPLE ID: WST-95-078 TCLP
NUS SAMPLE NO: P0305137
P.O. NO.: 67763

DATE SAMPLED: 23-MAR-95
DATE RECEIVED: 24-MAR-95
APPROVED BY: Kieda, Chuck

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	8903	TCLP Bottle Extraction		
		Begin Date/Time	03/27(1240)	
		End Date/Time	03/28(0535)	
		Extraction Fluid	1	
		Final Leachate pH	5.4	
2	OTCLP	SEMIVOLATILES - TCLP		
		1,4-dichlorobenzene [p-dichlorobenzene]	< 0.10	mg/L
		2,4,5-trichlorophenol	< 0.50	mg/L
		2,4,6-trichlorophenol	< 0.10	mg/L
		2,4-dinitrotoluene	< 0.10	mg/L
		2-methylphenol [o-cresol]	< 0.10	mg/L
		3-methylphenol [m-cresol]	< 0.10	mg/L
		4-methylphenol [p-cresol]	< 0.10	mg/L
		hexachlorobenzene	< 0.10	mg/L
		hexachlorobutadiene	< 0.10	mg/L
		hexachloroethane	< 0.10	mg/L
		nitrobenzene	< 0.10	mg/L
		pentachlorophenol	< 0.50	mg/L
		pyridine	< 0.10	mg/L
4	G130L	CHLORINATED HERBICIDES - TCLP		
		2,4,5-TP [silvex]	< 0.5	ug/L
		2,4-D	< 5	ug/L
6	G121L	ORGANOCHLORINE PESTICIDES - TCLP		
		chlordane	< 0.1	ug/L
		endrin	< 0.05	ug/L
		gamma-BHC [lindane]	< 0.02	ug/L
		heptachlor	< 0.02	ug/L
		methoxychlor	< 0.5	ug/L
		toxaphene	< 1.0	ug/L
8	5904	Zero Headspace Extraction [ZHE]		
		Begin Date/Time	03/28(1300)	

Halliburton NUS
CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559

April 08, 1995
Report No.: 00025401

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION, WID/WIPP
SAMPLE ID: WST-95-078 TCLP
NUS SAMPLE NO: P0305137

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		End Date/Time	03/29(0530)	
9	OVZHE	VOLATILES - TCLP/ZHE		
		1,1-dichloroethene [1,1-dichloroethylene]	< 0.05	mg/L
		1,2-dichloroethane	< 0.05	mg/L
		2-butanone (methylethyl ketone) [MEK]	< 0.50	mg/L
		benzene	< 0.05	mg/L
		carbon tetrachloride	< 0.05	mg/L
		chlorobenzene	< 0.05	mg/L
		chloroform	< 0.05	mg/L
		tetrachloroethene [tetrachloroethylene]	< 0.05	mg/L
		trichloroethene [trichloroethylene]	< 0.05	mg/L
		vinyl chloride	< 0.10	mg/L

COMMENTS:

Halliburton NUS CORPORATION

NUS LABORATORY
5350 Campbells Run Road
Pittsburgh, Pennsylvania 15205

TEL: (412) 747-2500
FAX: (412) 747-2559
May 14, 1995
Report No.: 00025899
Section A Page 2

LABORATORY ANALYSIS REPORT

CLIENT NAME: WESTINGHOUSE ELECTRIC CORPORATION, WID/WIPP
ADDRESS: P.O. BOX 2078
CARLSBAD, NM 88221-2078
ATTENTION: MS. KAREN GAYDOSH

NUS CLIENT NO: 1783 0001
WORK ORDER NO: 55830
VENDOR NO: 01830727

Carbon Copy:

SAMPLE ID: WST-95-078 (P305137)
NUS SAMPLE NO: P0309776
P.O. NO.: 67763

DATE SAMPLED: 23-MAR-95
DATE RECEIVED: 24-MAR-95
APPROVED BY: Kieda, Chuck

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	S090	Flash Point (Pensky-Martens)	> 200	F
2	8088	Bulk Density on Waste	1.56	g/cc

COMMENTS:

Dole

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous & Radioactive Materials Bureau
525 Camino De Los Marquez
P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-4358
Fax (505) 827-4389

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

June 15, 1995

Dear Concerned Citizen:

On May 26, 1995, the New Mexico Environment Department (NMED) received a revised RCRA Part B Permit Application (Revision 5) from the Department of Energy (DOE) for the disposal of hazardous waste at the Waste Isolation Pilot Plant (WIPP). DOE provided this application to comply with a September 2, 1994, NMED order to submit a complete revised application that more accurately reflected future WIPP activities. The revised WIPP application is available for public review during normal business hours at the locations listed on the back of this letter.

NMED is also updating its WIPP mailing list. If any aspect of your address requires correction, or if you wish to have your name deleted from the mailing list, please contact Ms. Chika Ezeanyim at (505) 827-4308, or at the address given above. Likewise, if you are aware of any individual or group who would like to receive future mailings about the WIPP hazardous waste disposal permitting process, have them contact Ms. Ezeanyim.

If you have any questions regarding the WIPP permit application (Revision 5), please contact Mr. Steve Zappe at (505) 827-4308.

Sincerely,

Barbara Hoditschek

Barbara Hoditschek, RCRA Permits Program Manager
Hazardous and Radioactive Materials Bureau

Enclosure

cc: George Dials, DOE/Carlsbad Area Office Manager
Mark Weidler, NMED Secretary
Ed Kelley, NMED Water & Waste Mgmt. Director
Benito Garcia, HRMB Chief
File WIPP 95-Red

RECEIVED

JUN 19 1995

GROUND WATER BUR

**Locations of Public Copies of the
WIPP Hazardous Waste Disposal Permit Application**

NMED Hazardous & Radioactive Materials Bureau
525 Camino de los Marquez, Suite 4
P.O. Box 26110
Santa Fe, NM 87502
Ph (505) 827-4308

NMED District I Office
4131 Montgomery Blvd, NE
Albuquerque, NM 87109
Ph (505) 841-9472

NMED District III Office
P.O. Box 965
1001 North Solano Drive
Las Cruces, NM 88001
Ph (505) 524-6300

NMED District IV Office
1914 West Second
Roswell, NM 88201
Ph (505) 624-6046

DOE/Forrestal Building
Public Library Reading Room
AD-234.1
FOI - USDOE
1000 Independence Avenue SW
Washington, DC 20585

Defense Nuclear Facilities Safety Board
625 Indiana Ave NW, Suite 700
Washington, DC 20004

Office of Scientific and Technical Information
Technical Information Center
P.O. Box 62
Oak Ridge, TN 37831

Thomas Brannigan Memorial Library
200 E. Picacho
Las Cruces, NM 88005

New Mexico State Library
325 Don Gaspar
Santa Fe, NM 87505

Pannell Library
New Mexico Junior College
5317 Lovington Highway
Hobbs, NM 88240

Carlsbad Public Library
101 South Halagueno Street
Carlsbad, NM 88220

Zimmermann Library
Government Publications Department
University of New Mexico
Albuquerque, NM 87138

WIPP Public Reading Room
National Atomic Museum
U.S. Department of Energy
Albuquerque Field Office
Albuquerque, NM 87115

Sandia National Laboratories
Technical Library
Organization 3144
P.O. Box 5800
Albuquerque, NM 87185

Sandia National Laboratories
Waste Management and Transportation Library
Organization 6332
P.O. Box 5800
Albuquerque, NM 87175

Martin Speare Memorial Library
New Mexico Institute of Mining and Technology
Campus Station
Socorro, NM 87801

Raton Public Library
244 Cook Avenue
Raton, NM 87740

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

Z 688 017 163

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Sent to Vernon Daub, Manager	
Street and No. PO Box 3090	
P.O., State and ZIP Code Carlsbad, NM 88221-3090	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form 3800, March 1993

CERTIFIED MAIL - RETURN RECEIP

June 16, 1995

Vernon Daub, Manager
Office of TRU Waste Operations
U. S. Department of Energy
Carlsbad Area Office
P.O. Box 3090
Carlsbad, NM 88221-3090

RE: Response to Notice of Intent to discharge
brines from hydrologic testing at WIPP

Dear Mr. Daub:

The New Mexico Environment Department (NMED)
Notice of Intent (NOI) for the discharge of one
drilling fluids and brines from hydrologic testing for the proposed Culebra Transport Test Program at the Waste Isolation Pilot Plant (WIPP) in accordance with Section 1-201. of the NM Water Quality Control Commission (WQCC) Regulations. The facility is located approximately 30 miles east of Carlsbad in Section 29, T22S, R31E, Eddy County. The application satisfies the requirements of Section 1-201 of the WQCC Regulations.

Based on the presently available information in your letter, dated May 18, 1995, a discharge plan is not being required for this discharge as long as the discharge is as described.

In accordance with WQCC regulation 3-104, a discharge plan is not being required because the information provided indicates that no effluent or leachate will move directly or indirectly into water.

The exempt discharge is briefly described as follows:

Approximately one million gallons of drilling fluids and brines produced from hydrologic testing for the Culebra Transport Test Program will be discharged to a synthetically-lined evaporation basin over a period of 4 to 6 months. The basin will be constructed to the specifications of the two drawings attached to the letter, dated May 18, 1995. A letter was issued from NMED on January 31, 1995 stating that a discharge plan was not required for the discharge of tracer chemicals to be used for the Culebra Transport Test Program. The program consists of injecting tracer solutions into the Culebra Formation at the H-19 well at the WIPP site hydropad. Movement of the tracers will be achieved by pumping approximately 10 hydrologic test wells located along the principle flow path of the Culebra aquifer. Monitoring will take place in seven additional wells at the site.

Although a discharge plan is not being required for this discharge, you are not relieved of liability should your operation result in actual pollution of surface or ground waters. Further, this decision by the NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, such as zoning requirements, plumbing codes and nuisance ordinances.

If at some time in the future you intend to change the amount, the character, or location of your discharge so that it will not be as described, or if observation or monitoring shows that the discharge is not as described, you must file a new request for exemption with the Ground Water Section.

If you have any questions, please contact either Clint Marshall of the Ground Water Section staff at 827-0027 or the Program Manager of the Ground Water Section at 827-2900.

Sincerely,

Marcy Leavitt, Chief
Ground Water Protection &
Remediation Bureau

ML:CLM

xc: Garrison McCaslin, District Manager, NMED Dist. 4
Dan Robertson, Consultant, DOE - WIPP Site, P.O. Box 3090, Carlsbad, NM 88221

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT

Z 207 482 661

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

PS Form 3800, March 1993

Sent to L.R. Fitch	
Street and No. Westinghouse	
P.O., State and ZIP Code No DP Required	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

June 12, 1995

L.R. Fitch, Manager
Environment, Safety, Health
and Regulatory Compliance
Westinghouse Electric Corporation
P.O. Box 2078
Carlsbad, NM 88221

RE: **Response to Notice of Intent to discharge chemicals at the WIPP Site**

Dear Mr. Fitch:

The New Mexico Environment Department (NMED) Notice of Intent for the discharge of addition to be used for the Culebra Transport Test Pr Isolation Pilot Plant in accordance with Section 1-201. of the NM Water Quality Control Commission (WQCC) Regulations. The facility is located approximately 30 miles east of Carlsbad in Section 29, T22S, R31E, Eddy County. The application satisfies the requirements of Section 1-201 of the WQCC Regulations.

Based on the presently available information in your letters, dated April 12, 1995, May 16, 1995 and May 24, 1995, a discharge plan is not being required for this discharge as long as the discharge is as described.

A discharge plan is not being required because it appears that the discharge conforms to the numerical ground water standards in WQCC Reg. 3-103 and does not contain any toxic pollutants as defined in WQCC Reg.1-101.ZZ, and therefore is exempt from the discharge plan requirement under WQCC Reg.3-105.A.

The exempt discharge is briefly described as follows:

NMED issued a letter on January 31, 1995 stating that a discharge plan was not required for a group of chemical tracers to be used in the Culebra Transport Test Program. Since that time, the discharger has submitted two requests for additional chemical constituents to be added to the original group.

The Culebra Transport Test Program consists of injecting tracer solutions into the Culebra Formation at the H-19 well at the WIPP site hydropad. Movement of the tracers will be achieved by pumping approximately 10 hydrologic test wells located along the principle flow path of the Culebra aquifer. Monitoring will take place in seven additional wells at the site.

In addition to the constituents approved in the letter, dated January 31, 1995, as possible tracers for the tests, the following chemicals have been added:

SODIUM HYDROXIDE
EOSIN B, Certified
2-AMINO-6-FLOUROBENZOTHIAZOLE, 99%
EOSIN Y FREE ACID
FLUORESCENT BRIGHTENER 28
2-HYDROXYNICOTINIC ACID
PHLOXINE B, Certified
LISSAMINE GREEN B
LISSAMINE FLAVINE FF
HYDROCHLORIC ACID
AC-2 (Organic Acid)
CITRIC ACID
I-22 (Corrosion Inhibitor)
NINE 40 (Surfactant)

Although a discharge plan is not being required for this discharge, you are not relieved of liability should your operation result in actual pollution of surface or ground waters. Further, this decision by the NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, such as zoning requirements, plumbing codes and nuisance ordinances.

If at some time in the future you intend to change the amount, the character, or location of your discharge so that it will not be as described, or if observation or monitoring shows that the discharge is not as described, you must file a new request for exemption with the Ground Water Section.

If you have any questions, please contact either Clint Marshall of the Ground Water Section staff at 827-0027 or the Program Manager of the Ground Water Section at 827-2900.

Sincerely,

Marcy Leavitt, Chief
Ground Water Protection &
Remediation Bureau

ML:CLM

xc: Garrison McCaslin, District Manager, NMED Dist. 4
Dan Robertson, Consultant, DOE - WIPP Site, P.O. Box 3090,
Carlsbad, NM 88221

WZ:95:03313
DA:95:2364

Westinghouse Electric Corporation

Government Operations

Waste Isolation Division

Box 2078
Carlsbad NM 88221

June 1, 1995

Mr. C. Marshall, Geologist III
New Mexico Environment Department
Ground Water Bureau
P. O. Box 26110
1190 St. Francis Drive
Santa Fe, New Mexico 87502

RECEIVED

JUN 07 1995

ROUND WATER BUR

Subject: FINAL EVAPORATION BASIN DRAWINGS

Dear Mr. Marshall:

Enclosed are the final drawings to be issued for the construction of a lined evaporation basin at the H-19 Hydropad for the containment of returned drilling fluids and brines from hydrologic testing in connection with the Culebra Transport Test Program. The drawings are offered as additional documentation for the U. S. Department of Energy, Carlsbad Area Office (DOE-CAO) request for written concurrence that a Part 3-100 Discharge Plan will not be required for the construction of the lined evaporation basin.

Please address your response to: Mr. Vernon Daub, Manager
Office of National TRU Waste Operations
U. S. Department of Energy
Carlsbad Area Office
P. O. Box 3090
Carlsbad, NM 88221-3090

If you have any questions about this proposed project or require any additional information, please contact Mr. Jim Hollen of my staff at (505) 234-8271.

Sincerely,

L. R. Fitch, Manager
Environment, Safety, Health and Regulatory Compliance

JRH:lwg

Attachments

cc:	V. Daub, CAO	MS-570
	R. D. Kaiser, CAO	MS-570
	M. H. McFadden, CAO	MS-564
	(without attachments)	
	A. R. Sattler, SNL	MS-300

Sandia National Laboratories
P. O. Box 5800
Albuquerque New Mexico 87185-1033

May 29, 1995

Warren Bodily
Environment, Health, Safety and Regulatory
Compliance Department, MS 170
P. O. Box 287
Carlsbad, New Mexico, 88221

Dear Warren:

Here are two copies of the "final" drawings for the proposed evaporation pond. One set is for you and the other set is for Clint Marshall at the Ground Water Protection and Remediation Bureau, New Mexico Environmental Department. Because of the severe problems with returned drilling fluids accumulating at the H-19 hydropad, we appreciate the prompt attention your staff has been giving this matter. We are continuing to plan for the construction of this pond as the only, as yet, available solution to disposal of the returned drilling fluids and the brines from hydraulic and hydrologic testing of the wells on the H-19 hydropad.

Please note that CH2MHILL was consulted in the design of the evaporation pond and Re/SPEC personnel at Carlsbad and Rapid City are being consulted for the implementation and construction of the evaporation pond. Also the berm may be somewhat wider than the minimum dimension.

I join Carla Mewhinney (letter to you, 5/19) in expressing appreciation for the collaboration of your staff.

Sincerely

Allan R. Sattler
Geothermal Research Department 6111

WZ:95:03314
DA:95:2365

Westinghouse Electric Corporation **Government Operations**

Waste Isolation Division

Box 2078
Carlsbad NM 88221

June 1, 1995

Mr. C. Marshall, Geologist III
New Mexico Environment Department
Ground Water Bureau
P. O. Box 26110
1190 St. Francis Drive
Santa Fe, New Mexico 87502

RECEIVED
JUN 07 1995
ROUND WATER BUR

Subject: CLARIFICATION OF PROPOSED CHEMICAL USE

Dear Mr. Marshall:

Enclosed is a hard copy of a letter from Mr. Allan R. Sattler, of Sandia National Laboratories, to Mr. Warren Bodily, of my staff, providing clarification of proposed chemical use in the Culebra Transport Test Program tracer testing. The letter was transmitted to you via facsimile on May 26, 1995, by Mr. Dan Robertson.

If you have any questions about this proposed project or require any additional information, please contact Mr. J. R. Hollen at (505) 234-8271.

Sincerely,

L. R. Fitch, Manager
Environment, Safety, Health and Regulatory Compliance

JRH:lwg

Attachment

cc:	R. D. Kaiser, CAO	MS-570
	A. R. Sattler, SNL	MS-300

Sandia National Laboratories

P.O. Box 5800
Albuquerque, New Mexico 87185-1033

May 24, 1995

Warren Bodily
Environment, Health, Safety and Regulatory
Compliance Department
Westinghouse Waste Isolation Division
MS 170
P. O. Box 287
Carlsbad, NM 87221

Dear Warren:

The proposed use of potassium and/or sodium hydroxide and hydrochloric acid should be clarified further. These strong basic and acidic compounds are to be used at H-19 only for the mixing process detailed on a separate page which is enclosed. They are not end products of the mixing process and, therefore, will not be injected directly into the formation.

As is stated in the DOE/AL Environmental Checklist/Action Description Memorandum, Attachment A, p.7. "Because of solubility problems associated with fluorinated and chlorinated acid tracers, one gram of potassium hydroxide must be added per gram of tracer." Potassium (or sodium) hydroxide is used to raise the pH to about 11. (Potassium hydroxide, KOH, dissociates into K^+ and OH^- ions.) At this higher pH, the benzoic acid can be dissolved in the Culebra brine. The addition of the benzoic acid will lower the pH. Some benzoic acids are stronger acids than others. If the addition of the benzoic acid does not lower the pH to very close to the natural original pH of the Culebra brine (~7.5), a small amount of hydrochloric acid will be added to restore the pH to close to the original Culebra brine pH (hydrochloric acid, HCl, dissociates into H^+ and Cl^- ions). The resulting solution to be injected will be Culebra brine at its original pH with additional potassium (or sodium), chloride, and benzoate ions (tracer). Potassium, sodium and chloride occur naturally in the Culebra brine in high concentrations, so the increase in concentration of these ions will be minimal.

Potassium hydroxide, sodium hydroxide and hydrochloride acid were included in the original or amended list of proposed chemicals. The solution going into the formation will have close to the same pH as the original Culebra brine. The solution added when injecting tracers will not be a strong acid or a strong base. (Appropriate QA procedures will be in place to assure that the injected solution is at the proper pH value.) Approval of the use of hydrochloric acid for tracer mixing is needed to ensure that the injected solution will have a pH close to the original pH of Culebra water from H-19. If there are any questions, please don't hesitate to call me at 844-1019 or Lucy Meigs at 848-0507.

Sincerely,

Allan R. Sattler, drr

Allan R. Sattler
Geothermal Research Department, 6111

ARS:drr

Attachment

Copy to: (w/attachment)
D. Robertson, Westinghouse
M. Whatley, Westinghouse
J. Hollen, Westinghouse MS170
MS-0141 R. Vandenberg, 11300
MS-1033 J. Dunn, 6111
MS-1156 J. Mercer, 9333
MS-1324 R. Beauheim, 6115
MS-1324 A. Lappin, 6115
MS-1324 L. Meigs, 6115
MS-1335 W. Weart, 6303
MS-1395 D. Cole, 6743
MS-1395 P. Jones, 6743
MS-1395 C. Mewhinney, 6700
MS-1395 W. Stensrud, 6743
MS-1033 A. Sattler, 6111
SWC FF-A WBS 1.1.5.3.4 - TD (2)

THE MIXING PROCESS

(1) ADD CULEBRA BRINE

(2) ADD NaOH or KOH TO BRING SOLUTION pH to ~ 11.
Na^+ or K^+ IONS PRODUCED.

(3) ADD (APPROVED) CHLORINATED OR FLUORINATED BENZOIC ADIC TRACER COMPOUND TO SOLUTION.
THE TRACER COMPOUND STARTS DISSOLVING. THE BENZOATE ION FORMS.
THE pH LOWERS SOMEWHAT.
THE TRACER COMPOUND CONTINUES TO DISSOLVE AS THE pH LOWERS.

(4) IF NECESSARY, ADD HC1 TO BRING pH OF SOLUTION BACK TO ORIGINAL pH VALUE OF CULEBRA BRINE. ~ 7.5.
PRODUCING OF IONS.
VERIFY THE pH.

TRACER INJECTION

TRANSFER SOLUTION FROM MIXING TANK TO INJECTION APPARATUS AND INJECT THE RESULTING SOLUTION IN THE FORMATION.
THE RESULTING SOLUTION CONSISTS OF CULEBRA BRINE, BENZOATE IONS (TRACER), ALONG WITH THE PRODUCED Na^+ or K^+ AND $C1^-$ IONS.
Na^+ or K^+ AND $C1^-$ IONS ALREADY ABUNDANT IN CULEBRA.

WZ:95:03310
DA:95:2345

Westinghouse Electric Corporation **Government Operations**

Waste Isolation Division

Box 2078
Carlsbad NM 88221

May 16, 1995

RECEIVED
MAY 19 1995
ROUND WATER BU

Mr. Clint Marshall, Geologist III
New Mexico Environment Department
Ground Water Bureau
P. O. Box 26110
1190 St. Francis Drive
Santa Fe, New Mexico 87502

Subject: REQUEST FOR USE OF ADDITIONAL POTENTIAL TRACER CHEMICAL

Dear Mr. Marshall:

Approval is requested for the use of the following chemical in the Culebra Transport Test Programs under development by Sandia National Laboratories at the Waste Isolation Pilot Plant (WIPP). A Material Safety Data Sheet (MSDS) is attached.

Hydrochloric Acid (Hydrogen Chloride)
CAS Number 7647-01-0

Because of additional solubility concerns with the previously approved chlorinated and fluorinated benzoic acid tracers, the use of hydrochloric acid is requested. The total amount of material deployed will be 100 kilograms or less.

Approval is also requested for the chemicals that would be used in the acidization of the DOE-1 well. The chemical requirements for the treatment have been provided by The Western Company with specific chemicals and quantities along with MSDSs.

As with our previous requests, the U. S. Department of Energy, Carlsbad Area Office (DOE-CAO) is requesting written concurrence that a Part 3-100 Discharge Plan will not be required for the proposed Culebra Transport Test Programs. The Culebra Transport Test Program is designed to collect additional hydrogeologic characterization data from the Culebra, and perhaps Rustler formation, to test hydrological models for the WIPP Performance Assessment.

To accomplish this, Sandia National Laboratories proposed to establish up to 10 hydrologic test wells located along the principal flow path of the Culebra aquifer. Most of the new test wells will be located on the new H-19 hydropad. Three existing wells in the vicinity of the H-19 hydropad and several new wells strategically located around H-19 will be used to monitor pressure responses associated with the hydrologic tracer tests being conducted at the H-19 hydropad.

The DOE-CAO believes that this project should be exempted from the discharge plan requirements because the existing concentration of ground water in adjacent wells exceeds 10,000 mg/l Total Dissolved Solids (TDS). Additionally, none of the proposed tracer or acidization chemicals are listed in the New Mexico Water Quality Control Regulations, Part 1-101(UU), *Toxic Pollutants*, or Part 3-103, *Standards for Ground Water of 10,000 mg/l TDS Concentration or Less*.

If you have any questions about this proposed project or require any additional information, please contact Mr. J. R. Hollen at (505) 234-8271.

Sincerely,

L. R. Fitch, Manager
Environment, Safety, Health and Regulatory Compliance

JRH:lg

Attachment

cc:	M. E. Bennington, CAO	MS-564
	R. D. Kaiser, CAO	MS-570
	A. R. Sattler, SNL	MS-300

WZ:95:03312
DA:95:02349

Westinghouse Electric Corporation **Government Operations**

Waste Isolation Division
Box 2078
Carlsbad NM 88221

RECEIVED
MAY 1 9 1995
GROUND WATER BUREAU

May 18, 1995

Mr. C. Marshall, Geologist III
New Mexico Environment Department
Ground Water Bureau
P. O. Box 26110
Santa Fe, New Mexico 87502

Subject: REQUEST FOR CONCURRENCE THAT A DISCHARGE PLAN IS NOT REQUIRED FOR THE CONSTRUCTION AND USE OF A LINED EVAPORATION BASIN TO COLLECT CULEBRA BRINE

Dear Mr. Marshall:

Per your telephone conversation of February 2, 1995 with Mr. Dan Robertson, the U. S. Department of Energy, Carlsbad Area Office (DOE-CAO) is requesting written concurrence that a Part 3-100 Discharge Plan will not be required for the proposed Culebra Transport Test Programs evaporation basin. The lined evaporation basin is to be constructed at the H-19 hydropad for the containment of returned drilling fluids and brines from hydrologic testing. The evaporation basin will be constructed to the specifications of the two enclosed drawings.

Please address your response to: Mr. Vernon Daub, Manager
Office of National TRU Waste Operations
U. S. Department of Energy
Carlsbad Area Office
P. O. Box 3090
Carlsbad, NM 88221-3090

If you have any questions about this proposed project or require any additional information, please contact Mr. Jim Hollen of my staff at (505) 234-8271.

Sincerely,

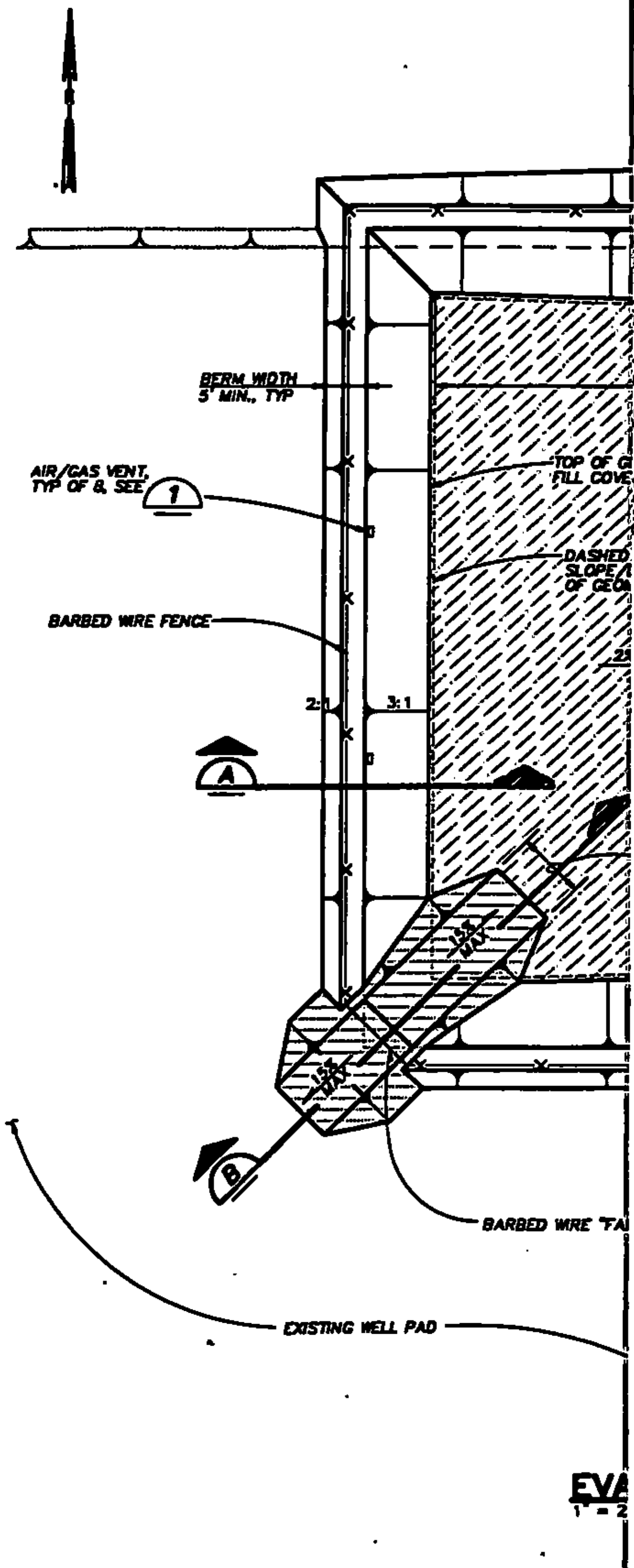
L. R. Fitch

L. R. Fitch, Manager
Environment, Safety, Health and Regulatory Compliance

JRH:lwg

Attachments

cc:	V. Daub, CAO	MS-570
	R. D. Kaiser, CAO	MS-570
	M. H. McFadden, CAO	MS-564
	(without attachments)	
	A. R. Sattler, SNL	MS-300



...ITIES ARE NOTED AS "EXISTING" AND ARE SHOWN
...KGROUND. NEW STRUCTURES AND FACILITIES ARE

...TED IN THE NORTHEAST CORNER OF THE WELL PAD
...ISTING WELL PAD CONSISTS OF AN APPROXIMATELY
...1-FOOT OF CRUSHED CALICHE. CONTRACTOR SHALL
... OWNER SELECTED LOCATION AND THE OWNER
... THE WORK. COORDINATE AND CONDUCT THE WORK
...IONS AT THE PROJECT SITE.

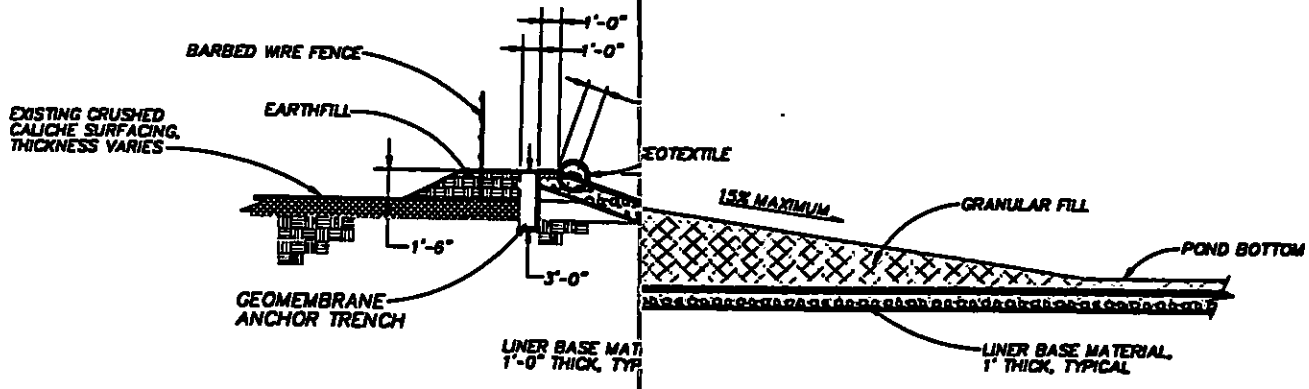
...ED ON THE DIMENSIONS, LINES, GRADES, AND SLOPES
...N AND ALIGNMENT OF FACILITIES IS SUBJECT TO OWNER

...SAME ELEVATION ALONG THE ENTIRE PERIMETER OF THE
...UTH TRENDING EMBANKMENT SHALL BE 5 FEET AS
...ANE LINER TO THE EMBANKMENT CREST. HEIGHT DIMENSION
...SHALL BE 5 FEET AT THE CORNERS AND 6.5 FEET AT THE
...ON, AS MEASURED FROM THE TOP OF THE GEOMEMBRANE

CH2M HILL	DSGN M. BROOKS	EMBANKMENT AND BASIN PLAN	SHEET 1 OF 2
	DR M. BREWER		DWG NO. C-1
	CHK		DATE 4-28-95
	APVD	NO.	PROJ NO. RME70153.SN

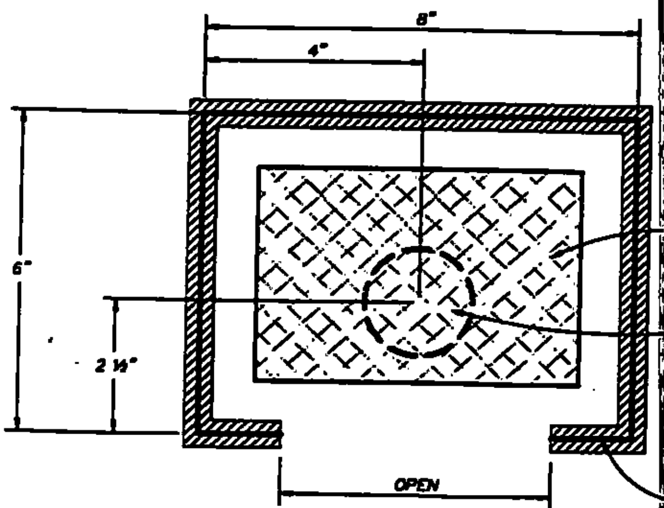
PRELIMINARY

1=20.0
PLAN.DWG



POND SLOPE SECTION (B / C-1)

1" = 5'-0"



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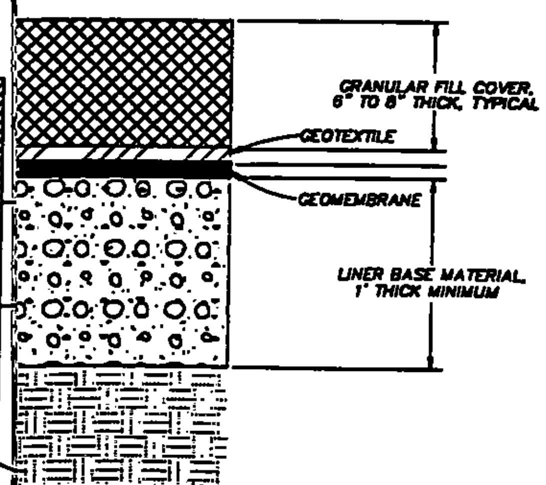

BOTTOM DETAIL (2 / C-2)

ALE

®

CH2M HILL

DSGN M. BROOKS	
DR M. BREWER	
CHK	
APVD	
	NO. DA

SECTIONS AND DETAILS

SHEET	2 OF 2
DWG NO.	C-2
DATE	4-28-95
PROJ NO.	RME70153.SN

PRELIMINARY

1=1.0

DETAILS.DWG

OHS11150

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MDL INFORMATION SYSTEMS, INC.
14600 CATALINA STREET
SAN LEANDRO, CA 94577
1-800-635-0064 OR
1-510-895-1313

FOR EMERGENCY SOURCE INFORMATION
CONTACT: 1-615-366-2000 USA

CAS NUMBER: 7647-01-0
RTECS NUMBER: MW9610000

SUBSTANCE: HYDROGEN CHLORIDE, ANHYDROUS

TRADE NAMES/SYNONYMS:
HYDROCHLORIC ACID, ANHYDROUS; HYDROGEN CHLORIDE; SPIRITS OF SALT; MURIATIC ACID; HYDROCHLORIC ACID; HYDROCHLORIC ACID GAS; ANHYDROUS HYDROCHLORIC ACID; HYDROGEN CHLORIDE (HCL); STCC 4904270; UN 1050; CLH; OHS11150

CHEMICAL FAMILY:
Inorganic acid

CREATION DATE: 11/28/84 REVISION DATE: 12/02/94

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT : HYDROGEN CHLORIDE, ANHYDROUS
CAS NUMBER: 7647-01-0
PERCENTAGE: 100

OTHER CONTAMINANTS: NONE

SECTION 3 HAZARDS IDENTIFICATION

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=0 REACTIVITY=1 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=3 FIRE=0 REACTIVITY=0

EMERGENCY OVERVIEW:
Colorless gas or fuming liquid with a suffocating odor.
Causes skin burns. Causes severe burns to mucous membranes. Causes respiratory tract and eye irritation, possibly severe.
Container may rupture in heat of fire. May react with water.
Do not breathe gas. Do not get in eyes, on skin, or on clothing. Keep away from heat and flame. Do not allow water to get in container. Do not puncture

container. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation. Handle with caution.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EFFECTS: May cause irritation, possibly severe. Additional effects may include headache, lung congestion and lung effects.
LONG TERM EFFECTS: May cause effects as in short term exposure. Additional effects may include digestive disorders.
SKIN CONTACT:
SHORT TERM EFFECTS: May cause irritation, possibly severe. Additional effects may include frostbite, reaction of skin to light and shock.
LONG TERM EFFECTS: Same effects as short term exposure.
EYE CONTACT:
SHORT TERM EFFECTS: May cause irritation, possibly severe. Additional effects may include frostbite and blindness.
LONG TERM EFFECTS: Same effects as short term exposure.
INGESTION:
SHORT TERM EFFECTS: May cause burns. Additional effects may include chills, fever, nausea, vomiting, diarrhea and shock.
LONG TERM EFFECTS: Same effects as short term exposure.

CARCINOGEN STATUS:
OSHA: N
NTP: N
IARC: N

SECTION 4 FIRST AID MEASURES

INHALATION:
FIRST AID- Remove from exposure area to fresh air immediately. Perform artificial respiration if necessary. Maintain airway, blood pressure and respiration. Keep warm and at rest. Treat symptomatically and supportively. Get medical attention immediately. Qualified medical personnel should consider administering oxygen.

SKIN CONTACT:
FIRST AID- Remove contaminated clothing and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). If burns occur, proceed with the following: Cover affected area securely with sterile, dry, loose-fitting dressing. Treat symptomatically and supportively. Get medical attention immediately.

EYE CONTACT:
FIRST AID- Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains (at

least 15-20 minutes). Continue irrigating with normal saline until the pH has returned to normal (30-60 minutes). Cover with sterile bandages. Get medical attention immediately.

INGESTION:
FIRST AID- Do not use gastric lavage or emesis. Give large amounts of water or milk. Repeat if vomiting occurs. Ingested corrosive should be diluted approximately 100 times to render it harmless to tissues. (Dreisbach & Robertson; Handbook of Poisoning; 12th Ed.). Do not give anything by mouth to a person who is unconscious or otherwise unable to swallow. If vomiting occurs, keep head lower than hips to help prevent aspiration. Maintain airway and respiration. Treat symptomatically and supportively. Get medical attention immediately.

NOTE TO PHYSICIAN
ANTIDOTE:
No specific antidote. Treat symptomatically and supportively.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARD:
Negligible fire hazard when exposed to heat or flame.

Container may explode in heat of fire.

EXTINGUISHING MEDIA:
Dry chemical or carbon dioxide
(1993 Emergency Response Guidebook, RSPA P 5800.6).

For larger fires, use water spray, fog or regular foam
(1993 Emergency Response Guidebook, RSPA P 5800.6).

FIREFIGHTING:
Do not get water inside container. Move container from fire area if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks. Isolate area until gas has dispersed (1993 Emergency Response Guidebook, RSPA P 5800.6, Guide Page 15).

Use agent suitable for type of fire. Cool containers with flooding quantities of water, apply from as far a distance as possible. Avoid breathing corrosive vapors, keep upwind.

FLASH POINT: no data available
LOWER FLAMMABLE LIMIT: no data available
UPPER FLAMMABLE LIMIT: no data available
AUTOIGNITION: no data available

HAZARDOUS COMBUSTION PRODUCTS:
Thermal decomposition products may include toxic and corrosive fumes of chlorine.

SECTION 6 ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL SPILL:
Stop leak if you can do it without risk. Use water spray to reduce vapors; do not put water directly on leak or spill area. Do not get water inside container. Isolate area until gas has dispersed. For small spills, flush area with flooding amounts of water. For larger spills, dike far ahead of spill for later disposal. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind, out of low areas, and ventilate closed spaces before entering. Isolate the leak or spill area immediately for at least 150 feet in all directions.

Reportable Quantity (RQ): 5000 pounds
The Superfund Amendments and Reauthorization Act (SARA) Section 304 requires that a release equal to or greater than the reportable quantity for this substance be immediately reported to the local emergency planning committee and the state emergency response commission (40 CFR 355.40). If the release of this substance is reportable under CERCLA Section 103, the National Response Center must be notified immediately at (800) 424-8802 or (202) 426-2675 in the metropolitan Washington, D.C. area (40 CFR 302.6).

SOIL SPILL:
Dig holding area such as lagoon, pond or pit for containment.

Dike flow of spilled material using soil or sandbags or foamed barriers such as polyurethane or concrete.

Use cement powder or fly ash to absorb liquid mass.

Neutralize spill with slaked lime, sodium bicarbonate or crushed limestone.

AIR SPILL:
Knock down vapors with water spray. Keep upwind.

Water used to knock down vapors may become corrosive or toxic and should be contained properly for later disposal.

WATER SPILL:
Neutralize with agricultural lime, slaked lime, crushed limestone, or sodium bicarbonate.

SECTION 7 HANDLING AND STORAGE

Observe all federal, state and local regulations when storing this substance.

Store in accordance with 29 CFR 1910.101.

Protect against physical damage. Store in cool, well-ventilated place, separated from all oxidizing materials (NFPA 49, Hazardous Chemicals Data, 1975).

Store away from incompatible substances.

Threshold Planning Quantity (TPQ):
The Superfund Amendments and Reauthorization Act (SARA) Section 302 requires that each facility where any extremely hazardous substance is present in a quantity equal to or greater than the TPQ established for that substance notify the state emergency response commission for the state in which it is located. Section 303 of SARA requires these facilities to participate in local emergency response planning (40 CFR 355.30).

Threshold quantity (TQ): 5000 pounds
The Occupational Safety and Health Administration (OSHA) Process Safety Management (PSM) standard requires that facilities utilizing a process which involves a chemical at or above its specified threshold quantity comply with the provisions of 29 CFR 1910.119, Process Safety Management of highly hazardous chemicals.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
HYDROGEN CHLORIDE (HYDROCHLORIC ACID):
5 ppm (7.6 mg/m3) OSHA ceiling
5 ppm (7.6 mg/m3) ACGIH ceiling
5 ppm (7.6 mg/m3) NIOSH recommended ceiling
5 ppm (7.6 mg/m3) DFG MAK TWA;
10 ppm (15.2 mg/m3) DFG MAK 5 minute peak, momentary value, 8 times/shift

Measurement method: Silica gel tube; sodium bicarbonate/sodium carbonate; ion chromatography; (NIOSH Vol. III # 7903, Inorganic Acids).

500 pounds SARA Section 302 Threshold Planning Quantity (gas)
5000 pound SARA Section 304 Reportable Quantity (gas)
5000 pounds CERCLA Section 103 Reportable Quantity (liquid)
5000 pounds OSHA Process Safety Management Threshold Quantity (gas)
Subject to SARA Section 313 Annual Toxic Chemical Release Reporting

VENTILATION:
Provide local exhaust ventilation system to meet published exposure limits.

EYE PROTECTION:

Employee must wear splash-proof or dust-resistant safety goggles and a faceshield to prevent contact with this substance.

Emergency wash facilities:
Where there is any possibility that an employee's eyes and/or skin may be exposed to this substance, the employer should provide an eye wash fountain and quick drench shower within the immediate work area for emergency use.

CLOTHING:
Employee must wear appropriate protective (impervious) clothing and equipment to prevent any possibility of skin contact with this substance.

GLOVES:
Employee must wear appropriate protective gloves to prevent contact with this substance.

RESPIRATOR:
The following respirators and maximum use concentrations are recommendations by the U.S. Department of Health and Human Services, NIOSH Pocket Guide to Chemical Hazards; NIOSH criteria documents or by the U.S. Department of Labor, 29 CFR 1910 Subpart Z.
The specific respirator selected must be based on contamination levels found in the work place, must not exceed the working limits of the respirator and be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration (NIOSH-MSHA).

HYDROGEN CHLORIDE (HYDROCHLORIC ACID):

50 ppm- Any supplied-air respirator.
Any self-contained breathing apparatus.
Any chemical cartridge respirator with cartridge(s) providing protection against hydrochloric acid.

100 ppm- Any supplied-air respirator operated in a continuous flow mode.
Any supplied-air respirator with a full facepiece.
Any self-contained breathing apparatus with a full facepiece.
Any air-purfiying, full-facepiece respirator (gas mask) with a chin-style, front-, or back- mounted canister providing protection against hydrochloric acid.
Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against hydrochloric acid.
Any powered, air-purfiying respirator with cartridge(s) providing protection against hydrochloric acid.
Escape- Any air-purifying, full facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister.
Any appropriate escape-type self-contained breathing apparatus.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

DESCRIPTION: Colorless gas or fuming liquid with a suffocating odor.
MOLECULAR WEIGHT: 36.46
MOLECULAR FORMULA: H-CL
BOILING POINT: -121 F (-85 C)
FREEZING POINT: -175 F (-115 C)
VAPOR PRESSURE: 3040 mmHg @ 17.8 C
VAPOR DENSITY: 1.268
SPECIFIC GRAVITY: 1.187 @ -85 C
WATER SOLUBILITY: 82.3% @ 0 C
PH: acidic in solution
ODOR THRESHOLD: 1-5 ppm
EVAPORATION RATE: not applicable
SOLVENT SOLUBILITY: Soluble in alcohol, ether, benzene, methanol.

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY:
HYDROGEN CHLORIDE (HYDROCHLORIC ACID):
May react exothermically with water.

CONDITIONS TO AVOID:
Material is extremely poisonous; avoid inhalation of vapors or contact with skin. Contents may be under pressure; containers may rupture violently and travel a considerable distance.

INCOMPATIBILITIES:
HYDROGEN CHLORIDE (HYDROCHLORIC ACID):
ACETIC ANHYDRIDE: Violent reaction.
ALCOHOLIC HYDROGEN CYANIDE: Explosive reaction.
ALUMINUM: Explosion.
ALUMINUM-TITANIUM ALLOYS: Ignites or incandesces when heated.
2-AMINOETHANOL: Violent reaction.
AMMONIUM HYDROXIDE: Violent reaction.
BASES: Violent reaction.
BRASS: Corrodes.
BRONZE: Corrodes.
CALCIUM CARBIDE: Reacts with incandescence.

CALCIUM HYPOCHLORITE: Ignition.
CESIUM ACETYLIDE: Ignites on contact.
CHLORINE + DINITROANILINES: Vigorous reaction with release of flammable hydrogen gas fumes.
CHLOROSULFONIC ACID: Violent reaction.
1,1-DIFLUOROETHYLENE: Extremely exothermic decomposition reaction.
DOWICIL 100: Decomposes.
ETHYLENE DIAMINE: Violent reaction.
ETHYLENE IMINE: Violent reaction.
FLUORINE: Ignites on contact.
HEXALITHIUM DISILICIDE: Incandesces.
IRON: Corrodes with evolution of flammable hydrogen gas.
MAGNESIUM BORIDE: Produces a spontaneously flammable gas.
MERCURIC SULFATE: Violent reaction at 125 C.
METAL ACETYLIDES: Violent reaction.
METALS: Severe corrosion with evolution of flammable hydrogen gas.
OLEUM: Violent reaction.
OXIDIZERS (STRONG): Violent reaction.
OXYGEN + PLATINUM: Ignites on contact.
PERCHLORIC ACID: Violent reaction.
PLASTICS, RUBBER, COATINGS: Attacks.
POTASSIUM PERMANGANATE: Explosion hazard.
BETA-PROPIOLACTONE: Violent reaction.
PROPYLENE OXIDE: Violent reaction.
RUBIDIUM ACETYLIDE: Ignites on contact.
SILICA (GEL): Incompatible.
SODIUM: Vigorous or explosive reaction.
SULFURIC ACID: Explosive reaction with release of toxic hydrogen chloride gas.
TETRASELENIUM TETRANITRIDE: Explodes on contact.
VINYL ACETATE: Violent reaction.

HAZARDOUS DECOMPOSITION:
Thermal decomposition products may include toxic and corrosive fumes of chlorine.

POLYMERIZATION:
Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

SECTION 11 TOXICOLOGICAL INFORMATION

HYDROGEN CHLORIDE (HYDROCHLORIC ACID):
IRRITATION DATA:
ANHYDROUS: 100 mg/30 seconds rinsed eye-rabbit mild.
HYDROCHLORIC ACID: 5 mg/30 seconds rinsed eye-rabbit mild.
TOXICITY DATA:
HYDROGEN CHLORIDE (ANHYDROUS GAS): 4701 ppm/30 minutes inhalation-rat LC50;

2644 ppm/30 minutes inhalation-mouse LC50.
MONOHYDRATE: No data available.
DIHYDRATE: No data available.
TRIHYDRATE: No data available.
HEXAHYDRATE: No data available.
HYDROGEN CHLORIDE (AEROSOL): 5666 ppm/30 minutes inhalation-rat LC50; 2142 ppm/30 minutes inhalation-mouse LC50.
HYDROCHLORIC ACID: 1300 ppm/30 minutes inhalation-human LCLo; 3000 ppm/5 minutes inhalation-human LCLo; 3124 ppm/1 hour inhalation-rat LC50; 1108 ppm/1 hour inhalation-mouse LC50; 4413 ppm/30 minutes inhalation-rabbit LCLo; 4413 ppm/30 minutes inhalation-guinea pig LCLo; 685 ug/m3/24 hours/84 days-continuous inhalation-rat TCLo; 900 mg/kg oral-rabbit LD50; 1449 mg/kg intraperitoneal-mouse LD50; 81 mg/kg unreported-man LDLo; mutagenic data (RTECS); reproductive effects data (RTECS).
CARCINOGEN STATUS: Human Inadequate Evidence, Animal Inadequate Evidence (IARC Group-3).
LOCAL EFFECTS: Corrosive- inhalation, skin, eye and ingestion.
ACUTE TOXICITY LEVEL: Moderately toxic by inhalation and ingestion.
TARGET EFFECTS: No data available.

HEALTH EFFECTS
INHALATION:
HYDROGEN CHLORIDE (HYDROCHLORIC ACID):
CORROSIVE. 100 ppm Immediately Dangerous to Life or Health.
ACUTE EXPOSURE- Inhalation of gas or fumes at levels of 5-35 ppm may cause irritation and burning of the throat, coughing and choking; 50-100 ppm may be barely tolerable for 1 hour. High levels may cause inflammation and occasionally ulceration of the nose, throat or larynx, bronchitis, pneumonia, palpitations and headache. Higher concentrations may cause necrosis of the tracheal and bronchial epithelium, nasoseptal perforation, atelectasis, emphysema, damage to pulmonary blood vessels and lesions of the liver and other organs. Death may be due to laryngeal spasm, bronchopneumonia or pulmonary edema. 1300-2000 ppm may be dangerous, even on brief exposures. Reproductive effects have been reported in animals.
CHRONIC EXPOSURE- Repeated or prolonged exposure may cause erosion and discoloration of exposed teeth, chronic bronchitis and gastritis.

SKIN CONTACT:
HYDROGEN CHLORIDE (HYDROCHLORIC ACID):
CORROSIVE.
ACUTE EXPOSURE- Contact may cause severe irritation, inflammation, ulceration, necrosis and chemical burns. Shock symptoms may develop including rapid pulse, sweating and collapse. Photosensitization reactions may occur in persons previously exposed. Contact with a compressed gas may cause frostbite.
CHRONIC EXPOSURE- Repeated or prolonged contact with vapors or dilute solutions may cause dermatitis. Photosensitization may occur.

EYE CONTACT:
HYDROGEN CHLORIDE (HYDROCHLORIC ACID):
CORROSIVE.

ACUTE EXPOSURE- Contact may cause severe irritation, conjunctivitis, corneal necrosis and burns with impairment or permanent loss of vision. A drop of hydrochloric acid splashed in the eye and immediately washed out has produced a white coagulation of the corneal and conjunctival epithelium. Animals exposed to vapor concentrations of 1350 ppm for one and a half hours showed clouding of the cornea and 300 ppm for 6 hours showed slight erosion of the corneal epithelium. Contact with a compressed gas may cause frostbite.

CHRONIC EXPOSURE- Animals exposed to vapor at 100 ppm for 6 hours daily for 50 days showed only slight unrest and irritation of the eyes, but no ocular injury. Effects are dependent upon concentration and duration of exposure. Conjunctivitis or effects similar to those for acute exposure may occur.

INGESTION:
HYDROGEN CHLORIDE (HYDROCHLORIC ACID):
CORROSIVE.

ACUTE EXPOSURE- Ingestion of the acid may cause burns of the mouth, throat, esophagus and stomach with consequent pain, uneasiness, nausea, salivation, vomiting, diarrhea, chills, shock and intense thirst. Nephritis, fever and perforation of the intestinal tract, and circulatory collapse may occur. Death may be due to esophageal or gastric necrosis.

CHRONIC EXPOSURE- No data available.

SECTION 12 ECOLOGICAL INFORMATION

ENVIRONMENTAL IMPACT RATING (0-4): no data available

ACUTE AQUATIC TOXICITY: no data available

DEGRADABILITY: no data available

LOG BIOCONCENTRATION FACTOR (BCF): no data available

LOG OCTANOL/WATER PARTITION COEFFICIENT: no data available

SECTION 13 DISPOSAL CONSIDERATIONS

Observe all federal, state and local regulations when disposing of this substance.

Disposal must be in accordance with standards applicable to generators of hazardous waste, 40 CFR 262. EPA Hazardous Waste Number D002.

100 pound CERCLA Section 103 Reportable Quantity.

SECTION 14 TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101:
Hydrogen chloride, refrigerated liquid-UN 2186

U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101:
2.3 - Poisonous gas

U.S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS, 49 CFR 172.101
AND SUBPART E:
Poison gas, corrosive

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS:
EXCEPTIONS: None
NON-BULK PACKAGING: None
BULK PACKAGING: 49 CFR 173.314 and 49 CFR 173.315

U.S. DEPARTMENT OF TRANSPORTATION QUANTITY LIMITATIONS 49 CFR 172.101:
PASSENGER AIRCRAFT OR RAILCAR: Forbidden
CARGO AIRCRAFT ONLY: Forbidden

SECTION 15 REGULATORY INFORMATION

TSCA STATUS: Y

CERCLA SECTION 103 (40CFR302.4):	Y	
HYDROGEN CHLORIDE (HYDROCHLORIC ACID)		5000 pounds RQ
SARA SECTION 302 (40CFR355.30):	Y	
HYDROGEN CHLORIDE (HYDROCHLORIC ACID)		500 pounds TPQ
SARA SECTION 304 (40CFR355.40):	Y	
HYDROGEN CHLORIDE (HYDROCHLORIC ACID)		5000 pounds RQ
SARA SECTION 313 (40CFR372.65):	Y	
HYDROGEN CHLORIDE (HYDROCHLORIC ACID)		
OSHA PROCESS SAFETY (29CFR1910.119):	Y	
HYDROGEN CHLORIDE (HYDROCHLORIC ACID)		5000 pounds TQ
CALIFORNIA PROPOSITION 65:	N	

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40 CFR 370.21)

ACUTE HAZARD:	Y
CHRONIC HAZARD:	N
FIRE HAZARD:	N
REACTIVITY HAZARD:	Y
SUDDEN RELEASE HAZARD:	Y

SECTION 16 OTHER INFORMATION

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AT010025 01

THE WESTERN COMPANY

Treatment Requirements for: ACID TREATMENT

ACID BLEND: **3,000 GALLONS 20% HCL**

Containing per 1000 Gallons:

1.00 Gallons I-22, CORROSION INHIBITOR
2.00 Gallons NINE-40, SURFACTANT
5.00 Gallons AC-2, ORGANIC ACID
5.00 Gallons CITRIC ACID LIQUID, IRON CONTROL

FLUSH TO BE PROVIDED BY SANDIA NATIONAL LABS.

AT010025

PRODUCT DESCRIPTIONS

AC-2 (Organic Acid)

A concentrated acetic acid commonly mixed with hydrochloric acid to slightly retard the acid spending rate and to prevent a rise in pH of the spent acid solution and subsequent precipitation of insoluble metal compounds.

CITRIC ACID (Iron Control Agent)

A liquid sequestering agent used to prevent the precipitation of metal oxides.

HYDROCHLORIC ACID (Inorganic Acid)

An inorganic acid (HCL) used in primary acidizing of carbonate and sandstone formations. It is the most common of oil field acids. It is typically used in concentrations from 3% to 28% (by weight). Higher concentrations are avoided due to increased volumes of inhibitors required and quantities of fines generated as the acid spends on the formation rock.

I-22 (Corrosion Inhibitor)

An organic liquid acid corrosion inhibitor for use in hydrochloric acid, HCL/HF acid, Mutual Solvent/HCL acid and organic acid/HCL acid systems with total acid strengths of up to 28% (by weight) and with well conditions where exposure temperatures are less than 300 Degrees Fahrenheit. Effective acid corrosion rates are less than 0.05 LB/SQ.FT.

NINE-40 (Surfactant)

A nonionic non-emulsifier with excellent load recovery capabilities in some reservoirs.

Occupational Safety and Health Administration

MATERIAL SAFETY DATA SHEET

DATE: September, 1984

SECTION I

Supplier's Name The Western Company of North America	EMERGENCY TELEPHONE NO. (817) 731-5100
ADDRESS (Number, Street, City, State and ZIP Code) P. O. Box 186, Ft. Worth, TX 76101	
CHEMICAL NAME AND SYNONYMS Proprietary blend	TRADE NAME AND SYNONYMS We-emulsifier. Nine-40
CHEMICAL FAMILY Surfactant	FORMULA
	W.I.N. 100472

SECTION IA HAZARDOUS MATERIAL CLASSIFICATION

D.O.T. PROPER SHIPPING NAME	Flammable Liquid, n.o.s.
NAME OF HAZARDOUS COMPONENT	Methanol
HAZARD CLASS	Flammable Liquid
IDENTIFICATION NUMBER	UN1993
D.O.T. LABEL(S) REQUIRED	Flammable Liquid
PRECAUTIONARY LABEL	Attached

SECTION II - HAZARDOUS INGREDIENTS

	%	TLV (Units)
Xylene		
Methanol	2	100pp
Isopropanol		200pp
Heavy Aromatic Naphtha		400pp
		100pp

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	162	SPECIFIC GRAVITY (H_2O=1)	0.881
VAPOR PRESSURE (mm Hg.)	200	PERCENT VOLATILE BY VOLUME (%)	62
VAPOR DENSITY (AIR=1) @ 100°F	>5	EVAPORATION RATE (n-Butyl Acetate=1)	2.03
SOLUBILITY IN WATER	Dispersible		
APPEARANCE AND ODOR	light yellow liquid, hydrocarbon odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) 52°F Seta CC-ASTM	FLAMMABLE LIMITS	Lel 0.5	Uel 36.0

EXTINGUISHING MEDIA
Dry chemical, foam, water spray or water fog

SPECIAL FIRE FIGHTING PROCEDURES
Use water spray to cool fire exposed surfaces and to protect personnel.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Respiratory protection required for fire-fighting personnel.

(Continued on reverse side)

Form OSHA-2.

TRADE NAME: W.I.N. 100472, De-emulsifier, Nine-40

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Isopropanol, Methanol, Xylene, heavy aromatic naphtha (400, 200, 100, 100 ppm)

EFFECTS OF OVEREXPOSURE
Acute: Liquid is irritating to skin and eyes

Chronic: Prolonged or repeated skin contact may cause dermatitis

EMERGENCY AND FIRST AID PROCEDURES
Remove to fresh air. If not breathing, apply artificial respiration and call
a physician. Immediately flush eyes with plenty of water for at least
15 minutes. Call a physician. If skin contact occurs, wash with soap and water.

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID None
	STABLE	X	

INCOMPATABILITY (Materials to avoid)
strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS
burning will emit smoke, fumes, CO and CO_2

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Keep public away. Eliminate source of ignition. Shut off source, if possible to do so safely. Prevent liquid from entering sewers, watercourses, or low areas. Advise authorities if material has entered a watercourse, or sewer or has contaminated soil or vegetation.

WASTE DISPOSAL METHOD
Contain spilled liquid with sand or earth. Recover by pumping or with suitable absorbent. Consult an expert on disposal of recovered material.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) Use NIOSH/MSHA approved respiratory protection such as air-supplied mask if used in confined spaces or other poorly ventilated areas.

VENTILATION	LOCAL EXHAUST Provide 250 fpm hood or face velocity for confined spaces.	SPECIAL explosion-proof ventilation equipment.	
	MECHANICAL (General) To provide ventilation equal to outdoors.	OTHER Not Applicable	
PROTECTIVE GLOVES Chemical resistant gloves		EYE PROTECTION Chemical splash goggles	
OTHER PROTECTIVE EQUIPMENT Usually not needed.			

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Keep container closed when not in use. Containers used for this material may be hazardous when emptied. Observe all hazard precautions outlined in this sheet. Emptied containers retain product residues (vapor, liquid, etc.).

OTHER PRECAUTIONS
Keep away from heat, sparks and open flames.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

MATERIAL SAFETY DATA SHEET

Western Pacesetters

DATE: 31JUL85

SECTION I

Supplier's Name: The Western Company of North America	EMERGENCY TELEPHONE NO.: (817) 731-5100
ADDRESS (Number, Street, City, State, and ZIP Code): P. O. Box 186, Ft. Worth, TX 76101	
CHEMICAL NAME AND SYNONYMS: 40%acetic acid 60%acetic anhydride	TRADE NAME AND SYNONYMS: ACID, AC-2
CHEMICAL FAMILY: Acid	FORMULA: W.I.N.100174

SECTION IA HAZARDOUS MATERIAL CLASSIFICATION

D.O.T. PROPER SHIPPING NAME: Corrosive liquid, N.O.S.

NAME OF HAZARDOUS COMPONENT: Acetic Anhydride

HAZARD CLASS: Corrosive material

IDENTIFICATION NUMBER: UN1760

D.O.T. LABEL(S) REQUIRED: Corrosive

PRECAUTIONARY LABEL:

SECTION II - HAZARDOUS INGREDIENTS

SECTION II - HAZARDOUS INGREDIENTS	%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)		SPECIFIC GRAVITY (H_2O=1) @20°C	1.072
VAPOR PRESSURE (mm Hg.)		PERCENT, VOLATILE BY VOLUME (%)	100
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____ =1)	
SOLUBILITY IN WATER	miscible		

APPEARANCE AND ODOR: clear, colorless liquid - sharp acrid odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	Lel	Uel
112°F, Tag Open cup; 109°F, Tag Closed Cup		2.9%	10.3%

EXTINGUISHING MEDIA: Water spray, dry chemical, and alcohol foam are effective extinguishing agents for acetic anhydride fires.

SPECIAL FIRE FIGHTING PROCEDURES: Addition of water will reduce intensity of flames. If a leak or spill has not ignited, use water spray to disperse the vapor and to protect the personnel trying to stop the leak. Fire fighters should wear self-contained breathing apparatus and full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Water and foam react with chemical, but the heat liberated is not enough to create a hazard. Dry chemical forced below surface can cause foaming and boiling.

(Continued on reverse side)

Form OSHA-20

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
5 ppm

EFFECTS OF OVEREXPOSURE
Contact with skin or eye causes burns. Breathing of vapors causes coughing, check pain, and irritation of nose and throat. Vapor exposure may cause nausea & vomiting.

EMERGENCY AND FIRST AID PROCEDURES
Remove contaminated clothing. Immediately flush skin and eye contact for at least 15 min. with plenty of water. Get medical care for eyes at once. If inhaled, remove to fresh air. Give oxygen if breathing is difficult. Call a physician.

SECTION VI - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		Contact with water or alcohols if confined.
	STABLE	X	

INCOMPATABILITY (Materials to avoid)
Water, alkalies, alcohols and strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Thermal decomposition may produce carbon monoxide and/or carbon dioxide.

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		Avoid contamination with water & alkalies.
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Eliminate ignition sources. Wear self-contained breathing apparatus & full protective clothes. Flush area with water spray, but avoid getting water into tank or other confined areas. Prevent washings from entering waterways.

WASTE DISPOSAL METHOD
Chemical incinerator; carefully mix liquid with large volumes of water or dilute alkalies.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)
Wear self-contained breathing apparatus.

VENTILATION		
	LOCAL EXHAUST: Preferable	SPECIAL
	MECHANICAL (General): May not be sufficient.	OTHER

PROTECTIVE GLOVES	EYE PROTECTION
Impervious gloves	Chemical safety goggles

OTHER PROTECTIVE EQUIPMENT
Full face mask, impervious boots, apron or clothing, eye bath, and safety shower.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Avoid contact with eyes, skin, or clothing. Avoid breathing vapro. Keep away from heat, sparks, and fires. Use only D.O.T. approved containers.

OTHER PRECAUTIONS
Do not get into eyes, on skin or on clothing. Avoid breathing vapors. Keep away from heat, sparks and fires.

Approval Expires April 30, 1971

U.S. DEPARTMENT OF LABOR
WORKPLACE STANDARDS ADMINISTRATION
Bureau of Labor Standards

MATERIAL SAFETY DATA SHEET

February 28, 19

SECTION I

MANUFACTURER'S NAME: Miles Laboratories, Inc., Marschall Division	EMERGENCY TELEPHONE NO.: (219) 264-8238
ADDRESS (Number, Street, City, State, and ZIP Code): 1127 Myrtle Street, Elkhart, Indiana 46514	
CHEMICAL NAME AND SYNONYMS: 2 Hydroxyl-1,2,3 propane tricarboxylic acid	TRADE NAME AND SYNONYMS: Citric Acid, U.S.P., F.C.C. Anh.
CHEMICAL FAMILY: Organic Acid (M.W. 192.13)	FORMULA: $HOC(CH_2COOH)_2$ COOH $C_6H_8O_7$

N/A

SECTION II HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

N/A

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III PHYSICAL DATA

BOILING POINT (°F.)	N/A	SPECIFIC GRAVITY (H_2O=1)	1.665
VAPOR PRESSURE (mm Hg.)	N/A	PERCENT VOLATILE BY VOLUME (%)	N/A
VAPOR DENSITY (AIR=1)	N/A	EVAPORATION RATE (=1)	N/A
SOLUBILITY IN WATER @ 25°C	162 g/100 ml.	Melting Point	153°C

APPEARANCE AND ODOR: Colorless, translucent, odorless, free-flowing, white crystalline granular powder.

N/A

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	FLAMMABLE LIMITS	LEL	UEL
EXTINGUISHING MEDIA			
SPECIAL FIRE FIGHTING PROCEDURES			
UNUSUAL FIRE AND EXPLOSION HAZARDS			

A[illegible] information, recommendations and suggestions appearing herein are based upon sources believed to be reliable: however, it is the user's responsib[illegible] to determine the safety, toxicity and suitability for his own use of this product. [illegible] is beyond our control, no guarantee, expressed or implied, is made as to the effect of such use, results to be obtained. Since actual use of [illegible] Miles Laboratories, Inc. does not assume any liability arising out of the use by others of this product. [illegible] of the safety and to
THIS INFORMATION IS NOT TO BE CONSTRUED AS COMPLETE [illegible]

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: Not Established

EFFECTS OF OVEREXPOSURE: Slight skin irritant.

EMERGENCY AND FIRST AID PROCEDURES: Wash contact area.

SECTION VI REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		N/A
	STABLE	X	

INCOMPATABILITY (Materials to avoid): N/A

HAZARDOUS DECOMPOSITION PRODUCTS: Not Established

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		N/A
	WILL NOT OCCUR	X	

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Recover by vacuum broom sweeping.

WASTE DISPOSAL METHOD

Any normal disposal procedure.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type): Approved nuisance mask.

VENTILATION			
	LOCAL EXHAUST: Satisfactory	SPECIAL	
	MECHANICAL (General)	OTHER	

PROTECTIVE GLOVES: None normally required.

EYE PROTECTION: Safety glasses with side shield.

OTHER PROTECTIVE EQUIPMENT: None

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Can be stored in dry form with no difficulty. High humidity and elevated temperatures should be avoided. Relative humidity of 50 to 70% are suitable.

OTHER PRECAUTIONS

MATERIAL SAFETY DATA SHEET

DATE: August 17, 1990

SECTION I

Supplier's Name
The Western Company of North America

EMERGENCY TELEPHONE NO.
(817) 731-5100

ADDRESS (Number, Street, City, State, and ZIP Code)
P. O. Box 186, Ft. Worth, TX 76101

CHEMICAL NAME AND SYNONYMS

TRADE NAME AND SYNONYMS
I-22

CHEMICAL FAMILY
Surfactant Blend

FORMULA
Proprietary

W.I.N. 499655

SECTION IA HAZARDOUS MATERIAL CLASSIFICATION

D.O.T. PROPER SHIPPING NAME	Flammable liquid (n.o.s.) (RQ /)
NAME OF HAZARDOUS COMPONENT	Methanol
HAZARD CLASS	Flammable liquid
IDENTIFICATION NUMBER	UN 1993
D.O.T. LABEL(S) REQUIRED	Flammable
PRECAUTIONARY LABEL	Flammable

SECTION II - HAZARDOUS INGREDIENTS

	%	TLV (Units)
Methanol (67561)	15-25	200
Heavy Aromatic Naptha (64742945)	3-4	100

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	ND	SPECIFIC GRAVITY (H_2O=1)	0.94
VAPOR PRESSURE (mm Hg.)	ND	PERCENT, VOLATILE BY VOLUME (%)	25
VAPOR DENSITY (AIR=1)	ND	EVAPORATION RATE (______ =1)	ND
SOLUBILITY IN WATER	Dispersible		

APPEARANCE AND ODOR Dark liquid with methanol/alkyl amine odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)
62°F (PMCC)

FLAMMABLE LIMITS	Lel	Uel
	[illegible]	[illegible]

EXTINGUISHING MEDIA
Foam, dry chemical, CO_2, water spray.

SPECIAL FIRE FIGHTING PROCEDURES
Water spray may be used to cool fire exposed metal containers to prevent re-ignition from hot surfaces. Do not breathe smoke or hot fumes.

UNUSUAL FIRE AND EXPLOSION HAZARDS
None known

(Continued on reverse side)

MATERIAL SAFETY DATA SHEET

DATE:

SECTION I

Supplier's Name The Western Company of North America	EMERGENCY TELEPHONE NO. (817) 731-5100
ADDRESS (Number, Street, City, State, and ZIP Code) P. O. Box 186, Ft. Worth, TX 76101	
CHEMICAL NAME AND SYNONYMS	
CHEMICAL FAMILY Surfactant Blend	TRADE NAME AND SYNONYMS I-22
	FORMULA Proprietary W.I.N.499655

SECTION X - LABEL COPY

FOR INDUSTRIAL USE ONLY

FIRST AID:
FOR EYES: In case of contact, flush copiously with water immediately for 15 to 20 minutes. Get medical treatment.
FOR SKIN: In case of contact, wash with soap and water. Remove contaminated clothing and wash skin with soap and water. Launder clothing before re-use.
FOR INGESTION: If swallowed, drink water to dilute. Induce vomiting. Get emergency medical treatment for ingestion of methanol.
FOR INHALATION: If breathed in, remove from exposure. Control delirium, avoid respiratory depression.
HANDLING: Employees must wear

ATTENTION! After this container has been emptied, it may contain flammable and toxic liquid or vapor; observe all warnings and precuations listed for this product. Donot cut, puncture or weld on or near this container. Refer to MSDS and SPM-04-04 for other safety requirements.

George Schuman

From: Clint Marshall [Clint_Marshall@nmenv.state.nm.us]
Sent: Thursday, August 26, 2004 9:47 AM
To: George Schuman
Subject: RE: WIPP DP public notice

I checked the correspondence file. As per WQCC 3108.A(1)(a), A(2), and A(4), WIPP posted a sign at the entrance to the facility and published notices in the Carlsbad and Hobbs newspapers. A copy of the package is in your mail slot outside your door.

-----Original Message-----
From: George Schuman [mailto:george_schuman@nmenv.state.nm.us]
Sent: Thursday, August 26, 2004 8:35 AM
To: Clint Marshall
Subject: WIPP DP public notice

I was thinking about the issue with WIPP and the fact that the public interest groups were unaware of the DP modification. If I'm learning this stuff correctly, there are three options for public notice, only one of which requires a newspaper advertisement. So it seems that WIPP may have selected an option that meets regulatory requirements but wouldn't necessarily have been obvious to out-of-town interest groups. What do you think?

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George Schuman

From: George Schuman [george_schuman@nmenv.state.nm.us]
Sent: Friday, August 13, 2004 1:23 PM
To: Clint Marshall
Cc: Mary Ann Menetrey
Subject: RE: WIPP Briefing

Clint:

Charles informed Mary Ann and I that Ron is interested in re-opening the permit, but Charles will get with Ron later today to see if this is still how Ron wants to proceed. Charles had two requests:
1) Distance from the site to protectable ground water.
2) Charles plans to visit WIPP during the week of September 6 and would like to have a copy of your inspection report/letter with him.

Charles will get back to us after he talks to Ron.

George

-----Original Message-----
From: Clint Marshall [mailto:Clint_Marshall@nmenv.state.nm.us]
Sent: Friday, August 13, 2004 11:43 AM
To: George Schuman
Cc: Mary Ann Menetrey
Subject: WIPP Briefing

Just to let you know, I am work adjusting some time at lunch to run errands.
Have not heard from you or Charles. I'll be back around 2:00 pm. Call me on
my cell if you need me earlier: 690-4102. Thanks.

Clint Marshall
Ground Water Quality Bureau
Clint_Marshall@nmenv.state.nm.us
505-827-0027

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George Schuman

From: George Schuman [george_schuman@nmenv.state.nm.us]
Sent: Friday, August 13, 2004 3:39 PM
To: Charles Lundstrom
Subject: FW: WIPP Briefing

Charles, FYI.

-----Original Message-----
From: Clint Marshall [mailto:Clint_Marshall@nmenv.state.nm.us]
Sent: Friday, August 13, 2004 3:15 PM
To: George Schuman
Cc: Mary Ann Menetrey
Subject: RE: WIPP Briefing

Here is the information:
1. The nearest protectable water (found so far) is approximately 0.5 miles from the WIPP sewage lagoons and about 1.2 miles from the salt piles.
2. I am working on the report now and will get a copy to Charles once I finish.

-----Original Message-----
From: George Schuman [mailto:george_schuman@nmenv.state.nm.us]
Sent: Friday, August 13, 2004 1:23 PM
To: Clint Marshall
Cc: Mary Ann Menetrey
Subject: RE: WIPP Briefing

Clint:

Charles informed Mary Ann and I that Ron is interested in re-opening the permit, but Charles will get with Ron later today to see if this is still how Ron wants to proceed. Charles had two requests:
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Sent: Friday, August 13, 2004 11:43 AM
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Clint Marshall
Ground Water Quality Bureau
Clint_Marshall@nmenv.state.nm.us
505-827-0027

George Schuman

From: Clint Marshall [Clint_Marshall@nmenv.state.nm.us]
Sent: Thursday, August 12, 2004 5:02 PM
To: George Schuman
Cc: Mary Ann Menetrey

George,

Here is the latest information concerning the discharge permit, DP-831 for WIPP.

The discharge permit is currently active. It was renewed on April 23, 2003, and then later modified on December 22, 2003. The permit modification includes an extensive stormwater catchment system to contol subsurface seepage that has occurred onsite. This system includes capping the old salt stockpile and constructing a new salt storage facility.

The current activity on DP-831 includes several wastestreams. WIPP continues to discharge up to 23,000 gallons per day (gpm) of domestic effluent to a series of synthetically lined lagoons for evaporation. The actual domestic discharge is much less than this. Non-hazardous seepage and condensate water collected from the facility's exhaust shaft and exhaust fans is discharged to a synthetically lined pond (H-19) for evaporation. WIPP is also in the process of constructing stormwater control features onsite to eliminate seepage of stormwater into the subsurface. They are currently placing a cap on the existing salt pile that has been used since the facility began. They are also in the process of constructing a new salt storage facility that began receiving salt in May of this year. Synthetically lined stormwater storage ponds have been constructed for both the new and existing salt pile facilities. New and and existing stormwater basins are also being constructed and lined at several locations around the facility.

WIPP was intending to submit a permit modification (12/22/03) request to allow the facility to convert part of its domestic wastewater lagoon system to a brine storage facility. They have since decided not to pursue this change, therefore they will not be sending the letter. However, I have been informed they may change their mind in the future. The only other correspondence we have received from WIPP since the permit modification, was for a minor spill that occurred when a sewage line was accidentally severed. NMED approved the corrective action for the spill on June 9, 2004. I conducted a full-day inspection of WIPP on August 11. WIPP will be submitting additional technical information in the next few months based on findings during the inspection.

Let me know if you need addtional information.

Clint Marshall
Ground Water Quality Bureau
Clint_Marshall@nmenv.state.nm.us
505-827-0027

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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

AUG 0 5
AUG 0 5 2003

JUL 3 0 2003

Ms. Marcy Leavitt, Chief
Groundwater Quality Bureau
New Mexico Environmental Department
P.O. Box 26110
Santa Fe, NM 87505

Subject: Completed Public Notice Requirements

Dear Ms. Leavitt:

In response to your letter dated June 13, 2003, WIPP has completed your requested Public Notice requirements for the Discharge Plan 831 (DP–831) modification application as required under discharge permit public notice requirements of 20.6.2.3108.A.1 NMAC.

On June 24, 2003 the public notices (copies enclosed) were published in the Carlsbad Current Argus newspaper in Section A and Hobbs-News Sun in Local 2. A sign of a synopsis of the public notice, in English and Spanish, was placed at the entrance of the WIPP facility. A photograph of the poster and an affidavit of sign posting are enclosed with this letter. The sign was in place for a period of 30 days as of July 24, 2003.

If you have any questions regarding these actions, please contact Mr. David Emery at (505) 234-7475.

Sincerely,

Inés Triay

Dr. Inés R. Triay
Manager

Enclosure

cc: w/enclosure
H. Johnson, CBFO
D. Emery, CBFO
D. Bignell, WRES
R. Salness, WRES
CBFO M&RC

CBFO:OEC:DE:IW:03-2076:UFC:5486

AFFIDAVIT OF SIGN POSTING, DP- *831*

AUG 0 5 2003

I certify, under penalty of law, that I fulfilled the ground water Discharge Permit public notice requirements of 20.6.2.3108.A.1 NMAC. I prominently posted a synopsis of the public notice (prepared by NMED), in English and in Spanish, at a conspicuous public location, approved by NMED, at or near the proposed facility for 30 days. I am aware that there are significant penalties for false certification including the possibility of fines. I have included a payment of $15.00 for the poster (If public notice option 1 or 2 was selected).

David D. Emery

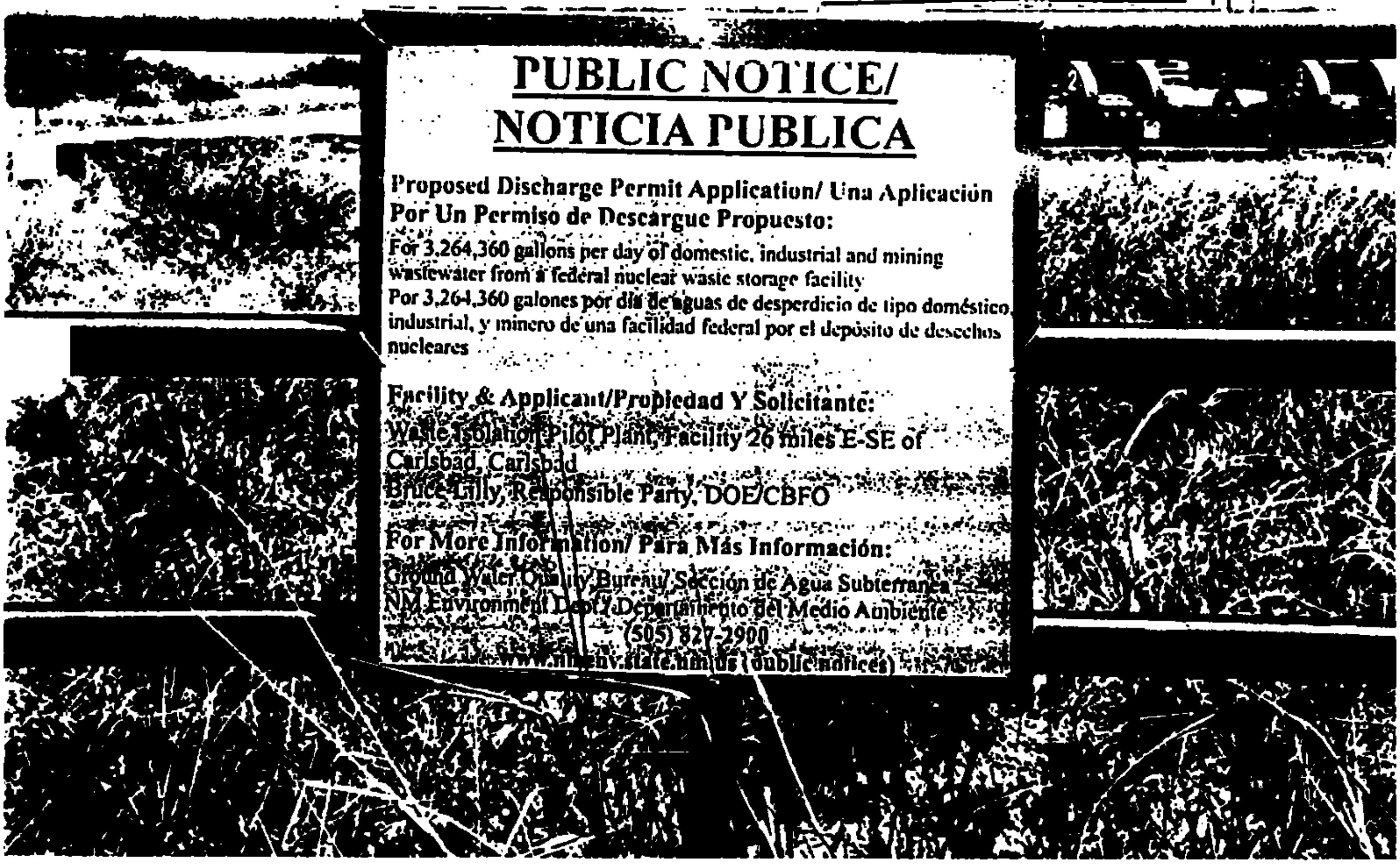
Signature of Applicant

July 24, 2003

Date

cm

AUG 0 5 200


PUBLIC NOTICE/
NOTICIA PUBLICA
Proposed Discharge Permit Application/ Una Aplicación Por Un Permiso de Descargue Propuesto:
For 3,264,360 gallons per day of domestic, industrial and mining wastewater from a federal nuclear waste storage facility
Por 3,264,360 galones por día de aguas de desperdicio de tipo doméstico, industrial, y minero de una facilidad federal por el depósito de desechos nucleares
Facility & Applicant/Propiedad Y Solicitante:
Waste Isolation Pilot Plant, Facility 26 miles E-SE of Carlsbad, Carlsbad
Bruce Lilly, Responsible Party, DOE/CBFO
For More Information/ Para Más Información:
Ground Water Quality Bureau/ Sección de Agua Subterranea
NM Environment Dept / Departamento del Medio Ambiente
(505) 827-2900

AUG 0 5 2003

Public Notice

DP-831
U. S. Department of Energy Waste Isolation Pilot Plant

DP-831, the U.S. Department of Energy's Waste Isolation Pilot Plant, proposes to modify its discharge permit to discharge up to 3,264,360 gallons per day of domestic and industrial wastewater and storm water runoff from mined rock salt tailings at its federal facility for disposing of defense generated transuranic radioactive waste.

Potential contaminants from this type of discharge include dissolved solids, chloride and nitrogen compounds. The groundwater most likely to be affected is at a depth of nearly 608 feet and has a total dissolved solids concentration of approximately 3920 milligrams per liter. The facility is located 26 miles southeast of Carlsbad, New Mexico, Section 20, T22S, R31E, in Eddy County.

Information in this public notice was provided by the applicant and will be verified by the New Mexico Environment Department (NMED) during the permit application review process. The NMED will accept comments and statements of interest regarding the application and create a facility-specific mailing list for persons who wish to receive future notices regarding this application. Comments and statements of interest should be sent to:

Clinton Marshall
DP-831
Ground Water Quality Bureau
P.O. Box 26110
Santa Fe, NM 87502

For additional information concerning this application, please call (505) 827-2900.

Applicant:
U.S. Department of Energy
Responsible Person: Mr. Bruce Lilly
U.S. Department of Energy Carlsbad Field Office
P. O. Box 3090
Carlsbad, NM 88221

AUG 0 5 2003

Public Notice

DP-831

U. S. Department of Energy Waste isolation Pilot Plant

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Information in this public notice was provided by the applicant and will be verified by the New Mexico Environment Department (NMED) during the permit application review process. The NMED will accept comments and statements of interest regarding the application and create a facility-specific mailing list for persons who wish to receive future notices regarding this application. Comments and statements of interest should be sent to:

Clinton Marshall
DP-831
Ground Water Quality Bureau
P.O. Box 26110 Santa Fe, NM 87502
For additional information conceming this application, please call (505) 827-2900.

Applicant:
U.S. Department of Energy
Responsible Person: Mr. Bruce Lilly
U.S. Department of Energy Carlsbad Field Office
P. O. Box 3090, Carlsbad, NM 88221

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2900
Fax (505) 827-2965

BILL RICHARDSON
Governor

RON CURRY
Secretary
DERRITH WATCHMAN-MOORE
Deputy Secretary

U.S. Postal Service
CERTIFIED MAIL
(Domestic Mail Only; No In
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Postage $
Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
Total Postage & Fees $
Sent To
Inez Triay, Manage
U.S. Dept. of Energy
Waste Isolation Pl
P.O. Box 3090
7001 2510 0001 2013 4382

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

April 29, 2003

Inez Triay, Manager
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Discharge Permit Renewal, DP-831, Waste Isolation Pilot Plant

Dear Dr. Triay:

Pursuant to Water Quality Control Commission (WQCC) Regulation 20.6.2.3109 NMAC, the application for discharge permit renewal for DP-831, submitted by Inez Triay for the discharge of 33,000 gallons per day of sewage effluent, non-hazardous brine water and neutralized acid waste from the Waste Isolation Pilot Plant (WIPP) is hereby approved, subject to the conditions listed below. The facility is located approximately 26 miles east of Carlsbad in Sections 28 and 29, T22S, R31E, Eddy County. In approving this discharge plan, the New Mexico Environment Department (NMED) has determined that the requirements of Section 20.6.2.3109.C NMAC have been met.

The approved WIPP treatment and disposal system is briefly described as follows:

Up to 23,000 gallons per day of sewage effluent is discharged to a series of seven synthetically lined ponds for treatment and evaporation (facultative lagoon system). Up to 2,000 gallons per day of non-hazardous brine water is discharged to a synthetically lined evaporation cell (north evaporation cell). Up to 8,000 gallons per day of non-hazardous brine water generated from mine dewatering activities, pumping of groundwater wells, and from other non-hazardous sources is discharged to a synthetically lined evaporation pond (H-19 evaporation pond). Up to 100 gallons per year of neutralized acid waste will also be discharged to the facultative lagoon system. Ground water below the site is at a depth of approximately 608 feet and has a total dissolved solids concentration of approximately 3,920 milligrams per liter.

The approved discharge plan renewal consists of the materials submitted by the U.S. Department of Energy (DOE) dated June 5, 2002. In addition, the discharge plan includes information and materials submitted as part of the original discharge plan approved on January 16, 1992, the materials for discharge plan amendment, dated August 28, 1995, the materials for discharge plan renewal and modification dated July 3, 1997, and the materials for discharge plan amendments dated June 12, 1998 and January 24, 2000. The discharge shall be managed in accordance with the approved plan and is subject to the conditions listed below.

However, renewal of this discharge plan does not relieve you of your responsibility to comply with any conditions or requirements of the previously approved discharge plan, DP-831, and the New Mexico Water Quality Act, WQCC Regulations, any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

CONDITIONS FOR APPROVAL

Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to modify permit requirements in the event NMED determines that the requirements of the WQCC Regulations are being violated or may be violated, or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under the discharge permit for WIPP are not protective of ground water quality, and that more stringent requirements to protect and/or remediate ground water quality may be required by NMED. These requirements may include lining or relining lagoons, changing waste storage or land application management practices, expanding monitoring requirements and/or implementing remediation systems.

This discharge plan renewal is subject to the following conditions for the following reasons:

OPERATIONS

General:

1. The permittee is authorized to discharge up to 23,000 gallons per day of sewage effluent to a series of seven synthetically lined lagoons for treatment and evaporation.

2. The permittee is authorized to discharge up to 2,000 gallons per day of non-hazardous brine water to the synthetically lined north evaporation cell.

3. The permittee is authorized to discharge up to 8,000 gallons per day of non-hazardous brine water generated from mine dewatering activities, pumping of groundwater wells, and from other non-hazardous sources to the synthetically lined H-19 evaporation pond.

4. The permittee is authorized to discharge up to 100 gallons per year of neutralized acid waste to the synthetically lined facultative lagoon system.

The reason for Conditions 1, 2, 3 and 4 is to comply with Secion 20.6.2.3104 NMAC by permitting a discharge consistent with the terms and conditions of the approved discharge plan.

Lagoon Operation and Maintenance:

5. The permittee shall properly operate and maintain all lagoons covered by this permit. The permittee shall maintain the capacity of the lagoons to store and evaporate the maximum daily discharge volume allowed by this discharge permit while maintaining two feet of freeboard at all times. In the event that a minimum of two feet of freeboard can not be maintained at all times, the permittee shall submit a corrective action plan to manage discharge volumes to the NMED for approval.

6. The permittee shall measure the thickness of the sludge blanket in each lagoon every five years. When sludge accumulation exceeds 1/3 of the total depth of any lagoon, the permittee shall remove the sludge in a manner, which is protective of the lagoon liner. Removed sludge shall be contained, transported, and disposed in accordance with all local, state, and federal (e.g., 40 CFR Part 503) regulations.

   The reason for this Conditions 5 and 6 is to comply with Section 20.6.2.3109 NMAC by preventing contaminated wastewater from moving directly or indirectly into ground water.

7. The permittee shall perform visual inspection of the lagoons and surrounding berms on a monthly basis. The water surface of the lagoons shall be kept free of floating plants and debris. Berms surrounding the lagoons shall be kept free of all "deep-rooted" plants. Berms shall be inspected for signs of wind or water erosion. In the event berms show signs of erosion, the permittee shall submit to the NMED for approval a plan for protection of the berms from erosion which may include the emplacement of rip rap or other methods for armoring the berms

   The reason for this condition is to comply with Sections 20.6.2.3107 and 20.6.2.3109 NMAC by properly maintaining and monitoring the condition of the effluent treatment and evaporation lagoons.

MONITORING AND REPORTING

8. The permittee shall measure the volume of effluent discharged to the facultative lagoon system using a totalizing flow meter or assume the discharge is equal to the total domestic water usage. Volumes of other permit-authorized discharges to the facultative lagoon system shall be calculated by a time/volume method or volumetric measurement of the transport container. Monthly meter readings, the units of measurement, monthly discharge volumes and other volumetric calculations for the previous 6-month period shall be submitted to NMED semi-annually in the monitoring reports due by January 31 and July 31 of each year.

The reason for this condition is to comply with Sections 20.6.2.3107 and 20.6.2.3109 NMAC by adequately measuring the quantity of effluent discharged.

9. The permittee shall sample and analyze semi-annually the influent to the lagoon system for nitrate-nitrogen (NO_3-N), total Kjeldahl nitrogen (TKN), total dissolved solids (TDS), plutonium 238, 239 and 240, americium 241, uranium 234, 235 and 238, and strontium 90. The permittee shall sample and analyze semi-annually the north evaporation pond (Pond B), the south evaporation pond (Pond C), and the H-19 evaporation pond for total dissolved solids (TDS), plutonium 238, 239 and 240, americium 241, uranium 234, 235 and 238, and strontium 90. Reports of the analyses shall be submitted to NMED by January 31 and July 31 of each year.

   The reason for this condition is to comply with Section 20.6.2.3107 NMAC by providing adequate monitoring of effluent quality.

10. The permittee shall notify NMED of the volume and origin of all wastewater to be discharged that is derived from miscellaneous non-hazardous sources. NMED may require more comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed.

    The reason for this condition is to comply with Sections 20.6.2.3106 and 20.6.2.3107 NMAC by monitoring and reporting the quality of effluent discharged.

CONTINGENCY

11. The permittee shall implement the contingency plan, dated December 16, 1996 in the event of a failure of the wastewater treatment and disposal system. The plan includes daily inspection and repair of pond liners as necessary, containment and investigation of all spills and releases, and submittal of a remediation plan to address contamination.

    The reason for this condition is to comply with Sections 20.6.2.1203 and 20.6.2.3107.A.10 NMAC by providing a contingency plan to address potential impacts to ground water quality.

CLOSURE

12. The permittee shall implement the closure plan, dated December 16, 1996 when the facility is decommissioned. The plan includes the pumping or evaporation of all wastewater ponds, removal of all solids, and recontouring and revegetation of the site. In addition, the permittee shall remove or perforate all lagoon liners upon closure of the site.

    The reason for this condition is to comply with Section 20.6.2.3107.A.11 NMAC by providing a closure plan to address potential impacts to ground water after the facility is closed.

GENERAL DISCHARGE PLAN REQUIREMENTS

In addition to any other requirements provided by law, approval of discharge plan, DP-831, is subject to the following general requirements:

Monitoring and Reporting

Monitoring and reporting shall be as specified in the discharge plan and supplements thereto. These requirements are summarized on the attached sheet(s). Any inadvertent omissions from this summary of a discharge plan monitoring or reporting requirement shall not relieve you of responsibility for compliance with that requirement.

Record Keeping

1. The discharger shall maintain at the facility, a written record of ground water and wastewater quality analyses.The following information shall be recorded and shall be made available to the NMED upon request.

   a. The dates, exact place and times of sampling or field measurements.

   b. The name and job title of the individuals who performed the sampling or measurements.

   c. The dates the analyses were performed.

   d. The name and job title of the individuals who performed the analyses.

   e. The analytical techniques or methods used.

   f. The results of such analyses, and

   g. The results of any split sampling, spikes or repeat sampling.

2. The discharger shall maintain a written record of any spills, seeps, and/or leaks of effluent, leachate and/or process fluids not authorized by this discharge permit.

3. The discharger shall maintain a written record of the operation, maintenance and repair of facilities/equipment used to treat, store and/or dispose of wastewater; to measure flow rates; and/or to monitor water quality. This will include repairs, replacement or calibration of any monitoring equipment and repairs or replacement of any equipment used in WIPP's waste or wastewater treatment and disposal system.

4. The discharger shall maintain a written record of the amount of wastewater discharged.

Inspection and Entry

In accordance with Sections 74-6-9.B & E NMSA 1978 and WQCC Regulation Section

20.6.2.3107.D NMAC, the discharger shall allow the Secretary or his authorized representative, upon the presentation of credentials, to:

1. Enter at regular business hours or at other reasonable times upon the discharger's premises or where records must be kept under the conditions of this discharge plan.

2. Inspect and copy, during regular business hours or at other reasonable times, any records required to be kept under the conditions of the discharge plan.

3. Inspect, at regular business hours or at other reasonable times, any facility, equipment (including monitoring and control equipment), practices or operations regulated or required under this discharge plan.

4. Sample or monitor, at reasonable times for the purpose of assuring discharge plan compliance or as otherwise authorized by the New Mexico Water Quality Act, any effluent at any location before or after discharge.

Duty to Provide Information

In accordance with Section 74-6-9.B NMSA 1978 and Section 20.6.2.3107.D NMAC, the discharger shall furnish to the NMED, within a reasonable time, any relevant information which it may request to determine whether cause exists for modifying, terminating and/or renewing this discharge plan or to determine compliance with this plan. The discharger shall furnish to the NMED, upon request, copies of records required to be kept by this discharge plan.

Spills, Leaks and Other Unauthorized Discharges

This approval authorizes only those discharges specified in the discharge plan. Any unauthorized discharges violate Section 20.6.2.3104 NMAC, and must be reported to the NMED and remediated as required by Section 20.6.2.1203 NMAC. This requirement applies to all seeps, spills, and/or leaks discovered from the pipelines, disposal ponds, and treatment and evaporation ponds.

Retention of Records

The discharger shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by this discharge plan, and records of all data used to complete the application for this discharge plan, for a period of at least five years from the date of the sample collection, measurement, report or application. This period may be extended by request of the Secretary at any time.

Enforcement

Failure to grant the Secretary or his authorized representative access to the records required to be kept by this discharge permit or to allow an inspection of the discharge facilities or to the collection of samples is a violation of this discharge permit and the WQCC Regulations. Such violations as well as other violations of the discharge permit, may subject the discharger to a compliance order, a compliance order assessing a civil penalty or an action in district court pursuant to Section 74-6-10 NMSA 1978, and/or modification or termination of this discharge permit pursuant to Section 74-6-5.L NMSA 1978. Penalties assessed as part of a compliance order shall not exceed $15,000 per day for violations of the terms of this permit or the requirements of Section 74-6-5 NMSA 1978, and shall not exceed $10,000 per day for violations of other sections of the Water Quality Act.

Modifications and/or Amendments

The discharger shall notify NMED, pursuant to Section 20.6.2.3107.C NMAC, of any modifications or additions to the WIPP's wastewater disposal system, including any increase in wastewater flow rate or wastewater storage and disposal management changes to the system as approved under this discharge plan. The discharger shall obtain NMED's approval, as a discharge permit modification, prior to any increase in the quantity or concentration of constituents in the leachate above those approved in this permit. Please note that Section 20.6.2.3109.E and F NMAC provide for possible future amendment of the permit.

Other Requirements

Please be advised that the approval of this plan does not relieve the U.S. Department of Energy of liability should your operation result in actual pollution of surface or ground water which may be actionable under other laws and/or regulations.

RIGHT TO APPEAL

If the U.S. Department of Energy is dissatisfied with this action taken by NMED, the U.S. Department of Energy may file a petition for hearing before the WQCC. This petition shall be in writing to the Water Quality Control Commission within thirty (30) days of the receipt of this letter. Unless a timely request for hearing is made, the decision of the NMED shall be final.

TRANSFER OF DISCHARGE PLAN

Pursuant to Section 20.6.2.3111 NMAC, prior to any transfer of ownership, the discharger shall provide the transferee a copy of the discharge permit, including a copy of this approval letter and shall document such to the NMED.

PERIOD OF APPROVAL

Pursuant to Section 20.6.2.3109.G.4 NMAC, this discharge permit approval is for a period of 5 years. This approval will expire **April 29, 2008**, and you must submit an application for renewal at least 180 days before that date.

Sincerely,

Marcy Leavitt, Chief
Ground Water Quality Bureau

ML:CLM/clm

Enclosures: Discharge Plan Summary
Monitoring Summary

xc: Carl Stubbs, Acting District Manager, NMED District 4
NMED Hobbs Field Office

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

APR 14 2003

APR 10 2003

Mr. Clint Marshall
Ground Water Pollution Prevention Section
Ground Water Quality Bureau
Harold Runnels Building
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Draft Discharge Plan Renewal, DP-831, Waste Isolation Pilot Plant (WIPP)

Dear Mr. Marshall:

Thank you for the opportunity to review and comment on the *Draft Discharge Permit Renewal, DP-831*. In accordance with your letter dated February 11, 2003, we have reviewed the *Draft Discharge Permit Renewal* for accuracy and completeness. The permittee submits the following comments for your consideration:

1. The description of the facultative lagoon system (Page 1, Paragraph 2) describes the treatment and evaporation system as consisting of 5 synthetically lined ponds for treatment and evaporation.

   The system consists of seven ponds (two settling ponds, two finishing ponds and three evaporation ponds). See the enclosed diagram of the Facultative Lagoon System and the January 3, 1992 Discharge Plan Application.

2. The *Draft Discharge Permit Renewal* (Page 1, Paragraph 2) states, "Up to 100 gallons per <u>day</u> of neutralized acid waste will also be discharged to the H-19 evaporation pond." The section titled Operations, General: Item 4, reiterates the same authorization for 100 gallons per <u>day</u> of neutralized acid waste to be discharged to the <u>H-19 evaporation pond</u>.

   The permittee requests authorization to continue to discharge the neutralized acid waste stream to the facultative lagoon system, not H-19 as identified in the June 5, 2002 Discharge Permit Renewal Application. Previous discharge plans have authorized the discharge of 100 gallons per <u>year</u> of neutralized acid to the facultative lagoon system. Currently less than 100 gallons per <u>year</u> of neutralized acid are discharged and the volume is not expected to increase in the foreseeable future.

3. The section of the *Draft Discharge Permit Renewal* titled Operations, General: Item 1, (Page 2) states: "The permittee is authorized to discharge up to 33,000 gallons per day of sewage effluent to a series of five synthetically lined lagoons for treatment and evaporation." The Draft Discharge Plan Application Page 1,

CBFO:OEC:CAZ:VW:03-0375:UFC:5487

Paragraph 2, states the approved WIPP treatment and disposal system is approved for 23,000 gallons per day of sewage effluent to the facultative lagoon system. The June 5, 2002 Discharge Plan Renewal Application described the discharge as only 23,000 gallons per day of sewage effluent to the facultative lagoon system. The Discharge Plan Renewal should authorize 23,000 gallons per day of sewage effluent to seven lagoons.

4. The section entitled Monitoring and Reporting, Item 8 (page 3), states: "The permittees shall measure the monthly volume of effluent discharged to the facultative lagoon system using a totalizing flow meter. The flow meter shall be kept operational at all times.

   The June 5, 2002 Discharge Plan DP-831 Renewal Application states, "Sewage effluent discharges to the facultative lagoon system are measured through the wastewater flow meter or are assumed to equal the total domestic water usage. Volumes of other permit-authorized discharges to the facultative lagoon system/evaporation facility are calculated by a time/volume method or volumetric measurement of the transport container."

   The permittee respectfully requests to continue to have the option to use the volume of the facilities total water use as a back-up to the effluent flow meter as described in the June 5, 2002 Discharge Renewal Application. Previous discharge plans have permitted the use of the total domestic water volume to monitor the flow into the facultative lagoon system. The domestic water use volume is measured with a totalizing flow meter and there are no other sources of water discharged from the facility, except as authorized by DP-831. The total domestic water use volume is a reasonable approximation of the water discharged to the facultative lagoon system, at all times a conservative value, and complies with 20.6.2.3107 and 20.6.2.3109 NMAC.

5. The section titled Monitoring and Reporting, Item 9, states, "the permittees shall sample and analyze semi-annually the final stage domestic lagoon for NO_3-N, TKN ...[other analytes]."

   We believe Item 9 should require that the permittee sample and analyze the influent to the lagoon as described in the June 5, 2002 Discharge Plan Renewal Application and illustrated in the enclosed figure of the facultative lagoon system.

6. Monitoring and Reporting, Item 9, states "the permittee shall sample and analyze semi-annually the east evaporation pond (Pond-A), the north evaporation pond (Pond B), the south Evaporation Pond (Pond C) and the H-19 Evaporation Pond for total dissolved solids, ..."

The Discharge Plan Renewal Application dated June 5, 2002 proposed to monitor only Evaporation Pond B and Evaporation Pond C. Sampling Ponds B and C are consistent with the *Discharge Plan Amendment Approval* dated June 12, 1998. Wastewater contained in Evaporation Pond A flows into the North Evaporation Pond B and the South Evaporation Pond C. The permittee sees no added value to sampling Evaporation Pond A and requests that the final Discharge Plan Renewal only require monitoring the north Evaporation Pond (Pond B), south Evaporation Pond (Pond C), and the H-19 Evaporation Pond.

7. The Discharge Permit Summary, Facility Information, Legally Responsible Party identifies the contact as Sean White (505-234-7285). This should be changed to Mr. Bruce Lilly, (505) 234-8136 and Mr. David Reber (505) 234-8799.

Thank you for your consideration of the comments and requests discussed above. If you have any questions or need additional information, please contact Mr. David Emery at (505) 234-7475.

Sincerely,

Inés Triay

Dr. Inés R. Triay, Manager
Carlsbad Field Office

FOR

Dr. Steven Warren, President
Washington TRU Solutions, LLC

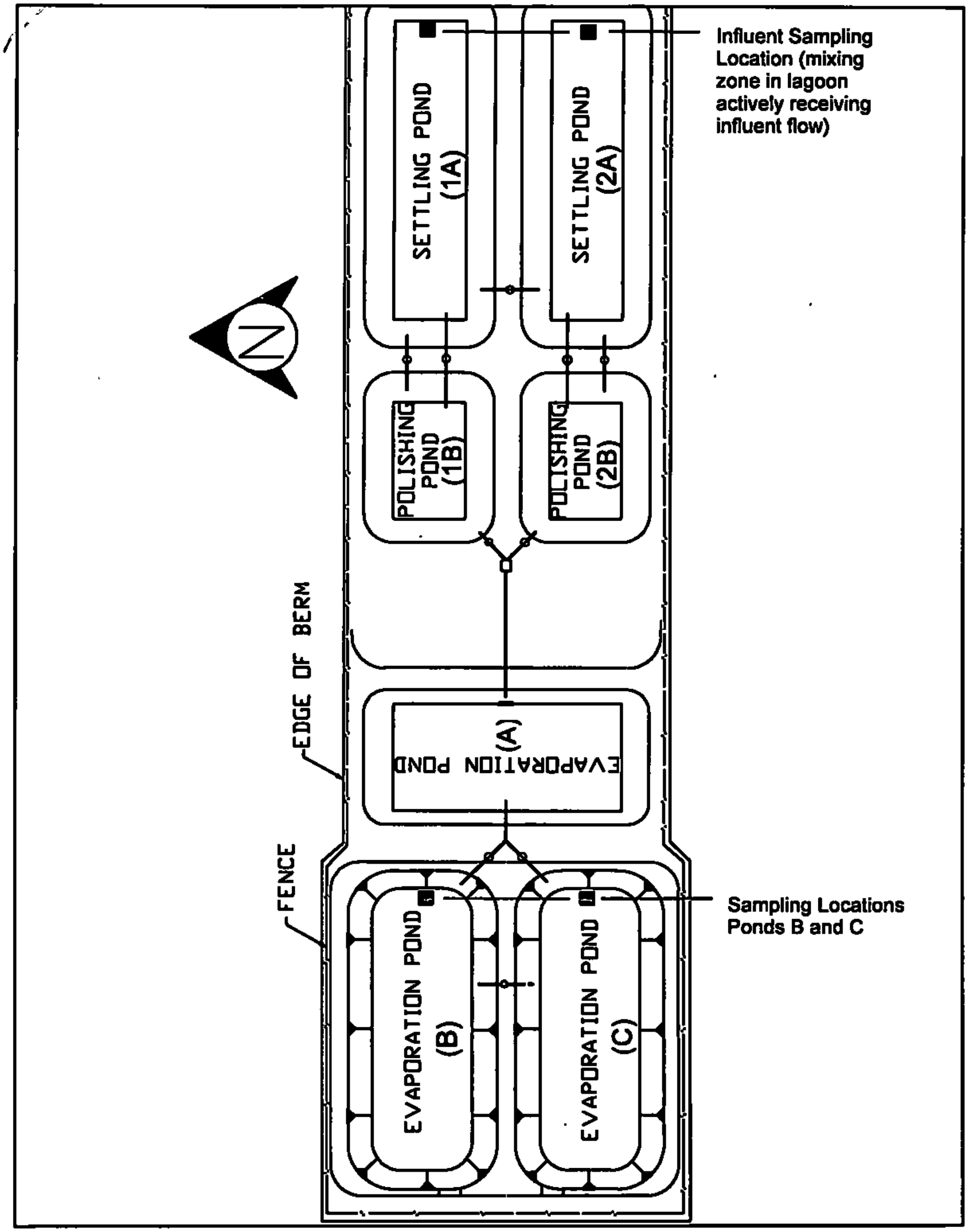
Enclosure

cc: w/enclosure
J. Gilbert, CBFO
C. Zvonar, CBFO
D. Emery, CBFO
H. Johnson, CBFO
D. Reber, WTS
CBFO M&RC

CBFO:OEC:CAZ:VW:03-0375:UFC:5487

APR 1 4 2003

WASTE ISOLATION PILOT PLANT FACULTATIVE LAGOON SYSTEM



State of New Mexico
E RONMENT DEPARTMEN
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2918
Fax (505) 827-2965

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Inez Triay, Manager
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, NM 88221

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

April 7, 2003

Inez Triay, Manager
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221

RE: Conceptual Design for Discharge Permit Modification, DP-831
Waste Isolation Pilot Plant (WIPP)

Dear Dr. Triay:

On April 1, 2003, Dave Emery and E.B. Nuckols with the Department of Energy (DOE), Dale Bignell with Washington, and I. Keith Gordon with Gordon Environmental, Inc. met with the New Mexico Environment Department (NMED) to discuss proposed plans for the modification of the discharge permit for the Waste Isolation Pilot Plant (WIPP), DP-831.

The existing discharge permit covers domestic wastewater and minor industrial discharges at the facility, and is currently in the process of being renewed. The proposed modification of DP-831 will expand permit coverage to include discharges associated with the salt pile and storm water impoundments at the site.

The preliminary plans presented at the meeting include a draft conceptual design for infiltration controls at the WIPP. The conceptual design, dated March 31, 2003, includes the following:

1. construction of two new synthetically lined cells to receive salt tailings from underground excavation,
2. construction of an evaporation basin to contain seepage and storm water runoff from the new salt storage cells,
3. capping of the existing salt piles with synthetic membranes, geotextiles, and a soil cover,
4. synthetically lining the existing salt pile evaporation pond, and
5. reconstructing and synthetically lining two stormwater retention basins on the south side of the facility (Evaporation Basins A and B).

NMED concurs with the proposed actions in the conceptual design as part of the permit modification for DP-831. NMED also understands that more detailed plans and specifications will be developed as the project moves forward.

If you have any questions, please contact me at (505) 827-0027 or Mary Ann Menetrey, Program Manager of the Mining Environmental Compliance Section at (505) 827-2944.

Sincerely,

Clint Marshall, Hydrogeologist
Mining Environmental Compliance Section
Ground Water Quality Bureau

xc: Carl Stubbs, Acting District Manager, NMED District IV

Memorandum of Meeting or Phone Conversation

☐ Telephone ☒ Meeting	**Time:** 9:00 AM	**Date:** April 1, 2003

Individuals Involved

Dave Emery & E.B. Nuckols, DOE	☐ called	Clint Marshall, GWQB
Dale Bignell, Washington	☐ returned call to	Steve Zappe, HRMB
I. Keith Gordon, Gordon Environmental	☐ teleconference	
	☐ other:	

Subject: Preliminary Plans for DP Modification of WIPP

Discussion:

WIPPpresentatives met with NMED to present conceptual designs for the modification of the discharge plan for the WIPP site. The plans included the following:

1. construction of two new synthetically lined cells to receive salt tailings from underground excavation,
2. construction of an evaporation basin to contain seepage and storm water runoff from the new salt storage cells,
3. capping of the existing salt piles with synthetic membranes, geotextiles, and a soil cover,
4. synthetically lining the existing salt pile evaporation pond, and
5. constructing and synthetically lining two stormwater retention basins on the south side of the facility (Evaporation Basins A and B).

The overall objective of these measures is to eliminate all seepage into the subsurface at the site. WIPP was informed that a monitoring plan needed to be submitted as part of the application for modification. A water balance study is presently being conducted and a report will be submitted to NMED. WIPP expects to have the modification to NMED by April 29, 2003. Comment on the existing draft DP renewal will be submitted by April 15, 2003.

NMED will submit a letter to WIPP giving preliminary approval of the plans presented at this meeting.

Conclusions:

Distribution:

Initialed

CBFO Approach for Discharge Permit DP-831 Modification Application

April 1, 2003

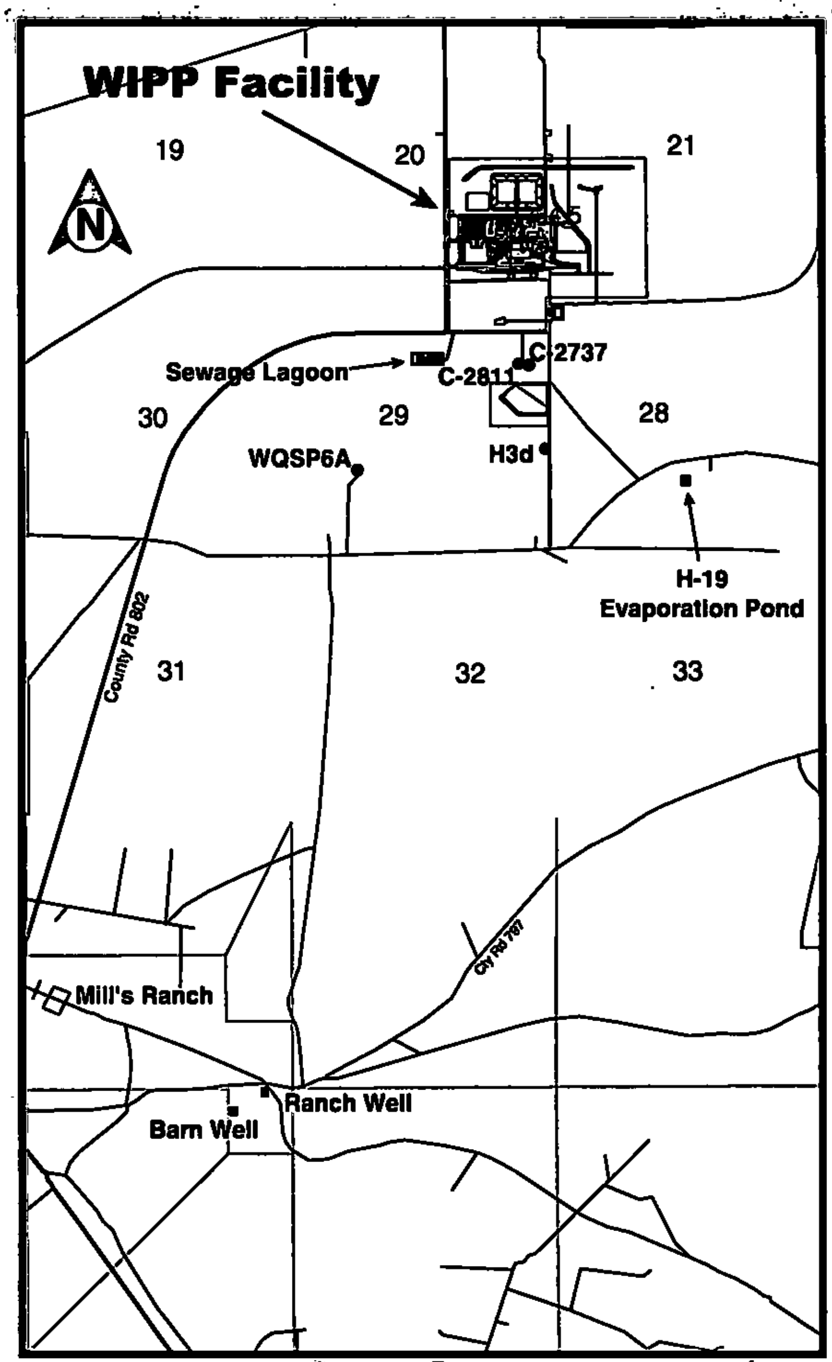
David Emery *DOE*

Dr. E. B. Nuckols *DOE*

Dale Bignell *WTS*

Keith Gordon *CTAC*

General Location



Progress Since October 2002

Accomplishments

- Draft Water Budget Analysis
- Field geophysics
- Source control strategy

TDS & Water Infiltration Controls

Source Control Actions

- Assessment
  - Total Dissolved Solids (TDS)
  - Water infiltration

Planned Activities

Planned Activities

- Salt Storage Area
- Salt Pile Evaporation Pond
- Evaporation Basin A (Detention Basin A)
- Evaporation Basin B (Pond 1 / Pond 2)
- Submission of Permit Application

Solutions

Expected Results

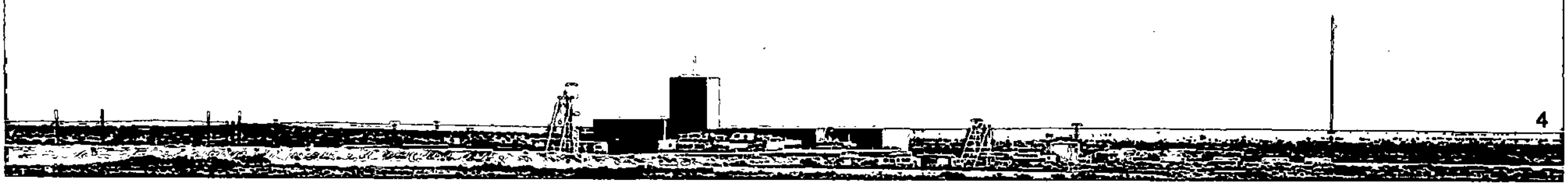
- Source control
- Migration Control

Implementation

Implementation Priorities

Accomplishments

- Draft "Water Budget Analysis of Shallow Subsurface Water"
- Initiated geophysical field work (time domain electro magnetic technique) in early February 2003 to delineate lateral and vertical extent of shallow subsurface water lens
- Developed comprehensive strategy to control TDS and water migration into subsurface



Source Control Actions

Assessment

Location	Estimated Seepage Volume*
■ Salt Storage Area	90% TDS - 37% water
■ Salt Pile Evaporation Pond	10% TDS - 26% water
■ Detention Basin A	0% TDS - 28% water
■ Pond 1/Pond 2	0% TDS - 9% water
■ Total	100% 100%

** Using MODFLOW simulation*

Planned Activities

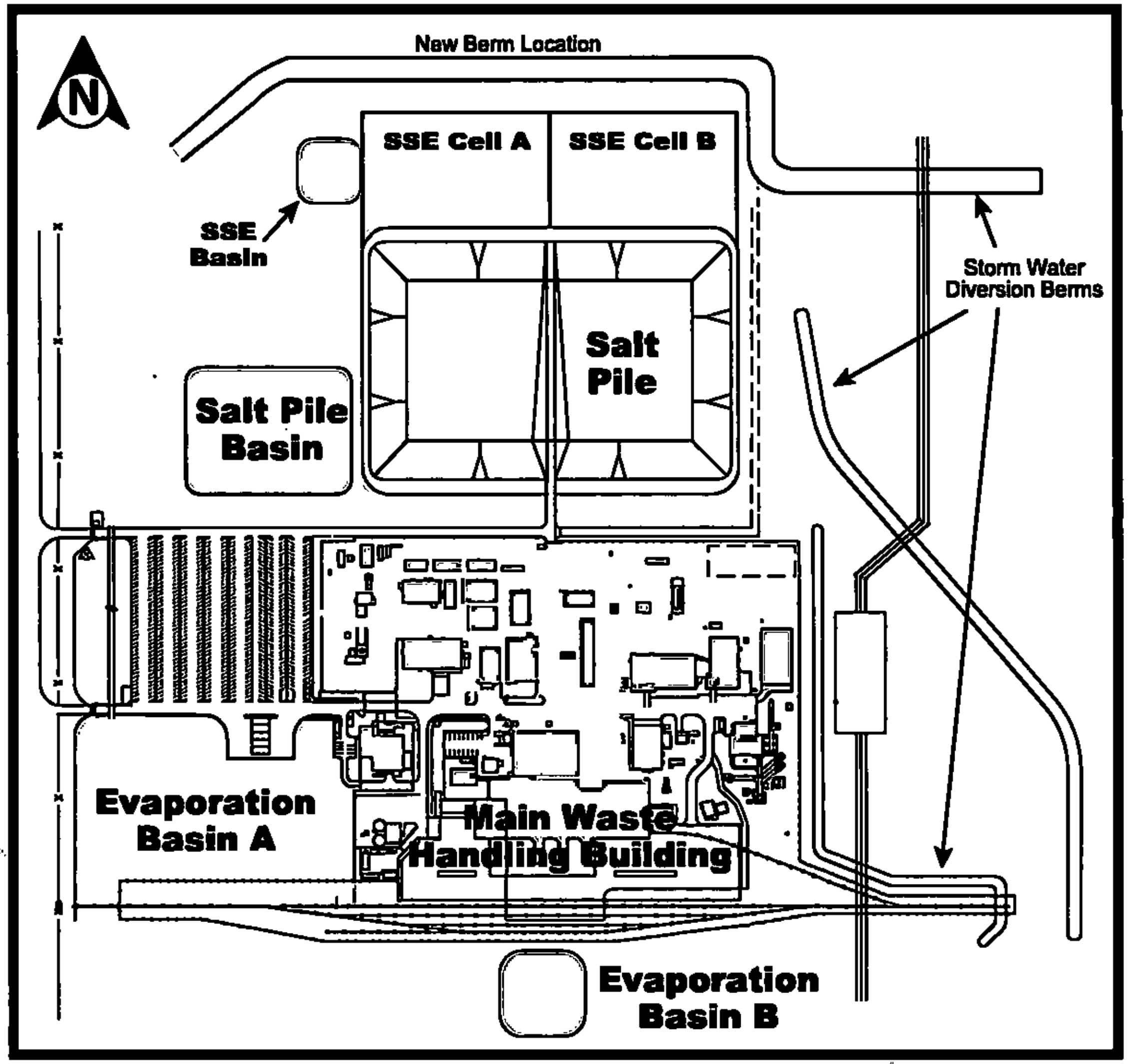
TDS Control

- Salt Pile Cap
- Cell A
- Cell B
- Salt Storage Extension Basin (SSE)

Infiltration Control

- Salt Pile Basin
- Evaporation Basin A
- Evaporation Basin B

DP Application



Expected Results

- Elimination of solute and water infiltration

- Drastic reduction in driving hydraulic head

Implementation Priorities

Permit Application Submittal	Priority 1
TDS Control	
■ Cell A	Priority 2
■ SSE Basin	Priority 3
■ Salt Pile Cap	Priority 4
■ Cell B	Priority 8
Infiltration Control	
■ Salt Pile Basin	Priority 5
■ Evaporation Basin A	Priority 6
■ Evaporation Basin B	Priority 7

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 1 7 2003

Mr. Clint Marshall
Ground Water Pollution Prevention Section
Ground Water Quality Bureau
Environment Department
State of New Mexico
1190 Saint Francis Drive
Santa Fe, NM 87502

RECEIVED
MAR 1 9 2003

RE: Draft Discharge Plan Renewal DP-831, Waste Isolation Pilot Plant (WIPP)

Dear Mr. Marshall:

In Accordance with discussions and decisions made this date, WIPP will submit comments on the Draft Discharge Permit Renewal, DP-831 on April 15, 2003. We will be prepared to present and discuss several issues relating to this renewal along with our new application at 9:00am Tuesday, April 1, 2003. In attendance from WIPP will be Dr. E.B. Nuckols, Dale Bignell, and David Emery, along with Consultant, Keith Gordon.

We appreciate your consideration.

Sincerely,

David D. Emery
Site Environment Compliance Manager

cc:
H. Johnson, CBFO
D. Emery, CBFO
CBFO M&RC

CBFO:OEC:DDE:IW:03-0357:UFC:5487

New Mexico Environmental Department
Ground Water Quality Bureau

Acknowledgement of Receipt

Acknowledgement of Receipt of Check/Cash

I hereby acknowledge receipt of Check No. # 96822 Dated. 3-11-03
or cash, received in the amount of $ 2300.00 from Westinghouse TRU Solutions
for Waste Isolation Pilot Plant (Facility Name) DP-831 (DP No.) 318 (AI ID)

For Central File Activity ______

Submitted to ASD by: ______ Date: ______

Received in ASD by: ______ Date: ______

Filing Fee [ ] New Facility [ ] Renewal [X]

Modification [ ] Other [ ] (Explain) ______

Organization Code ______ Application FY ______

To be Deposited in the Ground Water Section Discharge Plan Fees.

Full Payment [ ] or Annual Increment [ ]

Westinghouse TRU Solutions, LLC
Waste Isolation Pilot Plant Project
P.O. Box 2078
Carlsbad, NM 88221

Under U.S. Department of Energy Contract

The Carlsbad National Bank
P.O. Box 1359
Carlsbad, N M 88220

95-179/1122

03/11/03

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Ground Water Quality Bureau
PO Box 26110
Sante Fe, NM 87502-6110

***********************2,300.00

Authorized Signature

DP-831

⑈096822⑈ ⑆112201797⑆ 51225⑈

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TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
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2.	MAR 1 4 2003	
3.		
4.		
5.		

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Barbara Smith CBFO	Phone No. 7321

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Westinghouse TRU Solutions, LLC
Waste Isolation Pilot Plant Project, P.O. Box 207[illegible] Carlsbad, NM 88221

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DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

National TRU Program
PO Box 3090
Carlsbad, NM 88221

FACSIMILE TRANSMITTAL ROUTING SHEET
FAX NUMBER (505) 234-7061

DATE: March 17, 2003

Pages (including cover sheet): 2

To: MR. Clint Marshall **From:** CBFO - David Emery

Location:

Phone: **Phone:** 505-234- 7475

Fax: 505-827-2965 **Fax:** 505-234-7061

☐ Urgent ☐ FYI ☐ For Review ☐ Please Comment ☐ Please Reply

♦ **Remarks:**

If you have any problems with this fax, please call Veronica @ (505) 234-7138.

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 17 2003

Mr. Clint Marshall
Ground Water Pollution Prevention Section
Ground Water Quality Bureau
Environment Department
State of New Mexico
1190 Saint Francis Drive
Santa Fe, NM 87502

RE: Draft Discharge Plan Renewal DP-831, Waste Isolation Pilot Plant (WIPP)

Dear Mr. Marshall:

In Accordance with discussions and decisions made this date, WIPP will submit comments on the Draft Discharge Permit Renewal, DP-831 on April 15, 2003. We will be prepared to present and discuss several issues relating to this renewal along with our new application at 9:00am Tuesday, April 1, 2003. In attendance from WIPP will be Dr. E.B. Nuckols, Dale Bignell, and David Emery, along with Consultant, Keith Gordon.

We appreciate your consideration.

Sincerely,

David D. Emery
Site Environment Compliance Manager

cc:
H. Johnson, CBFO
D. Emery, CBFO
CBFO M&RC

CBFO:OEC:DDE:IW:03-0357:UFC:5487

client.

§ of New Mexico Environment Department

Ground Water Bureau
1190 St. Francis Drive
Santa Fe, NM 87505

Telephone:(505) 827-2905 Fax: (505) 827-2965

INVOICE

Primary Billing Party:
US Dept of Energy-Carlsbad Area Office
PO Box 3090
Carlsbad, NM 88221
DP-831-R

Agency Interest:
318 - Waste Isolation Pilot Plant ATTN: Inez Triay
28 miles SE of Carlsbad
Carlsbad, NM 88221

INVOICE ID: 851

INVOICE DATE: 02/11/2003
INVOICE DUE DATE: 03/13/2003

ASSESSMENTS
Ground Water. PRD20020002. 341 - Discharge Fee. $2,300.00
DP-831

INVOICED AMOUNT $2,300.00

BALANCE DUE $2,300.00

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Primary Billing Party:
US Dept of Energy-Carlsbad Area Office
PO Box 3090
Carlsbad, NM 88221
DP-831-Attn: Inez Triay

Agency Interest:
318 - Waste Isolation Pilot Plant
28 miles SE of Carlsbad
Carlsbad, NM 88221

INVOICE ID: 851
Invoice Amount: $2,300.00

INVOICE DUE DATE: 03/13/2003
Amount Enclosed ____________________

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Mail payments to:
NMED Federal Tax ID#: 85-6000565

New Mexico Environment Department
Ground Water Quality Bureau
PO Box 26110
Santa Fe, NM 87502-6110
Telephone: (505) 827-2905 **Fax:** (505) 827-2965

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

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Governor

RON CURRY
Secretary

DERRITH WATCHMAN-MOORE
Deputy Secretary

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Inez Triay, Manager
US Dept. of Energy
Waste Isolation Pilot Plan
PO Box 3090
Carlsbad, New Mexico 8

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

February 11, 2003

Inez Triay, Manager
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Draft Discharge Plan Renewal, DP-831, Waste Isolation Pilot Plant (WI

Dear Ms. Triay:

Please review the enclosed draft permit for Discharge Plan Renewal, DP-831, Waste Isolation Pilot Plant (WIPP). The conditions in the draft permit should be reviewed for accuracy and completeness. Please pay special attention to Condition 7, because it differs significantly from your proposed discharge plan application. Any comments, questions, or concerns should be directed towards Clint Marshall of the New Mexico Environment Department (NMED), Ground Water Quality Bureau (GWQB) at (505) 827-0027 before **March 15, 2003**. If no comments are received by this date, the NMED GWQB will issue a signed permit with conditions as written in the enclosed draft.

Sincerely,

Clint Marshall

Clint Marshall
Ground Water Pollution Prevention Section
Ground Water Quality Bureau

Enclosures: Draft Discharge Permit Renewal

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2900
Fax (505) 827-2965

BILL RICHARDSON
Governor

RON CURRY
Secretary
DERRITH WATCHMAN-MOORE
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

[Approval Date]

Inez Triay, Manager
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Discharge Permit Renewal, DP-831, Waste Isolation Pilot Plant

Dear Ms. Triay:

Pursuant to Water Quality Control Commission (WQCC) Regulation 20.6.2.3109 NMAC, the application for discharge permit renewal for DP-831, submitted by Inez Triay for the discharge of 33,000 gallons per day of sewage effluent, non-hazardous brine water and neutralized acid waste from the Waste Isolation Pilot Plant (WIPP) is hereby approved, subject to the conditions listed below. The facility is located approximately 26 miles east of Carlsbad in Sections 28 and 29, T22S, R31E, Eddy County. In approving this discharge plan, the New Mexico Environment Department (NMED) has determined that the requirements of Section 20.6.2.3109.C NMAC have been met.

The approved WIPP treatment and disposal system is briefly described as follows:

Up to 23,000 gallons per day of sewage effluent is discharged to a series of 5 synthetically lined ponds for treatment and evaporation (facultative lagoon system). Up to 2,000 gallons per day of non-hazardous brine water is discharged to a synthetically lined evaporation cell (north evaporation cell). Up to 8,000 gallons per day of non-hazardous brine water generated from mine dewatering activities, pumping of groundwater wells, and from other non-hazardous sources is discharged to a synthetically lined evaporation pond (H-19 evaporation pond). Up to 100 gallons per day of neutralized acid waste will also be discharged to the H-19 lined evaporation pond. Ground water below the site is at a depth of approximately 608 feet and has a total dissolved solids concentration of approximately 3,920 milligrams per liter.

The approved discharge plan renewal consists of the materials submitted by the U.S. Department of Energy (DOE) dated June 5, 2002. In addition, the discharge plan includes information and materials submitted as part of the original discharge plan approved on January 16, 1992, the materials for discharge plan amendment, dated August 28, 1995, the materials for discharge plan renewal and modification dated July 3, 1997, and the materials for discharge plan amendments dated June 12, 1998 and January 24, 2000. The discharge shall be managed in accordance with the approved plan and is subject to the conditions listed below.

However, renewal of this discharge plan does not relieve you of your responsibility to comply with any conditions or requirements of the previously approved discharge plan, DP-831, and the New Mexico Water Quality Act, WQCC Regulations, any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

CONDITIONS FOR APPROVAL

Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to modify permit requirements in the event NMED determines that the requirements of the WQCC Regulations are being violated or may be violated, or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under the discharge permit for WIPP are not protective of ground water quality, and that more stringent requirements to protect and/or remediate ground water quality may be required by NMED. These requirements may include lining or relining lagoons, changing waste storage or land application management practices, expanding monitoring requirements and/or implementing remediation systems.

This discharge plan renewal is subject to the following conditions for the following reasons:

OPERATIONS

General:

1. The permittee is authorized to discharge up to 33,000 gallons per day of sewage effluent to a series of five synthetically lined lagoons for treatment and evaporation.

2. The permittee is authorized to discharge up to 2,000 gallons per day of non-hazardous brine water to the synthetically lined north evaporation cell.

3. The permittee is authorized to discharge up to 8,000 gallons per day of non-hazardous brine water generated from mine dewatering activities, pumping of groundwater wells, and from other non-hazardous sources to the synthetically lined H-19 evaporation pond.

4. The permittee is authorized to discharge up to 100 gallons per day of neutralized acid waste to the synthetically lined H-19 evaporation pond.

The reason for Conditions 1, 2, 3 and 4 is to comply with Secion 20.6.2.3104 NMAC by permitting a discharge consistent with the terms and conditions of the approved discharge plan.

Lagoon Operation and Maintenance:

5. The permittee shall properly operate and maintain all lagoons covered by this permit. The permittee shall maintain the capacity of the lagoons to store and evaporate the maximum daily discharge volume allowed by this discharge permit while maintaining two feet of freeboard at all times. In the event that a minimum of two feet of freeboard can not be maintained at all times, the permittee shall submit a corrective action plan to manage discharge volumes to the NMED for approval.

6. The permittee shall measure the thickness of the sludge blanket in each lagoon every five years. When sludge accumulation exceeds 1/3 of the total depth of any lagoon, the permittee shall remove the sludge in a manner, which is protective of the lagoon liner. Removed sludge shall be contained, transported, and disposed in accordance with all local, state, and federal (40 CFR Part 503) regulations.

The reason for this Conditions 5 and 6 is to comply with Section 20.6.2.3109 NMAC by preventing contaminated wastewater from moving directly or indirectly into ground water.

7. The permittee shall perform visual inspection of the lagoons and surrounding berms on a monthly basis. The water surface of the lagoons shall be kept free of floating plants and debris. Berms surrounding the lagoons shall be kept free of all "deep-rooted" plants. Berms shall be inspected for signs of wind or water erosion. In the event berms show signs of erosion, the permittee shall submit to the NMED for approval a plan for protection of the berms from erosion which may include the emplacement of rip rap or other methods for armoring the berms

The reason for this condition is to comply with Sections 20.6.2.3107 and 20.6.2.3109 NMAC by properly maintaining and monitoring the condition of the effluent treatment and evaporation lagoons.

MONITORING AND REPORTING

8. The permittee shall measure the monthly volume of effluent discharged to the facultative lagoon system using a totalizing flow meter. Monthly meter readings, the units of measurement, and monthly discharge volumes for the previous 6-month period shall be submitted to NMED semi-annually in the monitoring reports due by January 31 and July 31 of each year. The flow meter shall be kept operational at all times.

The reason for this condition is to comply with Sections 20.6.2.3107 and 20.6.2.3109 NMAC by adequately measuring the quantity of effluent discharged.

9. The permittee shall sample and analyze semi-annually the final-stage domestic lagoon for nitrate-nitrogen (NO_3-N), total Kjeldahl nitrogen (TKN), total dissolved solids (TDS), plutonium 238, 239 and 240, americium 241, uranium 234, 235 and 238, and strontium 90. The permittee shall sample and analyze semi-annually the east evaporation pond (Pond A), the north evaporation pond (Pond B), the south evaporation pond (Pond C), and the H-19 evaporation pond for total dissolved solids (TDS), plutonium 238, 239 and 240, americium 241, uranium 234, 235 and 238, and strontium 90. Reports of the analyses shall be submitted to NMED by January 31 and July 31 of each year.

   The reason for this condition is to comply with Section 20.6.2.3107 NMAC by providing adequate monitoring of effluent quality.

10. The permittee shall notify NMED of the volume and origin of all wastewater to be discharged that is derived from miscellaneous non-hazardous sources. NMED may require more comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed.

   The reason for this condition is to comply with Sections 20.6.2.3106 and 20.6.2.3107 NMAC by monitoring and reporting the quality of effluent discharged.

CONTINGENCY

11. The permittee shall implement the contingency plan, dated December 16, 1996 in the event of a failure of the wastewater treatment and disposal system. The plan includes daily inspection and repair of pond liners as necessary, containment and investigation of all spills and releases, and submittal of a remediation plan to address contamination.

   The reason for this condition is to comply with Sections 20.6.2.1203 and 20.6.2.3107.A.10 NMAC by providing a contingency plan to address potential impacts to ground water quality.

CLOSURE

12. The permittee shall implement the closure plan, dated December 16, 1996 when the facility is decommissioned. The plan includes the pumping or evaporation of all wastewater ponds, removal of all solids, and recontouring and revegetation of the site. In addition, the permittee shall remove or perforate all lagoon liners upon closure of the site.

   The reason for this condition is to comply with Section 20.6.2.3107.A.11 NMAC by providing a closure plan to address potential impacts to ground water after the facility is closed.

GENERAL DISCHARGE PLAN REQUIREMENTS

In addition to any other requirements provided by law, approval of discharge plan, DP-831, is subject to the following general requirements:

Monitoring and Reporting

Monitoring and reporting shall be as specified in the discharge plan and supplements thereto. These requirements are summarized on the attached sheet(s). Any inadvertent omissions from this summary of a discharge plan monitoring or reporting requirement shall not relieve you of responsibility for compliance with that requirement.

Record Keeping

1. The discharger shall maintain at the facility, a written record of ground water and wastewater quality analyses.The following information shall be recorded and shall be made available to the NMED upon request.

   a. The dates, exact place and times of sampling or field measurements.

   b. The name and job title of the individuals who performed the sampling or measurements.

   c. The dates the analyses were performed.

   d. The name and job title of the individuals who performed the analyses.

   e. The analytical techniques or methods used.

   f. The results of such analyses, and

   g. The results of any split sampling, spikes or repeat sampling.

2. The discharger shall maintain a written record of any spills, seeps, and/or leaks of effluent, leachate and/or process fluids not authorized by this discharge permit.

3. The discharger shall maintain a written record of the operation, maintenance and repair of facilities/equipment used to treat, store and/or dispose of wastewater; to measure flow rates; and/or to monitor water quality. This will include repairs, replacement or calibration of any monitoring equipment and repairs or replacement of any equipment used in WIPP's waste or wastewater treatment and disposal system.

4. The discharger shall maintain a written record of the amount of wastewater discharged.

Inspection and Entry

In accordance with Sections 74-6-9.B & E NMSA 1978 and WQCC Regulation Section 20.6.2.3107.D NMAC, the discharger shall allow the Secretary or his authorized representative, upon the presentation of credentials, to:

1. Enter at regular business hours or at other reasonable times upon the discharger's premises or where records must be kept under the conditions of this discharge plan.

2. Inspect and copy, during regular business hours or at other reasonable times, any records required to be kept under the conditions of the discharge plan.

3. Inspect, at regular business hours or at other reasonable times, any facility, equipment (including monitoring and control equipment), practices or operations regulated or required under this discharge plan.

4. Sample or monitor, at reasonable times for the purpose of assuring discharge plan compliance or as otherwise authorized by the New Mexico Water Quality Act, any effluent at any location before or after discharge.

Duty to Provide Information

In accordance with Section 74-6-9.B NMSA 1978 and Section 20.6.2.3107.D NMAC, the discharger shall furnish to the NMED, within a reasonable time, any relevant information which it may request to determine whether cause exists for modifying, terminating and/or renewing this discharge plan or to determine compliance with this plan. The discharger shall furnish to the NMED, upon request, copies of records required to be kept by this discharge plan.

Spills, Leaks and Other Unauthorized Discharges

This approval authorizes only those discharges specified in the discharge plan. Any unauthorized discharges violate Section 20.6.2.3104 NMAC, and must be reported to the NMED and remediated as required by Section 20.6.2.1203 NMAC. This requirement applies to all seeps, spills, and/or leaks discovered from the pipelines, disposal ponds, and treatment and evaporation ponds.

Retention of Records

The discharger shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by this discharge plan, and records of all data used to complete the application for this discharge plan, for a period of at least five years from the date of the sample collection, measurement, report or application. This period may be extended by request of the Secretary at any time.

Enforcement

Failure to grant the Secretary or his authorized representative access to the records required to be kept by this discharge permit or to allow an inspection of the discharge facilities or to the collection of samples is a violation of this discharge permit and the WQCC Regulations. Such violations as well as other violations of the discharge permit, may subject the discharger to a compliance order, a compliance order assessing a civil penalty or an action in district court pursuant to Section 74-6-10 NMSA 1978, and/or modification or termination of this discharge permit pursuant to Section 74-6-5.L NMSA 1978. Penalties assessed as part of a compliance order shall not exceed $15,000 per day for violations of the terms of this permit or the requirements of Section 74-6-5 NMSA 1978, and shall not exceed $10,000 per day for violations of other sections of the Water Quality Act.

Modifications and/or Amendments

The discharger shall notify NMED, pursuant to Section 20.6.2.3107.C NMAC, of any modifications or additions to the WIPP's wastewater disposal system, including any increase in wastewater flow rate or wastewater storage and disposal management changes to the system as approved under this discharge plan. The discharger shall obtain NMED's approval, as a discharge permit modification, prior to any increase in the quantity or concentration of constituents in the leachate above those approved in this permit. Please note that Section 20.6.2.3109.E and F NMAC provide for possible future amendment of the permit.

Other Requirements

Please be advised that the approval of this plan does not relieve the U.S. Department of Energy of liability should your operation result in actual pollution of surface or ground water which may be actionable under other laws and/or regulations.

RIGHT TO APPEAL

If the U.S. Department of Energy is dissatisfied with this action taken by NMED, the U.S. Department of Energy may file a petition for hearing before the WQCC. This petition shall be in writing to the Water Quality Control Commission within thirty (30) days of the receipt of this letter. Unless a timely request for hearing is made, the decision of the NMED shall be final.

TRANSFER OF DISCHARGE PLAN

Pursuant to Section 20.6.2.3111 NMAC, prior to any transfer of ownership, the discharger shall provide the transferee a copy of the discharge permit, including a copy of this approval letter and shall document such to the NMED.

PERIOD OF APPROVAL

Pursuant to Section 20.6.2.3109.G.4 NMAC, this discharge permit approval is for a period of 5 years. This approval will expire **[Approval Date]**, and you must submit an application for renewal at least 180 days before that date.

Sincerely,

Marcy Leavitt, Chief
Ground Water Quality Bureau

ML:CLM/clm

Enclosures: Discharge Plan Summary
Monitoring Summary

xc: Carl Stubbs, District Manager, NMED District 4
NMED Hobbs Field Office

draft

New Mexico Environment Department
Ground Water Pollution Prevention Section
Discharge Permit Summary

January 31, 2003

Facility Information

Facility Name	Waste Isolation Pilot Plant (WIPP)
Discharge Plan Number	DP-831
Legally Responsible Party	U.S. Department of Energy Inez Triay, Manager P.O. Box 3090 Carlsbad, New Mexico 88221-3090 505-234-7285 (contact: Shawn White)

Treatment, Disposal And Site Information

Primary Waste Type	Domestic/Industrial	
Treatment	Lagoons	Synthetic
Discharge	Evaporation	
Discharge Location	26 miles east of Carlsbad	
Depth To Ground Water	608 feet	
Total Dissolved Solids (TDS)	3920 mg/L	

Permit Information

Application Received	June 5, 2002
Public Notice Published	September 12, 2002
Discharge Plan Approved	**Approval Date**
Discharge Plan Expires	**Expiration Date**
Permitted Discharge Volume	33,000 gallons per day

Nmed Contact Information

Mailing Address	Ground Water Pollution Prevention Section P.O. Box 26110 Santa Fe, New Mexico 87502
GWPPS Telephone Number	505-827-2900
NMED GWQB Fax Number	505-827-2965
NMED Lead Staff	Clint Marshall
Lead Staff Telephone Number	505-827-0027
Lead Staff E-Mail	Clint_Marshall@nmenv.state.nm.us

Discharge Permit Monitoring Summary
WASTE ISOLATION PILOT PLANT, DP-831

Monitoring Report Due Dates

Monitoring Reports are due each year by

31-JAN, 31-JUL

Monitoring Requirements

The following summarizes the monitoring requirements for this facility:

Annual Sampling Frequency	Annual Reporting Frequency	Number of Sites	Sampling Description
12	2	1	Meter discharge volumes to facultative lagoon - measured monthly & reported semi-annually
2	2	1	NO3, TKN, TDS, Pu 238, 239 & 240; Am 241, U 234, 235 & 238; and Sr 90 in effluent to facultative lagoon
2	2	4	TDS; Pu 238, 239 & 240; Am 241, U 234, 235 & 238; and Sr 90 in effluent to Ponds A, B & C and H-19 Pond.
12		7	Monthly inspections of all lagoons.
As needed	As needed	As needed	Report volume and origin of miscellaneous non-hazardous waste to be discharged.

Submit all monitoring reports to the Ground Water Quality Bureau at the address on the Discharge Plan Summary Sheet

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2918
Fax (505) 827-2965

GARY E. JOHNSON
GOVERNOR

JOHN D'ANTONIO, JR.

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Name (Please Print Clearly) (To be c
Inez Triay, Manage
Street, Apt. No.; or PO Box No.
Waste Isolation Pi
P.O. Box 3090
Carlsbad, New Mexi

PS Form 3800, July 1999

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

December 31, 2002

Inez Triay, Manager
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221

RE: Proposed Source Control Activities and Site Investigation Work Plan, Waste Isolation Pilot Plant (WIPP), Mining Operations

Dear Dr. Triay:

This letter is in response to proposals in the October 30, 2002, Notice of Intent (NOI), which was submitted to the New Mexico Environment Department (NMED) in accordance with Section 6.2.1201 NMAC "Notice of Intent to Discharge" of the NM Water Quality Control Commission (WQCC) Regulations. In the NOI, Section 5 proposes source control activities to limit seepage from the salt pile (SP) and salt pile evaporation pond (SPEP). Section 6 of the NOI presents a site investigation work plan to gather information regarding a zone of shallow subsurface water (SSW) underlying the WIPP site.

NMED has reviewed your NOI with regard to the requirement to obtain a discharge permit and responded in a letter dated December 30, 2002. This letter is to address specific studies and activities proposed in your NOI. NMED hereby approves the proposed source control activities (Section 5) and site investigation work plan (Section 6) pending the following comments.

Section 5, Source Control Activities

1. Section 5.2 describes reshaping of the SP by placement and grading of salt. NMED agrees that this should be considered an interim step in source control and should be integrated with measures to cover the SP as described in Section 5.4.

2. Section 5.3 proposes to line the SPEP and SP run-off ditches with emulsified asphalt. Attachment 10 of the NOI provides a preliminary design for the liner including provisions for a double-lined sump with a leak detection system within the SPEP. NMED hereby approves the proposed liner system, however a schedule for inspection of cracks and other such failures must be included in the final operational plan.

3. Section 5.4 describes a proposal to cover the SP to reduce infiltration of water and solute into the subsurface. The preliminary design to be submitted to NMED should include a detailed plan that describes how the cover will be maintained while salt stockpiling operations continue.

Section 6. Site Investigation Work Plan

4. Attachment 11 of the NOI describes the proposed activities for a site investigation that focuses primarily on the nature and extent of the SSW that presently exists in the vicinity of the WIPP site. NMED agrees that the objective of the investigation is to determine the extent of the SSW and the potential for commingling with the deeper ground water located in the Dewey Lake Formation to the south of the site.

5. Section 2.5 discusses the current understanding of the subsurface hydrogeology and Figure 4 of the NOI shows a conceptual cross-section of the WIPP site. This section also states that the Santa Rosa Formation pinches out near the center of the WIPP site. Given the stratigraphic complexities in the area, NMED recommends that a subsurface geologic map be constructed at the unconformity that extends from the top of the Santa Rosa Formation along the base of the Gatuna Formation. This map should aid in understanding the relationship between the SSW and the extent of the Santa Rosa Formation. An isopach map of the Santa Rosa Formation may also be helpful.

6. Section 2.5.1 discusses the most recent water level and water quality data at the WIPP site. Please provide an updated potentiometric map reflecting the most recent water level measurements for the SSW. The most recent map NMED could find in the NOI was a map dated October 1998 in Attachment 5. Additionally, a more detailed analysis and discussion, as well as an updated TDS isoconcentration map would be helpful in explaining the high TDS concentrations in and around PZ-9 and PZ-3.

7. Section 2.5.2 discusses the natural ground water in wells south of the WIPP site. It is noted that the TDS concentrations in Barn Well are significantly lower than those in the Ranch Well. If possible, please provide an explanation for this difference.

As mentioned previously, NMED responded to the NOI in a letter dated December 30, 2002. In that letter, the WIPP facility is required to submit a discharge plan for discharges to ground water occurring from the SP and SPEP as well as other possible sources. The letter also indicates that you may choose between filing a new permit application or modifying your existing discharge permit, DP-831. The requested information and comments discussed above may be addressed in the discharge application. In addition, information provided in the NOI may be referenced in application.

If you have any questions, please contact Clint Marshall at (505) 827-0027 or Mary Ann Menetrey, Program Manager of the Mining Environmental Compliance Section at (505) 827-2944.

Sincerely,

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau

ML:CLM

cc: Pat Pattengale,District Manager, NMED District 4
DP Required File

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2918
Fax (505) 827-2965

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Name (Please Print Clearly) (To be co
Inez Triay, Manager
Waste Isolation Pi
Street, Apt. No.; or PO Box No.
P.O. Box 3090
Carlsbad, New Mexic

PS Form 3800, July 1999

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

December 30, 2002

Inez Triay, Manager
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221

RE: Discharge Plan Required the Waste Isolation Pilot Plant (WIPP), Mining Operations

Dear Dr. Triay:

This is in response to the October 30, 2002, Notice of Intent (NOI), which was submitted to the New Mexico Environment Department (NMED) in accordance with Section 6.2.1201 NMAC "Notice of Intent to Discharge" of the NM Water Quality Control Commission (WQCC) Regulations, copy enclosed.

The information you have provided and supplemental materials you have submitted have been reviewed by the NMED. You are hereby notified that a discharge plan, as defined in WQCC Reg. 6.2.1101.N, is required for the mining operations at the Waste Isolation Pilot Plant (WIPP) located east of Carlsbad in Eddy County.

The WIPP facility currently has a discharge permit in effect (DP-831) for the domestic sewage lagoons and miscellaneous discharges to the H-19 impoundment. The permitee may fulfill the permit requirements of this letter by submitting a separate application for a new discharge permit or a applying for a modification of the existing discharge permit, DP-831.

Enclosed are the necessary materials for the preparation of a discharge plan application. In addition, the filing of plans and specifications is required under WQCC Reg. 6.2.1202. Please mail <u>three</u> copies of your completed discharge plan and plans and specifications to the Program Manager, Ground Water Pollution Prevention Section, at the address listed above.

The application should include plans and specifications of facility operations not specifically provided for in previous submittals, including all buildings on the property, the location and size of all impoundments and tailing piles, and any other systems used for the treatment, storage and discharge of wastes and waste water. Information provided in the October 30, 2002, NOI may be included as part of the discharge plan application either by resubmitting the information or referencing the applicable portions of the NOI. Specifically, this applies to the plans and specifications for liners and the site investigation work plan.

Please submit the application to NMED within 120 days of the date of this letter. Pursuant to Section 20.6.2.3106.B of the WQCC Regulations, please include a request for temporary permission to discharge for additional 120 days. Temporary permission can only be granted for good cause shown by you and can only be for a nonrenewable period of up to 120 days.

Any appeal from this determination must be made to the New Mexico Water Quality Control Commission within 30 days, in accordance with WQCC Reg. 6.2.3112.B.

If you have any questions, please contact either Clint Marshall at (505) 827-0027 or Mary Ann Menetrey, Program Manager of the Mining Environmental Compliance Section at (505) 827-2944.

Sincerely,

Marcy Leavitt, Chief
Ground Water Quality Bureau

ML:CLM

Enclosures: WQCC Regulations
Discharge Plan Application

cc: Pat Pattengale,District Manager, NMED Dist. 4
DP Required File

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
November 8, 2002

RECEIVED
NOV 1 2 2002

Mr. William Fetner
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Subject: Notice of Intent, Waste Isolation Pilot Plant, Carlsbad, New Mexico

Dear Mr. Fetner:

Enclosed, in response to your telephone request of November 4, 2002 is a spreadsheet listing the latitudes and longitudes of the wells indicated on the maps we previously sent to you on October 10, 2002. We have divided the spreadsheet into two sections, one lists the shallow wells and piezometers currently in place that provided information about the shallow subsurface water that is the subject of our recent NOI. The other section gives the location of the deeper wells that are indicated on the maps. As noted on the spreadsheet, we do not know the exact location of the Barn and Ranch wells that are indicated on the maps we sent you.

If you have any questions regarding the enclosed information please contact me at (505) 234-7349.

Sincerely,

Harold Johnson

Harold Johnson
NEPA Compliance Officer

Enclosure

cc: with Enclosure
C. Marshall, NMED
P. Ritzma, NMED
D. Bignell, WTS
CBFO M&RC

CBFO:ORC:HJ:KJB:02-1331:UFC:5486

Latitude and Longitude of Wells and Piezometers
(North American Datum, NAD, 1983)

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NOV 1 2 2002

SSW WELLS AND PIEZOMETERS

Well or Piezometer	Latitude (Degrees, Minutes, Seconds)	Longitude (Degrees, Minutes, Seconds)
C-2505	32 22 17.59558 N	103 47 30.18274 W
C-2506	32 22 17.72272 N	103 47 29.83217 W
C-2507	32 22 15.64593 N	103 47 30.14765 W
C-2811	32 21 56.12806 N	103 47 36.33804 W
PZ-1	32 22 20.46067 N	103 47 31.39010 W
PZ-2	32 22 19.88681 N	103 47 29.10805 W
PZ-3	32 22 22.95867 N	103 47 30.06931 W
PZ-4	32 22 19.36211 N	103 47 31.36163 W
PZ-5	32 22 22.98747 N	103 47 32.16805 W
PZ-6	32 22 21.39587 N	103 47 34.85940 W
PZ-7	32 22 25.61309 N	103 47 44.48951 W
PZ-8	32 22 17.09605 N	103 47 19.88957 W
PZ-9	32 22 27.44620 N	103 47 26.55613 W
PZ-10	32 22 16.22843 N	103 47 43.70520 W
PZ-11	32 22 31.12518 N	103 47 49.15641 W
PZ-12	32 22 13.50618 N	103 47 36.55017 W

OTHER WELLS

Well	Latitude (Degrees, Minutes, Seconds)	Longitude (Degrees, Minutes, Seconds)
AEC-8	32 24 38.45821 N	103 45 02.58411 W
DOE-1	32 21 20.19513 N	103 46 34.13873 W
DOE-2	32 24 02.59079 N	103 47 30.17795 W
P-14	32 22 16.50174 N	103 50 27.55541 W
P-15	32 20 30.82217 N	103 49 29.96930 W
P-17	32 19 48.32954 N	103 47 24.24861 W
P-18	32 21 20.29508 N	103 44 33.09387 W
D-268	32 20 36.00081 N	103 50 43.43861 W
H-1	32 22 05.02705 N	103 47 41.56741 W
H-15	32 22 10.46174 N	103 46 29.17250 W
H-16	32 22 22.20441 N	103 47 43.43680 W
H-17	32 19 49.20684 N	103 46 15.68801 W
H-18	32 22 54.04810 N	103 48 25.34803 W
ERDA-9	32 22 13.84858 N	103 47 31.00951 W
EXHAUST SHAFT	32 22 17.80333 N	103 47 30.16984 W
CABIN BABY	32 20 07.47717 N	103 47 51.78240 W
WIPP-19	32 22 41.00450 N	103 47 29.07604 W

Latitude and Longitude of Wells and Piezometers
(North American Datum, NAD, 1983)

WIPP-22	32	22	36.38324	N	103	47	29.10346	W
WIPP-21	32	22	25.55711	N	103	47	29.09773	W

OTHER WELLS (Continued)

Well	Latitude (Degrees, Minute, Seconds)				Longitude (Degrees, Minute, Seconds)			
WIPP-18	32	22	53.89886	N	103	47	29.08115	W
WIPP-12	32	23	05.11437	N	103	47	29.88924	W
WIPP-13	32	23	28.99712	N	103	48	10.40459	W
H-14	32	21	22.71150	N	103	48	23.61231	W
H-5A	32	23	44.58191	N	103	45	27.68982	W
H-5B	32	23	45.40596	N	103	45	28.27946	W
H-5C	32	23	45.44016	N	103	45	27.10123	W
H-6A	32	23	53.23940	N	103	49	29.02960	W
H-6B	32	23	54.10796	N	103	49	28.46489	W
H-6C	32	23	53.26438	N	103	49	27.86307	W
H-4A	32	20	16.05525	N	103	48	21.92145	W
H-4B	32	20	21.91775	N	103	48	22.90176	W
H-4C	32	20	22.43808	N	103	48	21.90797	W
H-3B1	32	21	39.73445	N	103	47	30.32555	W
H-3B2	32	21	40.09540	N	103	47	31.41936	W
H-3B3	32	21	39.10508	N	103	47	31.25034	W
H-3D	32	21	39.54779	N	103	47	30.64145	W
H-2A	32	22	04.36893	N	103	48	10.75613	W
H-2B1	32	22	04.67751	N	103	48	11.18576	W
H-2B2	32	22	04.62656	N	103	48	10.83625	W
H-2C	32	22	05.25905	N	103	48	10.63436	W
H-11B1	32	20	41.84414	N	103	46	29.23614	W
H-11B2	32	20	41.10166	N	103	46	29.17073	W
H-11B3	32	20	41.75152	N	103	46	28.43237	W
H-11B4	32	20	41.88136	N	103	46	30.93783	W
WQSP-1	32	23	02.52076	N	103	48	13.95206	W
WQSP-2	32	23	19.67025	N	103	47	27.36538	W
WQSP-3	32	23	04.21021	N	103	46	52.54100	W
WQSP-4	32	21	35.07670	N	103	46	52.26356	W
WQSP-5	32	21	22.18035	N	103	47	32.92447	W
WQSP-6	32	21	35.05877	N	103	48	13.47952	W
WQSP-6A	32	21	35.32919	N	103	48	14.24744	W
C-2737	32	21	56.22168	N	103	47	35.08990	W
BARN WELL	latitude unknown				longitude unknown			
RANCH WELL	latitude unknown				longitude unknown			

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

RECEIVED

30 OCT 2002

Mr. Clint Marshall
Ground Water Quality Bureau
State of New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87505

Subject: Notice of Intent, Waste Isolation Pilot Plant, Carlsbad, New Mexico

Dear Mr. Marshall:

In accordance with our meeting on October 4th, find enclosed two copies of a Notice of Intent (NOI) with the information we discussed. This NOI is being submitted to update the information included in the Waste Isolation Pilot Plant's (WIPP's) April 1983 NOI that covered the Salt Pile and Salt Pile Evaporation Pond.

The enclosed NOI describes a lens of shallow subsurface water existing under the WIPP surface facilities and provides a brief description of the current understanding of the shallow geology at the site. Enclosed to the NOI are copies of various reports produced from 1997 to 2002 that describe the hydrogeological conditions of the shallow subsurface at WIPP. The NOI also describes several activities that WIPP proposes to undertake to control infiltration of water, and to investigate the lens of shallow subsurface water.

As described in the enclosed NOI, WIPP proposes to do the following:

- Modify Salt Pile operations and cover the pile to improve drainage to the Salt Pile Evaporation Pond and minimize water infiltration through the pile;
- Line the Salt Pile Evaporation Pond and Salt Pile run-off ditches with a synthetic liner system;
- Pursue options for alternative management of salt;
- Perform a water budget study; and,
- Determine the rate, extent, and fate of the lens of shallow subsurface water;

If you have any questions regarding the enclosed NOI, please contact me at (505) 234-7349.

Sincerely,

Harold Johnson

Harold Johnson
NEPA Compliance Officer

Enclosure

CBFO:ORC:CAZ:VW:02-1317:UFC:5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

RECEIVED
OCT 15 2002

10 OCT 2002

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87505

Subject: Shallow Subsurface Water at WIPP

Dear Mr. Marshall:

At our meeting Friday, October 4th, you requested that we provide copies of the two large maps that were reviewed during the meeting. While we left the maps used at the meeting, with you, one map had an error in it. Enclosed are copies of the maps that contain the corrected information. We are also sending Will Fetner copies of these maps to ensure that the Hazardous Waste Bureau also has them, as he requested.

As we discussed during the meeting, WIPP will submit a Notice of Intent to the Groundwater Quality Bureau by October 31, 2002. In the meantime, if you have any questions regarding this matter or the enclosed maps, please call me at (505) 234-7349 or Mr. Dale Bignell at (505) 234-7545.

Sincerely,

Harold Johnson

Harold Johnson
NEPA Compliance Manager

Enclosures

cc: w/enclosures
W. Fetner, NMED
CBFO Mailroom

cc: w/o enclosures
D. Bignell, WTS

CBFO:ORC:HJ:VW:02-1308:UFC:5400

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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

30 OCT 2002

Mr. Clint Marshall
Ground Water Quality Bureau
State of New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87505

Subject: Notice of Intent, Waste Isolation Pilot Plant, Carlsbad, New Mexico

Dear Mr. Marshall:

separate bound report

In accordance with our meeting on October 4th, find enclosed two copies of a Notice of Intent (NOI) with the information we discussed. This NOI is being submitted to update the information included in the Waste Isolation Pilot Plant's (WIPP's) April 1983 NOI that covered the Salt Pile and Salt Pile Evaporation Pond.

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- Pursue options for alternative management of salt;
- Perform a water budget study; and,
- Determine the rate, extent, and fate of the lens of shallow subsurface water;

If you have any questions regarding the enclosed NOI, please contact me at (505) 234-7349.

Sincerely,

Harold Johnson

Harold Johnson
NEPA Compliance Officer

Enclosure

CBFO:ORC:CAZ:VW:02-1317:UFC:5486

Sequence of NOIs and NMED Determinations Regarding Discharges to Salt Pile Evaporation Pond

Provided by WIPP

Date	Document
1) April 1983	NOI for Construction Phase of WIPP (including Salt Pile and Salt Pile Evaporation Pond)
2) May 16, 1983	Letter from EID to WIPP determining that no Discharge Plan needed
3) August 26, 1985	NOI for temporary discharge of construction water from WS to Salt Pile Evaporation Pond
4) December 29, 1987	NOI for temporary discharge of drill cuttings and brine from construction of the AIS to the Salt Pile Evaporation Pond
5) August 22, 1991	Letter from WIPP to NMED requesting an emergency permit to discharge brine to the Salt Pile Evaporation Pond
6) September 18, 1991	Letter from NMED granting temporary permission for disposal of brine into the Salt Pile Evaporation Pond
7) November 14, 1991	Discharge Plan Application for sewage lagoons and temporary discharge of brine waters from mine de-watering and monitoring wells to the Salt Pile Evaporation Pond until the sewage lagoon expansion is completed - note this DPA resulted in issuance of DP-831.
8) January 16, 1992	Discharge Plan DP-831, issued by NMED
9) September 16, 1993	Letter from NMED to WIPP granting a 60-day extension for continued temporary discharge of brine water into the salt pile evaporation pond

Memorandum of Meeting or Phone Conversation

☐ Telephone ☒ Meeting	Time: 1:30 PM	Date: 10-4-02

Individuals Involved

WIPP: Harold Johnson, Sean White, Dennis Powers, Dale Bignell, Larry Coons

☐ called — Clint Marshall

☐ returned call to

☐ teleconference

☐ other:

Subject: Discovery of Discharge from Salt Pile to Shallow Groundwater

Discussion:

A presentation was made by WIPP staff (see attached) to NMED staff describing the cause for seepage of shallow groundwater into the exhaust shaft at the facility. The operator believes the discharge is coming from runoff from the salt pile located on the north side of the facility. As a corrective action at this time, WIPP plans to line the salt pile evaporation pond and associated ditches to cut off the source of seepage into groundwater. WIPP plans to submit an update NOI to NMED by the end of October 2002.

Conclusions:

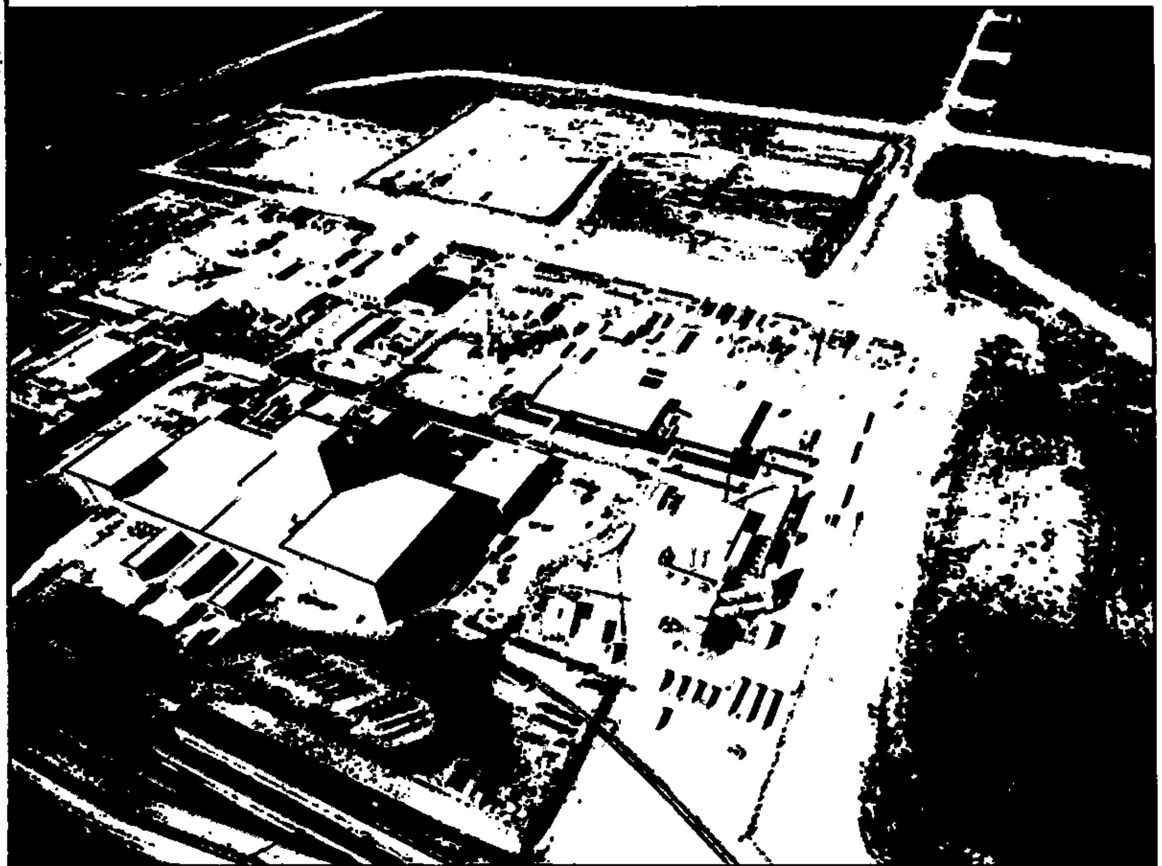
Distribution:

Initialed

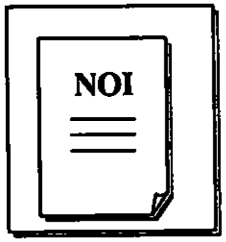
Shallow Subsurface Water at WIPP

Harold Johnson, DOE
Dale Bignell, WTS
Larry Coons, CTAC
Dennis Powers, WTS
Sean White, WTS

October 4, 2002



Purpose

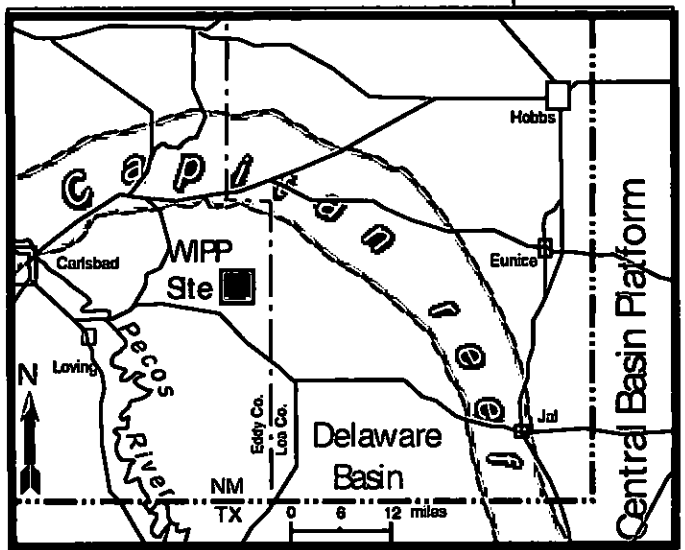


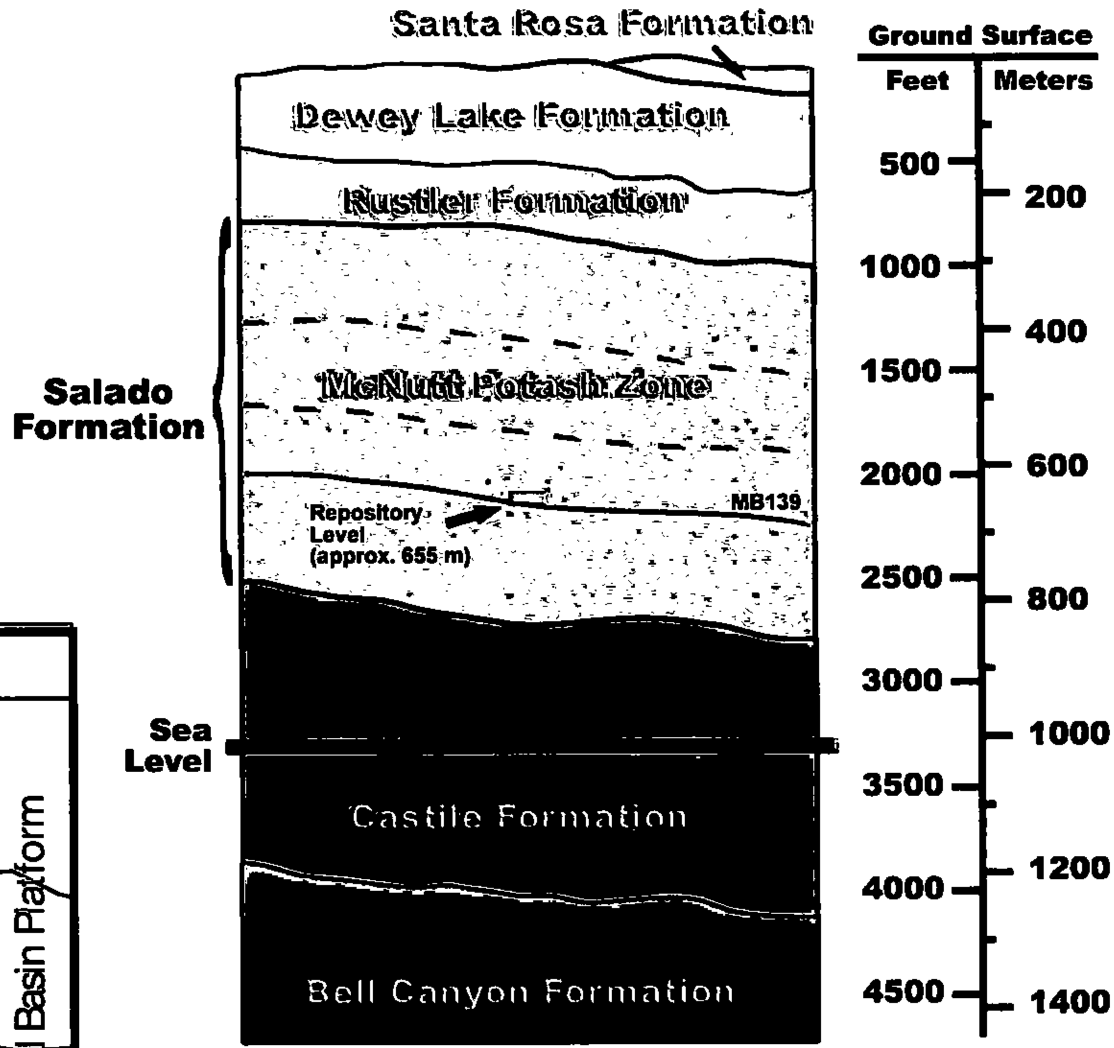
Notify you of an update to the existing NOI

Describe the nature of the update

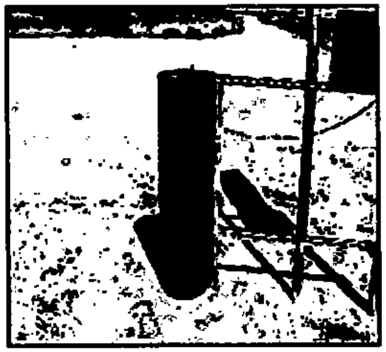
Discuss our proposed approach

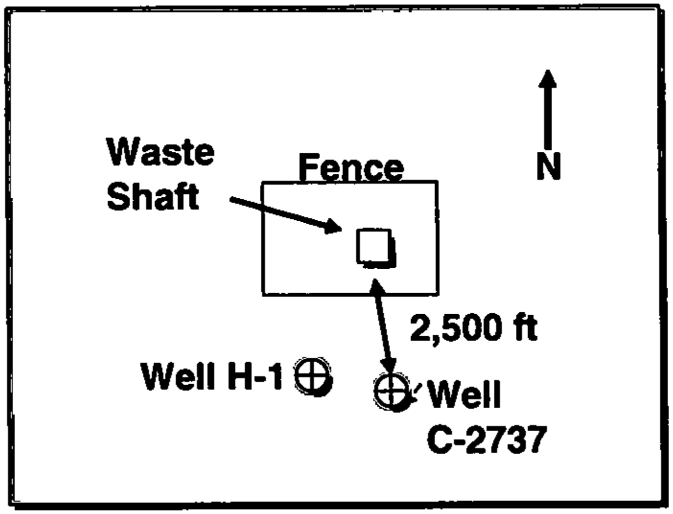
General Location and Stratigraphic Section

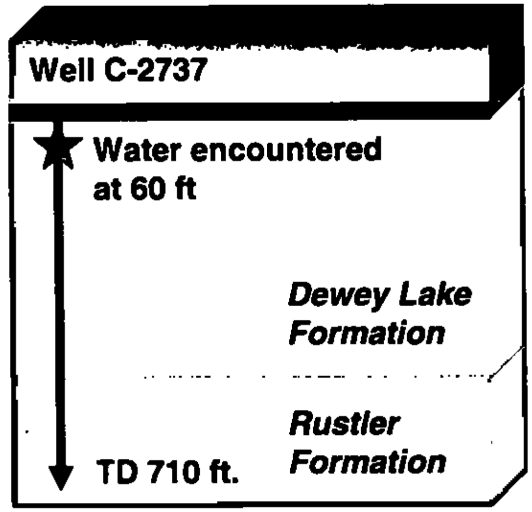




Monitoring Well C-2737 Results





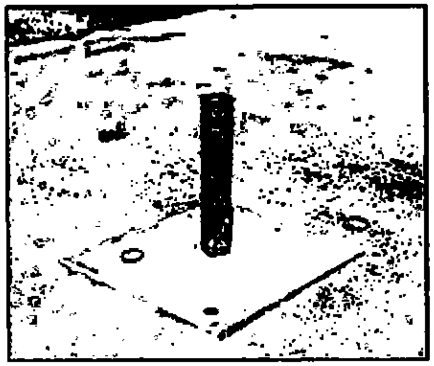


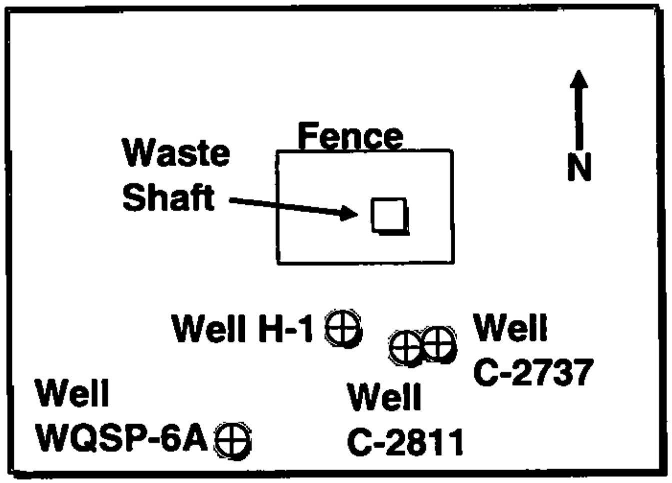
February-March 01

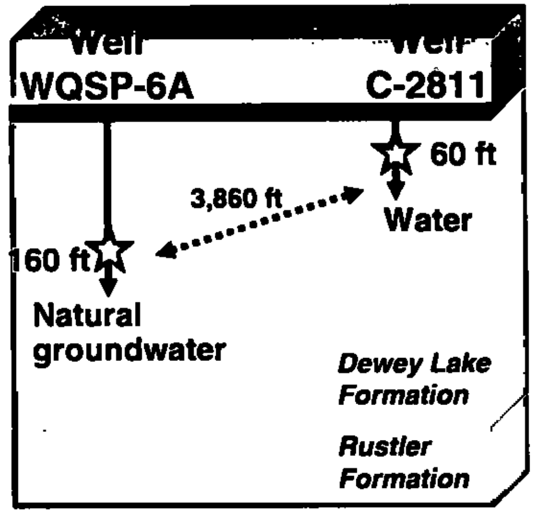
- C-2737 installed to replace H-1, which was plugged and abandoned

- Encountered water at approximately 60 feet below the ground surface in the upper portion of the Dewey Lake Formation

Monitoring Well C-2811 Results







March 01	**C-2811 installed to monitor the water found in the upper portion of Dewey Lake Formation**
January 02	**First water sample results returned from C-2811. Total Dissolved Solids (TDS): 2,630 mg/l**
July 02	**Comprehensive review of data and WIPP hydrology leads to concern that subsurface water could eventually contact natural groundwater (TDS: 3,620 mg/l) known to occur 3,860 feet to the southwest and 100 feet below C-2811**

Action Team

DOE-CBFO

CTAC

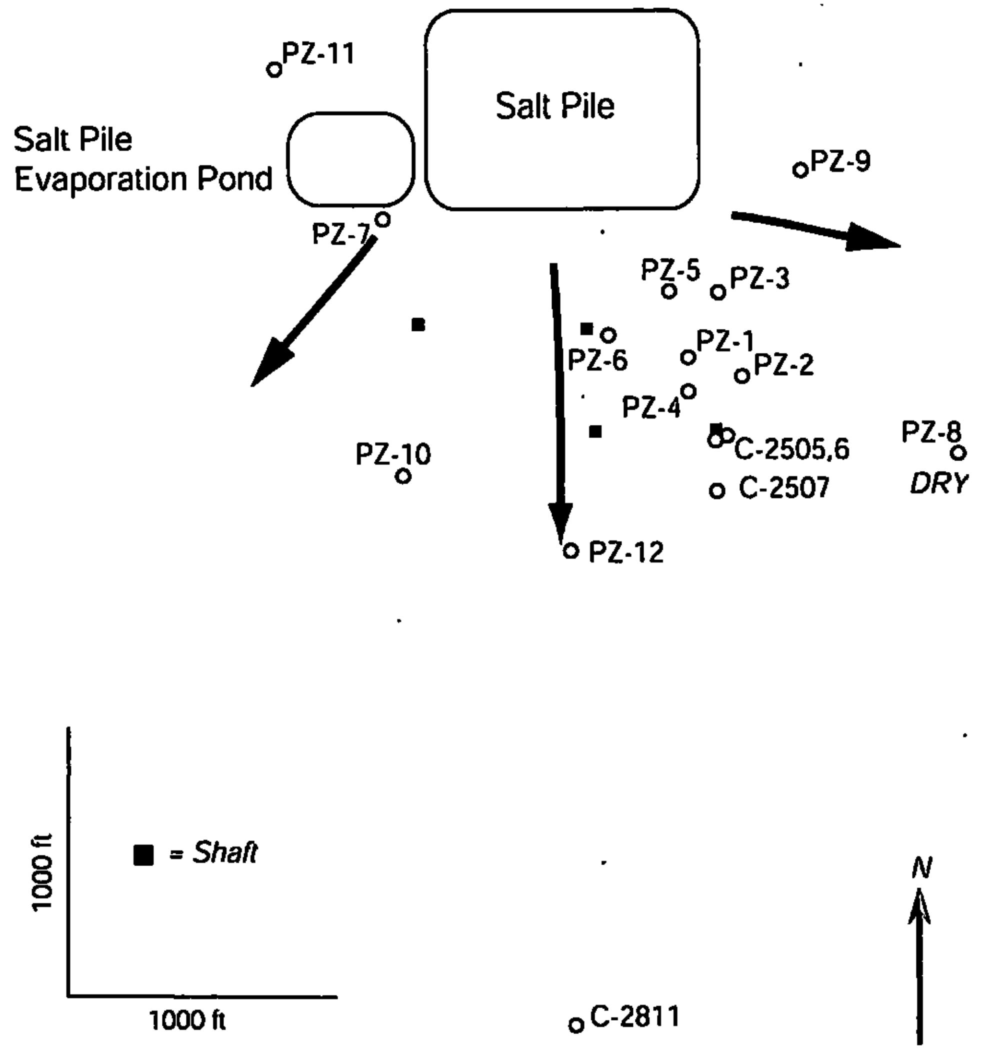
Westinghouse TRU Solutions

Other Washington Group International organizations

August-September 02

- Formed action team composed of hydrologists, geologists, and engineers
- After studying current and historic data and reviewing WIPP hydrology, the action team identified probable sources of the subsurface water and TDS

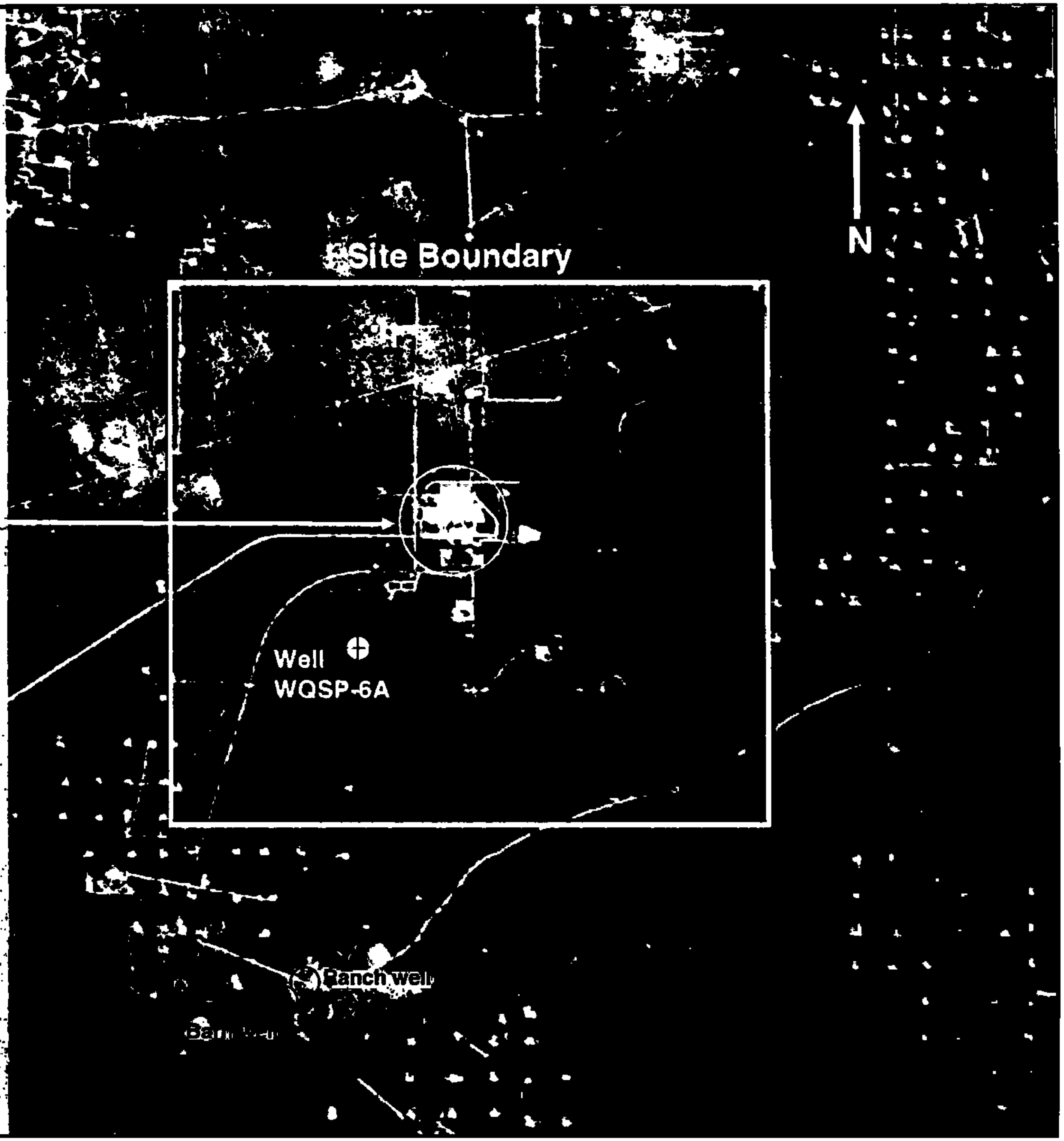
Conceptual Model



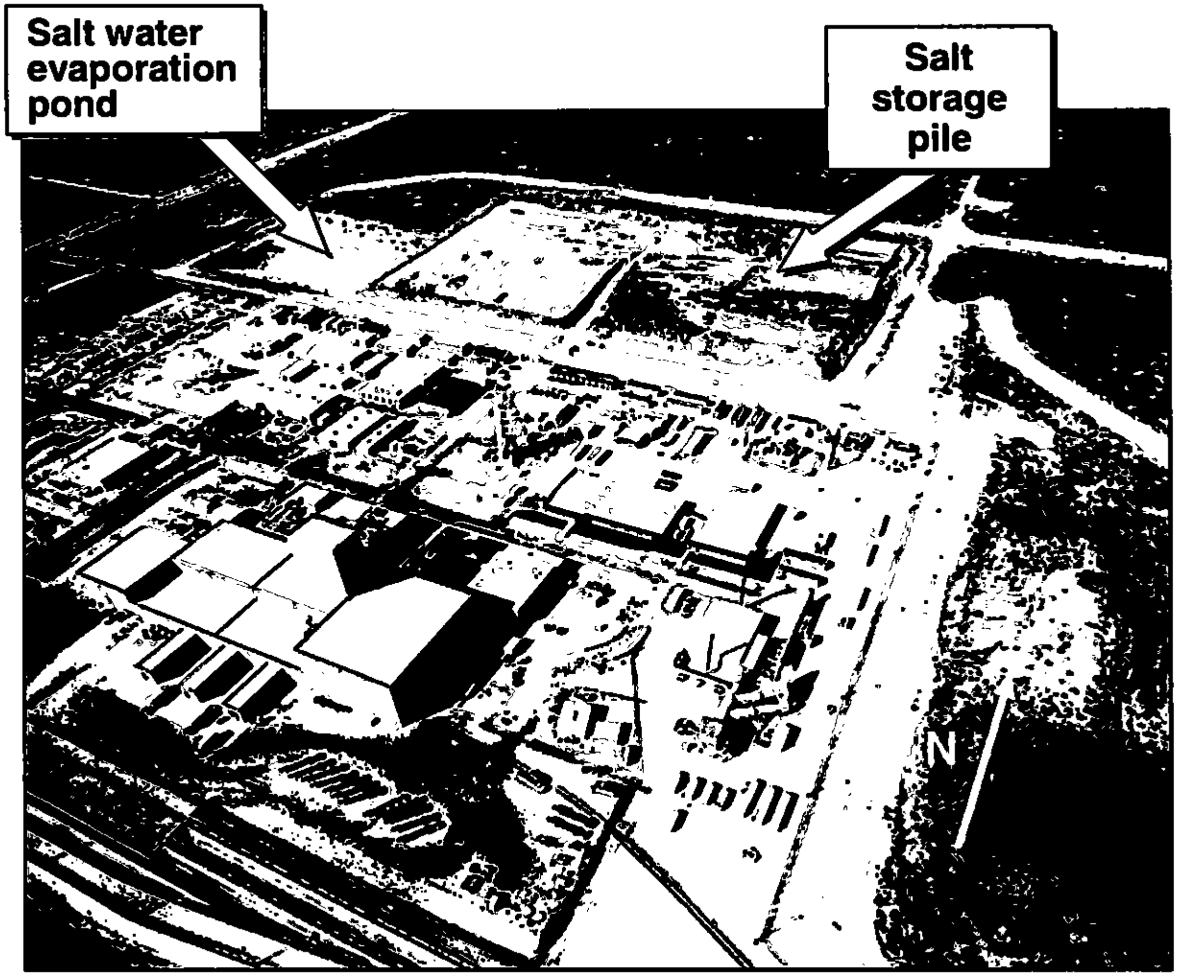
- **PZ-9 ~ 134,000 mg/l TDS (12/01)**
  (Water level 3,363.4 ft amsl; 9/12/02)
- **C-2811 ~ 2,630 mg/l TDS (12/01)**
  (Water level 3,355.8 ft amsl; 9/12/02)

Probable Sources of Shallow Subsurface Water

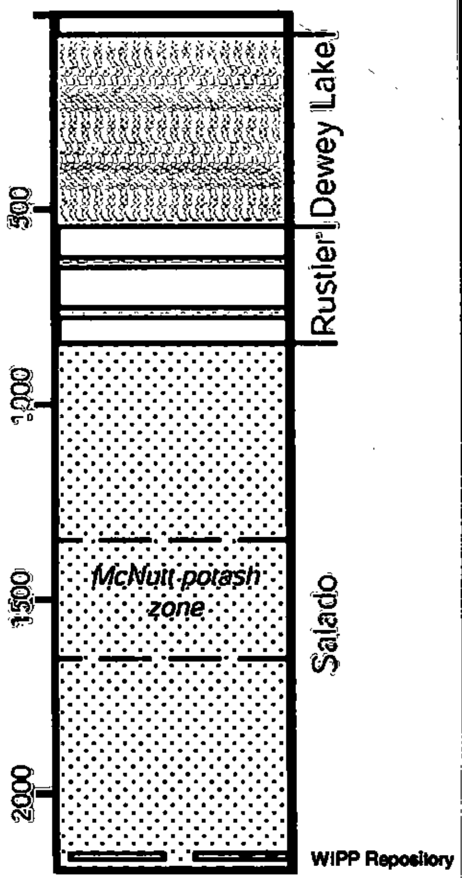
- Salt Pile Evaporation Pond
- Salt Pile
- Stormwater Basins

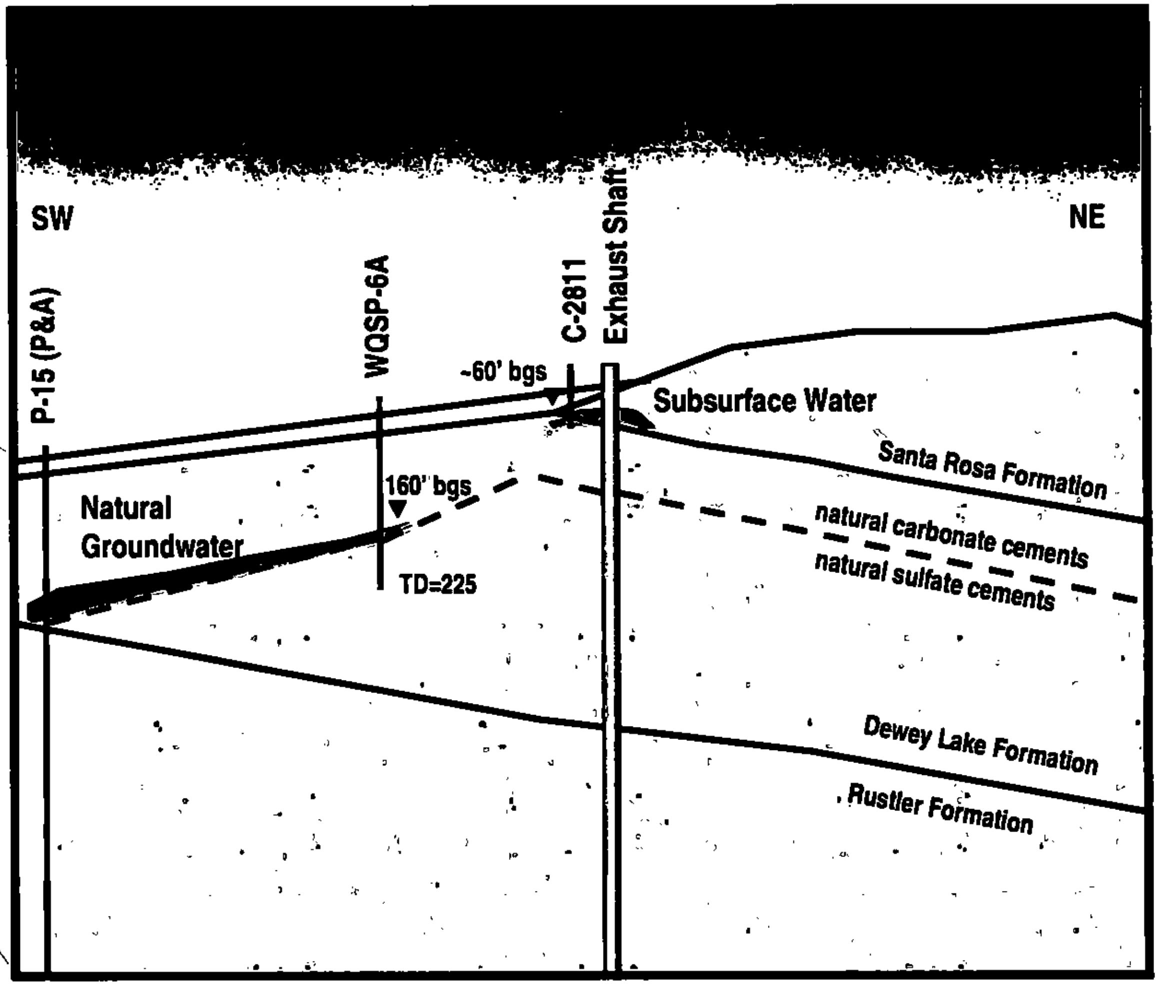


Probable Sources of TDS



Diagrammatic Cross-Section of Water Locations





Vertical scale exaggerated: not to precise scale

(Mills Ranch wells apx. 3 miles S-SW of Exhaust Shaft)

Salt Pile and Evaporation Pond Regulatory Framework

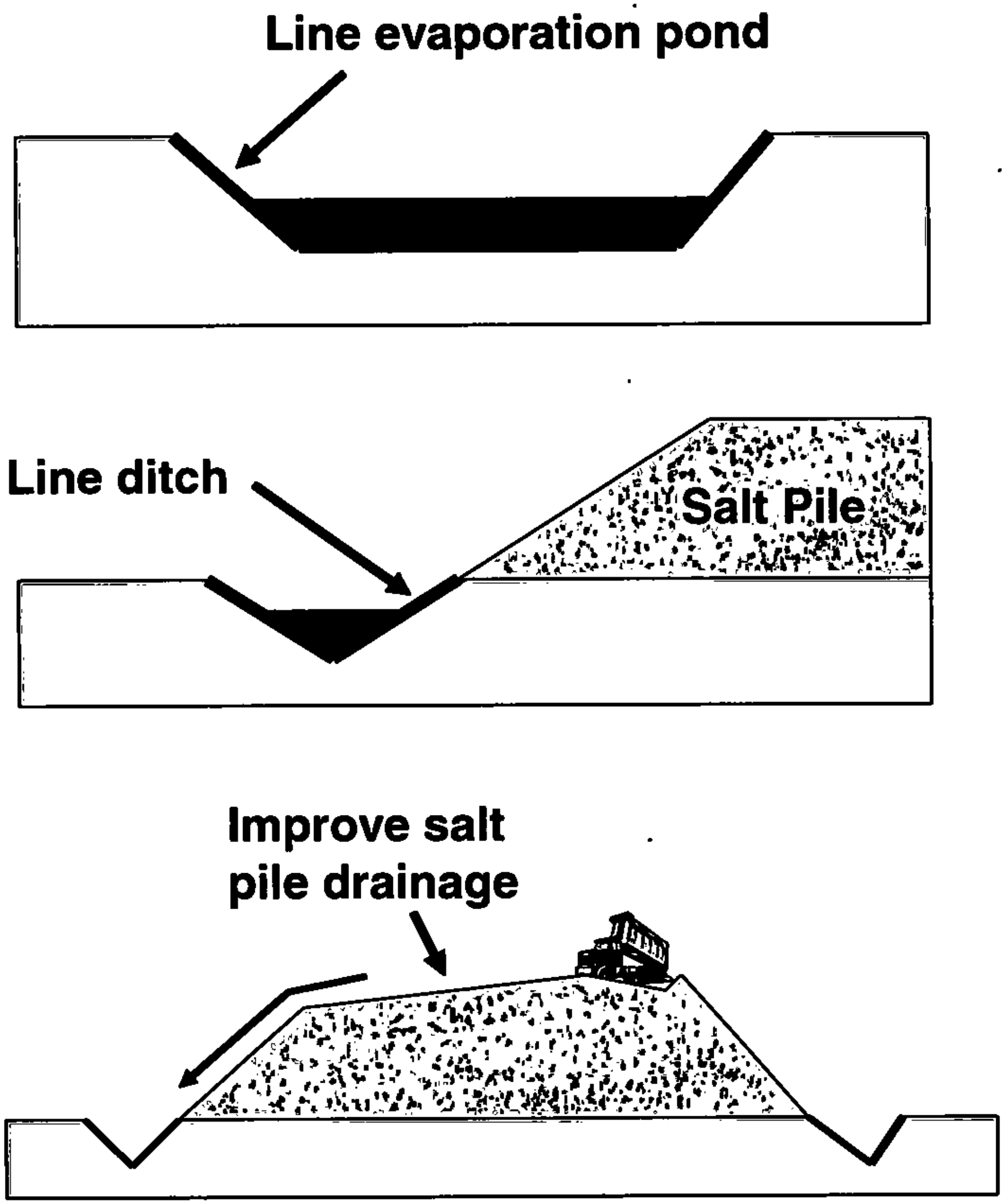
NOI: April 1983

- Addressed salt storage pile, salt pile evaporation pond
- Salt pile evaporation pond to be constructed of compacted soil that would minimize infiltration
- No impacts on groundwater expected, because of low permeability of the caliche and high net water loss
- NMED determined discharge plan not required in May 1983

Proposed Approach

- Update NOI
  - Line the salt pile evaporation pond
  - Line the salt pile runoff ditches
  - Improve drainage from the salt pile to the evaporation pond
  - Continue to monitor shallow subsurface water through piezometers and wells

Proposed Approach
--
continued



Path Forward

Discussion

Field Trip Report
Ground Water Pollution Prevention Section

Date: 8/27/02

Inspector (s)
Clint Marshall

Facility

Facility Name: WIPP
Contact: Jim Holland, Ron Reeves, Steve Kouba
Location: East of Carlsbad.
Discharge Plan Number: DP- 831
UIC Related? Yes (No)
Type of Operation: Radioactive Waste Storage facility

Inspection Summary

Purpose:
(a) Evaluation of Proposed Discharge Plan
b. Compliance Inspection (Complete Checklist o Reverse Side)
c. Other (Specify):

Activities

a. Inspection of Facilities or Construction (specify): Domestic Waste water lagoon system H-19 pond

Flow Measurement: Type: Condition:

b. Effluent Sample (s): (provide sampling location): None taken.

No. of Ponds: 6 No. in Use: 6 Condition of Ponds: Good
Condition of Pond Liner (s):

c. Ground Water Sample (s) (provide well name and location): None taken

No. of Monitor Wells: — Well Condition:

d. Other (specify):

Observations and Information Obtained

~~###~~ All facilities seem in order. Discussed DP renewal

Action Required

Move forward with renewal

Water Quality Inspection & Sampling Checklist
Reference: Regulation No. HED 86 – 14 (EID)

Entry Conference:

Was facility representative informed of EID's right of entry and authority: (To access records, inspect monitoring equipment or methods and sample effluents under Sections 74-6-9.E of the New Mexico Water Quality Act NMSA 1978)?

Was EID identification presented?

Were other potential or suspected violations which prompted inspections listed?

During the inspection, was the facility representative immediately advised or addition potential violations?

Exit Conference:

Were the preliminary inspection results summarized?

Was the facility representative advised if violations discussed during the entry conference remain under investigation?

Were other potential violations discovered during the inspection discussed?

Was a date provided as to when EID expects to complete consideration of potential violation?

Water Quality Sampling:

Was the facility representative offered a reasonable opportunity to obtain split/replicate samples, perform simultaneous tests, measurements or photographs?

Were copies of EID's results (sampling, testing, photos) requested? If yes, copies must be provided within ten working days after such results are in EID's possession.

Field Trip Report

Ground Water Pollution Prevention Section

Start Date: 08/27/2002 03:00 PM   **End Date:** 08/27/2002 04:00 PM

Facility Information
Facility Name: Waste Isolation Pilot Plant   Type of Operation: Federal Agency
Contact: Jim Holland (DOE), Ron Reeves (Westinghouse), Steven Kouba (Westinghouse) Location: Carlsbad

Inspector(s): Clinton Marshall

Inspection Summary
Purpose: Facility Inspection (GWB)

Activities
Samples Taken: No

Observations and Information Obtained
Inspected domestic waste lagoons, evaporation lagoons, and H-19 pond. Two facultative lagoons are lined with 34 mil Hypalon. Evaporation ponds lined with HDPE. Jim indicated damage in facultative lagoon made by gophers or othe rodents. Holes had been repaired. Facultative lagoons still receiving neutralized acid. WIPP facility now staffed at about 500. Lagoons are handling the effluent volume just fine. H-19 Pond lined with hypalon. Receiving purged brine water from wells and condensate water from underground. H-19 pond also acts as an overflow pond for facultative lagoons. Overflow line still in place.

Subject Item ID	Category	Type	Condition
%%:ce_gw_si_list%%	%%NEXT%%	%%NEXT%%	Entry Condition of Subject Item

Action Required

State of New Mexico
ENVIRONMENT DEPARTMENT
Office of the Secretary
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2918
Fax (505) 827-2965

GARY E. JOHNSON
GOVERNOR

JOHN D'ANTONIO, Jr.
SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

U.S. Postal Service
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(Domestic Mail Only; No Ins
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Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Board of County C
Eddy County
101 W. Greene St.,
Carlsbad, NM 882

7001 2510 0001 2015 2379

DP-831 (CM)

September 9, 2002

Board of County Commissioners
Eddy County
101 W. Greene St., Suite 225
Carlsbad, New Mexico 88220

Board of County Commissioners :

Enclosed is a copy of the public notice for one or more operations located in your county which is being published by the New Mexico Environment Department in a newspaper of general circulation.

If you have any questions, please do not hesitate to contact me at the address listed above or at 827-2900.

Sincerely,

Maura H

Maura Hanning, Program Manager
Ground Water Pollution Prevention Section

MH:ds

Enclosures

State of New Mexico
ENVIRONMENT DEPARTMENT
Office of the Secretary
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
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Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Sent To Ms. Inez Triay, Mar
Street, Apt. No.; P.O. Box 3090
City, State, ZIP+4 Carlsbad, NM 8822

PS Form 3800, January 2001

7001 2510 0001 2015 2195

DP-831 (CM)

September 9, 2002

Ms. Inez Triay, Manager
P.O. Box 3090
Carlsbad, New Mexico 88221

Dear Ms. Triay:

Enclosed is a copy of the public notice pertaining to your proposed discharge plan(s) which is being published by the New Mexico Environment Department in a newspaper of general circulation.

If you have any questions, please do not hesitate to contact me at the address listed above or at 827-2900.

Sincerely,

Maura Hanning

Maura Hanning, Program Manager
Ground Water Pollution Prevention Section

MH:ds

Enclosures

TO BE PUB: IED ON OR BEFORE SEPTEMB__ 12, 2002

NEW MEXICO ENVIRONMENT DEPARTMENT

Notice is hereby given that, pursuant to New Mexico Water Quality Control Commission Regulations, the following proposed ground water discharge permit(s) have been submitted for approval to the New Mexico Environment Department. The information in this notice generally has been supplied by the applicant and may or may not have been confirmed by the NM Environment Department.

DP-109, BLUEWATER SEWAGE LAGOONS, Van Spencer, Chairman, proposes to renew the discharge permit for the discharge of up to 65,000 gallons per day of domestic waste. The facility is located in Bluewater in Section 23, T12N, R11W, Cibola County. Up to 65,000 gallons per day of domestic wastewater is treated in a package treatment plant then discharged to an unlined lagoon. Following disinfection wastewater is land applied to 4.45 acres at the Bluewater Village cemetery. Ground water most likely to be affected is at a depth of approximately 178 feet and has a total dissolved solids concentration of approximately 950 milligrams per liter.

DP-519, LOVELACE RESPIRATORY RESEARCH INSTITUTE, Stephen Rohrer, proposes to renew the discharge permit for the former sewage lagoon. The facility is located on Kirtland Air Force Base in Albuquerque in Section 3, T08N, R04E, Bernalillo County. There will be no discharge of wastewater. The permit is for post-closure monitoring of ground water following the closure of a sewage lagoon in 1996. Ground water most likely to be affected is a depth of approximately 100 feet and has a total dissolved solids concentration of approximately 1600 milligrams per liter.

DP-658, AMERICAN WASTE REMOVAL, Gregory Jarvies, President, proposes to renew the discharge permit for the discharge of 6,000 gallons per day of wastewater generated from the processing of restaurant grease trap waste. The facility is located in Albuquerque at 502 Carmony Road, NE, in projected Section 4, T10N, R3E, Bernalillo County. Restaurant grease trap waste is processed on-site in above ground tanks, and recovered grease is transported off-site for sale. Wastewater is temporarily stored in two partially buried 10,000 gallon tanks, prior to being transported to the City of Albuquerque's wastewater treatment plant. Ground water below the site is at a depth of approximately 35 feet and has a total dissolved solids concentration of approximately 200 milligrams per liter.

DP-686, CITY OF FARMINGTON SLUDGE DISPOSAL PROJECT, Dean Roquemore, Plant Manager, proposes to renew and modify the discharge permit for the discharge of 2.5 dry tons per day of municipal sludge. The facility is located approximately 2 miles northwest of Farmington in Section 29, T30N, R13W, San Juan County. Dried sludge will be land applied and disked into 80 acres at the La Plata reclamation site. The modification consists of reducing the land application area by 239 acres through discontinuing the use of the Palmer Farm land application area. Ground water most likely to be affected is at a depth of approximately 400 feet and has a total dissolved solids concentration of approximately 2,500 milligrams per liter.

DP-808, VILLAGE OF MELROSE WASTEWATER TREATMENT PLANT, Ray Hestor, Mayor, proposes to renew the discharge permit for the discharge of 90,000 gallons per day of domestic wastewater. The facility is located approximately 1 mile south of Melrose in Section 7, T2N, R32E, Curry County. Wastewater is treated by an oxidation lagoon followed by a constructed wetland, prior to disposal to infiltration ponds or to 80 acres of land application area located within the wastewater treatment plant property boundaries. Ground water most likely to be affected is at a depth of approximately 50 feet and has a total dissolved solids concentration of approximately 448 milligrams per liter.

DP-818, CONTROLLED RECO' Y INC., Ken Marsh, Owner, propose renew the discharge permit for the discharge of up to 55,550 gallons per day of industrial waste. The facility is located approximately 37 miles southwest of Hobbs in Section 27, T20S, R32E, Lea County. Up to 275 cubic yards per day of soils contaminated with hydrocarbons and agricultural solids are land applied within a 62-acre landfarm and disked to increase aeration. Limited amounts of nonhazardous hydrocarbon contaminated liquids are periodically added to the soils to enhance remediation. Ground water most likely to be affected is at a depth of approximately 14 feet and has a total dissolved solids concentration of approximately 3300 milligrams per liter.

DP-831, WASTE ISOLATION PILOT PLANT, Inez Triay, Manager, proposes to renew the discharge permit for the discharge of 33,000 gallons per day of domestic waste and non-hazardous brine water. The facility is located 26 miles east of Carlsbad in Sections 28 & 29, T22S, R31E, Eddy County. Up to 23,000 gallons per day of domestic wastewater and 100 gallons annually of neutralized acid waste is discharged to five synthetically lined lagoons for evaporation. Up to 2,000 gallons per day of non-hazardous brine water is discharged to a synthetically lined pond for total evaporation. Up to 8,000 gallons per day of non-hazardous brine water generated from mine dewatering activities, pumping of ground water wells, and from other non-hazardous sources to a synthetically lined evaporation pond. Ground water most likely to be affected is at a depth of approximately 608 feet and has a total dissolved solids concentration of approximately 3920 milligrams per liter.

DP-1025, WORDEN DAIRY, Charles Worden, Owner, proposes to renew and modify the discharge permit for the discharge of 40,000 gallons per day of agricultural waste. The facility is located 3 miles south of Lovington in Section 7, T17S, R37E, Lea County. Dairy wastewater will be discharged to two clay-lined lagoons for storage. From the lagoons, the wastewater will be land applied to 120 acres of cropland by center-pivot irrigation. The modification consists of adding a new 120-acre land application area in the southeast ¼ of Section 7, T17S, R37E. Ground water most likely to be affected is at a depth of approximately 47 feet and has a total dissolved solids concentration of approximately 500 milligrams per liter.

DP-1065, GENERAL ELECTRIC AIRCRAFT ENGINES, Julie DeWane, Manager, proposes to modify the discharge permit for the discharge of 1,814,400 gallons per day of treated groundwater. The modification allows for the addition of one deep zone extraction well, and up to three additional deep zone injection wells. The facility is located in Albuquerque's South Valley on Woodward Road, in Sections 32 and 33, T10N, R03E, Bernalillo County. Ground water contaminated with volatile organic compounds is currently recovered by eight shallow zone and three deep zone extraction wells, and is treated to Water Quality Control Commission Standards using filtration, air stripping, and activated carbon polishing. Effluent is currently discharged to one shallow zone and 10 deep zone injection wells. The depth to ground water in the deep zone aquifer below the site ranges from approximately 50 feet to 150 feet, and has a total dissolved solids concentration of approximately 500 milligrams per liter. Shallow zone ground water below the site is at a depth of approximately 18 to 26 feet, and has a total dissolved solids concentration that ranges from 577 to 2210 milligrams per liter.

DP-1080, WOODLANDS SUBDIVISION WASTEWATER TREATMENT, C. J. Mead, Owner, proposes to renew the discharge permit for the discharge of 31,800 gallons per day of domestic wastewater. The facility is located in Tijeras in Section 10, T10N, R06E, Bernalillo County. Wastewater is treated using a nitrifying filter and constructed wetlands, prior to disposal in a leachfield. Ground water most likely to be affected is at a depth of approximately 150 feet and has a total dissolved solids concentration of approximately 700 milligrams per liter.

DP-1125, STULL TRAILER WASH, Dale Stull, Owner, proposes to renew the discharge permit for the discharge of 3,600 gallons per day of wastewater from a livestock trailer wash. The facility is located 0.5 miles east of Nara Visa in Section 14, T16N, R36E, Quay County. Wastewater from trailer washing is discharged to a concrete sump and then pumped to a synthetically lined lagoon for storage. Wastewater from the lagoon is land applied to either 31.11 acres adjacent to the trailer wash, to 31 acres of cropland located in Section 21, T15N, R36E, or to 200 acres of cro[illegible] l located in Section 6, T18N, R37E, [illegible] County. Ground water most likely to be affected is at a depth of approximately 40 feet and has a total dissolved solids concentration of approximately 250 milligrams per liter.

Any interested person may obtain further information from the Ground Water Pollution Prevention Section of the NM Environment Department, telephone (505) 827-2900, and may submit written comments to the Ground Water Pollution Prevention Section, NM Environment Department, P.O. Box 26110, Santa Fe, NM 87502. Prior to ruling on any proposed discharge permit or its modification, the NM Environment Department will allow thirty (30) days after the date of publication of this notice to receive written comments and during which a public hearing may be requested by any interested person. Requests for public hearing shall set forth the reasons why the hearing should be held. A hearing will be held if the NM Environment Department determines that there is significant public interest.

LAWRENCE EARTH ENGINEERING 4500 Glenwood Hills NE, Albuquerque, NM 87111
lawearth@earthlink.net Phone (505) 294-7227 Fax (505) 294-7712

August 8, 2002

RECEIVED
AUG 0 8 2002

Ms. Marcy Leavitt, Chief
New Mexico Environment Department
Groundwater Quality Bureau
1190 St. Francis Drive
Runnels Building N 2250
Santa Fe, NM 87502

RE: Request for DP-831 Files VIA FAX: 505-827-2965

Dear Marcy:

This letter is to request permission to copy files pertaining to the referenced Discharge Plan for the Waste Isolation Pilot Project (WIPP) near Carlsbad, New Mexico. I have spoken with Clint Marshall of your staff regarding the specific files that I will instruct Paper Tiger in Santa Fe to pick up at your offices.

Thank you for your assistance. Please contact me with any questions.

Sincerely,

LAWRENCE EARTH ENGINEERING
Larry M. Coons, P.E., P.Hg., DEE
Owner, Principal Engineer

C:\WEG\Proposals\WIPP\Leavitt Letter 8-8

New Mexico Environment Department
Ground Water Qu Bureau

DP# 831 Reviewer Clint	Date	Initial
Notice of Intent		
NOI Received		
DP Required Letter Sent		
Discharge Plan Application		
❖ DP Application Received	6-10-02	CV
❖ Filing Fee Received	6-10-02	CV
❖ Copy Transmitted to District Manager		
Additional Information Requested		
❖ DP application Complete per Completeness Checklist		
❖ Application Information Entered in to TEMPO Database		
Public Notice		
❖ Public Notice Published		
Public Notice Corrected		
Plans and Specifications		
❖ Plans and Specifications Received	6-10-02	CV
❖ Copy Sent to District Engineer	6/21/02	ds
❖ Comments Received from District Engineer		
Other Technical Requirements		
❖ Field Inspections		
Hydrogeologic Assessment Reviewed		
❖ Operational Plan Reviewed		
❖ Monitoring Plan Reviewed		
❖ Contingency Plan Reviewed		
❖ Closure Plan Reviewed		
Additional Information Requested		
❖ Technical Review Complete		
❖ Computer Database Updated		
❖ Correspondence Transferred to Discharge Plan and Correspondence Public Drawers		
Public Hearing/Meeting		
Public Meeting Held		
Public Hearing Held		
Public Hearing/Meeting Denied		
Discharge Plan Decision		
❖ Approval/Disapproval Letter Drafted		
❖ Discharge Fee Received		
❖ Approval/Disapproval Letter Sent		
Appeal of Discharge Plan Decision		
WQCC Hearing Schedule		
Appeal Resolved		

❖ Must be Completed
Date is Date Received, Sent, Published, Approved or Completed.

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2918
Fax (505) 827-2965

GARY E. JOHNSON
GOVERNOR

PETER MAGGIORE
SECRETARY

TO: Pat Pattengale, District Manager, Dist. 4

FROM: Maura Hanning, Program Manager *CM for MH*
Ground Water Pollution Prevention Section

RE: Discharge Plan Renewal & Modification

DATE: June 10, 2002

Enclosed is a copy of the latest discharge plan renewal & modification which the NMED Ground Water Pollution Prevention Section has received for your district. It is for:

DP-831-Waste Isolation Pilot Plant

Plans and specifications are included for review by the District Engineer.

Please call Clint Marshall of the Ground Water Pollution Prevention Section at 827-0027, if you would like additional information on this facility.

Enclosure(s)

cc: Glenn Saums, Program Manager, Surface Water Section
Discharge Plan File

Clint A.

New Mexico onmental Department
Ground Water Quality Bureau

Acknowle_ _ment of Receipt Of Cash

Acknowledgement of Receipt of Check/Cash

I hereby acknowledge receipt of Check No. 91852 Dated. 6/3/02
or cash received in the amount of $ 100.00 from
for Waste Isolation Pilot Plant 831
(Facility Name) (DP No.)

Submitted to ASD by: ______ Date: ______

Received in ASD by: ______ Date: ______

Filing Fee [ ] New Facility [ ] Renewal [X]

Modification [X] Other [ ] (Explain) ______

Organization Code ______ Application FY ______

To be Deposited in the Ground Water Section Discharge Plan Fees.

Full Payment [ ] or Annual Increment [ ]

Westinghouse TRU Solutions, LLC
Waste Isolation Pilot Plant Project
P.O. Box 2078
Carlsbad, NM 88221

Under U.S. Department of Energy Contract

The Carlsbad National Bank
P.O. Box 1359
Carlsbad, N M 88220

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06/03/02

Check Number: 91852

Pay To Order Of

New Mexico Environment Department
Harold Runnels Bld.
1190 St. Francis Dr
PO Box 26110
Sante Fe, NM 87502

Amount of Check
************************100.00

Authorized Signature

⑈091852⑈ ⑆112201797⑆ 51225⑈

Westinghouse TRU Solutions, LLC
Waste Isolation Pilot Plant Project, P.O. Box 2078, Carlsbad, NM 88221

CHECK No. 091852

P.O. No.	YOUR INVOICE OR FREIGHT PRO. No.	INVOICE DATE	OUR REF. No.	GROSS AMOUNT	DISCOUNT AMOUNT	NET AMOUNT
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RECEIVED
JUN 10 2002

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
June 6, 2002

Ms. Maura Henning, Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
P. O. Box 26110
Santa Fe, NM 87502

RECEIVED
JUN 10 2002

RE: Renewal and Modification of Discharge Plan – DP-831

Dear Ms. Henning:

Enclosed please find the three (3) copies of the completed Discharge Plan Application and $100.00 filing fee for the renewal and modification of Discharge Plan DP–831 for the Waste Isolation Pilot Plant (WIPP).

The facility description, and the volumes and character of the discharges to the sewage lagoon facilities and evaporation ponds described in the current Discharge Plan DP–831 remain the same. The modifications requested to DP–831 are two fold. First, we are requesting the reduction in monitoring and reporting frequencies from quarterly to semi-annually. Secondly, we are requesting the removal of the sampling and analysis requirement for gross alpha activity. A complete description of the modification requests is found in the enclosed Discharge Plan Application for Renewal.

If you have any questions or comments, please contact Mr. Harold Johnson at (505) 234-7349.

Sincerely,

Cynthia Zvonar

Cynthia A. Zvonar
CBFO Assistant Manager
Office of Regulatory Compliance

Enclosure

cc: w/o enclosure
H. Johnson, CBFO
CBFO Mailroom

CBFO:ORC:HJ:VW:02-1131:UFC:5486

DISCHARGE PLAN DP-831

RENEWAL

RECEIVED
JUN 10 2002

NEW MEXICO
ENVIRONMENT DEPARTMENT

GROUND WATER DISCHARGE
PERMIT APPLICATION

June 5, 2002

RECEIVED

ADMINISTRATIVE COMPLETENESS

To be deemed administratively complete for publication of a public notice, the following information must be provided. [20.6.2.3106, 20.6.2.3108 NMAC]

1. Name of the proposed discharger and facility [20.6.2.3106, 20.6.2.3108.C.1 NMAC]:

Type of facility or operation (dairy, municipal wwtp, mining, school, etc.):

The Waste Isolation Pilot Plant (WIPP) is an underground geologic repository designed to permanently dispose of transuranic waste from the research and production of nuclear weapons. As a Hazardous Waste Treatment Storage and Disposal Facility (Permit # NM4890139088-TSDF), WIPP is authorized to dispose of transuranic waste containing hazardous constituents.

The WIPP uses a facultative lagoon system for sewage wastewater treatment and a series of evaporation ponds for storage and evaporation of the non-hazardous water generated at the site and approved for discharge under Discharge Plan DP-831. The facultative lagoon system consists of four synthetically lined ponds (two settling ponds and two polishing ponds) that discharge into an evaporation facility containing three synthetically lined evaporation ponds, the east evaporation (pond A), the north evaporation pond (pond B), and the south evaporation pond (pond C). The facultative lagoon system / evaporation ponds are located approximately ½ mile southwest of the WIPP site. In addition, a separate synthetically lined evaporation pond (H-19), located approximately one and 1/4 miles southeast of the WIPP site, is used for storage and evaporation of non-hazardous water(s) approved for discharge under DP-831.

	Name	Address	City	State	Zip	Telephone & Fax
Facility*	Waste Isolation Pilot Plant	26 miles E-SE of Carlsbad, NM	Carlsbad	NM	88221	505-234-8271 505-234-8854
Owner	U.S. Department of Energy	P.O. Box 3090	Carlsbad	NM	88221	505-234-7303 505-234-7027
Responsible Party	Same as above	Same as above	Same as above	Same as above	Same as above	Same as above
Facility Representative	Jim Hollen, Westinghouse TRU Solutions	P.O. Box 2078 MS 452-09	Carlsbad	NM	88221	505-234-8271 505-234-8854
Consultant	N/A	N/A	N/A	N/A	N/A	N/A
Other (specify)	N/A	N/A	N/A	N/A	N/A	N/A

*For the facility address, enter physical address - not mailing address.

2. Locations of the Discharges [20.6.2.3106.C.2 and 20.6.3108.C.2 NMAC]:

List the locations of the discharges covered by this permit. Add rows as necessary to include all discharge locations. Sections should be described to the nearest ¼ of a ¼ of a ¼ section (please see attachment).

Discharge Location (lagoons, leach fields, land application areas, outfalls, etc.)	County	Township	Range	Section	Latitude	Longitude
Facultative Lagoon System and evaporation facility	**Eddy**	**22S**	**31E**	**NE, NW, NE, 29**	**32.22.30N**	**103.47.30W**
H-19 Evaporation Pond	**Eddy**	**22S**	**31E**	**SE, NE, SW, 28**	**32.21.33N**	**103.46.58W**

The facultative lagoon system and evaporation facility location contains three lined evaporation ponds, the east evaporation pond (pond A), the north evaporation pond (pond B), and the south evaporation pond (pond C).

3. Brief Description of Discharge [20.6.2.3108.C.3 NMAC]:

Briefly describe the activities which produce the discharge(s) including the treatment and disposal methods. Attach additional pages as necessary.

The sewage and evaporation facilities currently permitted under DP-831 will remain the same with regard to the physical description, volumes, and character of the discharges as provided in DP-831, previous applications, renewals, and modifications. WIPP is authorized to discharge of up to:

23,000 gpd of sewage effluent to the facultative lagoon system and evaporation facility

an additional 2,000 gpd of non-hazardous brine water to the north evaporation cell (north evaporation pond [pond B] of the evaporation facility)

8,000 gpd of non-hazardous brine water to the H-19 evaporation pond

100 gallons per year of neutralized acid to the domestic wastewater lagoons (facultative lagoon system and evaporation facility)

The non-hazardous brine waters include water generated from mine dewatering activities, pumping of ground water monitoring wells, and from miscellaneous non-hazardous sources.

The neutralized acid is a buffered acidic solution generated from the conditioning of virgin resins used in laboratory separation columns.

4. Discharge Characteristics [20.6.2.3106.C.1 and 20.6.2.3108.C.4 NMAC]:

4.a. Quantity:

Peak design discharge rate in gallons per day (gpd) (design capacity of the treatment and disposal system):	**23,000 gpd to the facultative lagoon system and evaporation facility** **Additional 2,000 gpd to the north evaporation pond (pond B) of the evaporation facility** **8,000 gpd to the H-19 Evaporation Pond**
Average discharge rate on annual basis in gpd (actual flow):	**2,828 gpd to the facultative lagoon and evaporation facility** **143 gpd to the H-19 Evaporation Pond**
Methods used to meter or calculate discharge volume:	**Sewage effluent discharges to the facultative lagoon system are measured through the wastewater flow meter or assumed to equal the total domestic water usage.** **Volumes of other permit authorized discharges to the facultative lagoon system / evaporation facility or the H-19 Evaporation Pond are calculated by a time/volume method or by volumetric measurement of the transport container.**

Average discharge rate was determined by dividing annual discharge volume by 365 days.

4.b. Quality: Add rows as necessary to include all contaminants and toxic pollutants.

Contaminant(s) or Toxic Pollutant(s) generally associated with facility type (contaminants of concern are listed in 20.6.2.7.uu, and 20.6.3103 NMAC)	**Influent Concentration (mg/L)**	**Effluent Concentration (mg/L)**
Total Dissolved Solids (TDS)	**519 mg/L**	**24,800 mg/L**
Nitrate (as N)	**< 1.0 mg/L**	**N/A**
Total Kjeldahl Nitrogen	**100.50 mg/L**	**N/A**
Plutonium 238	**0.005 ± 0.007 pCi/L**	**0.005 ± 0.007 pCi/L**
Plutonium 239/240	**-0.001 ± 0.007 pCi/L**	**-0.001 ± 0.007 pCi/L**
Uranium 234	**0.773 ± 0.134 pCi/L**	**0.773 ± 0.134 pCi/L**
Uranium 235	**0.022 ± 0.034 pCi/L**	**0.022 ± 0.034 pCi/L**
Uranium 238	**0.281 ± 0.078 pCi/L**	**0.281 ± 0.078 pCi/L**
Americium 241	**-0.006 ± 0.024 pCi/L**	**-0.006 ± 0.024 pCi/L**
Strontium 90	**0.580 ± 0.540 pCi/L**	**0.580 ± 0.540 pCi/L**
Radium 226	**0.110 ± 0.170 pCi/L**	**3.910 ± 0.440 pCi/L**
Radium 228	**-0.230 ± 1.460 pCi/L**	**0.990 ± 0.540 pCi/L**
The above-listed contaminants reflect the proposed removal of the sampling and analysis requirement for gross alpha particle activity that is presented in this renewal application. Influent and effluent (evaporation pond B) concentrations are from the first quarter 2002 WIPP Discharge Monitoring Report for Discharge Plan DP-831. A copy of this report is provided as Attachment 1.		

4.c. Flow Characteristics:

Number of days per week discharge occurs:	7
Number of months per year discharge occurs (specify months):	12
Is flow continuous or intermittent: **Sewage effluent discharges to the facultative lagoon system** **Other permit authorized discharges to the facultative lagoon system / evaporation facility** **Permit authorized discharges to the H-19 Evaporation Pond**	 **Continuous** **Intermittent** **Intermittent**

5. <u>Ground Water Conditions</u> [20.6.2.3106.C.3 and 20.6.2.3108.C.5 NMAC]:

Sources for this information may be the New Mexico State Engineers Office, NMED, GWPPS web site (www.nmenv.state.nm.us), and USGS reports. If you do not have a TDS value, take a sample from the nearest well to the discharge location and submit the results from the analysis.

Depth to ground water below the discharge site:	**Approximately 608 feet**
Flow direction of ground water below the site:	**Generally North to South**
Flow gradient of ground water below the site:	**Approximately 0.00013**
Reference* or source for depth, direction and gradient:	**WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996 and approved by NMED July 3, 1997**

* If determined from well logs, please provide photocopies of well logs with application. If depth is derived from a report include copies of appropriate pages and complete reference to report including author, title, and publication date.

Total Dissolved Solids (TDS) concentration (mg/L) of ground water below the site:	**TDS concentrations ranged from 4,600 mg/L at WIPP Water Quality Sampling Program (WQSP) Well # 6a, to 234,000 mg/L at WIPP WQSP Well # 3.**
Reference or source for TDS:	**<u>WIPP Groundwater Detection Monitoring Program, Semiannual Groundwater Monitoring Report Submitted to the New Mexico Environment Department, Sampling Round 13, September through</u> November 2001, dated March 2002**

Copies of the analytical results and chains-of-custody are provided as Attachment 2. Round 13 groundwater sampling analytical results did not indicate any changes in overall groundwater chemistry and were within the expected concentration ranges as defined by the background baseline. The groundwater chemistry baseline was developed from the first 10 sample rounds collected semiannually in accordance with the WIPP hazardous waste facility permit (Permit # NM4890139088-TSDF).

TECHNICAL ADEQUACY

To be deemed technically adequate, for purposes of issuing the discharge permit, the following information must be provided. [20.6.2.3106, 20.6.2.3107, 20.6.2.3109 NMAC]. Operational, monitoring, contingency, and closure plans must be submitted and must be appropriate for the proposed treatment and disposal type and meet the site specific conditions for the proposed facility.

6. <u>Permit Plans</u> [20.6.2.3106.C.7, 20.6.2.3107.A, and 20.6.2.3109.C NMAC]:

6.a. Operational Plan [20.6.2.3106.C.7 and 20.6.2.3109.C NMAC]:

The operational plan must describe how the system(s) for conveyance, collection, treatment, distribution, and disposal of wastewaters or other discharges will be constructed, operated, inspected, and maintained. The operational plan must demonstrate that ground water standards will not be exceeded.

6.a.i. In the following table, identify all proposed conveyance, collection, treatment distribution, and disposal units included in the operational plan. Add rows as necessary to include all units.

Treatment/Storage/ or Disposal Unit **Treatment units** (lagoon, mechanical treatment plant, manure separator, clarifier, etc.) **Disposal Units** (land application area, leach field, evaporative lagoon, leach stockpile, etc.)	**Construction Material**	**Volumetric Capacity*/Area*** (gallons or cubic yards/ acres)
Facultative Lagoon System and evaporation facility	**34 mil Hypalon Geomembrane or HDPE**	**6.74 Acre Feet at Normal Depth**
H-19 Evaporation Pond	**34 mil HDPE**	**1.55 Acre Feet at Normal Depth**

*Volumetric Capacity must be provided for all tanks, chambers, and impoundments or other storage units.
*Area must be provided for all land application areas, leach fields or other area features.

6.a.ii. Describe in detail the operational plan, including all conveyance, collection, treatment, distribution and disposal systems. Attach additional pages as necessary:

The operational plan for the facultative lagoon system and evaporation facilities will remain the same as is currently permitted under DP-831 and described in previous applications, renewals, and modifications.

6.a.iii. Describe the operations and maintenance plan that will be followed to ensure the system is maintained as described. At a minimum the plan must include monthly inspections of all wastewater treatment and disposal units. Attach additional pages as necessary.

The operations and maintenance plan for the facultative lagoon system and evaporation facilities will remain the same as is currently permitted under DP-831 and described in previous applications, renewals, and modifications.

6.b. Monitoring Plan [20.6.2.3106.C.5 and 20.6.2.3107.A.1-9 NMAC]:

The monitoring plan must describe how the facility will be monitored to ensure the discharge will not adversely impact ground water quality. The plan must include all monitoring locations (effluent sampling, monitoring wells, lagoons, soil sampling, plant tissue analysis, etc.). Monitoring locations must be included on the facility map.

The monitoring plan for the facultative lagoon system and evaporation facilities will remain the same as is currently permitted under DP-831 and described in previous applications, renewals, and modifications with the exception of the following modification requests.

1. **Reduce the discharge sampling and reporting frequency requirements from quarterly (four times per year) to a semi-annual basis (two times per year).**

2. **Remove the sampling and analysis requirement for gross alpha particle activity.**

The WIPP facultative lagoon system / evaporation facility and H-19 evaporative pond are lined facilities designed to dispose of domestic sewage and non-hazardous waste water by evaporation, therefore, no discharges are released to surface or groundwater and no effluent limits were established in the current permit (DP-831). The proposed modification to reduce the sampling and reporting requirements to twice a year will comply with the Water Quality Control Commission regulations at 20.6.2 NMAC to measure the amount of effluent discharged, monitor the effluent quality, and report this information to the New Mexico Environmental Department. Since all discharges will be monitored and no discharges are released, the proposed modification will not alter the monitoring program's ability to continue to ensure discharges will not adversely impact ground water quality.

Removal of the sampling and analysis requirement for gross alpha particle activity is requested because interference from the solids present in the waste water prevent the analysis from producing meaningful results. The discharge plan amendment approved by the NMED Ground Water Quality Bureau on June 12, 1998 included analysis for gross alpha particle activity in place of Radium 226 and Radium 228 if the gross alpha activity was 15 pCi/L or less. Since the implementation of this change, the accuracy range for Gross alpha activity has consistently exceeded 15 pCi/L and additional analysis for Radium 226 and Radium 228 has been required.

6.b.i. Monitoring Locations. In the following tables, identify all monitoring locations. Add additional rows as necessary to include all monitoring locations.

Flow, Effluent and Ground Water Monitoring

Monitoring Location	State Plane Coordinates		Elevation (also specify at what point in well casing)	Sampling Frequency per year	Reporting Frequency per year	Water or Soil Contaminant Type (please refer to 20.6.2.7.uu, and 20.6.3103 NMAC)
	East	North				
Wastewater Flow Meter*	103.47.30E	32.21.30N	3,400 ft. amsl	2 Note #1	2 Note #1	(volume measurement)
North Evaporative Pond (B)*	103.47.30W	32.22.30N	3,384 ft. amsl	2 Note #1	2 Note #1	(volume measurement)
H-19 Evaporative Pond*	103.46.58W	32.21.33N		2 Note #1	2 Note #1	(volume measurement)
Inflow to Lagoon System*	103.47.30W	32.22.30N	3,384 ft. amsl	2 Note #1	2 Note #1 Note #2	TDS, N03-N, TKN, Pu 238, 239/240, U 234, 235, 238, Am 241, Sr 90, Ra 226/228
North Evaporative Pond (B)*	103.47.30W	32.22.30N	3,384 ft. amsl	2 Note #1	2 Note #1 Note #2	TDS, Pu 238, 239/240, U 234, 235, 238, Am 241, Sr 90, Ra 226/228
South Evaporative Pond (C)*	103.47.30W	32.22.30N	3,384 ft. amsl	2 Note #1	2 Note #1 Note #2	TDS, Pu 238, 239/240, U 234, 235, 238, Am 241, Sr 90, Ra 226/228
H-19 Evaporative Pond*	103.46.58W	32.21.33N		2 Note #1	2 Note #1 Note #2	TDS, Pu 238, 239/240, U 234, 235, 238, Am 241, Sr 90, Ra 226/228
WQSP # 1	663600	503774	3416.6 ft. amsl TOC	2	2 Note #3	Described in WP 02-1, Attached
WQSP # 2	667598	505542	3461.4 ft. amsl TOC	2	2 Note #3	Described in WP 02-1 , Attached
WQSP # 3	670576	504030	3477.5 ft. amsl TOC	2	2 Note #3	Described in WP 02-1 , Attached
WQSP # 4	670658	495000	3430.5 ft. amsl TOC	2	2 Note #3	Described in WP 02-1 , Attached
WQSP # 5	667170	493666	3381.6 ft. amsl TOC	2	2 Note #3	Described in WP 02-1 , Attached
WQSP # 6	663691	494942	3361.8 ft. amsl TOC	2	2 Note #3	Described in WP 02-1, Attached
WQSP # 6a	663625	494969	3361.2 ft. amsl TOC	2	2 Note #3	Described in WP 02-1, Attached

*Identify the sampling locations as designated or named by the facility.

amsl – above mean sea level **TOC – Top of Casing**

Note #1: The sampling and reporting frequency listed represent the proposed reduction from quarterly to semiannual presented in this renewal application.

Note #2: The analytical parameters listed represent the proposed removal of the sampling and analysis requirement for gross alpha particle activity that is presented in this renewal application.

Note #3: The WQSP wells 1through 6a constitute the Resource Conservation and Recovery Act (RCRA) groundwater monitoring network specified in the WIPP Groundwater Detection Monitoring Program to comply with the requirements of 20 NMAC 4.1.500. The seven monitoring wells are sampled and reports of the analyses are submitted to the NMED on a semiannual basis pursuant to the Hazardous Waste Treatment Storage and Disposal Facility Permit # NM4890139008-TSDF.

Soil, Plant Tissue and Other Sampling

Monitoring Location*	Lat	Long	Sampling Frequency per year	Reporting Frequency per year	Water or Soil Contaminant Type
land application area soil sampling	N/A	N/A	N/A	N/A	N/A
land application area plant tissue analysis	N/A	N/A	N/A	N/A	N/A
Other	N/A	N/A	N/A	N/A	N/A

6.b.ii. Describe in detail the sampling protocols that will be used for sample collection at all monitoring locations. Attach additional pages as necessary.

The sampling protocols that will be used for sample collection at the designated sampling locations for this discharge application (facultative lagoon system / evaporation facility and the H-19 evaporative pond) are described in procedure WP 02-EM1001, Sewage Lagoon Sampling. A copy of this procedure is enclosed as Attachment 3. This procedure will be revised to incorporate specific discharge plan requirements or modifications that are approved by the WQCC.

The sampling protocols that are used for sample collection at the monitoring wells forming the RCRA groundwater monitoring network are described in procedure WP 02-1, WIPP Groundwater Monitoring Program Plan and comply with the standard permit conditions in 6.b.iii. A copy of this procedure is enclosed as Attachment 4.

6.b.iii. Standard Monitoring Requirements: The following paragraphs are standard permit conditions. Please read the condition and check the boxes that you will comply with as a condition of your permit.

- [x] All monitoring wells will be installed according to NMED Monitoring Well Construction and Abandonment Guidelines (copy enclosed).

- [x] All monitoring wells (if 3 or more monitoring wells are on site) will be surveyed to a common permanent benchmark and that the survey will be submitted to the NMED, GWQB within 60 days of installation of all monitoring wells. Survey data will include northing, easting, and elevation to the nearest hundredth of a foot. One of the wells may be used as the benchmark.

- [x] This facility will measure the depth to ground water in each monitoring well to the nearest hundredth of a foot prior to purging and sampling, and that three well volumes will be purged from each monitoring well prior to sample collection.

- [ ] This facility will complete land application data sheets (LADS, copy enclosed) documenting the amount of nitrogen applied to each land application area if applicable. The LADS will incorporate the wastewater volume and analytical results of the wastewater testing to determine total nitrogen applied to each field.

6.c. Contingency Plan [20.6.2.3107.A.10 NMAC]:

The contingency plan must describe the actions to be taken if Regulation 20.6.2.3103 NMAC ground water standards are exceeded or if toxic pollutants are present (20.6.2.7.uu) as a result of discharges regulated under the proposed permit, and to cope with failure of the discharge permit or system.

6.c.i. Standard Contingency Requirements: The following paragraphs are standard permit conditions. Please read the condition and check the boxes that you will comply with as a condition of your permit.

- [x] This Facility will comply with the following contingency language:

In the event that monitoring indicates ground water standards are violated or may be violated during the term of the discharge permit or upon post closure monitoring, this facility will collect a confirmation sample from the monitoring wells within 15 days to confirm the initial sampling results. Upon confirmation of contamination, all ground water monitoring will be conducted monthly and a corrective action plan will be submitted to the NMED. The corrective action plan will include a site investigation to define the source, nature and extent of ground water contamination and a proposed abatement option; and a schedule for implementation. The site investigation and abatement option must be consistent with the requirements and provisions of Regulations 20.6.2.4101, 20.6.2.4103, 20.6.2.4106.E, 20.6.2.4107, and 20.6.2.4112 NMAC. The corrective action plan will be submitted to NMED for approval within 30 days of confirmation of ground water contamination, and will be initiated within 30 days of NMED approval.

[V] This facility will comply with the following contingency language:

In the event of a spill or release that is not as prescribed in the approved discharge permit, this facility will take immediate corrective action to contain or mitigate the damage caused by the discharge and will initiate the notifications and corrective actions as required by Regulation 20.6.2.1203 NMAC. Within 24 hours discovery of the incident, this facility will verbally notify NMED and provide the information outlined in Regulation 20.6.2.1203.A.1. NMAC. Within 7 days of discovering the incident, this facility will submit a written notification verifying the oral notification and providing any additional pertinent information or changes. Within 15 days of the incident, this facility will submit a corrective action plan describing actions taken and/or to be taken to remedy the impact of the unauthorized discharge.

6.c.ii. Specific Contingency Plan:

Describe any additional specific corrective actions or contingencies that will be taken to cope with failure of the discharge system: Attach additional pages as necessary.

The standard permit conditions in 6.c.i will be incorporated into the contingency plan for the facultative lagoon system and evaporation facilities currently permitted under DP-831 and described in section 17 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996, previous applications, renewals, and modifications.

The plan includes weekly inspection and repair of the pond liners as necessary, containment and investigation of all spills and releases, and submittal of a corrective action plan to address contamination. In the event of a tear in a liner that results in a release to the environment, an effluent spill or unauthorized discharge, the Ground Water Section of the NMED will be notified pursuant with the standard permit conditions in 6.c.i. The WIPP Environmental Compliance and the Operations Department will assess damages and attempt to isolate any discharge. Samples will be taken to determine the extent and severity of contamination. A corrective action plan will be developed based on communications with the NMED Ground Water Section.

6.d. Closure Plan [20.6.2.3107.A.11 NMAC]:

The closure plan must describe the closure actions to be taken to prevent Regulation 20.6.2.3103 NMAC ground water standards from being exceeded, or the introduction of a toxic pollutant in ground water after cessation of operations. At a minimum, the closure plan must include a description of closure measures, post closure monitoring plans, and financial assurance (if required by NMED).

6.d.i. Specific Closure Plan: Describe the specific closure activities to ensure that ground water quality will be protected after cessation of operations. The plan shall include plugging, removal, and/or filling of all conveyance, collection, treatment, distribution and disposal features in order to prevent future discharges at the facility. The plan must also describe how all liquid and solid wastes will be removed and disposed of according to local, state, and federal laws. The plan must also describe how disturbed areas will be backfilled to blend with the original surface topography to prevent future ponding and to prevent a discharge at the facility from occurring after the cessation of operations. Attach additional pages as necessary.

The standard permit conditions in 6.d.ii will be incorporated into the closure plan for the facultative lagoon system and evaporation facilities currently permitted under DP-831 and described in section 19 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996.

At the time the WIPP facility is decommissioned, the closure plan will specify the closure activities required to ensure that ground water quality will be protected. These activities include the pumping or evaporation of all wastewater ponds, removal and disposal of all solids in accordance with applicable regulations, and contouring and revegetation of the site.

6.d.ii. Standard Closure Requirements: The following paragraphs are standard permit conditions. Please read the condition and check the boxes that you will comply with as a condition of your permit.

This facility will comply with the following closure requirements:

[V] The discharger will notify NMED at least 30 days prior to cessation of operations and will provide a schedule for implementation of the closure plan.

[V] This facility will conduct post closure monitoring at the frequency and locations prescribed under the active permit for a period approved by NMED. If Regulation 20.6.2.3103 NMAC ground water standards are violated or toxic pollutants are present during post closure monitoring, this facility will implement the contingency plan required in the active permit.

[V] All monitoring wells will be plugged and abandoned in accordance with NMED Monitoring Well Construction and Abandonment Guidelines once NMED has agreed in writing that post closure ground water monitoring may cease.

[V] Once NMED has approved all closure activities, this facility will submit a letter requesting termination of the discharge permit.

TECHNICAL SUPPORT

The following information must be submitted as required by Regulation 20.6.2.3106, and 20.6.2.3109 NMAC.

7. <u>Other Discharge Locations</u> [20.6.2.3106.C.2 NMAC]:

7.a. List the locations of any other discharges at this facility not covered by this permit but permitted under the New Mexico Liquid Waste Disposal Regulations, Hazardous Waste Management Regulations, Federal Clean Water Act (NPDES), and any un-permitted discharges. Add rows as necessary to include all other discharge locations.

Discharge Type (septic tank/leach fields, surface water discharges, etc.)	**Permit Identification**	**Discharge Location Description**
None	**N/A**	**N/A**

7.b. **Area Map:** On the appropriate United States Geological Survey (USGS) 7.5 minute topographic quadrangle map, identify the location of all water supply wells, injections wells, seeps, springs, bodies of water, and watercourses within one mile of the outside perimeter of the discharge site.

As described in section 8 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996, previous applications, renewals, and modifications, there are no water supply wells, injection wells, seeps, springs, bodies of water, or watercourses within one mile of the outside perimeter of the discharge site.

8. <u>Flooding Potential</u> [20.6.2.3106.C.4 NMAC]:

8.a. Describe the flooding potential of the discharge site based on the latest Federal Emergency Management Agency flood plain map or site specific analysis:

As described in section 12 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996, the flooding potential of the WIPP facility is considered minimal since the general ground elevation in the vicinity of the surface facilities is approximately 400 feet above the 100-year floodplain. The potential for flash flooding is minimal because the facility is constructed on the sand dunes of the Los Medanos plateau.

8.b. Describe the methods used to control flooding, run-on and run-off at the discharge site (berms, diversion channels, etc.):

As described in section 13 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996, flooding, run-on, and run-off is controlled by

diversion berms that surround the facultative lagoon system / evaporation facility and by the construction of the H-19 evaporative pond on an elevated caliche pad.

9. **Geologic and Soil Information** [20.6.2.3106.5 NMAC]:

9.a. **Lithology:** Describe the lithology and thickness of each geologic unit below the discharge site and indicate which units bear water. This information may be obtained from a driller's log or geologic report. Include photocopies of all well logs with the application. Add rows as necessary to include all units.

As described in section 15 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996, previous applications, renewals, and modifications.

9.b. **Soil Map:** Attach a copy of the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey map and descriptive information for soil(s) associated with the discharge site.

As provided in attachment 9 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996.

10. **Signatures:**

Owner: I certify that I am the legal owner of the property in which all discharges will occur. I certify that I am knowledgeable about the information contained in this application, and believe the information is true, complete and accurate.

Print Name: ______________________________

Signature: ______________________________ Date ____________________

Responsible Party* (if property is leased or operated by someone other than the owner):

I certify that I am knowledgeable about the information contained in this application, and believe the information is true, complete and accurate.

Print Name: **N/A**

Signature: **N/A** Date **N/A**

* Enclose a signed copy of the lease agreement between the responsible party and the owner of the property on which the proposed discharge will occur. Lease agreement should be valid for the duration of the discharge permit or until the discharge permit is modified to reflect a new lessee.

ATTACHMENT 1

WASTE ISOLATION PILOT PLANT (WIPP) DISCHARGE MONITORING REPORT FOR DISCHARGE PLAN DP-831

REPORT NUMBER 33: FIRST QUARTER, 2002

SPECIFIC REQUIREMENTS OF DP-831

1. DISCHARGE VOLUMES:

Facultative Lagoon System *	(Total Domestic Water Flow)	965,558 gallons
Miscellaneous Water Discharged to the Lagoon System		None
"B" Evaporation Pond		None
H-19 Evaporation Pond		1,600 gallons
Neutralized Spent Acid Waste		14.8 gallons

* The flow meter for waste water discharged to the Facultative Lagoon System is out of order as of 11/26/01. A work order is in place for repair and calibration of the meter. The volume discharged to the Facultative Lagoon System above, is the total amount of domestic water used by the facility which demonstrates that flow to the Lagoon System could not exceed 23,500 gallons per day as prescribed by DP-831.

The water discharged to the H-19 Evaporation Pond was generated as a result of ground water monitoring well pumping and sampling activities and fan condensate.

Laboratory analyses used in characterization of these waste waters is on file.

2. WATER QUALITY ANALYSIS

Analysis of Inflow to Facultative Lagoon System:

Nitrate (as N)	<1.0 mg/L
Total Kjeldahl Nitrogen (as N)	100.50 mg/L
Total Dissolved Solids (TDS)	519 mg/L
	Activity ± TPU*
Plutonium 238	0.014 ± 0.015 pCi/L
Plutonium 239/240	0.004 ± 0.011 pCi/L
Americium 241	-0.005 ± 0.024 pCi/L
Uranium 234	1.250 ± 0.158 pCi/L
Uranium 235	0.040 ± 0.028 pCi/L
Uranium 238	0.494 ± 0.019 pCi/L
Strontium 90	0.290 ± 0.470 pCi/L

Analysis of Inflow to Facultative Lagoon System (Cont.)

Gross Alpha	1.570 ± 2.580 pCi/L
Radium 226	0.110 ± 0.170 pCi/L
Radium 228	-0.230 ± 1.460 pCi/L

Analysis of Evaporation Ponds:

Evaporation Pond "B"

Total Dissolved Solids (TDS)	24,800 mg/L
	Activity ± TPU*
Plutonium 238	0.005 ± 0.007 pCi/L
Plutonium 239/240	-0.001 ± 0.007 pCi/L
Americium 241	-0.006 ± 0.024 pCi/L
Uranium 234	0.773 ± 0.134 pCi/L
Uranium 235	0.022 ± 0.034 pCi/L
Uranium 238	0.281 ± 0.078 pCi/L
Strontium 90	0.580 ± 0.540 pCi/L
Gross Alpha	143.000 ± 88.200 pCi/L
Radium 226	3.910 ± 0.440 pCi/L
Radium 228	0.990 ± 0.540 pCi/L

Evaporation Pond "C"

Total Dissolved Solids (TDS)	28,300 mg/L
	Activity ± TPU*
Plutonium 238	0.008 ± 0.011 pCi/L
Plutonium 239/240	0.014 ± 0.015 pCi/L
Americium 241	-0.021 ± 0.020 pCi/L
Uranium 234	0.681 ± 0.111 pCi/L
Uranium 235	-0.003 ± 0.019 pCi/L

Evaporation Pond "C" (Cont.)

Uranium 238	0.296 ± 0.007 pCi/L
Strontium 90	0.540 ± 0.550 pCi/L
Gross Alpha	60.7 ± 82.0 pCi/L
Radium 226	4.33 ± 0.46 pCi/L
Radium 228	0.88 ± 1.53 pCi/L

H-19 Evaporation Pond

Total Dissolved Solids (TDS)	100,000 mg/L
	Activity ± TPU*
Plutonium 238	0.004 ± 0.010 pCi/L
Plutonium 239/240	0.003 ± 0.008 pCi/L
Americium 241	-0.004 ± 0.023 pCi/L
Uranium 234	2.960 ± 0.315 pCi/L
Uranium 235	0.055 ± 0.033 pCi/L
Uranium 238	1.060 ± 0.160 pCi/L
Strontium 90	0.280 ± 0.610 pCi/L
Gross Alpha	20.700 ± 234.000 pCi/L
Radium 226	9.630 ± 0.790 pCi/L
Radium 228	1.650 ± 1.620 pCi/L

3. BERMS PROTECTING THE LAGOON WILL BE MAINTAINED TO PROTECT AGAINST PRECIPITATION RUN-OFF AND RUN-ON

   Berms are maintained and inspected on a regular basis. All berms are stable and functioning properly.

4. SPILLS
   No spills, seeps, and/or leaks of effluent, leachate and/or process fluids have occurred that are not authorized by DP-831.

* - Total Propagated Uncertainty

ATTACHMENT 2

TRACEANALYSIS

FORM 1
CLASSICALS ANALYSIS DATA SHEET

Lab Name: TraceAnalysis, Inc.

SDG No.: A01111425

Matrix (aqueous/solid/leachate): aqueous

Receipt date: 11/14/01

WIPP Round No. 13

WIPP Well No. 6A

Concentration Units (mg/L or mg/Kg dry weight): mg/L

WIPP Sample No.	Lab Sample No.	CAS No.	Analyte	Conc.	C	Analysis Date	EPA Method No. (unless otherwise noted)	RL
WQ6ADLR13N9	T184890		Alkalinity	102	U	11/27/01	EPA 310.1	4.0
WQ6ADLR13N9	T184890	7726-95-6	Bromide	1.14		11/27/01	300.0	0.2
WQ6ADLR13N9	T184890	7782-50-5	Chloride	414		11/27/01	300.0	2.0
WQ6ADLR13N9	T184890		Density	1.0049		12/4/01	ASTM D 854-92	N/A
WQ6ADLR13N9	T184890		Fluoride	1.39		12/4/01	340.2	0.10
WQ6ADLR13N9	T184890		Iodide	2.00	U	12/4/01	345.1	2.0
WQ6ADLR13N9	T184890	7727-37-9	Nitrate (as N)	3.67		11/21/01	SM 4500 NO3E	0.10
WQ6ADLR13N9	T184890		Orthophosphate (as P)	0.040	U	11/15/01	SM 4500 PE	0.04
WQ6ADLR13N9	T184890		pH	7.52		11/14/01	150.1	4-10
WQ6ADLR13N9	T184890		Conductivity	4160		12/11/01	SM2510B	N/A
WQ6ADLR13N9	T184890		Sulfate	1900		11/27/01	300.0	2.0
WQ6ADLR13N9	T184890		Total Dissolved Solids (TDS)	4600		11/20/01	160.1	10
WQ6ADLR13N5	T184882		Total Organic Carbon (TOC)	1.00	U	11/29/01	415.1	1.0
WQ6ADLR13N4	T184880		Total Organic Halogen (TOX)	~~0.390~~ .039		12/5/01	5320B/9020A	0.005
WQ6ADLR13N8	T184888		Total Phenols	0.100	U	12/10/01	SM 5530AD	0.10
WQ6ADLR13N9	T184890		Total Suspended Solids (TSS)	1.00	U	11/23/01	160.2	1.0
WQ6ADLR13N2	T184876	78-83-1	Isobutanol	2.00	U	11/21/01	8015	2.0

(Density reported in g/mL, pH reported in s.u., Conductivity reported in uMHOs/cm, all other analytes reported in mg/L)

(pH ran as soon as received in laboratory)

Comments:

TOX and Isobutanol ran by ATEL

Iodide received out of hold time.

SECTION I
Page 3

COVER PAGE - CLASSICALS ANALYSES DATA PACKAGE

Lab Name: TraceAnalysis, Inc.

SDG No.: A01111425

Program: WIPP/GWMP

WIPP Sample No.	Lab Sample ID.
WQ6ADLR13N2	T184876
WQ6ADLR13N2D	T184877
WQ6ADLR13N4	T184880
WQ6ADLR13N4D	T184881
WQ6ADLR13N5	T184882
WQ6ADLR13N5D	T184883
WQ6ADLR13N8	T184888
WQ6ADLR13N8D	T184889
WQ6ADLR13N9	T184890
WQ6ADLR13N9D	T184891

Comments: Narrative Report is attached. Yes X No ____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the Narrative Report. Release of data contained in this hardcopy data package (and in the data submitted on magnetic media, if data is submitted on magnetic media), has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Michael T. Abel
Date: 2/11/02

Name: Blair Leftwich
Title: Managing Director

Forms by ChemSW™(707)864-0845;p/n11092;v3.2;11/1/97

4/92

CHAIN-OF-C TODY RECORD

WASTE ISOLATION PILOT PLANT
WESTINGHOUSE ELECTRIC CORP.
P.O. BOX 2078
CARLSBAD, NM 88221-2078

C of C Control No. 6242
RFA Control No. 6242

SAMPLING PROGRAM WIPP/GWMP
LAB DESTINATION Trace Analysis
SAMPLE TEAM MEMBERS B. Foster, M. Belderrama
CARRIER/WAYBILL NO. N/A

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
WQ6ADLR13N7D	WQSP-6A, Dewey Lake	11/14/01 06:30-06:35	Ground water	1 liter plastic x 1	Intact good	
WQ6ADLR13W8		06:35-06:40		1 liter amber gl. x 1	condition	
WQ6ADLR13N8D		06:40-06:45		1 liter amber gl. x 1		
WQ6ADLR13N9		06:45-06:50		1 liter plastic x 1		
WQ6ADLR13W9D BF 11/14/01		06:50-06:55		1 liter plastic x 1		
WQ6ADLR13 ~~N10~~ 13		05:15-05:20		1 liter plastic x 1		
WQ6ADLR13N13D BF 11/13/01		05:20-05:25		1 liter plastic x 1		
WQ6ADLR ~~14~~ 13N14		05:25-05:30		1 liter plastic x 1		
WQ6ADLR13N14D	WQSP-6A, Dewey Lake	11/14/01 05:30-05:35	Ground water	1 liter plastic x 1		

Special Instructions: Please analyze VOC's and Semi-Vols. ASAP

Possible Sample Hazards: NONE

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: Bill Foster, WTS, 11/14/01, 07:20
Received By: Ron Richardson, WTS, 11/14/01, 07:20
2. Relinquished By: Ron Richardson, WTS, 11/14/01, 11:30 AM
Received By: Vicki Hensley 11-14-01 11:30 AM
3. Relinquished By:
Received By:
4. Relinquished By:
Received By:

Carry In 4°

WP 02-EM3001

WHITE - Original, to accompany samples YELLOW - Field Copy PINK - Other

FINAL SAMPLING CHECKLIST

PROJECT NAME : WIPP-GWMP

WELL NUMBER: WQSP-6A

ZONE: DEWEY LAKE

ROUND: THIRTEEN

FILTER TYPE: WHATMAN

PORE SIZE : 0.45 um

LOT # : H718 718400410

COLLECTED BY : B. Foster, M. Balderrama

DATE COLLECTED : 11/14/01

SAMPLE NUMBER	PARAMETERS	SAMPLE FOR	DESTINATION	CONTAINERS NUMBER	CONTAINERS VOLUME	TYPE	ACID WASH	SAMPLE FILTER	PRESERVATIVE	COLLECTION TIME
WQ6ADLR13N 1	VOC	W	TRA. ANA.	4	40 ml	GLASS	NO	NO	HCL, pH<2	05:35-05:40
WQ6ADLR13N 1D	VOC	W	TRA. ANA.	4	40 ml	GLASS	NO	NO	HCL, pH<2	05:40-05:[illegible]5
WQ6ADLR13N 2	VOC(OTHER)	W	TRA. ANA.	2	40 ml	GLASS	NO	NO	HCL, pH<2	05:45-05:50
WQ6ADLR13N 2D	VOC(OTHER)	W	TRA. ANA.	2	40 ml	GLASS	NO	NO	HCL, pH<2	05:50-05:55
WQ6ADLR13N 3	VOC TRIP BLANK	W	TRA. ANA.	4	40 ml	GLASS	NO	NO	HCL, pH<2	05:00-05:05
WQ6ADLR13N 3D	VOC TRIP BLANK	W	TRA. ANA.	4	40 ml	GLASS	NO	NO	HCL, pH<2	05:05-05:10
WQ6ADLR13N 4	TOX	W	TRA. ANA.	1	500 ML	GLASS	YES	NO	H2SO4,pH<2	05:55-06:00
WQ6ADLR13N 4D	TOX	W	TRA. ANA.	1	500 ML	GLASS	YES	NO	H2SO4,pH<2	06:00-06:05
WQ6ADLR13N 5	TOC	W	TRA. ANA.	1	250 ml	GLASS	NO	NO	HCL, pH<2	06:05-06:10
WQ6ADLR13N 5D	TOC	W	TRA. ANA.	1	250 ml	GLASS	NO	NO	HCL, pH<2	06:10-06:15
WQ6ADLR13N 6	SEMI-VOLATILES	W	TRA. ANA.	6	1 LITER	GLASS	YES	NO	NONE	06:15-06:20
WQ6ADLR13N 6D	SEMI-VOLATILES	W	TRA. ANA.	2	1 LITER	GLASS	YES	NO	NONE	06:20-06:25
WQ6ADLR13N 7	METALS	W	TRA. ANA.	1	1 LITER	PLASTIC	YES	NO	HNO3, pH<2	06:25-06:30
WQ6ADLR13N 7D	METALS	W	TRA. ANA.	1	1 LITER	PLASTIC	YES	NO	HNO3, pH<2	06:30-06:
WQ6ADLR13N 8	TOTAL PHENOL	W	TRA. ANA.	1	1 LITER	GLASS	YES	NO	H2SO4,pH<2	06:35-06:40
WQ6ADLR13N 8D	TOTAL PHENOL	W	TRA. ANA.	1	1 LITER	GLASS	YES	NO	H2SO4,pH<2	06:40-06:45
WQ6ADLR13N 9	GENERAL CHEMISTRY	W	TRA. ANA.	1	1 LITER	PLASTIC	YES	NO	NONE	06:45-06:50
WQ6ADLR13N 9D	GENERAL CHEMISTRY	W	TRA. ANA.	1	1 LITER	PLASTIC	YES	NO	NONE	06:50-06:55
WQ6ADLR13N 10	RADIONUCLIDES	W	WIPP LAB	2	2 LITER	PLASTIC	YES	YES	HNO3, pH<2	06:55-07:00
WQ6ADLR13N 10D	RADIONUCLIDES	W	WIPP LAB	2	2 LITER	PLASTIC	YES	YES	HNO3, pH<2	07:00-07:05
BU6ADLR13N 11	RADIONUCLIDES	W	WIPP LAB	2	2 LITER	PLASTIC	YES	YES	HNO3, pH<2	05:10-05:15
WQ6ADLR13N 12	HOLD	W	HOLD	1	2 LITER	PLASTIC	YES	YES	HNO3, pH<2	07:05-07:10

ORIGINAL

FINAL SAMPLES CHECKLIST

ACID/REAGENT BLANKS

PROJECT NAME : WIPP-GWMP   WELL NUMBER : WQSP-6A   FILTER TYPE: BARNSTEAD   COLLECTED BY: B. Foster / M. Balderrama

ZONE: DEWEY LAKE   ROUND: THIRTEEN   LOT # : 6K   DATE COLLECTED: 11/14/01

SAMPLE NUMBER	PARAMETERS	SAMPLE FOR	DESTINATION	CONTAINERS NUMBER	CONTAINERS VOLUME	TYPE	ACID WASH	SAMPLE FILTER	PRESERVATIVE	COLLECTION TIME
WQ6ADLR13N 13	METALS	W	TRA. ANA.	1	1 LITER	PLASTIC	YES	YES	HNO3, pH<2	05:15-05:20
WQ6ADLR13N 13D	METALS	W	TRA. ANA.	1	1 LITER	PLASTIC	YES	YES	HNO3, pH<2	05:20-05:25
WQ6ADLR13N 14	METALS	W	TRA. ANA.	1	1 LITER	PLASTIC	YES	YES	NONE	05:25-05:30
WQ6ADLR13N 14D	METALS	W	TRA. ANA.	1	1 LITER	PLASTIC	YES	YES	NONE	05:30-05:35

PRESERVATIVES

NITRIC ACID: MANUFACTURER JT Baker; LOT # T23540; DATE OPENED 9/7/00.

SULFURIC ACID: MANUFACTURER JT Baker; LOT # M12539; DATE OPENED 9/7/00.

HYDROCHLORIC ACID: MANUFACTURER JT Baker; LOT # J52540; DATE OPENED 3/1/99.

ORIGINAL

TRACEANALYSIS

FORM 1
CLASSICALS ANALYSIS DATA SHEET

Lab Name: TraceAnalysis, Inc.

SDG No.: A01100426

Matrix (aqueous/solid/leachate): aqueous

Receipt date: 10/04/01

WIPP Round No. 13

WIPP Well No. 3

Concentration Units (mg/L or mg/Kg dry weight): mg/L

WIPP Sample No.	Lab Sample No.	CAS No.	Analyte	Conc.	C	Analysis Date	EPA Method No. (unless otherwise noted)	RL
WQ3CR13N9	T181100		Alkalinity	32		10/11/01	EPA 310.1	4.0
WQ3CR13N9	T181100	7726-95-6	Bromide	127		10/12/01	300.0	0.2
WQ3CR13N9	T181100	7782-50-5	Chloride	131000		10/12/01	300.0	2.0
WQ3CR13N9	T181100		Density	1.1520		10/18/01	ASTM D 854-92	N/A
WQ3CR13N9	T181100		Fluoride	0.938		10/31/01	340.2	0.10
WQ3CR13N9	T181100		Iodide	2.0	U	11/2/01	345.1	2.0
WQ3CR13N9	T181100	7727-37-9	Nitrate (as N)	0.100	U	10/17/01	353.3	0.10
WQ3CR13N9	T181100		Orthophosphate (as P)	0.118		10/16/01	SM 4500 PE	0.04
WQ3CR13N9	T181100		pH	6.77		10/4/01	150.1	4-10
WQ3CR13N9	T181100		Conductivity	195000		10/22/01	SM2510B	
WQ3CR13N9	T181100		Sulfate	7460		10/12/01	300.0	2.0
WQ3CR13N9	T181100		Total Dissolved Solids (TDS)	234000		10/8/01	160.1	10
WQ3CR13N5	T181092		Total Organic Carbon (TOC)	1.00	U	10/16/01	415.1	1.0
WQ3CR13N4	T181090		Total Organic Halogen (TOX)	5.8		10/16/01	5320B/9020A	0.005
WQ3CR13N8	T181098		Total Phenols	0.153		10/25/01	SM 5530AD	0.10
WQ3CR13N9	T181100		Total Suspended Solids (TSS)	82.0		10/11/01	160.2	1.0
WQ3CR13N2	T181086	78-83-1	Isobutanol	2.0	U	9/27/01	8015	2.0

(Density reported in g/mL, pH reported in s.u., Conductivity reported in uMHOs/cm, all other analytes reported in mg/L)

(pH ran as soon as received in laboratory)

Comments:

TOX and Isobutanol ran by ATEL

Iodide out of hold time.

Nitrate (as N) ran as a NO3-NO2 because of the high amounts of Cl raising the Nitrate by IC reporting limit. NO3-NO2 was <0.10 mg/L so Nitrate as N should be <0.10 mg/L

COVER PAGE - CLASSICALS ANALYSES DATA PACKAGE

Lab Name: TraceAnalysis, Inc.

SDG No.: A01100426

Program: WIPP/GWMP

WIPP Sample No.	Lab Sample ID.
WQ3CR13N2	T181086
WQ3CR13N2D	T181087
WQ3CR13N4	T181090
WQ3CR13N4D	T181091
WQ3CR13N5	T181092
WQ3CR13N5D	T181093
WQ3CR13N8	T181098
WQ3CR13N8D	T181099
WQ3CR13N9	T181100
WQ3CR13N9D	T181101

Comments: Narrative Report is attached. Yes X No ____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the Narrative Report. Release of data contained in this hardcopy data package (and in the data submitted on magnetic media, if data is submitted on magnetic media), has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Michael T. Abel

Date: 11/19/01

Name: Blair Leftwich

Title: Managing Director

REQUEST R ANALYSIS

RFA Control No. 6226
C of C Control No. 6226

WASTE ISOLATION PILOT PLANT
WESTINGHOUSE ELECTRIC CORP.
P.O BOX 2078
CARLSBAD, NM 88221-2078

DATE SAMPLES SHIPPED 10/4/01
LAB DESTINATION Trace Analysis
LABORATORY CONTACT James Taylor
SEND LAB REPORT TO Mark Edwards
P.O. Box 2078
Carlsbad, N.M. 88221
DATE REPORT REQUIRED 11/4/01
PROJECT CONTACT Ron Richardson
PROJECT CONTACT PHONE NO. (505) 234-8

SAMPLING PROGRAM WIPP/GWMP
PURCHASE ORDER NO. 3230

Sample Number	Sample Type	Sample Quantity	Preservative	Req't. Testing Program	Special Instructions
WQ3CR13N7D	Ground Water	1 liter x 1	HNO_3 pH<2	Metals	181097
WQ3CR13N8	↕	1 liter x 1	H_2SO_4 pH<2	Total Phenol	181098 Please Analyze
WQ3CR13N8D		1 liter x 1	H_2SO_4 pH<2	Total Phenol	181099 VOC's and Semi-Vols
WQ3CR13N9		1 liter x 1	NONE	General Chemistry	181100 ASAP
WQ3CR13N9D	Ground Water	1 liter x 1	NONE	General Chemistry	181101

TURNAROUND TIME REQUIRED: (Rush must be approved by appropriate Manager) NORMAL X RUSH ____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)

NONHAZARD X FLAMMABLE ____ SKIN IRRITANT ____ HIGHLY TOXIC ____ BIOLOGICAL ____ OTHER X ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis.) RETURN TO CLIENT ____ DISPOSAL BY LAB X

SECTION V
Page 3

FOR LAB USE ONLY

RECEIVED BY [signature] DATE/TIME 10-4-01 11:

WP 02-EM3001

WHITE - Original, to accompany samples YELLOW - Field Copy PINK - Other

Carry In 3° jms

FINAL SAMPLES CHECKLIST

PROJECT NAME : WIPP-GWMP   WELL NUMBER: WQSP-3   FILTER TYPE: WHATMAN   COLLECTED BY : B. Foster / M. Balderrama

PORE SIZE : 0.45 um

ZONE: CULEBRA   ROUND: THIRTEEN   LOT # : H718718400410   DATE COLLECTED : 10/4/01

SAMPLE NUMBER	PARAMETERS	SAMPLE FOR	DESTINATION	CONTAINERS NUMBER	CONTAINERS VOLUME	TYPE	ACID WASH	SAMPLE FILTER	PRESERVATIVE	COLLECTION TIME
WQ3CR13N 1	VOC	W	TRA. ANA.	4	40 ml	GLASS	NO	NO	HCL, pH<2	05:15-05:
WQ3CR13N 1D	VOC	W	TRA. ANA.	4	40 ml	GLASS	NO	NO	HCL, pH<2	05:20-05:
WQ3CR13N 2	VOC(OTHER)	W	TRA. ANA.	2	40 ml	GLASS	NO	NO	HCL, pH<2	05:25-05:30
WQ3CR13N 2D	VOC(OTHER)	W	TRA. ANA.	2	40 ml	GLASS	NO	NO	HCL, pH<2	05:30-05:35
WQ3CR13N 3	VOC TRIP BLANK	W	TRA. ANA.	4	40 ml	GLASS	NO	NO	HCL, pH<2	05:00-06:05
WQ3CR13N 3D	VOC TRIP BLANK	W	TRA. ANA.	4	40 ml	GLASS	NO	NO	HCL, pH<2	05:05-05:10
WQ3CR13N 4	TOX	W	TRA. ANA.	1	500 ML	GLASS	YES	NO	H2SO4, pH<2	05:35-05:40
WQ3CR13N 4D	TOX	W	TRA. ANA.	1	500 ML	GLASS	YES	NO	H2SO4, pH<2	05:40-05:45
WQ3CR13N 5	TOC	W	TRA. ANA.	1	250 ml	GLASS	NO	NO	HCL, pH<2	05:45-05:50
WQ3CR13N 5D	TOC	W	TRA. ANA.	1	250 ml	GLASS	NO	NO	HCL, pH<2	05:50-05:55
WQ3CR13N 6	SEMI-VOLATILES	W	TRA. ANA.	6	1 LITER	GLASS	YES	NO	NONE	05:55-06:00
WQ3CR13N 6D	SEMI-VOLATILES	W	TRA. ANA.	2	1 LITER	GLASS	YES	NO	NONE	06:00-06:05
WQ3CR13N 7	METALS	W	TRA. ANA.	1	1 LITER	PLASTIC	YES	NO	HNO3, pH<2	06:05-06:10
WQ3CR13N 7D	METALS	W	TRA. ANA.	1	1 LITER	PLASTIC	YES	NO	HNO3, pH<2	06:10-06:1
WQ3CR13N 8	TOTAL PHENOL	W	TRA. ANA.	1	1 LITER	GLASS	YES	NO	H2SO4, pH<2	06:15-06:20
WQ3CR13N 8D	TOTAL PHENOL	W	TRA. ANA.	1	1 LITER	GLASS	YES	NO	H2SO4, pH<2	06:20-06:25
WQ3CR13N 9	GENERAL CHEMISTRY	W	TRA. ANA.	1	1 LITER	PLASTIC	YES	NO	NONE	06:25-06:30
WQ3CR13N 9D	GENERAL CHEMISTRY	W	TRA. ANA.	1	1 LITER	PLASTIC	YES	NO	NONE	06:30-06:35
WQ3CR13N 10	RADIONUCLIDES	W	WIPP LAB.	2	2 LITER	PLASTIC	YES	YES	HNO3, pH<2	06:35-06:40
WQ3CR13N 10D	RADIONUCLIDES	W	WIPP LAB.	2	2 LITER	PLASTIC	YES	YES	HNO3, pH<2	06:40-06:45
BU3CR13N 11	RADIONUCLIDES	W	WIPP LAB.	2	2 LITER	PLASTIC	YES	YES	HNO3, pH<2	05:10-05:15
WQ3CR13N 12	HOLD	W	HOLD	1	2 LITER	PLASTIC	YES	YES	HNO3, pH<2	06:45-06:50

ORIGINAL

PRESERVATIVES

NITRIC ACID: MANUFACTURER JT Baker; LOT # T23540; DATE OPENED 9/7/00.

SULFURIC ACID: MANUFACTURER JT Baker; LOT # M12539; DATE OPENED 9/7/00.

HYDROCHLORIC ACID: MANUFACTURER JT Baker; LOT # J52540; DATE OPENED 3/1/99.

ORIGINAL

ATTACHMENT 3

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WP 02-EM1001

Revision 4

Sewage Lagoon Sampling

Technical Procedure

EFFECTIVE DATE: 07/31/01

Stewart Jones
PRINTED NAME
APPROVED FOR USE

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INTRODUCTION

This procedure provides instructions necessary for Environmental Monitoring (EM) personnel to sample the sewage lagoon as required by DP-831, Sewage System Discharge Plan, and DOE/WIPP 99-2194, Environmental Monitoring Plan.

One or more of the following records are generated by the use of this procedure:

- WP Form 02-EM3001-1, Chain of Custody
- WP Form 02-EM3001-2, Request for Analysis
- WP Form 15-PM3525-1, Shipping Authorization
- WP 02-EM3001, Attachment 1, Sample Tracking Log Book

REFERENCES

BASELINE DOCUMENTS

- 40 CFR 503, Standards for the Use or Disposal of Sewage Sludge
- 49 CFR Subpart B, Transportation
- SW 846, EPA Test Methods for Evaluating Solid Waste
- WP 12-IH.02, WIPP Industrial Hygiene Program

REFERENCED DOCUMENTS

- DOE/WIPP 99-2194, Environmental Monitoring Plan
- DP-831, Sewage System Discharge Plan, New Mexico Environment Department, July 3, 1997
- WP 02-EM3001, Administrative Processes for Environmental Monitoring Programs
- WP 12-IS1832, Emergency Eyewash and Shower Equipment
- WP 15-PM3525, Preparation and Processing of Shipping Authorization

EQUIPMENT

SAMPLING EQUIPMENT

- Buckets (2)
- Clock or watch
- Communications equipment (radio or cellular phone)
- Portable eye wash station
- Eye protection
  - Splash goggles
  - Face shield
- Key to sewage lagoon
- Sample containers (in accordance with Attachment 1, Sampling Parameters and Environmental Monitoring Sample Plan)
- Sample shipping cases
- Sampling boom
- Tyvek suits/Tyvek Lab coats

CONSUMABLES

- Biohazard bags (large size preferable, available from site nurse)
- Disinfecting solution
- Deionized (DI) water (5 gallons minimum)
- Disposable paper towels
- Frozen ice packs
- Gloves, for handling nitric acid
- Gloves, nitrile
- Tape, clear for sampling labels

- Tape, plastic (for sealing container caps)
- Tape, tamper evidence seal
- pH strips
- Concentrated nitric and sulfuric acids
- Disposable pipettes

PRECAUTIONS AND LIMITATIONS

- Only personnel qualified in accordance with EM-12, or a qualification card, or under the direct supervision of a qualified individual, may perform this procedure.
- Sampling must be performed by a team of at least two people.
- Material Safety Data Sheets (MSDS) must be reviewed, kept up to date, and readily available.
- Requirements for personal protective equipment (PPE) must be followed.
- All personnel performing this procedure must have Hepatitis B vaccination series, current tetanus immunization, and hepatitis A vaccination.
- Sampling team will reglove when changing sampling locations.
- Use caution when moving about sewage lagoons; the liner surfaces may be slippery, which could result in slips or falls.

PREREQUISITE ACTIONS

1.0 Order sample containers two to three weeks prior to planned sampling date, including containers for selected control samples per Attachment 3.

NOTE

Contract laboratory may substitute sample containers different from those listed on Attachment 1.

Trip blanks received from laboratories with preserved containers must be kept with the sample containers and returned to the contract laboratory with each set of samples.

2.0 Upon receipt of sample containers, verify the following:

- Appropriate container types and size match container criteria listed on Attachment 1.
- Preservatives indicated on container labels match preservative criteria shown on Attachment 1.
- Containers are visually clean.

3.0 At least two working days prior to sampling, contact Shipping Coordination for shipping guidance.

4.0 If substitute sample containers are required, add required preservatives shown on Attachment 1.

5.0 Verify all necessary equipment for the type sampling to be performed is available and ready for use.

6.0 Collect sampling equipment and materials for transport to lagoon.

7.0 Notify Central Monitoring Room Operator (CMRO) prior to entering sewage facility area (at extension 8125 or 8457).

PERFORMANCE

1.0 EFFLUENT SAMPLING

1.1 Set up a portable eye wash station at the sampling location.

1.2 Don PPE.

1.3 Set up decontamination equipment as follows:

1.3.1 Fill two buckets ½ full with DI water.

1.3.2 Add disinfectant to one of the buckets, following manufacturer's recommended concentration.

WARNING

Liner surface may be slippery. Slips or falls while walking on the liner may result in personnel injury or contamination.

CAUTION

Overflowing prepreserved sample containers can invalidate the sample.

NOTE

Touching the inside of sample containers and caps can cross-contaminate the sample. Sample containers and caps need to remain free of contamination from soil, debris and blowing sand.

NOTE

Sample chain of custody is established and maintained in accordance with WP 02-EM3001.

1.4 Obtain sample using sampling boom, taking care **NOT** to overfill sample container.

1.5 Install sample container cap.

1.6 Rinse outside of sample container with DI water.

1.7 Dry sample container with disposable towel(s).

1.8 Seal sample container with plastic tape.

1.9 Place tamper evidence seal tape on cap so that seal tape will have to be broken to open sample container.

1.10 Date and initial evidence tape.

1.11 Affix sample code label to the sample container.

1.12 Cover label with clear tape.

1.13 Verify chilled samples meet chilling requirements per Attachment 1.

1.14 Place container in shipping case.

1.15 **IF** additional samples are to be taken at this sample location, **THEN** repeat Steps 1.4 through 1.14.

1.16 Clean and disinfect reusable sampling equipment as follows:

1.16.1 Wash in disinfectant solution.

1.16.2 Rinse with DI water.

1.16.3 Rinse again in free flowing stream of DI water.

1.17 Repeat Steps 1.4 through 1.16.3 for remaining sample locations.

1.18 Notify CMRO (at extension 8125 or 8457) when leaving sewage facility.

1.19 Dispose of nonreusuable equipment, materials and trash in a biohazard bag and deliver to the site nurse for disposal.

NOTE

Sample must be handled, packaged, and shipped in accordance with contract laboratory requirements and Shipping Coordination requirements.

1.20 Complete the following documents prior to final packaging of sample containers for shipment:

- WP Form 02-EM3001-1, Chain of Custody
- WP Form 02-EM3001-2, Request for Analysis
- WP 02-EM3001, Attachment 1, Sample Tracking Log Book

1.21 Prepare the following for hand-delivered samples:

- Shipping cases
- WP Form 02-EM3001-1, Chain of Custody
- WP Form 02-EM3001-2, Request for Analysis

1.22 If samples are to be shipped via carrier, perform the following:

1.22.1 <u>At least two working days prior to sampling, contact Shipping Coordination for shipping guidance.</u>

1.22.2 Prepare a transmittal letter and WP Form 15-PM3525-1, Shipping Authorization.

1.22.3 Deliver the following to the warehouse for shipment to the contract laboratory:

- Shipping cases
- WP Form 02-EM3001-1, Chain of Custody
- WP Form 02-EM3001-2, Request for Analysis
- WP Form 15-PM3525-1, Shipping Authorization
- Transmittal letter

2.0 SLUDGE SAMPLING

NOTE
Sludge sampling will be requested by Environmental Compliance (EC).

2.1 Obtain the following information from EC:

- Sampling locations
- Preservatives to be used
- Container types, sizes, and analytical parameters

2.2 Notify CMRO (at extension 8125 or 8457) prior to entering sewage facility area.

2.3 Set up a portable eye wash station at the sampling location.

2.4 Don PPE.

2.5 Set up decontamination equipment as follows:

2.5.1 Fill two buckets ½ full with DI water.

2.5.2 Add disinfectant to one of the buckets, following the manufacturer's recommended concentration.

WARNING

Liner surface may be slippery. Slips or falls while walking on the liner may result in personnel injury or contamination.

CAUTION

Overflowing prepreserved sample containers can invalidate the sample.

NOTE

Touching the inside of sample containers and caps can cross-contaminate the samples. Sample containers and caps need to remain free of contamination from soil, debris, and blowing sand.

NOTE

Sample chain of custody is established and maintained in accordance with WP 02-EM3001.

2.6 Obtain sample.

2.7 Install sample container cap.

2.8 Rinse outside of sample container with DI water.

2.9 Dry sample container with disposable towel(s).

2.10 Seal sample container with plastic tape.

2.11 Place tamper evidence seal tape on cap so that seal tape will have to be broken to open sample container.

2.12 Date and initial evidence tape.

2.13 Affix sample code labels to sample container.

2.14 Cover label with clear tape.

2.15 Place container in shipping case.

2.16 **IF** additional samples are to be taken at this sample location, **THEN** repeat Steps 2.6 through 2.15.

2.17 Clean and disinfect reusable sampling equipment as follows:

2.17.1 Wash in disinfectant solution.

2.17.2 Rinse in DI water.

2.17.3 Rinse again in free-flowing stream of DI water.

2.18 Repeat Steps 2.6 through 2.17.3 for remaining sample locations.

2.19 Notify CMRO (at extension 8125 or 8457) when leaving sewage facility.

2.20 Dispose of nonreusuable equipment, materials, and trash in a biohazard bag and deliver to the site nurse for disposal.

NOTE

Sample must be handled, packaged, and shipped in accordance with contract laboratory requirements and Shipping Coordination requirements.

2.21 Complete the following documents prior to final packaging of sample containers for shipment:

- WP Form 02-EM3001-1, Chain of Custody
- WP Form 02-EM3001-2, Request for Analysis
- WP 02-EM3001, Attachment 1, Sample Tracking Log Book

2.22 Prepare the following for hand delivered samples:

- Shipping cases
- WP Form 02-EM3001-1, Chain of Custody
- WP Form 02-EM3001-2, Request for Analysis

2.23 If samples are to be shipped via carrier, perform the following:

2.23.1 <u>At least two working days prior to sampling, contact Shipping Coordination for shipping guidance</u>.

2.23.2 Prepare a transmittal letter and WP Form 15-PM3525-1, Shipping Authorization.

2.23.3 Deliver the following to the warehouse for shipment to the contract laboratory:

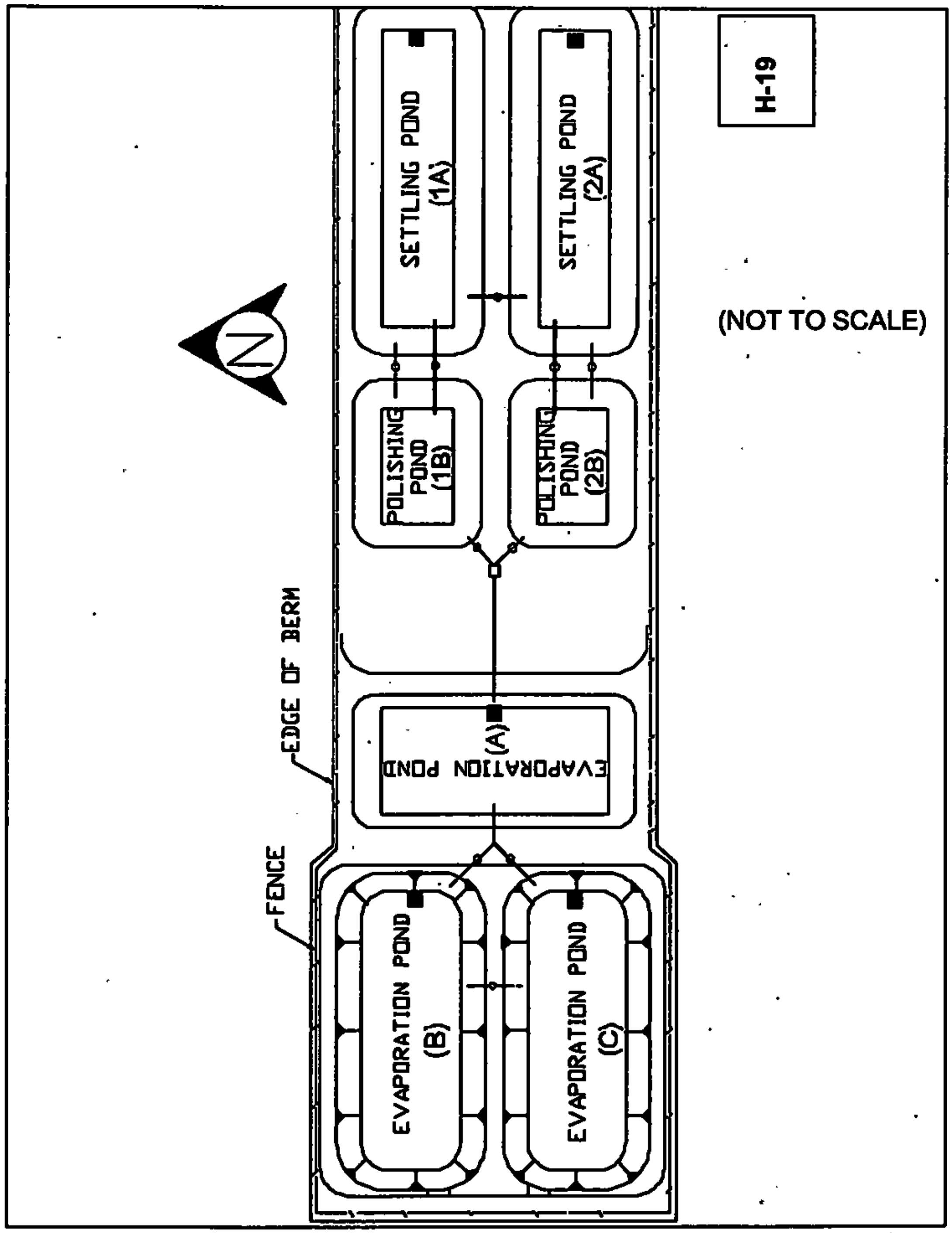
- Shipping cases
- WP Form 02-EM3001-1, Chain of Custody
- WP Form 02-EM3001-2, Request for Analysis
- WP Form 15-PM3525-1, Shipping Authorization
- Transmittal letter

Working Copy

Attachment 1 - Sampling Parameters

ANALYTICAL REQUIREMENTS FOR DP-831 COMPLIANCE					
ANALYTICAL PARAMETERS	LOCATION	SIZE	CONTAINER	PRESERVATIVE	MAXIMUM HOLD TIME
Nitrate (NO3)	Inflow of active setting pond (1A or 2A)	1 Liter	Plastic	H2SO4 to pH<2; <4°C,	28 days
Kjeldahl Nitrogen (TKN)	Inflow of active setting pond (1A or 2A)	1 Liter	Plastic	H2SO4 to pH<2; <4°C,	28 days
Total Dissolved Solids (TDS)	Inflow of active setting pond (1A or 2A)	500 ml	Plastic	<4°C,	7 days
Total Dissolved Solids (TDS)	Pond B	500 ml	Plastic	<4°C,	7 days
Total Dissolved Solids (TDS)	Pond C	500 ml	Plastic	<4°C,	7 days
Total Dissolved Solids (TDS)	H-19	500 ml	Plastic	<4°C,	7 days
As Required	Dupe	Dupe	Plastic	As Required, <4°C,	As Required
As Required	Blank	Dupe	Plastic	As Required, <4°C,	As Required
Radiochemistry Pu238, Pu239/240, Am241,U234,U235,U238, Sr90, Gross Alpha/Beta, Ra226, Ra228.	Inflow of active setting pond (1A or 2A)	4 Liter	Plastic	HNO3 pH<2	180 days
	Pond B	4 Liter	Plastic	HNO3 pH<2	180 days
	Pond C	4 Liter	Plastic	HNO3 pH<2	180 days
	H- 19	4 Liter	Plastic	HNO3 pH<2	180 days
	Dupe	4 Liter	Plastic	HNO3 pH<2	180 days
	Blank	4 Liter	Plastic	HNO3 pH<2	180 days

Attachment 2 - WIPP Sewage Facility Sample Locations



Attachment 3 - Quarterly Sewage Samples Data/Worksheet

QUARTERLY SEWAGE SAMPLES DATA/WORKSHEET

Data / Worksheet No. ______________

_____QUARTER, 2001

TO CONTRACT LAB

SAMPLE CODES	POND	SIZE	ANALYSIS	PRESERVATIVE	DATE/TIME
TO WIPP LABS					

Personnel: ____

Comments: ____

____

____

Checked By:

____

Printed Name Signature Date

Attachment 3 - Quarterly Sewage Samples Data/Worksheet (Cont.)

QUARTERLY SEWAGE SAMPLES DATA / WORKSHEET

Data / Worksheet No. ______________

FIRST QUARTER, 2001

TO CONTRACT LAB					
SAMPLE CODES	POND	SIZE	ANALYSIS	PRESERVATIVE	DATE/TIME
EC-SWL-20010111-1.14	2A	1Liter	NO3	H2SO4 pH<2; <4°C.	
EC-SWL-20010111-2.14	2A	1 Liter	TKN	H2SO4 pH<2; <4°C.	
EC-SWL-20010111-3.14	2A	500ml	TDS	<4°C.	
EC-SWL-20010111-4.14	B	500ml	TDS	<4°C.	
EC-SWL-20010111-5.14	C	500ml	TDS	<4°C.	
EC-SWL-20010111-6.14	H-19	500ml	TDS	<4°C.	
EC-SWL-20010111-7.14	DUPE2A	1 Liter	NO3	H2SO4 pH<2; <4°C.	
EC-SWL-20010111-8.14	BLANK	1 Liter	NO3	H2SO4 pH<2; <4°C.	
TO WIPP LABS					
EC-SWL-20010111-9.14	2A	4 Liter	RADCHEM	HNO3 pH<2	
EC-SWL-20010111-10.14	B	4 Liter	RADCHEM	HNO3 pH<2	
EC-SWL-20010111-11.14	C	4 Liter	RADCHEM	HNO3 pH<2	
EC-SWL-20010111-12.14	H-19	4 Liter	RADCHEM	HNO3 pH<2	
EC-SWL-20010111-13.14	DUPE B	4 Liter	RADCHEM	HNO3 pH<2	
EC-SWL-20010111-14.14	BLANK	4 Liter	RADCHEM	HNO3 pH<2	

Personnel: ______________________________

Comments: ______________________________

Checked By:

Printed Name Signature Date

ATTACHMENT 4

Effective Date: 11/1799

WP 02-1
Revision 5

WIPP Groundwater Monitoring Program Plan

Cognizant Section: Environmental Monitoring

Approved By: W. R. White

WASTE ISOLATION PILOT PLANT
WIPP

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Acronyms and Abbreviations

ASER	Annual Site Environmental Report
AR/VR	Approval/Variation Request
Bell Canyon	Bell Canyon Formation
bgs	below ground surface
Castile	Castile Formation
cm	centimeter(s)
Culebra	Culebra Member of the Rustler Formation
CofC	Chain of Custody
°C	degree(s) Celsius
%C	percent completeness
DI	deionized
DMP	Detection Monitoring Program
DOE	U.S. Department of Energy
DQO	data quality objectives
EM	Environmental Monitoring
EPA	U.S. Environmental Protection Agency
ES&H	Environment, Safety, and Health Department
FEIS	Final Environmental Impact Statement
ft	foot (feet)
ft^2	square foot (square feet)
g/cm^3	gram per cubic centimeter
GMP	Groundwater Monitoring Program
GWSP	Groundwater Surveillance Program
HWDU	hazardous waste disposal unit(s)
km	kilometer(s)
km^2	square kilometer(s)
$lb/in.^2$	pound(s) per square inch
LCS	laboratory control samples
LD	limit of detection
LWA	Land Withdrawal Act
m	meter(s)
M&DC	monitoring and data collection
m^2	square meter(s)
mg/L	milligram(s) per liter
mi	mile(s)
mi^2	square mile(s)
Mpa	megapascal(s)
mV	millivolt(s)
NIST	National Institute for Standards and Technology
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
PRS	Project Records Services

QA	Quality Assurance
QA/QC	quality assurance/quality control
QC	quality control
RCRA	Resource Conservation and Recovery Act
RFA	request for analysis
RIDS	Records Inventory and Disposition Schedule
RPD	relative percent difference
Rustler	Rustler Formation
%R	percent recovery
Salado	Salado Formation
SC	specific conductance
SOP	Standard Operating Procedure
STLB	sample tracking logbook
TDS	total dissolved solids
TOC	total organic carbon
TOX	total organic halogens
TRU	transuranic
TSDF	treatment, storage, and disposal facilities
TSS	total suspended solids
VOC	volatile organic compound
WID	Waste Isolation Division
WIPP	Waste Isolation Pilot Plant
WLMP	Water Level Monitoring Program
WQSP	Water Quality Sampling Program
µg/L	microgram(s) per liter
µm	micrometers

1.0 INTRODUCTION

This is the implementing document for the Waste Isolation Pilot Plant (WIPP) Groundwater Monitoring Program (GMP). The GMP ensures compliance with the Final WIPP Hazardous Waste Permit mandated by 20 NMAC 4 of the New Mexico Administrative Code incorporating applicable sections of 40 CFR 264 and 40 CFR 265. The GMP also ensures compliance with the WIPP Compliance Certification Application mandated by 40 CFR 191 and 40 CFR 194 of the Code of Federal Regulations. DOE orders 5400.1 and 5400.5, which were the driving documents for the previous groundwater surveillance program, now become secondary to the above mentioned regulatory drivers. The intent of the orders and subsequent documents required by these DOE orders continue to be implemented and carried out by the current GMP. A hierarchy of GMP governing documents are outlined in Figure 1.

The Waste Isolation Pilot Plant (WIPP) is a geologic repository for the disposal of transuranic (TRU) waste. The disposal horizon is located 2,150 feet (ft) (655 meters [m]) below the land surface in the bedded salt of the Salado Formation (hereinafter referred to as the Salado). At WIPP, water-bearing units occur both above and below the disposal horizon. Groundwater monitoring of the uppermost aquifer below the facility is not proposed at WIPP because that water-bearing unit (the Bell Canyon Formation) is not considered a credible pathway for a release from the repository. This is because the repository horizon and water-bearing sandstones of the Bell Canyon Formation are separated by over 2000 ft (610 m) of very low-permeability evaporite sediments. No natural credible pathway has been established for contaminant transport to aquifers below the repository horizon, as there is no hydrologic communication between the repository and underlying aquifers. The U.S. Environmental Protection Agency (EPA) concluded in 1990 that natural vertical communication does not exist based on their review of numerous studies (EPA, 1990). Furthermore, drilling boreholes for groundwater monitoring through the Salado and the Castile Formation (hereinafter referred to as the Castile) into the Bell Canyon aquifer would compromise the isolation properties of the repository medium.

Two types of waste are to be disposed of at the WIPP; TRU waste and TRU mixed waste. Disposal of TRU waste is subject to regulation under 40 CFR 191 and 40 CFR 194.

Disposal of TRU mixed waste in the WIPP facility is subject to regulation under Title 20 of the New Mexico Administrative Code, Chapter 4, Part 1, Subpart V (20 NMAC 4.1.500). As required by 20 NMAC 4.1.500 (incorporating 40 CFR § 264.601), the WIPP intends to demonstrate that the environmental performance standards for all regulatory requirements will be met.

Groundwater monitoring at WIPP in the past has focused on the Culebra member of the Rustler Formation (hereinafter referred to as the Culebra) because it represents the most significant hydrologic contaminant migration pathway to the accessible environment. The Culebra is the most significant water-bearing unit lying above the repository. Modeling of groundwater movement in the Culebra, based on the concept of a groundwater basin, is discussed in detail in Appendix D6, Section D6-2a(1), of the WIPP RCRA Part B Permit Application (DOE, 1997b). Groundwater modeling is also discussed in chapter six of the Compliance Certification Application (DOE, 1996b).

The WIPP site is located in Eddy County in southeastern New Mexico (Figure 2) within the Pecos Valley section of the southern Great Plains physiographic province (Powers et al., 1978). The site is 26 miles (mi) (42 kilometers [km]) east of Carlsbad, New Mexico in an area known as Los Medaños (the dunes). Los Medaños is a relatively flat, sparsely inhabited plateau with little water and limited land uses.

The WIPP site (Figure 2) consists of 16 sections of Federal land in Township 22 South, Range 31 East. The 16 sections of Federal land were withdrawn from the application of public land laws by the WIPP Land Withdrawal Act (LWA), Public Law 102-579. The WIPP LWA transferred the responsibility for the administration of the 16 sections from the Department of Interior, Bureau of Land Management, to the U.S. Department of Energy (DOE). This law specified that mining and drilling for purposes other than support of the WIPP project are prohibited within this 16 section area with the exception of Section 31. Oil and gas drilling activities are restricted in Section 31 from the surface down to 6,000 feet.

This monitoring plan addresses requirements for sample collection, groundwater surface elevation monitoring, groundwater flow direction, data management, and reporting of groundwater monitoring data. It also identifies analytical parameters selected to assess groundwater quality, and establishes personnel responsibilities for the WIPP groundwater detection monitoring program (DMP). Because quality assurance is an integral component of the groundwater sampling, analysis, and reporting process, quality assurance/quality control (QA/QC) elements and associated data acceptance criteria are included in this plan.

Instructions for performing field activities that will be conducted in conjunction with this sampling and analysis plan are provided in field operating procedures. Procedures are required for each aspect of the groundwater sampling process, including groundwater surface elevation measurement, groundwater flow direction, sampling equipment installation and operation, field water-quality measurements, and sample collection. These procedures prescribe proper field sampling techniques. Samples will be collected by trained personnel under the supervision and direction of qualified engineers, scientists, or other technical personnel.

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3.0 GEOLOGIC AND HYDROLOGIC CHARACTERISTICS

3.1 Geology

The WIPP site is situated within the Delaware Basin, which is part of the larger Permian Basin, located in the south-central region of North America. During the Permian period, which came to a close about 245 million years ago, ancient seas covered the basin. Their later evaporation resulted in the deposition of a thick sequence of evaporites. Appendix D6 of the WIPP RCRA Part B Permit Application (DOE, 1997b) presents a detailed discussion of the regional geologic history. Three major evaporite-bearing formations were deposited in the Delaware Basin (see Figure 3):

- The Castile, which formed through evaporation of the Permian Sea, consists of interbedded anhydrites and halite. Its upper boundary is at a depth of about 2,825 ft (861 m) below ground surface (bgs), and its thickness at the WIPP facility is 1,250 ft (381 m).

- The repository is located in the Salado, which overlies the Castile and resulted from prolonged desiccation that produced predominantly halite, with some carbonates, anhydrites, and clay seams. Its upper boundary is at a depth of about 850 ft (259 m) bgs, and it is about 2,000 ft (610 m) thick in the repository area.

- The Rustler Formation (hereinafter referred to as the Rustler) was deposited in a lagoonal environment during a major freshening of the basin and consists of carbonates, anhydrites, and halites. Its beds consist of clay and anhydrite and contain small amounts of brine. The Rustler's upper boundary is about 500 ft (152 m) bgs, and it ranges up to 350 ft (107 m) in thickness in the area.

These evaporite-bearing formations lie between two other formations significant to the geology and hydrology of the WIPP site. The Dewey Lake overlying the Rustler is dominated by non-marine sediments and consists almost entirely of mudstone, claystone, siltstone, and interbedded sandstone. This formation forms a 500-ft- (152-m) thick barrier of fine-grained sediments that retard the downward percolation of water into the evaporite units below. The Bell Canyon Formation (hereinafter referred to as the Bell Canyon), the first water-bearing unit below the repository, is confined by the thick evaporite sequences of the Castile above. It consists of 1,200 ft (366 m) of interbedded sandstone, shale, and siltstone.

The Salado was selected to host the WIPP repository for several reasons. First, it is regionally extensive, underlying an area of more than 36,000 square mi (mi^2) (93,240 square kilometers [km^2]). Second, its permeability is extremely low. Third, salt behaves mechanically in a plastic manner under pressure (the pressure at the disposal horizon is more than 2,000 pounds per square inch [lb/in.^{2}] or 13.8 megapascals [MPa]) and eventually moves to fill any opening (referred to as creep). Fourth, any fluid remaining in small fractures or openings is saturated with salt, is incapable of further salt dissolution, and has probably remained in place for millions of years. Finally, the Salado lies between the Rustler and the Castile, which contain very low permeability layers that help confine and isolate waste within and keep water outside of the WIPP.

Further discussions of site geology can be found in Appendix D6 of the RCRA Part B Permit Application and Appendix GCR of the CCA.

3.2 Groundwater Hydrology

The general hydrogeology of the area surrounding the WIPP facility is described in this section starting with the first geologic unit below the Salado. Relevant hydrological parameters for the various rock units above the Salado at WIPP are summarized in Table 1.

3.2.1 The Castile

The Castile is a basin-filling evaporite sequence of sediments surrounded by the Capitan Reef. The Castile represents a major regional groundwater aquitard that effectively prevents upward migration of water from the underlying Bell Canyon. Fluid present in the Castile is very restricted because evaporites do not readily maintain pore space, solution channels, or open fractures at depth. Drill-stem tests conducted in the Castile during construction of the WIPP facility found its permeability to be lower than detection limits; however, the hydraulic conductivity has been conservatively estimated to be less than 10^{-8} ft (3×10^{-9} m) per day.

3.2.2 The Salado

The Salado is an evaporite sequence that filled the remainder of the Delaware Basin and lapped extensively over the Capitan Reef and the back-reef sediments beyond. The Salado consists of approximately 2,000 ft (610 m) of bedded halite, with interbeds or seams of anhydrite, clay, and polyhalite. It acts hydrologically as a regional confining bed. The porosity of the Salado is very low and interconnected pores are probably nonexistent in halite at the depth of the disposal horizon. Fluids associated with the Salado occur mainly as very small fluid inclusions in the halite crystals and also occur between crystal boundaries (interstitial fluid) of the massive crystalline salt formation; fluids also occur in clay seams and anhydrite beds. Permeabilities measured from the surface in the area of the WIPP facility range from 0.01 to 25 microdarcies. The most reliable value, 0.3 microdarcy, was obtained from well DOE-2. The results of permeability testing at the disposal horizon are within the range of 0.001 to 0.01 microdarcy. As a comparison, the permeability of the Salado is roughly a thousand times less than that of a lower clay liner required of surface impoundments and landfills, assuming similar thicknesses.

3.2.3 The Rustler

The Rustler has been the subject of extensive characterization activities because it contains the most transmissive hydrologic units overlying the Salado specifically, the Culebra. Within the Rustler, five members have been identified. Of these, the Culebra is the most transmissive and has been the focus of most of the Rustler hydrologic studies.

The Culebra is the first continuous water-bearing zone above the Salado and is up to approximately 30 ft (9 m) thick. Water in the Culebra is usually present in fractures and is confined by overlying gypsum or anhydrite and underlying clay and anhydrite beds. The hydraulic gradient within the Culebra in the area of the WIPP facility is approximately 20 ft per mi (3.8 m per km) and becomes much flatter south and southwest of the site. Culebra transmissivities in the Nash Draw range up to 1,250 square ft (ft^2) (116 square m [m^2]) per day; closer to the WIPP facility, they are as low as 0.007 to 74 ft^2 (0.00065 to 7.0 m^2) per day. The Culebra is hydrologically confined.

The two primary types of field tests that are being used to characterize the flow and transport characteristics of the Culebra are hydraulic tests and tracer tests.

The hydraulic tests consist of pump, injection, and slug testing of wells across the study area (e.g., Beauheim, 1987a). The most detailed hydraulic test data exist for the WIPP hydropads (e.g., H-19). The hydropads generally comprise a network of three or more wells located within a few tens of meters of each other. Long-term pumping tests have been conducted at hydropads H-3, H-11, and H-19 and at well WIPP-13 (Beauheim, 1987b, 1987c). These pumping tests provided transient pressure data both at the hydropad and over a much larger area. Tests often included use of automated data-acquisition systems, providing high-resolution (in both space and time) data sets.
In addition to long-term pumping tests, slug tests and short-term pumping tests have been conducted at individual wells to provide pressure data that can be used to interpret the transmissivity at that well (Beauheim, 1987a). (Additional short-term pumping tests have been conducted in the Water Quality Sampling Program (WQSP) wells [Stensrud, 1995]). Detailed cross-hole hydraulic testing has recently been conducted at the H-19 hydropad (Kloska et al., 1995).

The hydraulic tests are designed to yield pressure data for estimation of hydrologic characteristics such as transmissivity, permeability, and storativity. The pressure data from long-term pumping tests and the interpreted transmissivity values for individual wells are used for input to flow modeling. Some of the hydraulic test data and interpretations are also important for the interpretation of transport characteristics. For instance, the permeability values interpreted from the hydraulic tests at a given hydropad are needed for interpretations of tracer test data at that hydropad.

There is strong evidence that the permeability of the Culebra varies spatially and varies sufficiently that it cannot be characterized with a uniform value or range over the region of interest to WIPP. The transmissivity of the Culebra varies spatially over six orders of magnitude from east to west in the vicinity of WIPP. Over the site, Culebra transmissivity varies over three to four orders of magnitude. Transmissivities have been calculated at 1×10^{-3} square feet per day (1×10^{-9} square meters per second) at well P-18 east of the WIPP site to 1×10^{3} square feet per day (1×10^{-3} square meters per second) at well H-7 in Nash Draw.

Transmissivity variations in the Culebra are believed to be controlled by the relative abundance of open fractures rather than by primary (that is, depositional) features of the unit. Lateral variations in depositional environments were small within the mapped region, and primary features of the Culebra show little map-scale spatial variability, according to Holt and Powers, 1988. Direct measurements of the density of open fractures are not available from core samples because of incomplete recovery and fracturing during drilling, but observation of the relatively unfractured exposures in the WIPP shafts suggests that the density of open fractures in the Culebra decreases to the east. Qualitative correlations have been noted between transmissivity and several geologic features possibly related to open-fracture density, including (1) the distribution of overburden above the Culebra, (2) the distribution of halite in other members of the Rustler, (3) the dissolution of halite in the upper portion of the Salado, and (4) the distribution of gypsum fillings in fractures in the Culebra.

Measured matrix porosities of the Culebra vary from 0.03 to 0.30. Fracture porosity values have not been measured directly, but interpreted values from tracer tests at the H-3, H-6, and H-11 hydropads vary from 5×10^{-4} to 3×10^{-3}. Data are insufficient to determine whether the average porosity of the matrix and fractures varies significantly on a regional scale.

Geochemical and radioisotope characteristics of the Culebra have been studied. There is considerable variation in groundwater geochemistry in the Culebra. The variation has been described in terms of different hydrogeochemical facies that can be mapped in the Culebra. A halite-rich hydrogeochemical facies exists in the region of the WIPP site and to the east, approximately corresponding to the regions in which halite exists in units above and below the Culebra, and in which a large portion of the Culebra fractures are gypsum filled. An anhydrite-rich hydrogeochemical facies exists west and south of the WIPP site, where there is relatively less halite in adjacent strata and where there are fewer gypsum-filled fractures. Radiogenic isotopic signatures suggest that the age of the ground water in the Culebra is on the order of 10,000 years or more (see, for example, Lambert, 1987; Lambert and Carter, 1987; and Lambert and Harvey, 1987).

The radiogenic ages of the Culebra ground water and the geochemical differences provide information potentially relevant to the groundwater flow directions and groundwater interaction with other units and are important constraints on conceptual models of groundwater flow. Previous conceptual models of the Culebra (see for example, Chapman, 1986; Chapman, 1988; LaVenue et al., 1990) have not been able to consistently relate the hydrogeochemical facies, radiogenic ages, and flow constraints (that is, transmissivity, boundary conditions, etc.) in the Culebra.

However, new conceptual models have been developed for groundwater flow that could explain observed geochemical facies and groundwater flow patterns. The new conceptualization, referred to as the groundwater basin model, offers a three dimensional approach to treatment of Supra-Salado rock units, and assumes vertical leakage (albeit very slow) between rock units of the Rustler exists (where hydraulic head is present).

Flow in the Culebra is considered transient. This differs from previous interpretations, wherein no-flow was assumed between Rustler units. The model assumes that the groundwater system is dynamic and is responding to the drying of climate that has occurred since the late Pleistocene period. The Model assumes that recharge rates during the late Pleistocene period were sufficient to maintain the water table near land surface, but has since dropped significantly. Therefore, the impact of local topography on groundwater flow was greater during wetter periods, with discharge from the Rustler to the west; flow is dominated by more regional topographic effects during drier times, with flow to a more southerly direction.

Four hydrogeochemical facies within the Culebra in the WIPP area (DOE, 1997a) have been identified:

- Zone A - saline (2-3 molal) NaCl brines, Mg/Ca ratio of 1.2 to 2;
- Zone B - dilute (<0.1 molal) $CaSO_4$ - rich ground water;
- Zone C - variable composition (0.3-1.6 molal); Mg/Ca ratio 0.3 to 1.2; and
- Zone D - high salinities (3-7 molal); K/Na weight ratios (0.2).

Facies A groundwater flow is slow, has not changed over the last 14,000 years, and probably recharged more than 600,000 years ago. Vertical leakage occurs to Facies A, and both lateral and vertical groundwater flow rates are extremely low. Facies B occurs in an area with greater vertical fracturing in the Culebra, and therefore exhibits more vertical infiltration and more rapid lateral flow in the Culebra. Flow in Facies B is currently to the south (it may mix with Facies C water to the southeast) but was more toward the west during wetter climates; vertical infiltration from the Dewey Lake to the Culebra Facies B is assumed to have occurred during wetter climates in an area south of the WIPP site. Facies C water was not diluted to create Facies B water. Facies C occurs "in between" Facies A and B, and groundwater flow entered the Culebra prior to the climate change (to drier conditions) 14,000 years ago. Facies C groundwater flow is to the south at WIPP, where it is theorized that it joins with a small amount of Facies A solute being transported from the east. Groundwater flow rate in Facies C is faster than in A but slower than in B, and the proposed recharge area from the Dewey Lake to the Culebra was to the northeast of the WIPP site. Facies C ground water infiltrated into the Dewey Lake and then interacted with anhydrite and halite along its path to the Culebra, wherein it mixed with smaller amounts of Facies A water. The Conclusion can be drawn that the presence of anhydrite within Rustler units does not preclude slow downward infiltration (DOE, 1997a).

Previously, some believed the geochemistry of Culebra ground water was inconsistent with flow directions. This was based on the premise that Facies C water must transform to facies B water (e.g. become "fresher"), which is inconsistent with the observed flow direction. It is now believed that the observed geochemistry and flow directions can be explained with different recharge areas and Culebra travel paths (DOE, 1997a).

Head distribution in the Culebra is consistent with groundwater basin modeling results indicating that the generalized groundwater flow direction in the Culebra is currently north to south. However, the fractured nature of the Culebra, coupled with variable fluid densities, can cause localized flow patterns to differ from general flow patterns.

Groundwater levels in the Culebra in the WIPP region have been measured for several decades. Water-level rises have been observed in the WIPP region and are possibly related to recovery from impacts caused by shaft installation, response to potash effluent discharge, or are unexplained, as discussed below. The extent of water-level rise observed at a particular well depends on several factors, but the proximity of the observation point to the potential cause of the water-level rise appears to be a primary factor.

In the vicinity of the WIPP site, water-level rises are believed to be caused by recovery from drainage into the shafts. Drainage into shafts has been reduced by a number of grouting programs over the years, most recently in 1993 around the Air Intake Shaft. Northwest of the site, in and near Nash Draw, water levels appear to fluctuate in response to effluent discharge from potash mines. Correlation of water-level fluctuation with potash mine discharge, however, cannot be proven definitively because sufficient data on the timing and volumes of discharge are not available. Water-level rises in the vicinity of the H-9 hydropad, about 6.5 miles south of the site, are thought to be caused by neither WIPP activities nor potash mining discharge. They remain unexplained. WIPP continues to monitor groundwater levels throughout the region.

Inferences about vertical flow directions in the Culebra have been made from well data collected. Beauheim (1987a) reported flow directions towards the Culebra from both the underlying unnamed lower member of the Rustler and the overlying Magenta member of the Rustler over the WIPP site, indicating that the Culebra acts as a drain for the units around it. This is consistent with results of groundwater basin modeling. Recent simulations to enhance the conceptual understanding of the geohydrology of the Rustler can be found in Corbet and Knupp, 1996.

Use of water from the Culebra in the WIPP area is quite limited because of its varying yields and high salinity. The Culebra is not used for water supply in the immediate WIPP site vicinity. Its nearest use is approximately 7 mi (11 km) southwest of the WIPP facility, where salinity is low enough to allow its use for livestock watering. However, the Culebra has been identified as a potential aquifer in the Compliance

Certification Application (DOE, 1996b). Because of this, the Culebra will be the focus of future groundwater monitoring at WIPP as it is also the most transmissive continuous water-bearing zone at WIPP and is the most likely pathway for contaminant migration.

Appendix D6 of the WIPP RCRA Part B Permit Application (DOE, 1997b) and appendix Hydro of the Compliance Certification Application (DOE, 1996b) provide more detailed discussions of the local and regional hydrogeology.

4.0 GENERAL REGULATORY REQUIREMENTS

DOE Order 5400.1 contains the following policy statement:

> *POLICY. a. It is DOE policy to conduct its operations in an environmentally safe and sound manner. Protection of the environment and the public are responsibilities of paramount importance and concern to DOE. All DOE activities should recognize and reflect this concern and public trust. To that end, DOE is firmly committed to ensuring incorporation of national environmental protection goals in the formulation and implementation of DOE programs. It has an equal commitment to advance the goals of restoring and enhancing environmental quality, and ensuring public health. Accordingly, it is DOE policy to conduct the Department's operations in compliance with the letter and spirit of applicable environmental statutes, regulations, and standards. In addition, DOE is committed to good environmental management of all its programs and at all its facilities to correct existing environmental problems, to minimize risks to the environment or public health, and to anticipate and address potential environmental problems before they pose a threat to the quality of the environment or the public welfare. Finally, it is DOE's policy that efforts to meet environmental obligations be carried out consistently across all operations and among all field organizations and programs.*

DOE Order 5400.5 states the following:

> *Regulatory Requirements. DOE facilities and operations, in some instances, are subject to the regulatory requirements of the NRC and the EPA, e.g., 10 CFR Parts 60 and 72 and 40 CFR Parts 61, 191, and 192. It is Departmental policy that DOE facilities and operations will comply fully with the requirements of those and other applicable regulatory requirements. In addition, these same DOE facilities and operations shall comply with all applicable requirements in this Order unless they are duplicative or conflict with any of the other Federal regulatory requirements.*

Earlier groundwater programs such as the WQSP and the WIPP Groundwater Surveillance Program (GWSP) were structured to meet the requirements of DOE orders. The current GMP is structured to be inclusive of the DOE Orders mentioned above and meet the requirements of more stringent regulatory drivers.

Because geologic repositories such as the WIPP facility are defined under the Resource Conservation and Recovery Act (RCRA) as land disposal facilities and as miscellaneous units, the groundwater monitoring requirements of 20 NMAC 4.1.500 (incorporating 40 CFR §§ 264.600 through 264.603) shall be addressed. 20 NMAC 4.1.500 (incorporating 40 CFR §§ 264.90 through 264.101) applies to miscellaneous unit treatment, storage, and disposal facilities (TSDF) only if groundwater monitoring is needed to satisfy 20 NMAC 4.1.500 (incorporating 40 CFR §§ 264.601 through 264.603) environmental performance standards.

The New Mexico Environment Department (NMED) has concluded that groundwater monitoring in accordance with 20 NMAC 4.1.500 (incorporating 40 CFR § 264 Subpart F) at WIPP is necessary to meet the requirements of 20 NMAC 4.1.500 (incorporating 40 CFR §§ 264.601 through 264.603).

The DOE has demonstrated that the WIPP facility can be operated and closed in a manner that complies with federal standards found in Title 40 of the Code of Federal Regulations, Part 191 (40 CFR Part 191), titled Environmental Radiation Protection Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Waste.

In 1992, the U.S. Congress passed the WIPP Land Withdrawal Act (LWA) which, among other things, mandated that the U.S. Environmental Protection Agency (EPA) certify the DOE's compliance with 40 CFR Part 191, Subparts B and C. The EPA issued the criteria that it intends to use for certification as 40 CFR Part 194, Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations (61 FR 5224). This application, titled Title 40 CFR Part 191 Compliance Certification Application for the Waste Isolation Pilot Plant, was the DOE submittal to the EPA, requesting certification which was granted in 1997.

5.0 WIPP GROUNDWATER DETECTION MONITORING PROGRAM (DMP) OVERVIEW

5.1 Scope

A RCRA "Groundwater Detection Monitoring Program (DMP) Plan" has been established to define and protect groundwater resources at WIPP. One of the objectives of the WIPP DMP is to establish, by means of groundwater sampling and analysis, an accurate and representative groundwater database that is scientifically defensible and demonstrates regulatory compliance. In addition, the DMP will be used to determine background or existing conditions of groundwater quality and quantity, including groundwater surface elevation and direction of flow, around the WIPP facility area.

The WIPP Compliance Certification Application specifically states:

> *The DOE has addressed the need for monitoring the disposal system during both the preclosure period and the postclosure period in its application for a hazardous waste facility operating permit (see Appendix MON). In its Pre-Closure and Post-Closure (Long-Term) Monitoring Plan (Appendix MON), the DOE incorporates three monitoring programs that will be used to ensure compliance with the hazardous waste regulations of RCRA as implemented by the NMED. These programs include (1) a confirmatory volatile organic compound (VOC) monitoring program to demonstrate that the numerical predictions of VOC releases are reasonable, (2) a groundwater monitoring program to verify knowledge regarding the characteristics of groundwater flow, including periodic testing for releases from the repository, and (3) a geomechanical monitoring program to support decisions regarding operations and maintenance of underground openings. Only the groundwater program is expected to extend into the 30-year RCRA postclosure period. The EPA has established, as a certification criterion, that the monitoring programs in this application must be complementary with the RCRA programs that the DOE will be required to implement.*

This plan governs all groundwater sampling events conducted to meet the requirements of 20 NMAC 4.1.500 (incorporating 40 CFR §§ 264.90 through 264.101), as well as 40 CFR 191 and 40 CFR 194 requirements of the CCA. It also ensures that all such data are gathered in accordance with these and other applicable requirements. The groundwater quality data generated by monitoring activities will provide a comprehensive background database against which future analytical results can be compared during the DMP.

Groundwater monitoring at WIPP has been historically conducted by several programs including the WIPP Site Characterization Program, the WIPP WQSP, and recently the GWSP. Groundwater quality and groundwater surface elevation data have been collected by these programs for over 12 years at WIPP. Data from the WQSP wells will be used to continually define changes in the area's potentiometric surface and groundwater flow directions to meet the requirements of the CCA. New monitoring wells included in the WIPP GWSP (WQSP wells 1-6a) were constructed to the specifications provided in the RCRA Groundwater Monitoring Technical Enforcement Guidance Document (EPA, 1986) and constitute the RCRA groundwater monitoring network specified in this DMP as required by 20 NMAC 4.1.500 (incorporating 40 CFR

§§ 264.90 through 264.101). These wells are being used to establish background groundwater quality, groundwater surface elevations and flow directions in accordance with 20 NMAC 4.1.500 (incorporating 40 CFR §§ 264.97(f) and (g) and 264.98(e)). Justification for the locations of these wells (3 upgradient and 4 downgradient) is presented below.

5.2 Current WIPP DMP

The WQSP wells 1 through 6a constitute the RCRA DMP for WIPP (Figure 4) during detection monitoring as required by 20 NMAC 4.1.500 (incorporating 40 CFR §§ 264.90 through 264.101). This monitoring plan is a continuation of the current WIPP GWSP, and these wells will serve as the monitoring locations during background water-quality characterization and the RCRA DMP (Figure 4).

Wells WQSP-1, WQSP-2, and WQSP-3 were located directly upgradient of the WIPP shaft area. The locations of the three upgradient wells were selected to be representative of the flow vectors of ground water moving downgradient onto the WIPP site. Figure 34 of Davies, 1989, shows the simulation of direction and magnitude of groundwater flow. The upgradient wells were located based on the flow vectors resulting from this model simulation. The original WQSP observation wells, as well as those in the RCRA DMP, have been and will continue to be used as piezometer wells to support collection of groundwater surface elevation and groundwater flow modeling data to demonstrate regulatory compliance(40 CFR 191). Well location surveys for each of the seven wells were performed by survey personnel using the State Plane Coordinates-North American Datum Model 27 method. Results of the surveys are on file with the New Mexico State Engineers Department along with the associated extraction permits for each well.

WQSP-4, WQSP-5, and WQSP-6 were located downgradient of the WIPP shaft area in concert with the flow vectors shown by this model simulation. WQSP-6a was installed in the Dewey Lake Formation at the WQSP-6 location to assess groundwater conditions at this location. All three Culebra downgradient wells (WQSP-4, 5, and 6) were sited based on the greatest velocity magnitude of groundwater flow leaving the shaft area as shown on Figure 34 of Davies, 1989, and upgradient of the WIPP LWA boundary. WQSP-4 was also specifically located to monitor the zone of higher transmissivity around wells DOE-1 and H-11, which may represent faster flow path away from the WIPP shaft area to the LWA boundary (DOE, 1996b).

The Culebra has been selected for the focus of the DMP due to it being regionally extensive and exhibiting the most significant transmissivity of the water-bearing units at WIPP. The Culebra has been extensively studied during all past hydrologic characterization programs and found to be the most likely hydrologic pathway to the accessible environment or compliance point for any potential contamination.

The compliance point is defined in 20 NMAC 4.1.500 (incorporating 40 CFR § 264.95) as the vertical plane immediately downgradient of the hazardous waste management unit area (i.e., at the downgradient footprint of the WIPP repository). RCRA Permit Module V specifies the point of compliance as "the vertical surface located at the hydraulically downgradient limit of the Underground HWDUs that extends to the Culebra Member of the Rustler Formation." The RCRA groundwater monitoring network was not installed immediately downgradient of this plane. However, because the Underground HWDUs at WIPP are Subpart X units, and due to the relatively unique containment and transport aspects of the site, monitoring at the proposed locations will allow for detection of releases prior to release of these contaminants to the general public at the LWA boundary.

The DMP wells were located to intercept flow vectors downgradient away from the WIPP shafts area based on density corrected potentiometric surfaces. The selected well placement locations are downgradient of the general flow direction from the shaft area. Transport modeling of contaminant migration throughout the Culebra to the Land Withdrawal Act boundary suggests that travel times could be on the order of thousands of years if, under worst case conditions, hazardous constituents could migrate from the sealed repository. If contaminants were to migrate from the disposal facility, they would be detected by the DMP wells located midway between the shafts and LWA such that samples from wells could detect these contaminants long before they could reach the LWA boundary.

Potentiometric surfaces and groundwater flow directions defined prior to large-scale pumping in the WIPP area and the excavation of WIPP shafts suggests that flow was generally to the south-southeast from the waste disposal and shaft areas (Mercer, 1983; Davies, 1989). Potentiometric surface maps (December 1998) of the Culebra adjusted for density differences show very similar characteristics (Figure 4). WQSP-4, WQSP-5, and WQSP-6 have been located downgradient of the waste emplacement areas according to adjusted potentiometric surfaces.

Potentiometric surfaces that have not been corrected for density differences and that contain transient relics of previous pumping-drawdown events, do not reflect accurate natural groundwater flow directions and should not be used to assess the adequacy of groundwater monitoring locations.

5.2.1 DMP Well Construction Specification

a. WQSP-1

Well WQSP-1 was drilled between September 13 and 16, 1994, to a total depth of 737 ft (225 m) bgs. The borehole was drilled through the Culebra and extends 15 ft (5 m) into the unnamed lower member of the Rustler. The well was drilled to a depth of 693 ft (211 m) bgs using compressed air as the drilling fluid. The interval from 693 to

737 ft (211 to 225 m) bgs (the total depth) was drilled using air mist with a foaming agent as the drilling fluid. WQSP-10 was drilled to 695.6 ft (212 m) bgs using a 9⅞-in. drill bit and was cored from 695.6 to 737 ft (212 to 225 m) bgs using a 5¼-in. core bit to cut 4-in. diameter core. After coring, WQSP-1 was reamed to 9⅞-in. in diameter to total depth. WQSP-1 was cased from the surface to 737 ft (224.6 m) bgs with 5-in. blank fiberglass casing with in-line 5-in. diameter fiberglass 0.02-in. slotted screen across the Culebra interval from 702 to 727 ft (214 to 222 m) bgs. The annulus between the borehole wall and the casing/screen is packed with sand from 640 to 651 ft (195 to 198 m) bgs and with 8/16 Brady gravel from 651 to 737 ft (198 to 225 m) bgs. Based on core log results, the Culebra is located from 699 to 722 ft (213 to 220 m) bgs (see Figure 6).

b. WQSP-2

Well WQSP-2 was drilled between September 6 and 12, 1994, to a total depth of 846 ft (257.9 m) bgs. The borehole was drilled through the Culebra and extends 12.3 ft (3.7 m) into the unnamed lower member of the Rustler. The well was drilled to a depth of 800 ft (244 m) bgs with a 9⅞-in. drill bit using compressed air as the drilling fluid. The interval from 800 to 846 ft (244 to 258 m) bgs (the total depth) was drilled with a 5¼-in. core bit to cut 4-in. diameter core using air mist with a foaming agent as the drilling fluid. After coring, WQSP-2 was reamed to 9⅞-in. in diameter to total depth. WQSP-2 was cased from the surface to 846 ft (258 m) bgs with 5-in. blank fiberglass casing with in-line 5-in. diameter fiberglass 0.02-in. slotted screen across the Culebra interval from 811 to 836 ft (247 to 255 m) bgs. The annulus between the borehole wall and the casing/screen is packed with sand from 790 to 793 ft (241 to 242 m) bgs and with 8/16 Brady gravel from 793 to 846 ft (242 to 258 m) bgs. Based on core log results, the Culebra is located from 810.1 to 833.7 ft (247 to 254 m) bgs (see Figure 7).

c. WQSP-3

Well WQSP-3 was drilled between October 21 and 26, 1994, to a total depth of 880 ft (268 m) bgs. The borehole was drilled through the Culebra and extends 10 ft (3.1 m) into the unnamed lower member of the Rustler. The well was drilled to a depth of 880 ft (268 m) bgs using compressed air as the drilling fluid. The borehole was cleaned using air mist with a foaming agent. WQSP-3 was drilled to 833 ft (254 m) bgs using a 9⅞-in. drill bit and was cored from 833 to 879 ft (254 to 268 m) bgs using a 5¼-in. core bit to cut 4 inch diameter core. After coring, WQSP-3 was reamed to 9⅞-in. in diameter to total depth of 880 ft (268 m) bgs. WQSP-3 was cased from the surface to 880 ft (268 m) bgs with 5-in. blank fiberglass casing with in-line 5-in. diameter fiberglass 0.02-in. slotted screen across the Culebra interval from 844 to 869 ft (257 to 265 m) bgs. The annulus between the borehole wall and the casing/screen is packed with sand from 827 to 830 ft (252 to 253 m) bgs and with 8/16 Brady gravel from 830 to 880 ft (253 to 268 m) bgs. Based on core log results, the Culebra is located from 844 to 870 ft (257 to 265 m) bgs (see Figure 8).

d. WQSP-4

Well WQSP-4 was drilled between October 5 and 10, 1994, to a total depth of 800 ft (244 m) bgs. The borehole was drilled through the Culebra and extends 9.2 ft (2.8 m) into the unnamed lower member of the Rustler. The well was drilled to a depth of 740 ft (226 m) bgs with a 9⅞-in. drill bit using compressed air as the drilling fluid. The interval from 740.5 to 798 ft (225.7 to 243 m) bgs was cored with a 5¼-in. core bit to cut 4-in. diameter core using air mist with a foaming agent as the drilling fluid. After coring, WQSP-4 was reamed to 9⅞-in. in diameter to total depth of 800 ft (244 m) bgs. WQSP-4 was cased from the surface to 800 ft (244 m) bgs with 5-in. blank fiberglass casing with in-line 5-in. diameter fiberglass 0.02-in. slotted screen across the Culebra interval from 764 to 789 ft (233 to 241 m) bgs. The annulus between the borehole wall and the casing/screen is packed with sand from 752 to 755 ft (229 to 230 m) bgs and with 8/16 Brady gravel from 755 to 800 ft (230 to 244 m) bgs. Based on core log results, the Culebra is located from 766 to 790.8 ft (233 to 241 m) bgs (see Figure 9).

e. WQSP-5

Well WQSP-5 was drilled between October 12 and 19, 1994, to a total depth of 681 ft (208 m) bgs. The borehole was drilled through the Culebra and extends into the unnamed lower member of the Rustler. The well was drilled to a depth of 676 ft (206 m) bgs using compressed air as the drilling fluid. The borehole was cleaned using air mist with a foaming agent. WQSP-5 was drilled to 648 ft (198 m) bgs using a 9⅞-in. drill bit and was cored from 648 to 676 ft (198 to 206 m) bgs using a 5¼-in. core bit to cut 4-in. diameter core. After coring, WQSP-5 was reamed to 9⅞-in. in diameter to total depth of 681 ft (208 m) bgs. WQSP-5 was cased from the surface to 681 ft (208 m) bgs with 5-in. blank fiberglass casing with in-line 5-in. diameter fiberglass 0.02-in. slotted screen across the Culebra interval from 646 to 671 ft (197 to 205 m) bgs. The annulus between the borehole wall and the casing/screen is packed with sand from 623 to 626 ft (190 to 191 m) bgs and with 8/16 Brady gravel from 626 to 681 ft (191 to 208 m) bgs. Based on core log results, the Culebra is located from 648 to 674.4 ft (198 to 205.6 m) bgs (see Figure 10).

f. WQSP-6

Well WQSP-6 was drilled between September 26 and October 3, 1994, to a total depth of 616.6 ft (187.9 m) bgs. The borehole was drilled through the Culebra and extends 9.7 ft (3 m) into the unnamed lower member of the Rustler. The well was drilled to a depth of 367 ft (112 m) bgs using compressed air as the drilling fluid. The interval from 367 to 616 ft (112 to 188 m) bgs (the total depth) was drilled using brine as the drilling fluid. WQSP-6 was drilled to 568 ft (173 m) ft bgs using a 9⅞-in. drill bit and was cored from 568 to 616 ft (173 to 188 m) bgs using a 5¼-in. core bit to cut 4-in. diameter core. After coring, WQSP-6 was reamed to 9⅞-in. in diameter to total depth of 616.6 ft (188 m) bgs. WQSP-6 was cased from the surface to 616.6 ft (188 m) bgs with 5-in.

blank fiberglass casing with in-line 5-in. diameter fiberglass 0.02-in. slotted screen across the Culebra interval from 581 to 606 ft (177 to 185 m) bgs. The annulus between the borehole wall and the casing/screen is packed with sand from 567 to 570 ft (173 to 173.7 m) bgs and with 8/16 Brady gravel from 570 to 616.6 ft (174 to 188 m) bgs. Based on core log results, the Culebra is located from 582 to 606.9 ft (177 to 185 m) bgs (see Figure 11).

g. WQSP-6A

Well WQSP-6A was drilled between October 31 and November 1, 1994, to a total depth of 225 ft (69 m) bgs. It is located approximately 100 feet immediately west of WQSP-6. The borehole was drilled through a water-producing zone in the Dewey Lake Redbeds that had been previously encountered while drilling well WQSP-6. The well was drilled to a depth of 225 ft (69 m) bgs using compressed air as the drilling fluid. The borehole was cleaned using air mist with a foaming agent. WQSP-6A was drilled to 160 ft (49 m) bgs using a 9⅞-in. drill bit and was cored from 160 to 220 ft (49 to 67 m) bgs using a 5¼-in. core bit to cut 4-in. diameter core. After coring, WQSP-6A was reamed to 9⅞-in. in diameter to total depth of 225 ft (69 m) bgs. WQSP-6A was cased from the surface to 225 ft (69 m) bgs with 5-in. blank fiberglass casing with in-line 5-in. diameter fiberglass 0.02-in. slotted screen from 190 to 215 ft (58 to 66 m) bgs. The annulus between the borehole wall and the casing/screen is packed with sand from 172 to 175 ft (52 to 53 m) bgs and with 8/16 Brady gravel from 175 to 225 ft (53 to 69 m) bgs (see Figure 12).

5.3 Well Plugging and Abandonment (P&A)

The main purposes of the P&A program is to reduce CAO liability and potential environmental damage by preventing disturbances to the existing hydrologic conditions in the subsurface domain in the vicinity of the WIPP. The objectives of the P&A program include:

- Eliminate physical hazards
- Prevent groundwater contamination
- Conserve aquifer yield and hydrostatic head
- Prevent intermixing of formation waters
- Comply with state and federal regulations

At the present time, the WIPP area wide groundwater-monitoring network contains more than 70 accessible wells, the majority of which are completed in the Culebra. Most of these wells are in reasonably good operating condition. Wells are selected for P&A based on health and safety factors, condition of the well (i.e. casing, annular seal, and production interval), geographic location, and the ability of the well to yield useful data.

The New Mexico State Engineers Office has regulatory authority over the plugging and abandoning of groundwater production and monitoring wells in the state. The State of New Mexico has several groundwater basins, with each basin having it's own district office providing oversight of groundwater issues. The WIPP area is under the jurisdiction of the Roswell, New Mexico branch of the State Engineers Office. The Roswell office will be the regulatory body to approve the WIPP plans for well P&A.

A proposal may be made to P&A a DMW by submitting a permit modification request to the Secretary in compliance with 20 NMAC 4.1.900 (incorporating 40 CFR 270.42). The DMW must be plugged and abandoned in a manner which eliminates physical hazards, prevents groundwater contamination, conserves hydrostatic head, and prevents intermixing of subsurface water. A report will be submitted to the NMED which summarizes and certifies DMW plugging and abandoning methods within ninety (90) calendar days from the date a DMW is removed from the DMP.

6.0 MONITORING PROGRAM DESCRIPTION

The WIPP DMP has been designed to meet the groundwater monitoring requirements of 20 NMAC 4.1.500 (incorporating 40 CFR §§ 264.90 through 264.101) and the CCA. The following sections of the monitoring plan specify the components of the DMP.

6.1 Monitoring Frequency

The seven RCRA monitoring wells have been sampled on a semiannual basis since their installation in 1995 to establish background groundwater quality in accordance with 20 NMAC 4.1.500 (incorporating 40 CFR §§ 264.97 and 264.98). This has included at least two full rounds of 20 NMAC 4.1.500 (incorporating 40 CFR § 264) Appendix IX analysis for samples from each of the proposed RCRA detection monitoring wells. In addition, groundwater samples were collected from the DMP wells (from March 1997 until waste emplacement) at a frequency of four sample replicates collected semiannually from each well for the indicator parameters of pH, specific conductance (SC), total organic carbon (TOC), and total organic halogen (TOX) to further establish background groundwater quality until detection monitoring in accordance with 20 NMAC 4.1.500 (incorporating 40 CFR § 264.98) becomes applicable. A total of four rounds of Appendix IX analysis will be conducted for samples from each well for use in background groundwater quality determinations.

Detection monitoring will start with the emplacement of waste and continue through the post-closure phase as required by 20 NMAC 4.1.500 (incorporating 40 CFR § 264.90[c]). During detection monitoring, one sample and one sample duplicate will be collected semiannually from each well in the RCRA detection monitoring network. As shown in Table 2, the DMP will continue to collect groundwater quality samples for all seven wells on a semiannual basis during the life of the DMP. 20 NMAC 4.1.500 (incorporating 40 CFR §264.97[g][2]) provides that an alternate sampling frequency to that provided in 20 NMAC 4.1.500 (incorporating 40 CFR § 264.98) may be proposed. Given the nature and rate of groundwater flow in the area surrounding WIPP, collecting and analyzing one sample semiannually will be protective of human health and the environment because any hazardous constituent leaving the underground disposal facility will not have the potential to migrate beyond the groundwater monitoring network in a one-year time frame. Groundwater flow characteristics are presented in detail in Appendices D6 and E1 of the RCRA Part B Permit Application (DOE, 1997b) and appendix Hydro of the CCA (DOE, 1996b).

Groundwater surface elevations will be monitored in each of the seven DMP wells on a monthly basis. The groundwater surface elevation in each DMP well will also be measured prior to each sampling event. Groundwater surface elevation measurements in the other existing WQSP well sites will also be monitored on a monthly basis to supplement the area water-level database and to help define regional changes in groundwater flow directions and gradients. The characteristics of the RCRA DMP (frequency, location) will be evaluated if significant changes are observed in the groundwater flow direction or gradient. If any change occurs which could affect the ability of the DMP to fulfill the requirements of 20 NMAC 4.1.500 (incorporating 40 CFR § 264 Subpart F), the proper notifications and actions will be taken to comply with applicable permit requirements (Table 5).

6.2 Analytical Parameters

The analytes of interest measured to establish background groundwater quality prior to emplacement of waste include all indicator parameters and all other parameters listed in 20 NMAC 4.1.500 (incorporating 40 CFR § 264) Appendix IX. Field measurements of pH, SC, temperature, chloride, Eh, total iron, and alkalinity are also measured during background sampling.

The DMP will be initiated upon waste emplacement, at which time the semiannual samples will be analyzed for the parameters listed in Table 3. Parameters to be analyzed by the contract laboratory such as specific conductance, total dissolved solids, total suspended solids, density, pH, total organic carbon, and total organic halogens were included as indicator parameters because of their universal commonality to ground water. Parameters such as chloride, alkalinity, calcium, magnesium, and potassium were included as matrix-specific general indicator parameters. Calcium, magnesium, potassium, chloride, and iron may be deleted during detection monitoring, with prior approval of NMED. Organic and inorganic compounds on the right hand side of Table 3 were chosen because they will occur in the waste to be disposed at the WIPP facility. Additional parameters may be identified through the tentatively identified compound (TIC) process resulting from a library search performed by the contracted Laboratory. If compounds are identified, these will be added to the DMP list, unless omission of these compounds is justified, and this omission is approved by NMED.

6.3 Groundwater Surface Elevation Measurement, Sample Collection and Laboratory Analysis

Groundwater surface elevations will be measured in each well prior to groundwater sample collection. Ground water will be extracted using serial and final sampling methods. Serial samples will be collected until groundwater field indicator parameters stabilize, after which the final sample for complete analysis will be collected. Final samples will then be analyzed for the DMP analytical suite.

6.3.1 Groundwater Surface Elevation Monitoring Methodology

The WIPP Water Level Monitoring Program (WLMP) is a subprogram of the DMP. The quality assurance activities of the WLMP are in strict accordance with the WID Quality Assurance Program Description (QAPD), WP 13-1, and the quality assurance implementing procedures specific to groundwater surface elevation monitoring. Groundwater surface elevation monitoring is in progress now and will continue through the post-closure care period. This section of the plan addresses the activities of the WLMP during the preoperational and operational phases of WIPP.

Collection of groundwater surface elevation data is required by 20 NMAC 4.1.500 (incorporating 40 CFR § 264.97(f)) and 40 CFR 191 Performance Assessment. These data also provide:

- Data collection as required by the Environmental Monitoring Plan.
- A means to fulfill commitments made in the Final Environmental Impact Statement (FEIS).
- A means to comply with future groundwater inventory and monitoring regulations.
- Input for making land use decisions, (i.e., designing long-term active and passive institutional controls for the site).
- Assistance in understanding any changes to readings from the water-pressure transducers installed in each of the shafts to monitor water conditions behind the liners.
- An understanding of whether or not the horizontal and vertical gradients of flow are changing over time.

The objective of the WLMP is to extend the documented record of groundwater surface elevation fluctuations in the Culebra and Magenta members of the Rustler in the vicinity of the WIPP facility and to meet the requirements of 20 NMAC 4.1.500 (incorporating 40 CFR § 264.97(f)) and 40 CFR 191, Performance Assessment, and 40 CFR 194.42, Monitoring. Groundwater surface elevation data will be collected from each well of the RCRA DMP. Groundwater surface elevation data will also be collected from other Culebra wells, as well as monitoring wells completed in other water-bearing zones overlying and underlying the WIPP repository horizon when access to those zones is possible (Figure 5). This includes, but is not limited to, the Bell Canyon, the Forty-niner, the contact zone between the Rustler and Salado, and the Dewey Lake.

Groundwater surface elevation measurements will be taken monthly in at least one accessible completed interval at each available well pad. At well pads with two or more wells completed in the same interval, quarterly measurements will be taken in the redundant wells. Groundwater surface elevation measurements will be taken monthly at each of the seven DMP wells, as well as prior to each sampling event. If a cumulative groundwater surface elevation change of more than 2 feet is detected in any DMP well over the course of one year which is not attributable to site tests or natural stabilization of the site hydrologic system, notification will be made to NMED in writing and discuss the origin of the changes in the report specified in Permit Module V. Abnormal, unexplained changes in groundwater surface elevation may indicate changes in site recharge/discharge which could affect the assumptions regarding DMP well placement and constitute new information as specified in 20 NMAC 4.1.900 (incorporating
40 CFR § 70.41(a)(2)).

Groundwater surface elevation monitoring will continue through the post-closure care period. The frequency of monitoring may be temporarily increased to effectively document naturally occurring or artificial perturbations that may be imposed on the hydrologic systems at any point in time. This will be conducted in selected key wells by increasing the frequency of the manual groundwater surface elevation measurements or by monitoring water pressures with the aid of electronic pressure transducers and remote data-logging systems. Such additional data will be included in the reports specified in Section V.J.2 of the RCRA permit.

Interpretation of groundwater surface elevation measurements and corresponding fluctuations over time is complicated at WIPP by spatial variation in fluid density both vertically in well bores and areally from well to well. To monitor the hydraulic gradients of the hydrologic flow systems at WIPP accurately, actual groundwater surface elevation measurements will be monitored at the frequencies specified in Table 2, and the densities of the fluids in the well bores will be measured annually. When both of these parameters are known, equivalent freshwater heads can be calculated. The concept of freshwater head is discussed in Lusczynski (1961).

A discussion explaining the calculation of freshwater heads from mid-formation depth at WIPP can be found in Haug, et al (1987). Freshwater heads are useful in identifying hydraulic gradients in aquifers of variable density such as those existing at the WIPP site. Freshwater head at a given point is defined as the height of a column of freshwater that will balance the existing pressure at that point (Lusczynski, 1961).

Measured groundwater surface elevation data can be converted to equivalent freshwater head from knowledge of the density of the borehole fluid, using the following formula.

$$p = \rho g h$$

where

p = freshwater head (pressure)
ρ = average specific gravity of the borehole fluid (unitless)
g = freshwater density (mass/volume)
h = fluid column height above the datum (length)

If the freshwater density is assumed to be 1.000 gram per cubic centimeter (g/cm^3), then the equivalent freshwater head is equal to the fluid column height times the average borehole fluid density (expressed as specific gravity).

Groundwater surface elevation data will be used to determine the direction and rate of flow in the Culebra at least annually. The results of the determination of direction and flow rate will be presented annually in the Site Environmental Report.

6.3.2 Field Methods and Data Collection Requirements

To obtain an accurate groundwater surface elevation measurement, a calibrated water-level measuring device will be lowered into a test well and the depth to water recorded from a known reference point. When using an electrical conductance probe, the depth to water will be determined by reading the appropriate measurement markings on the embossed measuring tape when the alarm is activated at the surface. WIPP procedures specify the methods to be used in obtaining groundwater-level measurements.

6.3.3 Groundwater Surface Elevation Records and Document Control

All incoming data will be processed in a timely manner to assure data integrity. The data management process for groundwater surface elevation measurements will begin with completion of the field data sheets. Date, time, tape measurement, equipment identification number, calibration due date, initial of the field personnel, and equipment/comments will be recorded on the field data sheets. If, for some unexpected reason, a measurement is not possible (i.e., a test is under way that blocks entry to the well bore), then a notation as to why the measurement was not taken will be recorded in the comment column. Personnel will also use the comment column to report any security observations (i.e., well lock missing).

Data recorded on the field data sheets and submitted by field personnel will be subject to guidelines outlined in WIPP environmental procedures. These procedures specify the processes for administering and managing such data. The data will be entered onto a computerized work sheet. The work sheet will calculate groundwater surface elevation in both feet and meters relative to the top of the casing and also relative to mean sea level. The work sheet will also adjust groundwater surface elevations to equivalent freshwater heads.

A check print will be made of the work sheet printout. The check print will be used to verify that data taken in the field was properly reported on the database printout. A minimum of 10 percent of the spreadsheet calculations will be randomly verified on the check print to ensure that calculations are being performed correctly. If errors are found, the work sheet will be corrected. The data contained on the computerized work sheet will be translated into a database file. A printout will be made of the database file. The data each month will then be compiled into report format and transmitted to the appropriate agencies as requested by the CAO. Groundwater surface elevation data and equivalent freshwater heads for all Culebra wells will be transmitted to NMED one month after data are collected.

A computerized database file will be maintained for all groundwater surface elevation data. Monthly and quarterly data will be appended into a yearly file. Upon verification that the yearly database is free of errors, it will be appended into the project database file. A printed copy of the current project database (through December of the preceding year) will be kept in the Environment, Safety and Health Department (ES&H) EM fire-resistant storage area (Operating Record).

6.4 Groundwater Sampling

6.4.1 Groundwater Pumping and Sampling Systems

The water-bearing units at WIPP are highly variable in their ability to yield water to monitoring wells. The Culebra, the most transmissive hydrologic unit in the WIPP area, exhibits transmissivities that range many orders of magnitude across the site area and is the primary focus of the DMP.

The groundwater pumping and sampling systems used to collect a groundwater sample from the seven DMP wells will provide continuous and adequate production of water so that a representative groundwater sample can be obtained. The wells used for groundwater quality sampling vary in yield, depth, and pumping lift. These factors affect the duration of pumping as well as the equipment required at each well.

The type of pumping and sampling system to be used in a well depends primarily on the aquifer characteristics of the Culebra and well construction. The DMP wells will be individually equipped with dedicated submersible pumping assemblies. Each well has a specific type of submersible pump, matched to the ability of the well to yield water during pumping. The down hole submersible pumps will be controlled by a variable electronic flow controller to match the production capacity of the formation at each well. The electronic flow controller allows personnel collecting samples to control the rate of discharge during well purging to minimize the potential for loss of volatiles from the sample. As recommended in the "RCRA Groundwater Monitoring Technical Enforcement Guidance Document" (EPA, 1986) the wells will be purged a minimum of three well bore volumes at a rate that will minimize the agitation of recharge water. This will be accomplished by monitoring formation pressure and matching the rate of discharge from the well as nearly as possible to the rate of recharge to the well. WIPP procedures specify the methods used for controlling flow rates and monitoring formation pressure. Well purging requirements will be used in conjunction with serial sampling to determine when the groundwater chemistry stabilizes and is therefore representative of undisturbed ground water.

The DMP wells will be cased and screened through the production interval with materials that do not yield contamination to the aquifer or allow the production interval to collapse under stress (high epoxy fiberglass). An electric, submersible pump installation without the use of a packer will be used in this instance. The largest amount of discharge from the submersible pump will take place from a discharge pipe. In addition to this main discharge pipe a dedicated sample line, running parallel to the discharge pipe, will also be used. Flow through the pipe will be regulated on the surface by a flow control valve and/or variable speed drive controller. Cumulative flow will be measured using a totalizing flow meter. Flow from the discharge pipe will be routed to a discharge tank for disposal.

The dedicated sampling line will be used to collect the water sample that will undergo analysis. By using a dedicated sample line, the water will not be contaminated by the metal discharge pipe. The sample line will branch from the main discharge pipe a few inches above the pump. Flow from the sample line will be routed into the sample collection area. Flow through the sample collection line will be regulated by a flow-control valve. The sample line will be insulated at the surface to minimize temperature fluctuations.

6.4.2 Pressure Monitoring Systems

The DMP wells do not require the installation of a packer because sample biases due to well construction deficiencies are not present. However, pressures will be monitored using down hole automatic air line bubblers in the formation to maintain the water level above the pump intake. Pressure transducers may be used in line with bubblers to provide continual electronic monitoring through data acquisition systems. WIPP procedures provide instructions for monitoring formation pressure using automatic airline bubblers in conjunction with pressure transducers and data acquisition systems. The mobile field laboratory provides a work place for conducting field sampling and analyses. The laboratory will be positioned near the wellhead, will be climate controlled, and will contain the necessary equipment, reagents, glassware, and deionized water for conducting the various field analyses.

6.4.3 Sampling Overview

Two types of water samples will be collected: serial samples and final samples. Serial samples will be taken at regular intervals and analyzed in the mobile field laboratory for various physical and chemical parameters (called field indicator parameters). The serial sample data will be used to determine whether the sample is representative of undisturbed ground water as a direct function of the stabilization of field indicator parameters and the volume of the water being pumped from the well. Interpretation of the serial sampling data will enable the Team Leader to determine when conditions representative of undisturbed ground water are attained in the pumped ground water.

Final samples will be collected when the serially sampled field indicator parameters have stabilized and are therefore representative of undisturbed ground water.

a. Serial Samples

Serial sampling is the collection of sequential samples for the purpose of determining when the groundwater chemistry stabilizes and is therefore representative of undisturbed ground water. A serial sample is considered representative of undisturbed ground water when the majority of field indicator parameter measurements have stabilized within ±5 percent of the average of analytical results for the field indicator parameter from the background groundwater quality for each DMP well. Nonstabilization of one or two field indicator parameters attributable to matrix interferences, instrument drift, or other unforeseen reasons will not preclude the collection of final samples, provided the volume of purged water exceeds three well bore volumes. Final samples collected, when field indicator parameters were not stabilized, will be reported in the operating record, and an explanation of why the sample was collected when field indicator parameters were not stabilized will be provided.

Serial samples will be collected and analyzed to detect and monitor the chemical variation of the ground water as a function of the volume of water pumped. Once serial sampling begins, the frequency at which serial samples are collected and analyzed will be left to the discretion of the Team Leader, but will be performed a minimum of three times during a sampling round.

The appropriate field methods to identify stabilization of the following field indicator parameters: chloride, divalent cations (hardness), alkalinity, total iron, pH, Eh, temperature, specific conductance, and specific gravity will be used. Protocols for collection of serial samples are specified in WIPP procedures.

The three field indicator parameters of temperature, Eh, and pH will be determined by either an "in-line" technique, using a self-contained flow cell, or an "off-line" technique, in which the samples will be collected from a sample line at atmospheric pressure. The iron, divalent cation, chloride, alkalinity, specific conductance, and specific gravity samples will be collected from the nylon sample line at atmospheric pressure. Because of the lack of sophisticated weights and measures equipment available for field density assessments, field density evaluations will be expressed in terms of specific gravity, which is a unitless measure. Density is expressed as unit weight per unit volume.

New polyethylene containers will be used to collect the serial samples from the sample line. Serial sampling water collected for solute and specific conductance determinations will be filtered through a 0.45 micrometers (μm) membrane filter using a stainless-steel, in-line filter holder. Filtered water will be used to rinse the sample bottle prior to serial sample collection. Unfiltered ground water will be used when determining temperature, pH, Eh, and specific gravity. Sample bottles will be properly identified and labeled.

The filtered sample collected for solute analyses will be immediately analyzed for iron and alkalinity because these two solution parameters are extremely sensitive to changes in the ambient water-sample pressure and temperature. A sample and duplicate of filtered water will be collected and analyzed for solute parameters (alkalinity, chloride, divalent cations, and iron). Temperature, pH, and Eh, when not measured in a flow cell, will be measured at the approximate time of serial sample collection. These samples will be collected from the unfiltered sample line.

Samples to be analyzed for chloride and divalent cations (after preservation with nitric acid and stored at 4°C) may be stored for one week prior to analysis with confidence that the analytical results will not be altered.

Upon completion of the collection of the last serial sample suite, the serial sample bottles accrued throughout the duration of the pumping of the well will be discarded. No serial sample bottles will be reused for sampling purposes of any sort. However, serial samples may be stored for a period of time depending upon the need.

During the first two years of DMP well serial sampling, the first sample will be analyzed as soon as possible after the pump is turned on and daily thereafter for a period of four days or until the field indicator parameters (chloride, divalent cations, alkalinity, and iron) stabilize. Eh, pH, and SC will be continually monitored by using a flow cell with ion-specific electrodes and a real-time readout. When detection monitoring begins, the serial sampling process may be modified and the decision to collect final samples would then be based on the number of well bore volumes purged and results of the analysis of chloride, temperature, specific gravity, pH, Eh, and SC. Removal of serial sampling from the DMP will be accomplished through a permit modification and a modification to this plan.

b. Final Samples

The final sample will be collected once the measured field indicator parameters have stabilized. A serial sample will also be collected and analyzed for each day of final sampling to ensure that samples collected for laboratory analysis are still representative of stable conditions. Sample preservation, handling, and transportation methods will maintain the integrity and representativeness of the final samples.

Prior to collecting the final samples, the collection team shall consider the analyses to be performed so that proper shipping or storage containers can be assembled. Table 4 presents the sample containers, volumes, and holding times for laboratory samples collected as part of the DMP.

The monitoring system will use dedicated pumping systems and sample collection lines from the sampled formation to the well head. Non-dedicated sample collection lines from the well head to the sample collection area will be discarded after each use.

Sample integrity will be ensured through appropriate decontamination procedures. Laboratory glassware will be washed after each use with a solution of nonphosphorus detergent and deionized (DI) water and rinsed in DI water. Sample containers will be new, certified clean containers that will be discarded after one use. Groundwater surface elevation measurement devices will be rinsed with fresh water after each use. Non-dedicated sample collection manifold assemblies will be rinsed with two gallons of fresh water, then rinsed with five gallons of 5 percent nitric acid solution and rinsed with five gallons of DI water after each use. The exposed ends will be capped off during storage. Prior to the next use of the sampling manifold, it will be rinsed a second time with DI water and a blank rinsate sample will be collected to verify decontamination.

Water samples will be collected at atmospheric pressure using either the filtered or unfiltered sampling lines branching from the main sample line. Detailed protocols, in the form of procedures, assure that final samples will be collected in a consistent and repeatable fashion.

Final samples will be collected in the appropriate type of container for the specific analysis to be performed. The samples will be collected in new and unused glass and plastic containers (refer to Table 4). For each parameter analyzed, a sufficient volume of sample will be collected to satisfy the volume requirements of the analytical laboratory (as specified by laboratory Standard Operating Procedures [SOPs]). This includes an additional volume of sample water necessary for maintaining quality control standards. All final samples will be treated, handled, and preserved as required for the specific type of analysis to be performed. Details about sample containers, preservation, and volumes required for individual types of analyses are found in the applicable procedures generated, approved, and maintained by the contract analytical laboratory.

Before the final sample is taken, all plastic and glass containers will be rinsed with the pumped ground water, either filtered or unfiltered, dependent upon analysis protocol. When the rinsing procedure is completed the final sample will be collected.

Final samples will be sent to contract laboratories and analyzed for general chemistry, radionuclides, metals, and selected VOCs that are specific to the waste anticipated to arrive at WIPP. Table 3 presents the specific analytes for the DMP.

WIPP has not accepted TRU mixed waste for disposal prior to issuance of a hazardous waste disposal permit, and previous WQSP sample analyses have shown that requested hazardous constituents have not been introduced to the ground water in the vicinity of WIPP by other activities. Appendix D18, Attachment A, of the RCRA Part B Permit Application (DOE, 1997b) presented analytical data obtained from WQSP wells 1-6 which indicated that, for the Appendix IX parameters analyzed for, none of the anticipated waste constituents presented on Table 3 were present in sampled ground water at WIPP.

Duplicates of the final sample will be provided to WIPP oversight agencies as requested by the CAO or NMED.

Resulting wastes are disposed of in accordance with the WID "Site Generated, Non-Radioactive Hazardous Waste Management Plan," WP 02 -RC.01.

6.4.4 Sample Preservation, Tracking, Packaging, and Transportation

Many of the chemical constituents measured by the DMP are not chemically stable and require preservation and special handling techniques. Samples requiring acidification will be treated with either high purity hydrochloric acid, nitric acid, or sulfuric acid (ULTREX or equivalent), depending upon the standard method of treatment required for the particular parameter suite or as requested by contract laboratory SOPs (see Table 4).

The contract laboratory receiving the samples will use procedures that prescribe the type and amount of preservative, the container material type, and the required sample volumes that shall be collected. This information will be recorded on the Final Sample Checklist for use by field personnel when final samples are being collected. EPA "RCRA Groundwater Monitoring Technical Enforcement Guidance Document," Table 4-1 (EPA, 1986), will be followed if laboratory SOPs do not specify sample container, volume, or preservation requirements.

The sample tracking system at WIPP will use uniquely numbered chain of custody (CofC) Forms and request for analysis (RFA) Forms. The primary consideration for storage or transportation is that samples shall be analyzed within the prescribed holding times for the parameters of interest. WIPP procedures provide instructions to ensure proper sample tracking protocol.

Insulated shipping containers packaged with crushed ice or reusable ice packs will be used to keep the samples cool during transport to the contract laboratory. Holding times for specific analytical parameters require samples to be shipped by express air freight. The coolers will be packaged to meet Department of Transportation and International Air Transportation Association commercial carrier regulations.

6.4.5 Sample Documentation and Custody

To ensure the integrity of samples from the time of collection through reporting date, sample collection, handling, and custody shall be documented. Sample custody and documentation for EM sampling and analysis activities are detailed in WIPP procedures. These procedures will be strictly followed throughout the course of each sample collection and analysis event.

Standardized forms used to document samples will include sample identification numbers, sample labels, custody tape, the sample tracking log books, and the request for analysis/chain of custody (RFA and CofC) form. The forms are briefly defined in the following subsections.

All sample documentation will be completed for each sample and reviewed by the Team Leader or his/her designee for completeness and accuracy.

a. Sample Numbers and Labels

A unique sample identification number will be assigned to each sample sent to the laboratory for analysis. The Team Leader will assign the numbers prior to sample collection. The sample identification numbers will be used to track the sample from the time of collection through data reporting. Every sample container sent to the laboratory for analysis will be identified with a label affixed to it. Sample label information will be completed in permanent, indelible ink and will contain the following information: sample identification number with sample matrix type; sample location; analysis requested; time and date of collection; preservative(s), if any; and the sampler's name or initials.

b. Custody Seals

Custody seals will be used to detect unauthorized sample tampering from collection through analysis. The custody seals will be adhesive-backed strips that are destroyed when removed or when the container is opened. The seal will be dated, initialed, and affixed to the sample container in such a manner that it is necessary to break the seal to open the container. Seals will be affixed to sample containers in the field immediately after collection. Upon receipt at the laboratory, the laboratory custodian will inspect the seal for integrity; a broken seal will invalidate the sample.

c. Sample Tracking Logbook

A sample tracking logbook (STLB) form will be completed for each sample collected. The STLB will include the following information: C of C number; RFA No.; date sample(s) were sent to the lab; laboratory name; acknowledgment of receipt or comments; well name and round number. Sample codes will indicate the well location; the geologic formation where the water was collected from, the sampling round number; and the sample number. The code is broken down as follows:

WQ6[1]C[2]R2[3]N1[4]

[1] Well identification (e.g., WQSP-6 in this case)
[2] Geologic formation (e.g., the Culebra in this case)
[3] Sample round no. (Round 2)
[4] Sample no. (N1)

To distinguish duplicate samples from other samples, a "D" is added as the last digit to signify a duplicate. STLB information will be completed in the field by the sampling team and checked by the Team Leader. When samples are shipped, the STLB will remain in the custody of the EM Section for sample tracking purposes.

d. Request for Analysis and Chain of Custody

An RFA and CofC form will be completed during or immediately following sample collection and will accompany the sample through analysis and disposal. The RFA and CofC form will be signed and dated each time the sample custody is transferred.
A sample will be considered to be in a person's custody if: the sample is in his/her physical possession; the sample is in his/her unobstructed view; and/or the sample is placed, by the last person in possession of it, in a secured area with restricted access. During shipment, the carrier's air bill number serves as custody verification. Upon receipt of the samples at the laboratory, the laboratory sample custodian acknowledges possession of the samples by signing and dating the RFA and CofC. The completed

original (top page) of the RFA and CofC will be returned to the Team Leader with the laboratory analytical report and becomes part of the permanent record of the sampling event. The RFA and CofC form also contains specific instructions to the laboratory for sample analysis, potential hazards, and disposal instructions.

6.5 Laboratory Analysis

Analysis of samples will be performed by a commercial laboratory. Methods will be specified in procurement documents and will be selected to be consistent with EPA recommended procedures in SW 846 (EPA, 1996). Additional detail on analytical techniques and methods will be given in laboratory SOPs. Table 3 presents the analytical parameters for the WIPP DMP.

The WID has established criteria for laboratory selection, including the stipulation that the laboratory follow the procedures specified in SW 846 and that the laboratory follow EPA protocols. The selected laboratory shall demonstrate, through laboratory SOPs, that it will follow appropriate EPA SW 846 requirements and the requirements specified by the EPA protocols. The laboratory shall also provide documentation to the WIPP describing the sensitivity of laboratory instrumentation. This documentation will be retained in the facility operating record and will be available for review upon request by an authorized agency. Instrumentation sensitivity needs to be considered because of regulatory requirements governing constituent concentrations in ground water and the complexity of brines associated with the WIPP repository.

Once the initial qualification criteria, as specified above, have been met, a laboratory will be selected based upon competitive bid. The selected laboratory will perform analytical work for the DMP for a predetermined period of time, as specified in the contract between the WID and the selected laboratory. As this period of performance comes to an end, a new laboratory selection/competitive bid process will be initiated by the DMP. The same or a different laboratory may be selected for the new contract period. The SOPs for the laboratory currently under contract will be maintained in a file in the operating record. An initial set of SOPs will be provided to the NMED for information purposes along with any SOP updates on an annual basis.

Data validation will be performed by WID Environmental Monitoring. Data validation results are documented on an Approval/Variation Request (AR/VR) form. If no discrepancies are found in the data, the AR/VR form will be signed and the approved box will be checked. If however, discrepancies are found, the AR/VR form will be signed and the disapproved or approved-on-condition box will be checked and the form will be returned to the team leader accompanied by an attached report discussing the data validation results, any anomalies, and resolutions. Copies of the data validation report will be distributed to the EM Manager, QA Manager, the Team Leader, and the Contract Administrator. Copies of the data validation report will be kept on file in the EM records section for review upon request by NMED.

7.0 CALIBRATION

7.1 Sampling Equipment Calibration Requirements

The equipment used to collect data for the WQSP and this DMP will be calibrated in accordance with maintenance administrative procedures. The EM Section will be responsible for calibrating needed equipment on schedule, in accordance with written procedures. The EM Section will also be responsible for maintaining current calibration records for each piece of equipment.

7.2 Groundwater Surface Elevation Monitoring Equipment Calibration Requirements

The equipment used in taking groundwater surface elevation measurements will be maintained in accordance with WIPP procedures. The EM Section will be responsible for calibrating the needed equipment on schedule in accordance with written procedures. The EM Section will also be responsible for maintaining current calibration records for each piece of equipment.

8.0 STATISTICAL ANALYSIS OF LABORATORY DATA

As required by 20 NMAC 4.1.500 (incorporating 40 CFR §§ 264.97 and 264.98), data collected to establish background groundwater quality and as part of the DMP will be evaluated using appropriate statistical techniques. The following specifies the statistical analysis to be performed by the DMP. Statistical analysis of DMP data will conform to EPA guidance "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (EPA, 1989), "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance" (EPA, 1992), and DOE/EH-0173T, "Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance".

8.1 Temporal and Spatial Analysis

Environmental parameters vary with space and time. The effect of one or both of these two factors on the expected value of a point measurement will be statistically evaluated through spatial analysis and time series analysis. These methods often require extensive sampling efforts that may exceed the practical limits of the DMP sampling procedures.

Spatial analysis may have limited use during the operational period, although the effect of spatial auto-correlation on the interpretation of the data will be considered for each parameter. Spatial variability will be accounted for by the use of predetermined key sampling locations. Data analysis will be performed on a location-specific basis, or data from different locations will be combined only when the data are statistically homogeneous. Statistical homogeneity will be determined by evaluating mean values and variances from the residuals from the individual well data.

Time series analysis plays a more important role in data analysis for the DMP. Parameters will be reported as time series, either in tabular form or as time plots. For key time series parameters, these plots will be in the form of control charts on which control levels will be identified based on preoperational database, fixed standards, control location databases, or other standards for comparison. Where significant seasonal changes in the expected value of the parameter are identified in the preoperational database or in the control locations, corrections in the control levels which reflect the seasonal change will be made and documented.

8.2 Distributions and Descriptive Statistics

For data sets which include more than ten data points that are homogeneous in space and time (including seasonal homogeneity) and have less than ten percent missing data, a test for conformance to the normal distribution will be performed. The test for normality of the data will be performed in accordance with the methodologies presented in "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance" (EPA, 1992). Examples of test performed on the data are Shapiro-Wilk Test or Olmogorov-Smirnov Test at the 95% confidence level, there is only a one-in-twenty chance of falsely identifying the distribution as normal when it really is not.

If normality is not met, the data will be log-transformed (or transformed using a suitable mathematical transformation, e.g., square root) and retested for normality. If the transformed data fit a normal distribution, the original data will be accepted as having lognormal or an otherwise mathematically-transformed normal distribution. If normality is still not found, two courses may be taken. One will be to continue to test the fit to standard families of distributions, such as the gamma, beta, and Weibull, with proper modifications to subsequent analyses based on these results. The other course will be to use nonparametric methods of data analysis. Non-radiological data sets with greater than 15 percent nondetect are automatically treated as nonparameteric distributions.

For data sets smaller than ten, but homogeneous and complete, the lognormal distribution will be assumed. Data sets with more than ten percent missing data will be analyzed using nonparametric methods. Nonhomogeneous data sets will be subdivided into homogeneous sets and each of these analyzed individually.

Descriptive statistics will be calculated for each homogeneous data set. At a minimum, these include a central value and a range of variation. The central value is the arithmetic mean of the untransformed data if the data are not censored at either end. If the data are censored, either a trimmed mean or the median will be used as the central value (which may be within the censored range). If the data set is greater than ten and is uncensored, the standard deviation will be calculated and used as a basis for the reported range in variation. If these criteria are not met, the range between the 0.25 and 0.75 cartelist will be used. Radiological normally distributed data with a small number of extreme or less than detectable values, the arithmetic mean is the estimator of central tendency. When data set contains large extreme values, the median, which is less sensitive to extreme values than the mean, will be used to summarize the data. All of the actual values, including those that are negative will be included in the statistical analysis for radiological data. Radiological data will also be transformed to approximate a normal distribution before the central values are calculated. Most often a log transformation will normalize environmental data.

8.3 Data Anomalies

Data anomalies include data points reported as being below the limit of detection (LD) or otherwise censored over a specific range of values, missing data points occurring randomly in the data set, and outliers that cannot be ascribed to a known source of variation.

Whenever possible, sample values which are reported below detection limits will be incorporated into the database as sample values measured at one-half the detection limit for statistical analysis. When values are not available, alternative methods of analysis, as specified in previous sections, will be used. In particular, the use of nonparametric statistics will be required.

Missing data points comprising less than 10 percent of the data set do not significantly affect data analyses. Results based on data in which more than 10 percent is missing will be identified as such at the time of reporting. Consideration of the potential effect of missing data shall be made when the majority of the data are missing from a discrete time span.

Formal testing for outliers will only be done in accordance with EPA guidance.
The methodologies specified in Section 8.2 of the "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities" (EPA, 1989) will be used to check for outliers.

If an outside source of variation is not identified to account for outliers in a data set, it will be included in the data set and all subsequent analyses. If the inclusion of such outliers is found to affect the final results of the analyses significantly, both results (with and without outliers) will be reported. Radiological outliers will be tested with respect to the mean or median of the entire data set for outliers. Trend analyses on radiochemical data will be performed by comparing the results for the current year with the results of last several years to identify changes or inconsistencies in the results. Radiological data will also be plotted in time series for historical comparison. Data points falling outside ± 3 standard deviations could be considered outliers. Time plot and other yearly or seasonal trends in the data should be considered to reject/accept outliers.

9.0 COMPARISONS AND REPORTING

Prior to waste receipt, measurements will have been made of each background groundwater quality parameter and constituent specified in Table 3 at every DMP groundwater monitoring well during each of the four background sampling events. If any background groundwater quality parameter or constituent has not been measured prior to waste receipt, measurements will be made for those parameters or constituents in hydraulically upgradient DMP groundwater monitoring wells for a sequence of four sampling events. Following completion of the four sampling events, the arithmetic mean and variance shall then be calculated by the field supervisor or designee for each well. These measurements will then serve as a background value against which statistical values for subsequent sampling events during detection monitoring will be compared. Statistical analysis and comparison will be accomplished within sixty (60) days after the final sample is taken, using one of the five statistical tests specified in 20 NMAC 4.1.500 (incorporating 40 CFR § 264.98(h)), which may include Cochran's Approximation to the Behrens-Fisher students' t-test at the 0.01 level of significance (described in Appendix IV to 20 NMAC 4.1.500 (incorporating 40 CFR §264). If the comparisons show a significant increase at any monitoring site (as defined in 20 NMAC 4.1.500 (incorporating 40 CFR § 264.98(f)), the well shall be resampled and an analysis performed as soon as possible, in accordance with 20 NMAC 4.1.500 (incorporating 40 CFR § 264.98(g)(2))(Final WIPP Hazardous Waste Permit Requirement V.J.3.b). The results of the statistical comparison will be reported annually in the Annual Site Environmental Report (ASER), and will be reported to NMED as stated in module V, section V.J.3 of the Final WIPP Hazardous Waste Permit and as required under 20 NMAC 4.1.500 (incorporating 40 CFR § 264.98(g)).

9.1 Reporting

9.1.1 Laboratory Data Reports

Laboratory data will be provided in electronic and hard copy reports. Laboratory data reports will be forwarded to the Team Leader and NMED and will contain the following information for each analytical report:

- A brief narrative summarizing laboratory analyses performed, date of issue, deviations from the analytical method, technical problems affecting data quality, laboratory quality checks, corrective actions (if any), and the project manager's signature approving issuance of the data report.

- Header information for each analytical data summary sheet including: sample number and corresponding laboratory identification number; sample matrix; date of collection, receipt, preparation and analysis; and analyst's name.
- Analytical parameter, analytical result, reporting units, reporting limit, analytical method used.
- Results of QC sample analyses for all concurrently analyzed QC samples.

9.1.2 Statistical Analysis and Reporting of Results

Analytical results from semi-annual groundwater sampling activities will be compared and interpreted by the Team Leader through generation of statistical analyses as specified in Section L-4e of the Final WIPP Hazardous Waste Permit. The Team Leader will perform statistical analyses; the results will be included in the ASER in summary form, and will also be provided to NMED as specified in Permit Module V (Final WIPP Hazardous Waste Permit section V.J.2).

9.1.3 Annual Site Environmental Report

Data collected from this DMP will be reported to NMED as specified in Permit Module V, and to the EM Manager and NMED in the ASER. The ASER will include all applicable information that may affect the comparison of background groundwater quality and groundwater surface elevation data through time. This information will include but is not limited to:

- Well configuration changes that may have occurred from the time of the last measurement (i.e., plug installation and removal, packer removal and reinstallation, or both; and the type and quantity of fluids that may have been introduced into the test wells).
- Any pumping activities that may have taken place since publication of the last annual report (i.e., groundwater quality sampling, hydraulic testing, and shaft installation or grouting activities).

The DMP data used in generating the ASER will be maintained as part of the WIPP operating record and will be provided to NMED for review as specified in the permit.

10.0 RECORDS MANAGEMENT

Records generated during groundwater sampling and groundwater surface elevation monitoring events will be maintained in the form project files (operating record) in the EM section. Project records will include, but are not limited to:

- Sampling and Analysis Plans (SAP)
- SOPs
- STLBs
- RFA and CofC forms
- Contract Analytical Laboratory Data Reports
- Variance Logs and Nonconformance Reports
- Corrective Action Reports

These and all raw analytical records generated in conjunction with groundwater sampling and groundwater surface elevation monitoring will be stored in fire resistant cabinets in the EM section according to the Records Management Program (WP 15-PR) and the Records Inventory and Disposition Schedule (RIDS) and will be made available for inspection upon request. The following records will be transmitted to the Project Records Services (PRS) for long-term storage in accordance with the RIDS:

- Instrument maintenance and calibration records
- QC sample data
- Control charts and calculation
- Sample tracking and control documentation
- Raw analytical results

11.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

11.1 Environmental Monitoring Manager

The EM Manager will be responsible for the overall design and implementation of the DMP. The EM Manager will develop and approve specific procedures all DMP activities, and will review and approve programmatic reports. The EM Manager will provide oversight of appropriate levels of cooperation and consultation between the EM Section and the State of New Mexico regarding environmental monitoring and will revise the QA section of the DMP, if necessary, and submit revisions as permit modifications as specified in 20 NMAC 4.1.900 (incorporating 40 CFR § 270.42).

The EM Manager and staff will be responsible for achieving and maintaining quality in the DMP. All DMP data will be reviewed and approved by the EM Manager, or designee, prior to release.

The EM Manager will establish minimum qualification criteria and training requirements for all DMP personnel. The EM Manager will assure that position descriptions for assigned DMP personnel are adequately prepared. The EM Manager and/or Team Leader will assure that training is performed on an individual basis to maintain an acceptable level of proficiency by all new or temporary DMP staff and by all permanent GWSP staff. The EM Manager will assure that documents detailing all staff training are current and properly filed. Copies of training records will be on file in the WID Technical Training Section.

The EM Manager will appoint a DMP Team Leader and Field Team, and assign the following responsibilities specified below.

11.2 Team Leader

The Team Leader will coordinate and oversee field sampling activities, ensuring that sampling and associated procedures will be followed and that QA/QC and safety guidelines will be met. The Team Leader will direct the DMP per written approved procedures, and initiate the review of programmatic plans and procedures. The Team Leader will review and evaluate sample data, prepare and review programmatic reports, and assure that appropriate samples will be collected and analyzed. The Team Leader will assure that adequate technical support is provided to the QA Department, when required during audits of vendor facilities. Any nonconformances or project changes will be immediately communicated to the Team Leader.

11.3 Field Team

The field team members will consist of one or more scientists, engineers, or technicians, who will be responsible for sample collection, handling, shipping, and preparation and maintenance of appropriate data sheets, and completion of sample tracking documentation under the direction of the Team Leader, in accordance with this DMP and associated field procedures. The field team will inspect, maintain, and ensure proper calibration of equipment prior to use at each site, while ensuring that site health and safety requirements will be met at all times. The field team will communicate any nonconformances, malfunctions, or project changes to the Team Leader immediately.

11.4 Safety Manager

The Safety Manager will be responsible for ensuring that the necessary requirements for the health and safety of personnel associated with sampling and analysis activities are met. The cognizant manager will be responsible for ensuring that field team members operate in a safe manner and personnel have appropriate training.
The Safety Manager will ensure that periodic health and safety assessments are conducted and that the cognizant manager will initiate corrective actions where deficiencies are identified.

11.5 Analytical Laboratory Manager

Sample collection containers supplied by the laboratory will be certified as clean by either the laboratory or their supplier. The WIPP will supply containers for radiological samples. The analytical laboratory will be responsible for performing analyses in accordance with this DMP Plan and regulatory requirements. The laboratory will maintain documentation of sample handling and custody, analytical results, and internal QC data. Additionally, the laboratory will analyze QC samples in accordance with this plan and its own internal QC program for indicators of analytical accuracy and precision. Data generated outside laboratory acceptance limits will trigger an investigation and, if appropriate, corrective action, as directed by the EM Manager. The laboratory will report the results of the environmental sample and QC sample analyses and any necessary corrective actions that were performed. In the event that more than one analytical laboratory is used (e.g., for different analyses), each one will have the responsibilities specified above.

11.6 Quality Assurance (QA) Manager

The QA Manager will provide independent oversight of the DMP, via the assigned cognizant QA engineer, to verify that quality objectives are defined and achieved. The QA Manager will ensure objective, independent assessments of the DMP quality performance and the quality performance of the contract analytical laboratory. The QA Manager has been delegated authority on behalf of the WID General Manager and will have access to work areas, identify quality problems, initiate or recommend corrective actions, verify implementation of corrective actions, and ensure that work will be controlled or stopped until adequate disposition of an unsatisfactory condition has been implemented.

12.0 QUALITY ASSURANCE REQUIREMENTS

Specific Quality Assurance (QA) requirements for WIPP are defined in the WID Quality Assurance Program Description (QAPD), WP 13-1. Requirements specific to the DMP are presented in this section.

12.1 QA Program Review

The QA program was developed to assure that integrity and quality will be maintained for all samples collected and that equipment and records will be maintained in accordance with EPA guidance. The QA Program identifies data quality objectives (DQO), processes for assuring sample quality, and processes for generating and maintaining quality records.

12.1.1 Data Quality Objectives (DQOs)

DQOs are qualitative and quantitative statements that specify the quality of data required to support project decisions. DQOs will be established to ensure that the data collected will be of a sufficient and known quality for their intended uses. The overall DQO for this project will be to collect accurate and defensible data of known quality that will be sufficient to assess the concentrations of constituents in the ground water underlying the WIPP area. The data generated thus far by the DMP has been used to establish background groundwater quality. For the purpose of this DMP, DQOs for measurement data will be specified in terms of accuracy, precision, completeness, representativeness, and comparability. Measurements of data quality in terms of accuracy and precision will be derived from the analysis of QC samples generated in the field and laboratory. Appropriate QC procedures will be used so that known and acceptable levels of accuracy and precision will be maintained for each data set. This section defines the acceptance criteria for each QC analysis performed. The following subsections define each DQO.

a. Accuracy

Accuracy is the closeness of agreement between a measurement and an accepted reference value. When applied to a set of observed values, accuracy is a combination of a random component and a common systematic error (bias) component. Measurements for accuracy will include analysis of calibration standards, laboratory control samples, matrix spike samples, and surrogate spike samples. The bias component of accuracy is expressed as percent recovery (%R). Percent recovery is expressed as follows:

$$\%R = \frac{(measured\ sample\ concentration)}{true\ concentration} x\ 100$$

1. Accuracy Objectives for Field Measurements

Field measurements will include pH, SC, temperature, Eh, and static groundwater surface elevation. Field measurement accuracy will be determined using calibration check standards. Thermometers used for field measurements will be calibrated to the National Institute for Standards and Technology (NIST) traceable standard on an annual basis to assure accuracy. Accuracy of groundwater surface elevation measurements will be checked before each measurement period by verifying calibration of the device within the specified schedule. The QAPD, Section 2.4.4, Monitoring, Measuring, Test and Data Collection Equipment, outlines the basic requirements for field equipment use and calibration. WP10-AD.01 "Metrology Program" contains instructions that outline protocols for maintaining current calibration of groundwater surface elevation measurement instrumentation.

2. Accuracy Objectives for Laboratory Measurements

Analytical system accuracy will be quantified using the following laboratory accuracy QC checks: calibration standards, laboratory control samples (LCS), laboratory blanks, matrix and surrogate spike samples. Single LCSs and matrix spike and surrogate spike sample analyses will be expressed as %R. Laboratory analytical accuracy is parameter dependent and will be prescribed in the laboratory SOP.

b. Precision

Precision is the agreement among a set of replicate measurements without assumption or knowledge of the true value. Precision data will be derived from duplicate field and laboratory measurements. Precision will be expressed as relative percent difference (RPD), which is calculated as follows:

$$RPD = \frac{|(measured\ value\ sample\ 1 - measured\ value\ sample\ 2)|}{average\ of\ measured\ samples\ 1 + 2} x\ 100$$

1. Precision Objectives for Field Measurements

Precision of field measurements of water-quality parameters will meet or exceed required reporting levels. SC, pH, temperature, and optionally Eh will be measured during well purging and after sampling. SC measurements will be precise to ±10% pH to 0.10 standard unit, and temperature to 0.10 degrees Celsius (°C), Eh to 10 millivolts (mV).

c. Precision Objectives for Laboratory Measurements

Precision of laboratory analyses will be assessed by performing the same analyses twice on LCSs with each analytical batch assessed at a minimum frequency of 1 in 20 groundwater samples for nonradiological parameters and 1 in 10 for radiological parameters. The laboratory will determine analytical precision control limits by performing replicate analyses of control samples. Precision measurements will be expressed as RPD. Laboratory analytical precision is also parameter dependent and will be prescribed in laboratory SOPs.

d. Contamination

In addition to measurements of precision and bias, QC checks for contamination will be performed. QC samples including trip blanks, field blanks, and method blanks will be analyzed to assess and document contamination attributable to sample collection equipment, sample handling and shipping, and laboratory reagents and glassware. Trip blanks will be used to assess volatile organic compound (VOC) sample contamination during shipment and handling and will be collected and analyzed at a frequency of one sample per sample shipment. Field blanks will be used to assess field sample collection methods and will be collected and analyzed at a minimum frequency of one sample per 20 samples (five percent of the samples collected). Method blanks will be used to assess contamination resulting from the analytical process and will be analyzed at a minimum frequency of one sample per 20 samples, or five percent of the samples collected. Evaluation of sample blanks will be performed following U.S. EPA "National Functional Guidelines for Organic Data Review" (EPA, 1991) and "Functional Guidelines for Evaluating Inorganics Analyses" (EPA, 1988). Only method blanks will be analyzed via wet chemistry methods. The criteria for evaluating method blanks will be established as follows: If method blank results exceed reporting limits, then that value will become the detection limit for the sample batch. Detection of analytes of interest in blank samples may be used to disqualify some samples, requiring resampling and additional analyses on a case-by-case basis.

e. Completeness

Completeness is a measure of the amount of usable valid data resulting from a data collection activity, given the sample design and analysis. Completeness may be affected by unexpected conditions that may occur during the data collection process. Occurrences that reduce the amount of data collected include sample container breakage in the laboratory and data generated while the laboratory was operating outside prescribed QC limits. All attempts will be made to minimize data loss and to recover lost data whenever possible. The completeness objective for noncritical measurements (i.e., field measurements) will be 90 percent and 100 percent for critical measurements (i.e., compliance data). If the completeness objective is not met, the WIPP EM Manager will determine the need for resampling on a case-by-case basis. Numerical expression of the completeness (%C) of data is as follows:

$$\%C = \frac{number\ of\ accepted\ samples}{total\ number\ of\ samples\ collected} x\ 100$$

f. Representativeness

Representativeness is the degree to which sample analyses accurately and precisely represent the media they are intended to represent. Data representativeness for this DMP will be accomplished through implementing approved sampling procedures and the use of validated analytical methods. Sampling procedures will be designed to minimize factors affecting the integrity of the samples. Groundwater samples will only be collected after well purging criteria have been met. The analytical methods selected will be those that will most accurately and precisely represent the true concentration of analytes of interest.

g. Comparability

Comparability is the extent to which one data set can be compared to another. Comparability will be achieved through reporting data in consistent units and collection and analysis of samples using consistent methodology. Aqueous samples will consistently be reported in units of measures dictated by the analytical method. Units of measure include:

- Milligrams per liter (mg/L) for alkalinity, inorganic compounds and metals
- Micrograms per liter (mg/L) for VOCs.

Groundwater surface elevation measurements will be expressed as equivalent freshwater elevation in feet above mean sea level.

12.2 Design Control

The groundwater monitoring system was designed and will be maintained to meet specifications established in 20 NMAC 4.1.500 (incorporating 40 CFR §§ 264 Subpart F and 264.601 through 264.603).

12.3 Instructions, Procedures, and Drawings

Provisions and responsibilities for the preparation and use of instructions and procedures at WIPP are outlined in Section 1.4, Documents, Section 2.1.2, Implementing Procedures, and Section 4, Sample Control, and Quality Assurance Requirements, of the QAPD. Any activities performed for groundwater monitoring that may affect ground water will be performed in accordance with documented and approved procedures which comply with the Permit and the requirements of 20 NMAC 4.1.500 (incorporating 40 CFR § 264 Subpart F).

Technical procedures, as specified elsewhere in this DMP, have been developed for each quality-affecting function performed for groundwater monitoring. The technical procedures unique to the DMP will be controlled by the ES&H at WIPP. The procedures are sufficiently detailed and include, when applicable, quantitative or qualitative acceptance criteria.

Procedures were prepared in accordance with requirements in Section 1.4, Documents, Section 2.1.2, Implementing Procedures, and Section 4, Sample Control, and Quality Assurance Requirements, of the QAPD.

12.4 Document Control

Document controls will ensure that the latest approved versions of procedures will be used in performing groundwater monitoring functions and that obsolete materials will be removed from work areas.

12.5 Control of Work Processes

Process control requirements, defined in the QAPD Section 2.1, Work Processes and Section 4, Sample Control and Quality Assurance Requirements, are met, and will continue to be met, for this DMP.

12.6 Inspection and Surveillance

Inspection and surveillance activities will be conducted as outlined in Section 2.4, Inspection and Testing, and Section 3.2, Independent Assessment of the QAPD. The QA Department will be responsible for performing the applicable inspections and surveillance on the scope of work. EM section personnel will be responsible for performance checks as defined in applicable procedures and determined by WID metrology laboratory personnel. Performance checks for the DMP will determine the acceptability of purchased items and assess degradation that occurs during use.

12.7 Control of Monitoring and Data Collection Equipment

QAPD Section 2.4.4, Monitoring, Measuring, Testing, and Data Collection Equipment, outline the basic requirements for control and calibrating monitoring and data collection (M&DC). M&DC equipment shall be properly controlled, calibrated, and maintained according to WIPP Procedures to ensure continued accuracy of groundwater monitoring data. Results of calibrations, maintenance, and repair will be documented. Calibration records will identify the reference standard and the relationship to national standards or nationally accepted measurement systems. Records will be maintained to track uses of M&DC equipment. If M&DC equipment is found to be out of tolerance, the equipment will be tagged and it will not be used until corrections are made.

12.8 Control of Nonconforming Conditions

Section 1.3, Quality Improvement, Section 4.4, Disposition of Nonconforming Samples, of the QAPD specifies the system used at WIPP for ensuring that appropriate measures are established to control nonconforming conditions. Nonconforming conditions connected to the DMP will be identified in and controlled by documented procedures. Equipment that does not conform to specified requirements will be controlled to prevent use. The disposition of defective items will be documented on records traceable to the affected items. Prior to final disposition, faulty items will be tagged and segregated. Repaired equipment will be subject to the original acceptance inspections and tests prior to use.

12.9 Corrective Action

Requirements for the development and implementation of a system to determine, document, and initiate appropriate corrective actions after encountering conditions adverse to quality at WIPP are outlined in Section 1.3, Quality Improvement, of the QAPD. Conditions adverse to acceptable quality will be documented and reported in accordance with corrective action procedures and corrected as soon as practical. Immediate action will be taken to control work performed under conditions adverse to acceptable quality and its results to prevent quality degradation.

12.10 Quality Assurance Records

Section 1.5, Records, of the QAPD outlines the policy that will be used at WIPP regarding identification, preparation, collection, storage, maintenance, disposition, and permanent storage of QA records.

Records to be generated in the DMP will be specified by procedure. QA and RCRA operating records will be identified. This will be the basis for the labeling of records as "QA" or "RCRA operating" on the EM RIDS.

QA records will document the results of the DMP implementing procedures and will be sufficient to demonstrate that all quality-related aspects are valid. The records will be identifiable, legible, and retrievable.

TABLE 1 HYDROLOGICAL PARAMETERS FOR ROCK UNITS ABOVE THE SALADO AT WIPP

Unit		Hydraulic Conductivity	Storage Coefficient	Transmissivity	Permeability	Thickness	Hydraulic Gradient
Santa Rosa		2×10^{-8} to 2×10^{-6} m/s (1) (2)	Specific capacity 0.029 to 0.041 ℓ/s/m	6×10^{-7} to 6×10^{-5} m^2/s (3)	10^{-10} m^2	0 to 91 m	0.001 (5)
Dewey Lake		10^{-8} m/s	Specific storage 1×10^{-5} (1/m) (2)	2.8×10^{-8} to 2.8×10^{-4} m^2/s (4)	5.01×10^{-17} m^2	152 m	0.001 (5)
Rustler	Forty-niner	1×10^{-13} to 1×10^{-11} m/s (anhydrite) 1×10^{-9} m/s (mudstone) (2)	Specific storage 1×10^{-5} (1/m) (2)	8×10^{-8} to 8×10^{-9} m^2/s	0 m^2	13 to 23 m	NA (6)
	Magenta	$1 \times 10^{-8.5}$ to $1 \times 10^{-6.5}$ m/s (2)	Specific storage 1×10^{-5} (1/m) (2)	4×10^{-4} to 1×10^{-9} m^2/s	6.31×10^{-14} m^2	7 to 8.5 m	3 to 6
	Tamarisk	1×10^{-13} to 1×10^{-11} m/s (anhydrite) 1×10^{-9} m/s (mudstone) (2)	Specific storage 1×10^{-5} (1/m) (2)	$<2.7 \times 10^{-11}$ m^2/s	0 m^2	26 to 56 m	NA (6)
	Culebra	$1 \times 10^{-7.5}$ to $1 \times 10^{-5.5}$ m/s (2)	Specific storage 1×10^{-5} (1/m) (2)	1×10^{-3} to 1×10^{-9} m^2/s	2.1×10^{-14} m^2	4 to 11.6 m	0.003 to 0.007 (5)
	Unnamed lower member	6×10^{-15} to 1×10^{-13} m/s 1.5×10^{-11} to 1.2×10^{-11} m/s (basal interval)	Specific storage 1×10^{-5} (1/m) (2)	2.9×10^{-10} to 2.2×10^{-13} m^2/s 2.9×10^{-10} to 2.4×10^{-10} m^2/s (basal interval)	0 m^2	29 to 38 m	NA (6)

Matrix characteristics relevant to fluid flow include values used in this table such as permeability, hydraulic conductivity, gradient, etc.)

Table Notes:

(1) The Santa Rosa Formation is not present in the western portion of the WIPP site. It was combined with the Dewey Lake Red Beds in three-dimensional regional groundwater flow modeling (Corbet and Knupp, 1996), and the range of values entered here are those used in that study for the Dewey Lake/Triassic hydrostratigraphic unit.

(2) Values or ranges of values given for these entries are the values used in three-dimensional regional groundwater flow modeling (Corbet and Knupp, 1996). Values are estimated based on literature values for similar rock types, adjusted to be consistent with site-specific data where available. Ranges of values include spatial variation over the WIPP site and differences in values used in different simulations to test model sensitivity to the parameter.

(3) The range of values given here for transmissivity of the Santa Rosa is estimated for the center of the site. Transmissivity is the product of the thickness of the productive interval times its hydraulic conductivity. Thickness of the Santa Rosa is estimated to be 30 meters at the center of the WIPP site, and the range of derived transmissivities are based on the range of hydraulic conductivity values used by Corbet and Knupp (1996) for the combined Dewey Lake/Triassic unit.

(4) The range of values given here by transmissivity of the Dewey Lake is estimated for the center of the site. Transmissivity is the product of the thickness of the productive interval times its hydraulic conductivity. Thickness of the Dewey Lake is estimated to be 140 meters at the center of the WIPP site, and the range of derived transmissivities are based on the range of hydraulic conductivity values used by Corbet and Knupp (1996) for the combined Dewey Lake/Triassic unit.

(5) Hydraulic gradient is a dimensionless term describing change in the elevation of hydraulic head divided by change in horizontal distance. Values given in these entries are determined from potentiometric surfaces. The range of values given for the Culebra reflects the highest and lowest gradients observed within the WIPP site boundary. Values for the Dewey Lake and Santa Rosa are assumed to be the same as the gradient determined from the water table. Note that the Santa Rosa Formation is absent or above the water table in most of the controlled area, and that the concept of a horizontal hydraulic gradient is not meaningful for these regions.

(6) Flow in units of very low hydraulic conductivity is slow, and primarily vertical. The concept of a horizontal hydraulic gradient is not applicable.

Sources: Beauheim, 1986; Domenico and Schwartz, 1990; Domski, Upton, and Beauheim, 1996; Earlough, 1977.

TABLE 2 WIPP GROUNDWATER DETECTION MONITORING PROGRAM SAMPLE COLLECTION AND GROUNDWATER SURFACE ELEVATION MEASUREMENT FREQUENCY

Installation	Frequency
Groundwater Quality Sampling	
DMP monitoring wells	Semiannually
All other WIPP surveillance wells	On special request only
Groundwater Surface Elevation Monitoring	
DMP monitoring wells	Monthly and prior to sampling events
All other WIPP surveillance well sites	Monthly
Redundant wells at all other WIPP surveillance well sites	Quarterly

TABLE 3 ANALYTICAL PARAMETER LIST FOR THE WIPP GMP

Background Groundwater Quality

<u>Indicator Parameters</u>

pH, SC, TOC, TOH, TDS, TSS, Density

<u>Parameters Listed in</u>

20 NMAC 4.1.500 (Incorporating 40 CFR 264) Appendix IX, + Calcium, Magnesium, Potassium

<u>Field Analysis</u>

pH, SC, temperature, chloride, Eh, alkalinity, total fe, Specific gravity

Operational Parameters

<u>Chemical Analysis</u>

Alkalinity	Bromide	Chloride
Fluoride	Iodide	Nitrate (as N)
Orthophosphate (as P)		Sulfate
Total Organic Carbon (TOC)		Total Phenols
Total Organic Halogens (TOX)		

<u>Physical Analysis</u>

pH	Total Dissolved solids
Total suspended solids	Density

<u>Inorganic Metals</u>

Antimony	Arsenic	Barium
Beryllium	Cadmium	Chromium
Cobalt	Copper	Lead
Mercury	Nickel	Selenium
Silver	Thallium	Tin
Vanadium	Zinc	Boron
Calcium	Iron	Lithium
Magnesium	Potassium	Silica
Sodium		

<u>Volatile Organic Compounds (VOC's)</u>

1,1-dichloroethylene	Carbon Tetrachloride
Methylene Chloride	Chloroform
1,1,2,2-tetrachloroethane	1,1,1-trichloroethane
Chlorobenzene	1,2-dichloroethane
Toluene	1,1-dichloroethane
Vinyl Chloride	Xylenes (Total)
Methyl Ethyl Ketone	Tetrachloroethylene
cis-1,2-dichloroethylene	Trichloroethylene
Trichlorofluoromethane	1,1,2-trichloroethane

<u>Semi-Volatile Organic Compounds (SVOC's)</u>

Cresols (Total)	1,2-dichlorobenzene
2,4-dinitrophenol	Hexachloroethane
Pyridine	Nitrobenzene
1,4-dichlorobenzene	2,4-dinitrotoluene
Hexachlorobenzene	Pentachlorophenol
Phenols (Total)	

<u>Radionuclides of Interest</u>

Gross alpha, Gross Beta

K^{40}, Cs^{137}, Co^{60}, U^{234}, U^{235}, U^{238}, Pu^{238}, $Pu^{239+240}$, Am^{241}

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TABLE 4 TYPICAL PARAMETER AND SAMPLE VOLUME REQUIREMENTS

Parameters	No. of Bottles	Volume	Type	Acid Wash	Sample Filter	Preservative	Holding Time
pH	-	25 ml	Glass	Field Determined	No	Field Determined	None
Specific Conductance	-	100 ml	Glass	Field Determined	No	Field Determined	None
TOC	4	15 ml	Glass	Yes	No	HCL, pH<2	28 Days
TOX	3	250 ml	Glass	Yes	No	H_2SO_4, pH<2	7 Days
General Chemistry	1	1 liter	Plastic	Yes	No	HNO_3, pH<2	Not Specified
Phenolics	1	1 liter	Amber Glass	Yes	No	H_2SO_4, pH<2	Not Specified
Metals/Cations	2	1 liter	Plastic	Yes	No	HNO_3, pH<2	6 Months
VOC	4	40 ml	Glass	No	No	HCL, pH<2	14 Days
Radionuclides	1	1 Gallon	Plastic Cube	Yes	Yes	HNO_3, pH<2	6 Months

Note: Volumes and number of containers may vary per Contract Laboratory

TABLE 5 RCRA PERMIT STIPULATIONS REQUIRING ACTIONS, REPORTING, OR NOTIFICATIONS

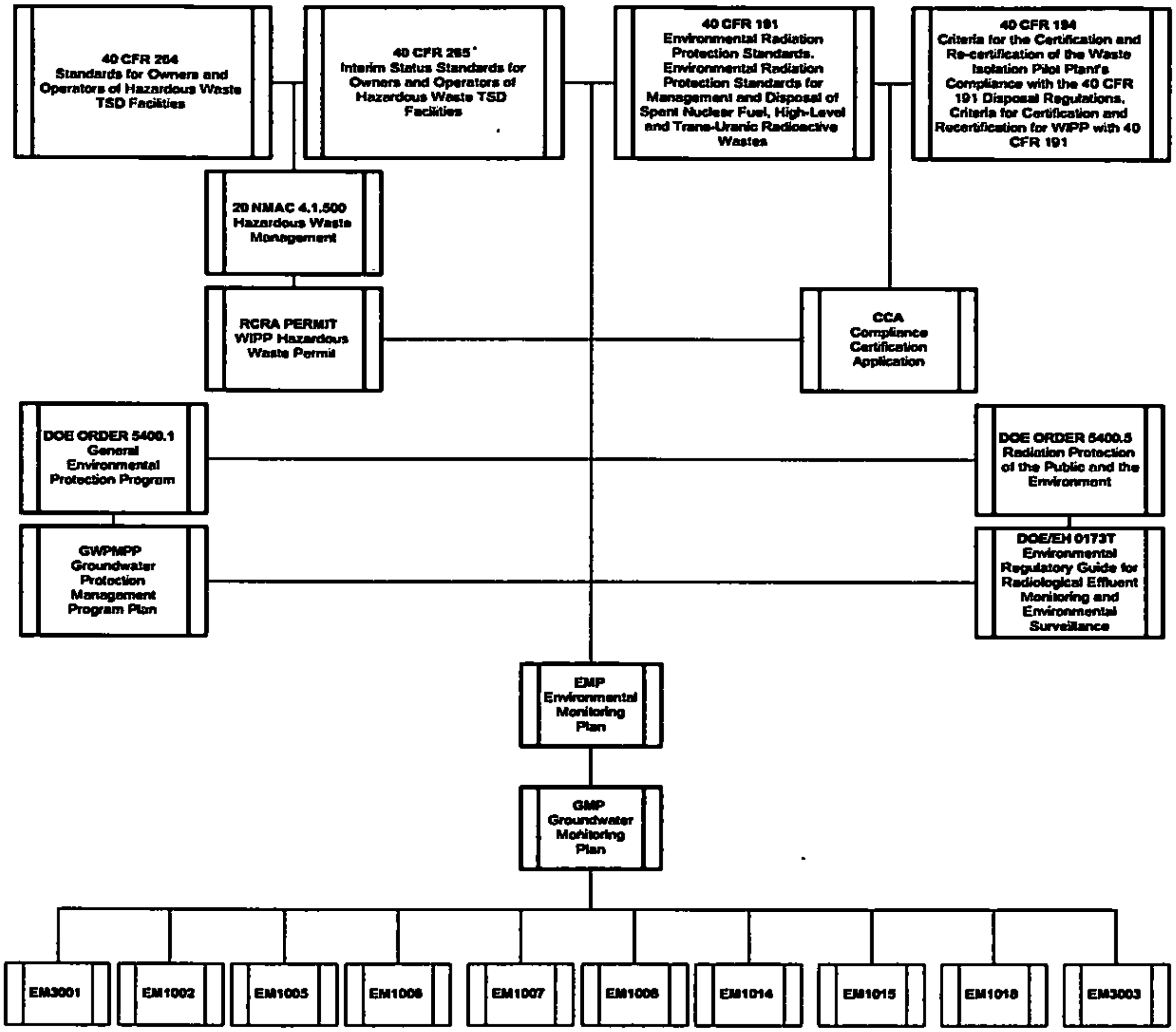
Permit Stipulation	Action, Report or Notification due date	Permit §
Determination of statistically significant contamination of parameters or constituents in table V.D.	7 calendar days from determination	V.J.3.a., V.J.4.a., L-4e(4)
If the Permittees determine, pursuant to permit condition V.I that there is a statistically significant difference for parameters or constituents specified in Table V.D at any DMW at the Compliance point, they may demonstrate that a source other than a regulated unit caused the increase or that the detection is an artifact caused by an error in sampling, analysis, statistical evaluation, or natural variation in the groundwater.	Submittal of modification request-the permittees shall, within 90 calendar days, submit to the Secretary an application for a permit modification to make any appropriate changes to the DMP, as required by 20 NMAC 4.1.500	V.J.4.c.
Changes that occur that could affect the DMP's ability to fulfill the requirements of 20 NMAC 4.1.500	Permit modification request - no time specified	L-4a
Groundwater Flow results Report-Direction and Rate of flow in the Culebra	Annually in the Site Environmental Report	V.J.2.c.,V.H
Background Water quality data report	Prior to waste receipt	V.F.3, L-4e(4)
For those parameters and constituents listed in Table V.D which the Permittees have not met the requirements of Permit Condition V.F1. For establishing background water quality at the time the Permit is approved, the Permittees shall collect additional background water quality data.	The permittees shall submit the background water quality data to the secretary within three months of complying with the permit condition V.F.1.	V.F.4.c
Groundwater Surface Elevation Results Report	30 days after data are collected	V.J.2b., L-4c(1)ii
DMP Statistical Comparison Report	Annually in the Site Environmental Report	L-4e(4)
The Permittees shall determine the groundwater flow rate and direction in the Culebra Member of the Rustler Formation at least annually.	Determine groundwater flow rate and direction annually	V.H.
For those parameters and constituents listed in Table V.D which the permittees have not met the requirements of Permit condition V.F.1 for establishing background Groundwater quality at the time the Permit is approved, the permittees shall collect additional background Groundwater quality data to comply with the following conditions:	The permittees shall collect background Groundwater quality data only from hydraulically upgradient DMWs.	V.F.4.a-b
Evidence that a source other than a regulated unit caused groundwater contamination, or that contamination resulted from error in sampling, analysis, or evaluation	90 calendar days from determination	V.J.4.b
DMW plugging and abandoning Reports	90 days after date DMW is removed from the DMP	V.C.3

Permit Stipulation	Action, Report or Notification	Permit §
The Permittees shall collect one (1) DMP sample and (1)DMP sample duplicate semiannually from each DMW using the procedure specified in Permit Attachment L section L-4c, as required by 20 NMAC 4.1.500 (incorporating 40 CFR 264.97(g)(2), 264.98(d), and 264.601(a)).	Collect one sample and one duplicate sample semiannually.	V.E.1.
DMP Data Evaluation Results Report	Biannually	V.J.2.a.
Cumulative groundwater surface elevation changes more than 2 feet in any DMW during one year which is not attributable to site tests or natural stabilization.	Notification in writing (time not specified) Report in the Site Environmental Report	L-4c(1), V.J.2.c
The permittees shall immediately, but no later than one(1) month, sample the groundwater in all DMWs specified in table V.C.1 for which there was statistically significant evidence of contamination. The remaining DMWs shall be sampled within two (2) months after statistically significant evidence of contamination is found in any DMW. All DMWs shall be sampled to determine the concentration of all substances identified in 20 NMAC 4.1.500 (incorporating 40 CFR 264 appendix IX), as required by 20 NMAC 4.1.500 (incorporating 40 CFR 264.98(g)(2)).	Contaminated well within 1 month All other DMWs within 2 months	V.J.3.b
Permittees may resample within one(1) month and repeat the analysis for those compounds detected. If the results of the second analysis confirm the initial analysis, these substances shall form the basis for compliance monitoring specified in permit condition V.J.3.d. If the permittees do not resample, the substances found during the initial analysis specified in condition V.J.3.b shall form the basis for compliance monitoring specified in permit condition V.J.3.d.	Resample within (1) month	V.J.3.c.
If the permittees determine, pursuant to Permit Condition V.I ...that there is statistically significant evidence of contamination for any parameter or constituent specified in Table V.D, the permittees shall comply with the following: ... The permittees shall within ninety(90) calendar days, submit to the secretary an application for a permit modification to establish a compliance monitoring program...	Submit an application for permit modification accompanied by a compliance monitoring program plan with in 90 days	V.J.3.d.
If the Permittees determine, pursuant to Permit Condition V.I ... that there is statistically significant evidence of contamination for any parameter or constituent specified in table V.D, the Permittees shall comply with the following: (i)All data necessary to justify an alternate concentration limit proposed in compliance with permit condition V.J.3.d.iv. (ii)An engineering feasibility plan for corrective action required by 20 NMAC 4.1.500 (incorporating 40 CFR 264.100) if necessary	Submit plan for corrective action within 180 calendar days accompanied by an engineering feasibility study if necessary	V.J.3.e.
The Permittees shall submit a report to the Secretary which summarizes and certifies DMW plugging and abandoning methods...	Ninety (90) calendar days from the date the DMW is removed from the DMP.	V.C.3

Permit Stipulation	Action, Report or Notification	Permit §
If the Permittees determine, pursuant to Permit condition V.I, that there is significant evidence of contamination for any parameter or constituents specified in Table V.d...	Submittal of compliance monitoring program within 90 calendar days with an application for a permit modification to establish a compliance monitoring program.	V.J.3.d
Releases have caused, or are expected to cause, concentrations of radionuclides or estimated doses due to radionuclides in underground sources of drinking water in the accessible environment to exceed the limits established pursuant to Part 191, Subpart C, of this Chapter.	Report to EPA, within 24 hours, in writing.	40 CFR 194.4(b)iic 40 CFR 194.4(b)iii

Note: Notifications to the NMED as specified in this table will be transmitted by the RCRA Compliance Section of the ES&H Department.

FIGURE 1 HIERARCHY OF DOCUMENTS GOVERNING THE GMP



EM3001 - Administrative Processes for Environmental Monitoring
EM1002 - Electric Submersible Pump Monitoring System Installation and Operation
EM1005 - Groundwater Serial Sample Analysis
EM1006 - Final Sample and Serial Sample Collection
EM1007 - Cation and Anion Analysis
EM1008 - ONAN 35 DGBB Generator Set Operation
EM1014 - Groundwater Level Measurement
EM1015 - Water Quality Monitoring Using the YSI Model 3560 Monitoring System
EM1018 - ONAN 25DKAF Generator Set Operation
EM3003 - Data Validation and Verification of RCRA Constituents

FIGURE 2 WIPP FACILITY LOCATION

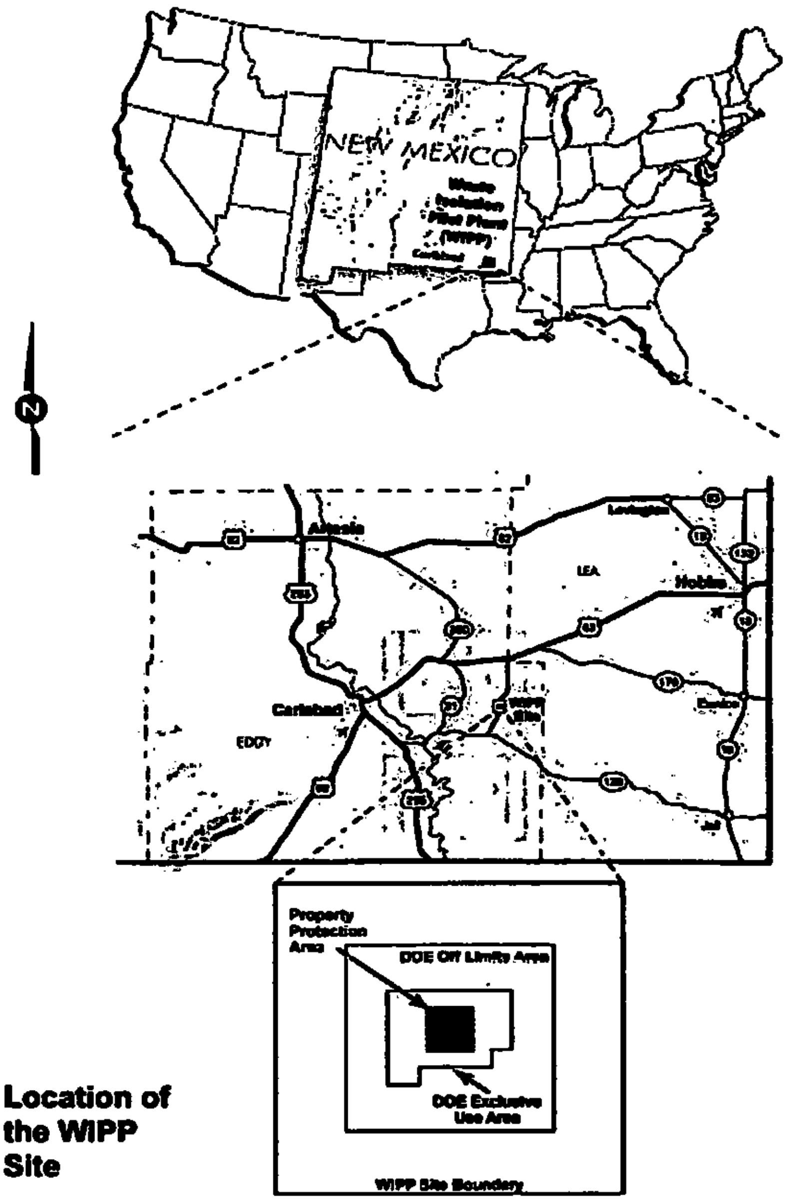


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FIGURE 3 SITE GEOLOGIC COLUMN

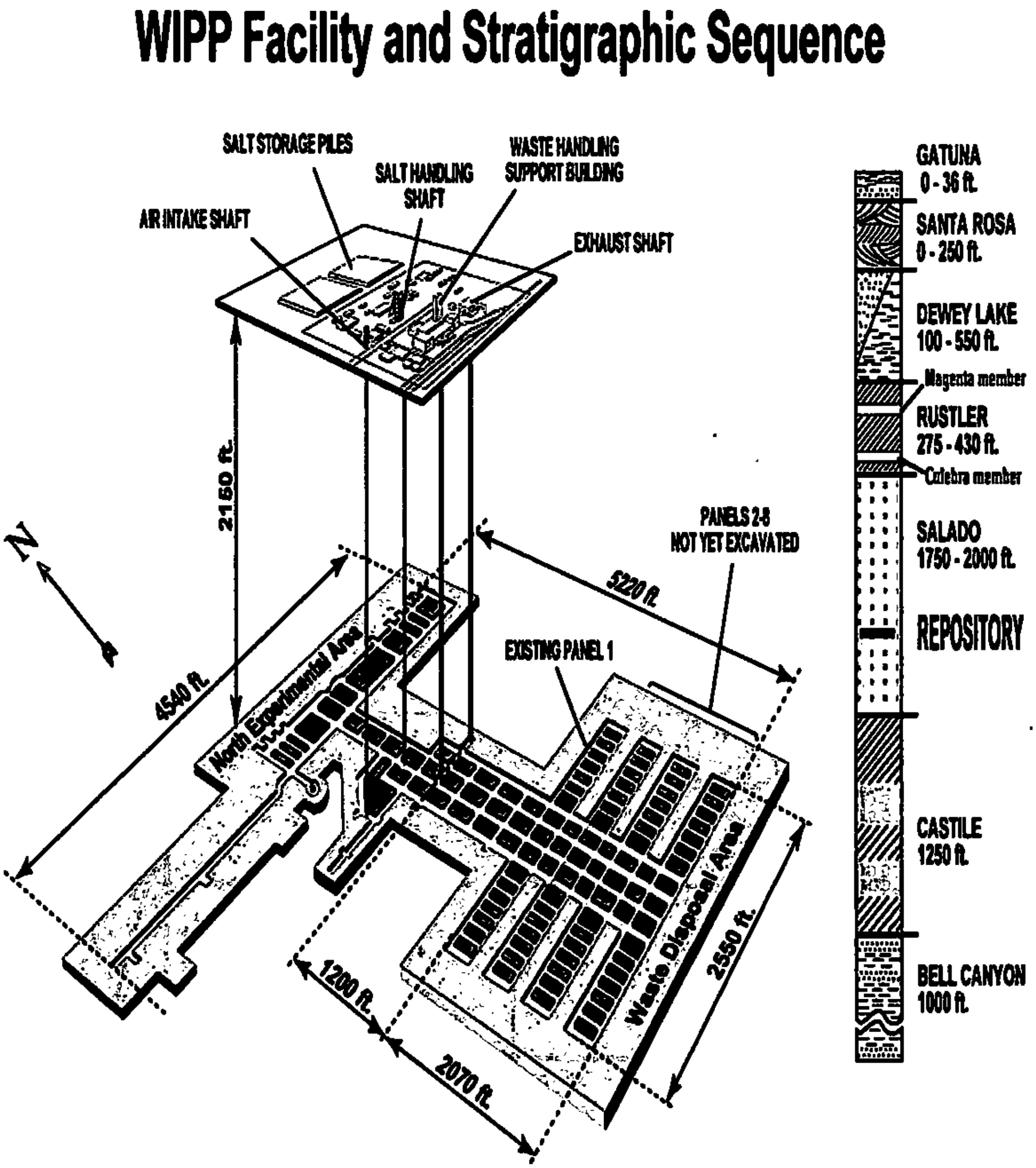

FIGURE 4 WIPP DMW CONFIGURATION WITH POTENTIOMETRIC SURFACES IN RELATIONSHIP TO THE WIPP SITE

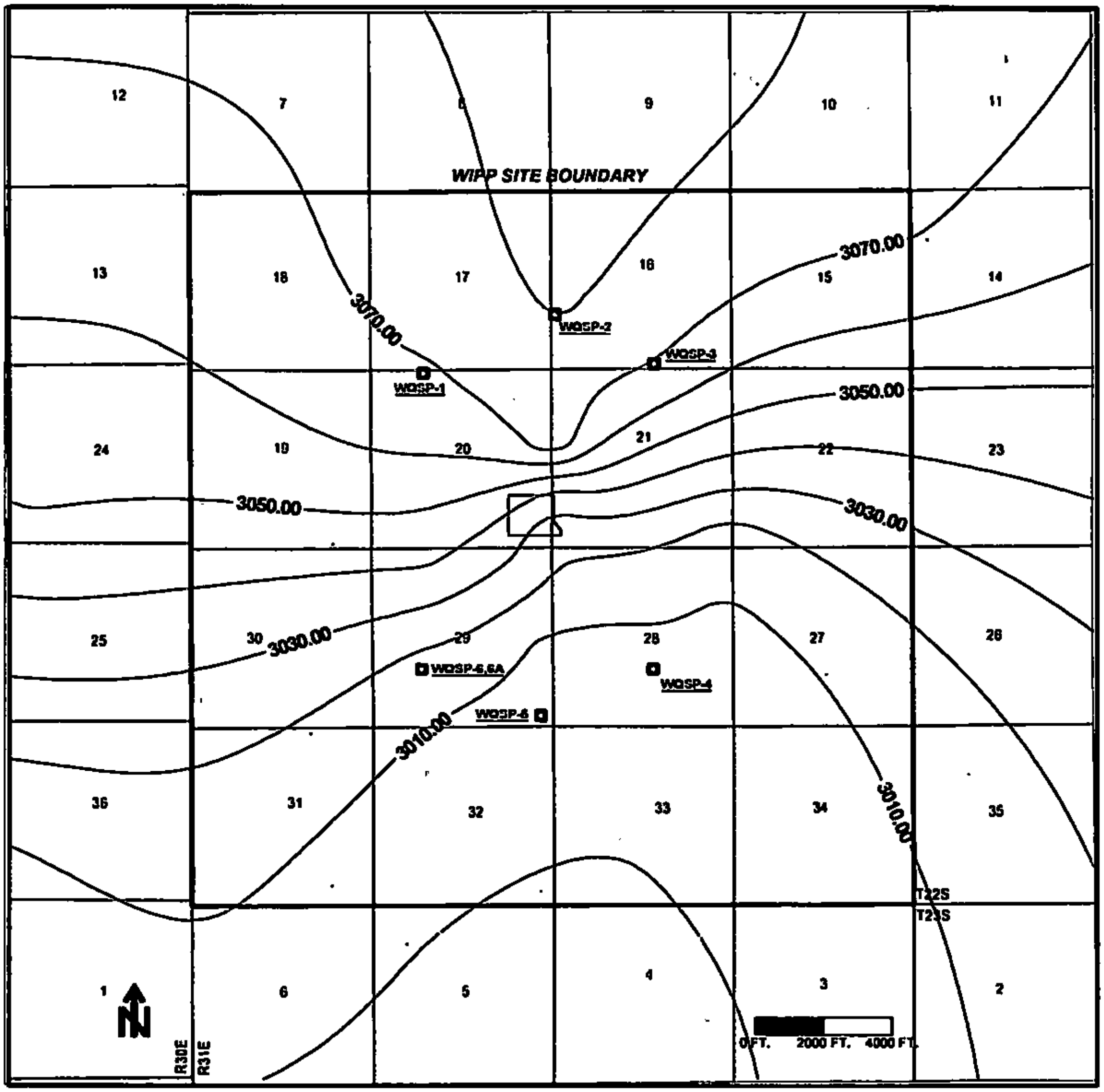

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FIGURE 5 WLMP PROGRAM WELLS

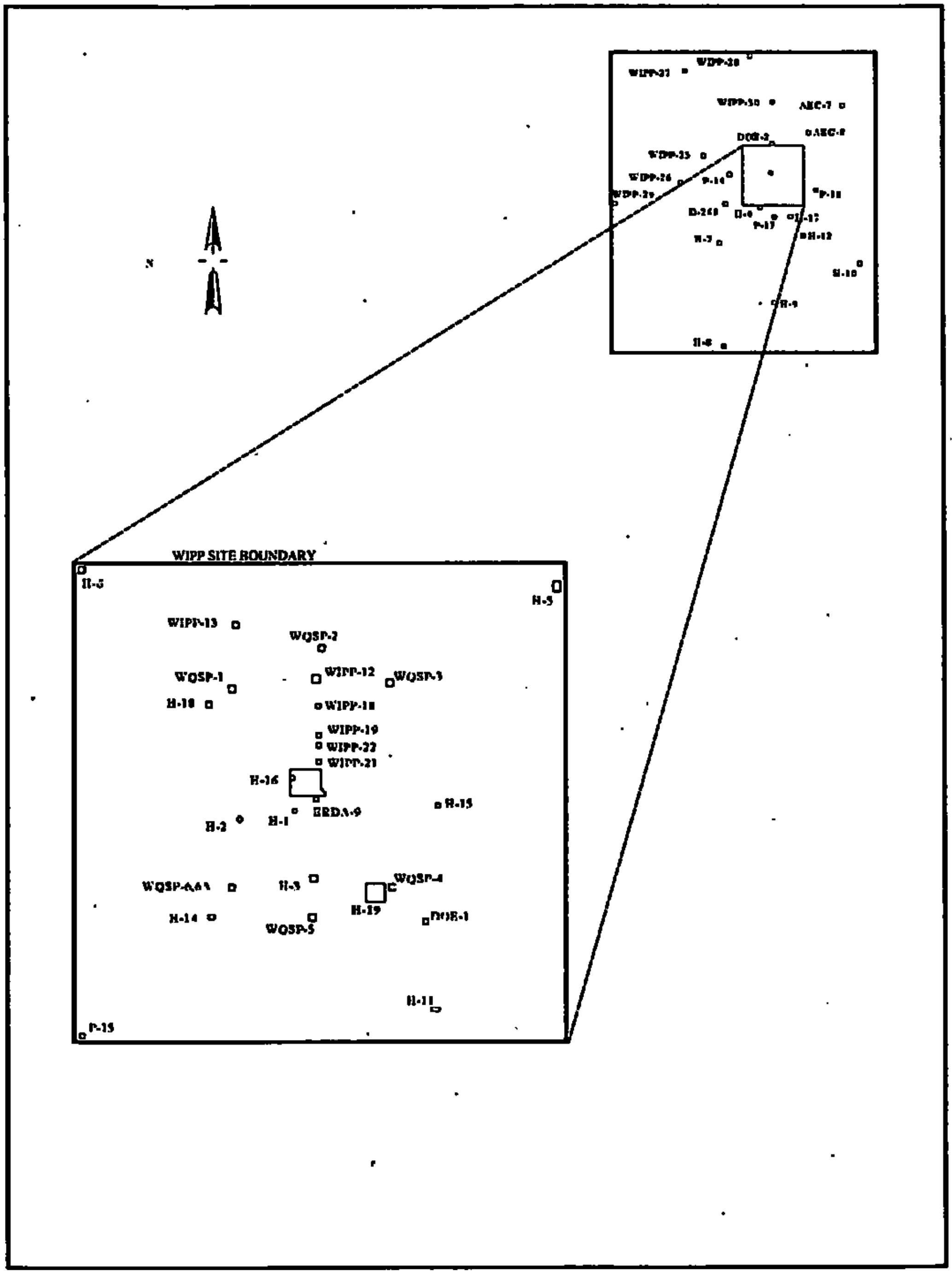
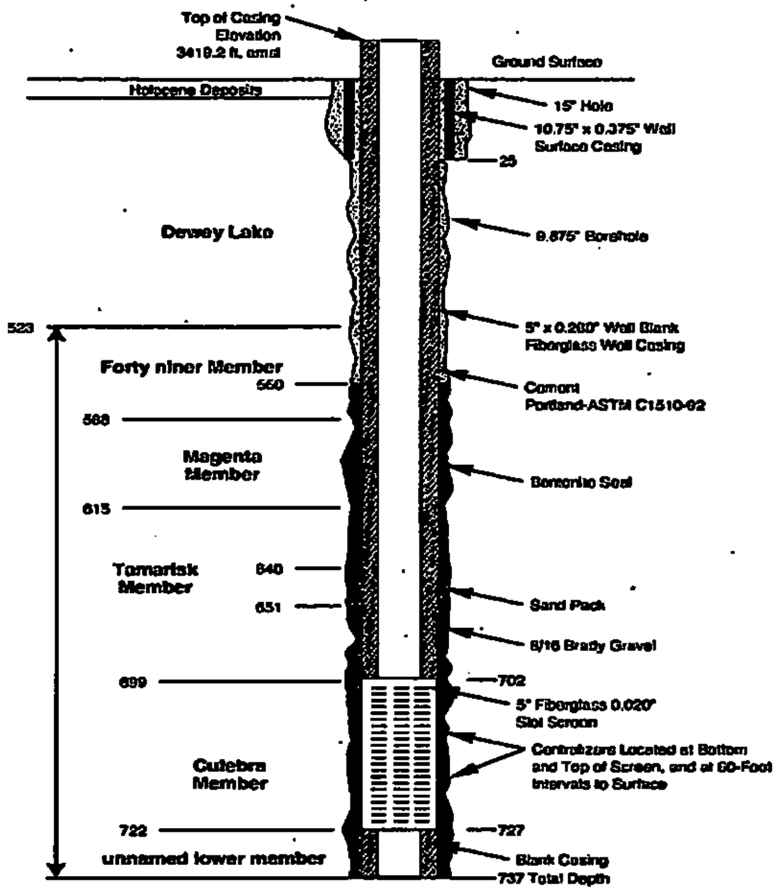
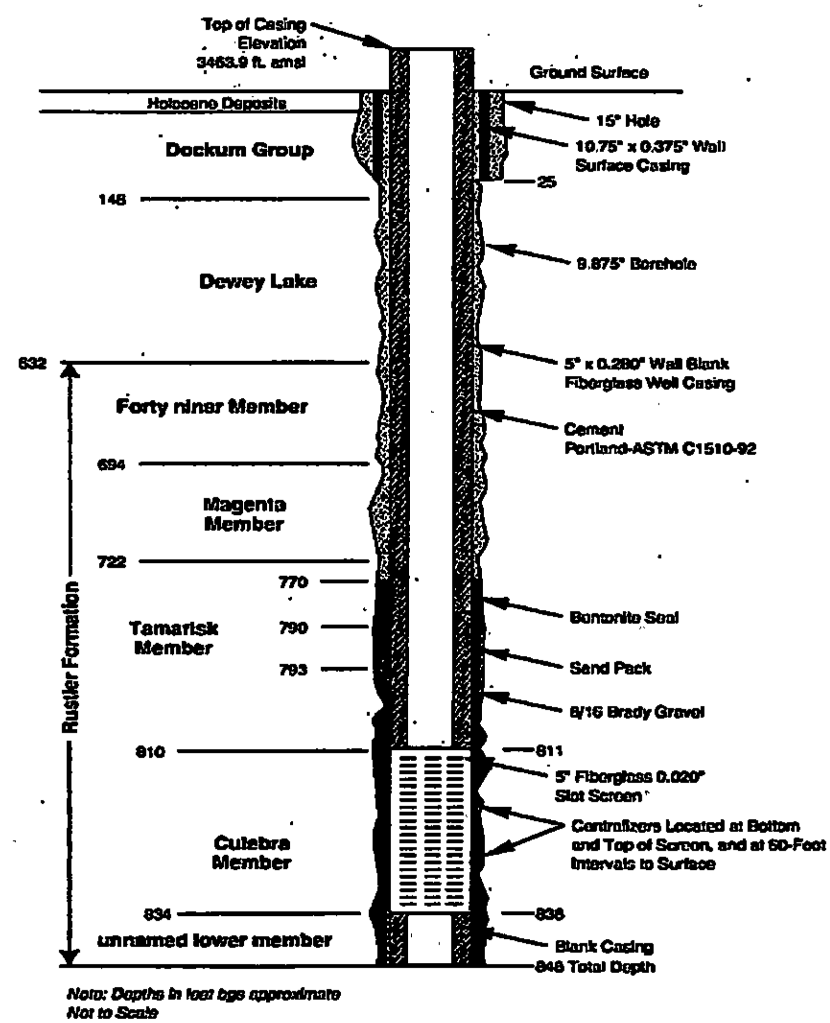


FIGURE 6 AS-BUILT CONFIGURATION OF WELL WQSP-1



Note: Depths in feet bgs approximate
Not to Scale

FIGURE 7 AS-BUILT CONFIGURATION OF WELL WQSP-2



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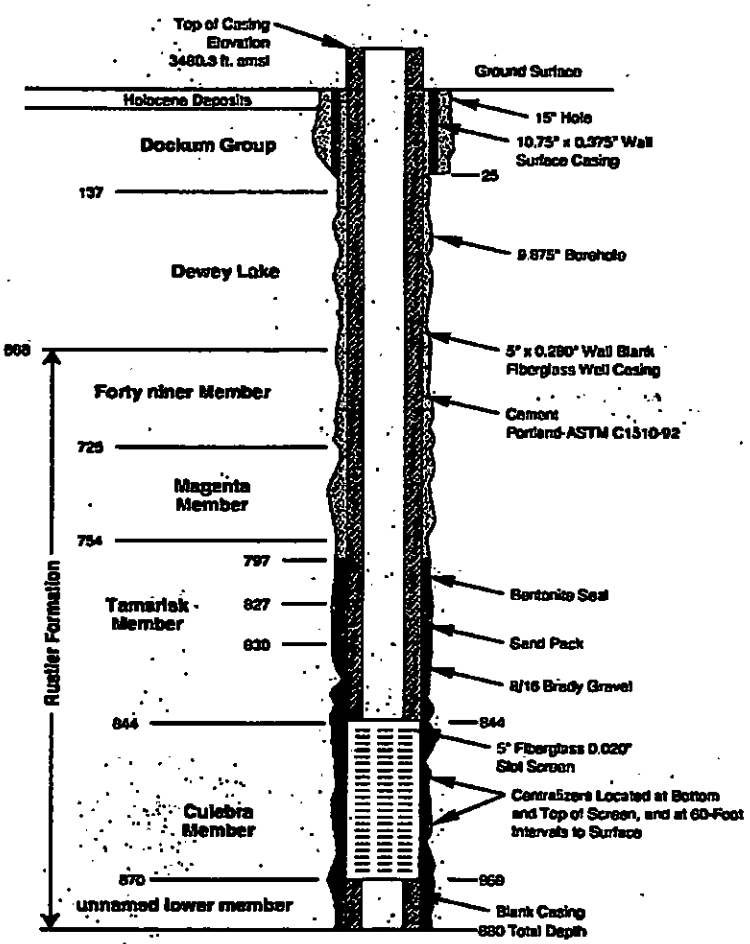
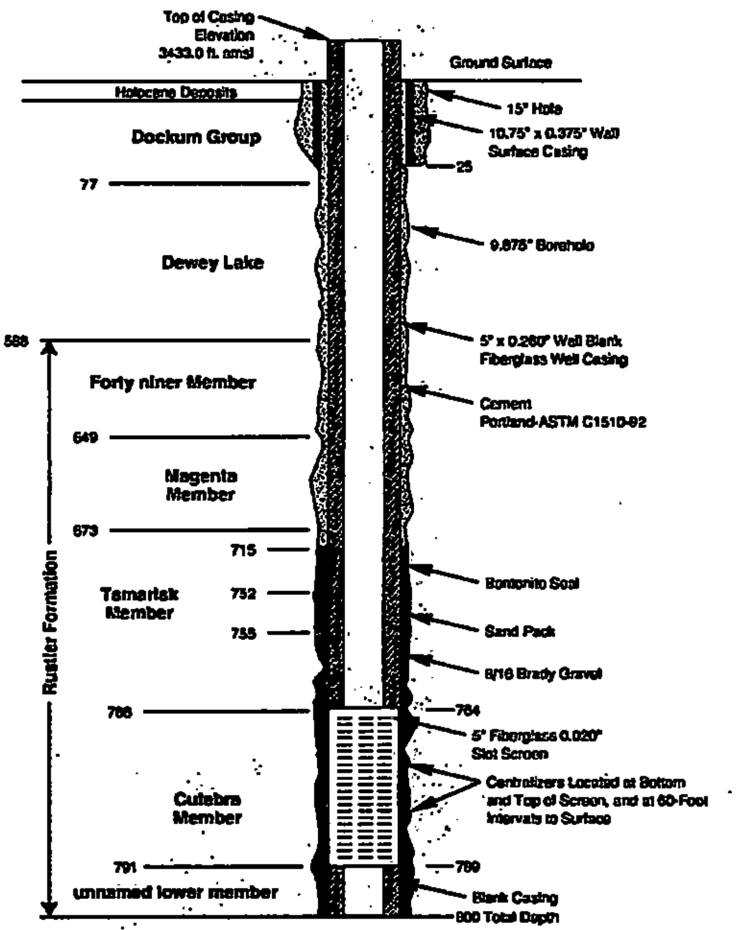
00605

FIGURE 8 AS-BUILT CONFIGURATION OF WELL WQSP-3



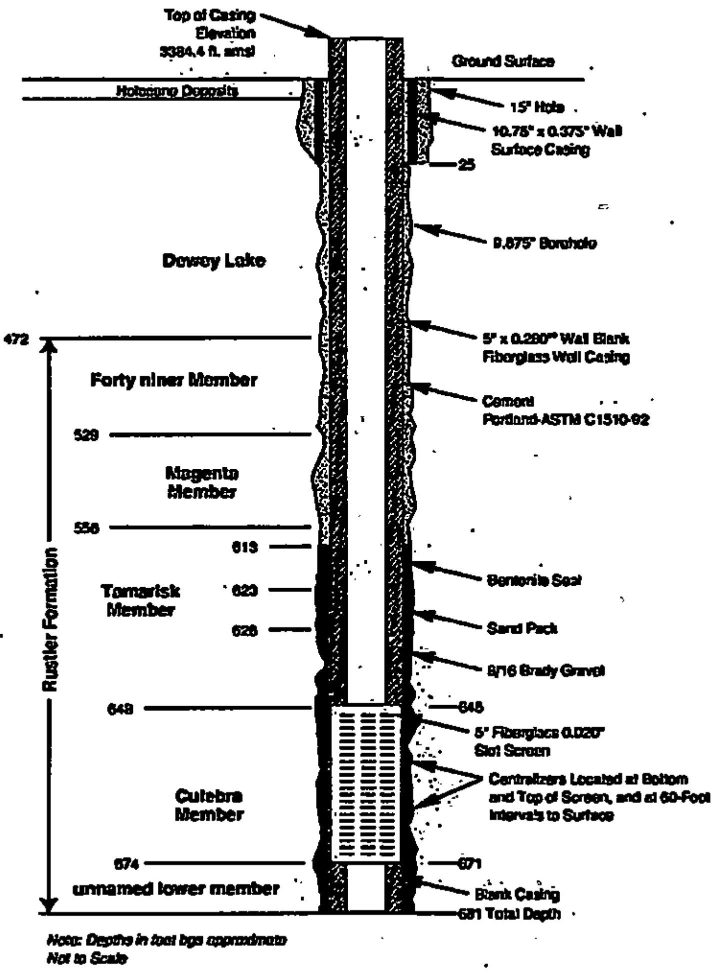
00606

FIGURE 9 AS-BUILT CONFIGURATION OF WELL WQSP-4



Note: Depths in feet bgs approximate
Not to Scale

FIGURE 10 AS-BUILT CONFIGURATION OF WELL WQSP-5



00608

FIGURE 11 AS-BUILT CONFIGURATION OF WELL WQSP-6

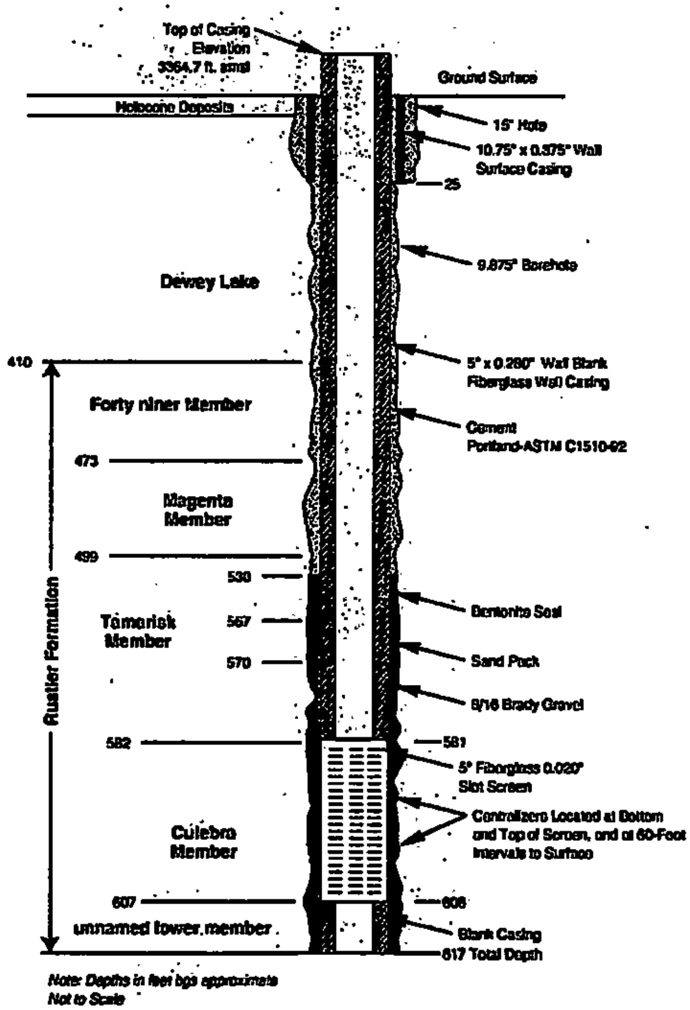
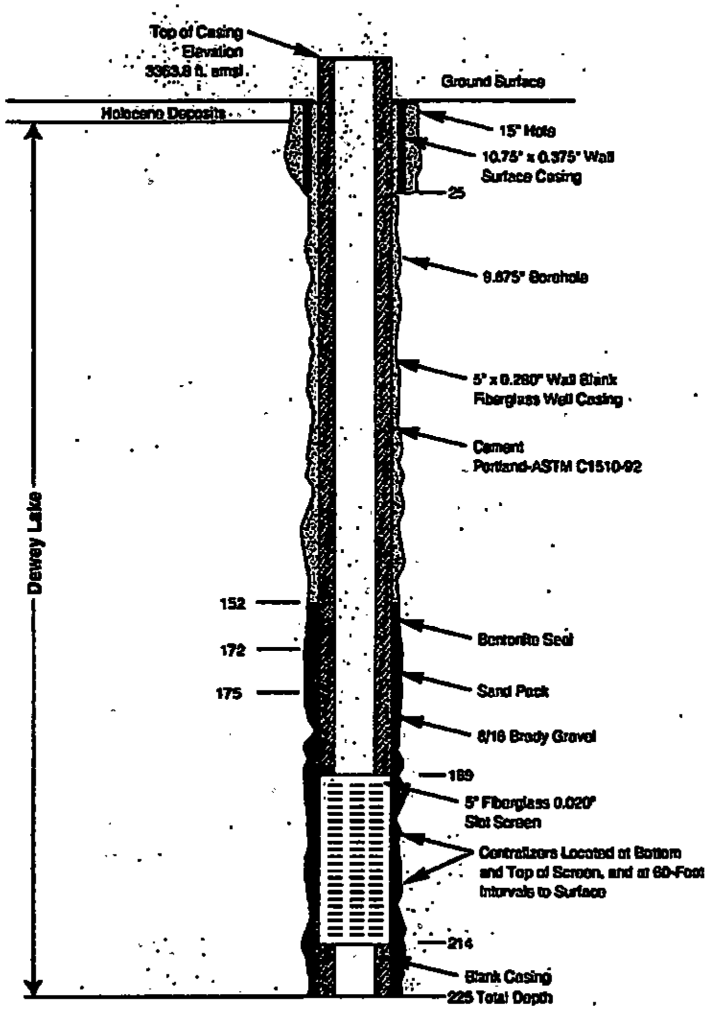


FIGURE 12 AS-BUILT CONFIGURATION OF WELL WQSP-6a



Note: Depths in feet bgs approximate
Not to Scale

GARY E. JOHNSON
GOVERNOR

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2900
Fax (505) 827-2965

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Candice Jierree
P.O. Box 2078/MS45
Carlsbad, NM 882
City, State, ZIP+4
PS Form 3800, May 2000

CERTIFIED LETTER - RETURN RECEIPT REQUIRED

~~February 11, 2002~~ ~~REMAILED: March 15, 2002~~--Remailed 3/26/02

~~George Dials, Manager~~
~~P.O. Box 3090~~
~~Carlsbad, NM 88221~~

Candice Jierree
PO Box 2078/MS45207
Carlsbad, New Mexico 88221

RE: Discharge Plan Renewal Reminder, Waste Isolation Pilot Plant, DP-831

~~Dear Mr. Dials~~: Dear Candice Jierree:

On July 3, 1997, the NM Environment Department (NMED) approved DP-831. According to our records, the discharge plan approval will expire on July 3, 2002.

An application for discharge plan renewal must be submitted to the NMED Ground Water Quality Bureau pursuant to the New Mexico Water Quality Control Commission (WQCC) Regulations 3106.F and 3109.H. The application for discharge plan renewal must include complete and updated operational, monitoring, contingency and closure plans, and any information necessary to ensure that the discharge will not result in an exceedance of WQCC ground and/or surface water quality standards. Your renewal application may be made by submitting a completed New Mexico Environment Department Ground Water Discharge Permit Application (copy enclosed). . Previously submitted materials may be included by reference provided they are current and readily available to the Ground Water Quality Bureau. Include in the application a detailed description of any changes you are planning to your operation which will affect the amount, quality or location of your discharge.

All requests for renewal must be accompanied by a filing fee of $100. An additional fee will be assessed prior to approval to cover the estimated cost to the NMED for investigation and issuance of the approval. The fee amounts for investigation and issuance are listed in Section 3114 of the WQCC Regulations.

If you are no longer discharging, please notify this office so that we may correct our records.

We look forward to your response. Processing of discharge plan renewals requires a minimum of 120 days. Timely action on your part can avoid a lapse in your permit coverage, which would be a violation of the WQCC Regulations. The person whom you may contact is Clint Marshall at 827-2900, if you have any questions.

Sincerely,

Maura Hanning
Program Manager
Ground Water Pollution Prevention Section

MH:ds

Encl: Discharge Plan Application

cc: Darwin Pattengale, District Manager, NMED District IV

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2900
Fax (505) 827-2965

GARY E. JOHNSON
GOVERNOR

PETER MAGGIORE
SECRETARY

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Total Postage & Fees	$

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George Dials, Mana
P.O. Box 3090
Carlsbad, New Mexi

PS Form 3800, May 2000

7000 1670 0009 1986 1676

CERTIFIED LETTER - RETURN RECEIPT REQUIRED

February 11, 2002

George Dials, Manager
P.O. Box 3090
Carlsbad, NM 88221

RE: Discharge Plan Renewal Reminder, Waste Isolation Pilot Plant, DP-831

Dear Mr. Dials:

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If you are no longer discharging, please notify this office so that we may correct our records.

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Sincerely,

Maura Hanning
Program Manager
Ground Water Pollution Prevention Section

MH:ds

Encl: Discharge Plan Application

cc: Darwin Pattengale, District Manager, NMED District IV

M.L.

1int - re: WIPP

TRU Solutions

Westinghouse TRU Solutions LLC

TS:01:00001

407 W. GREENE ST.
CARLSBAD, NEW MEXICO 88220
PHONE: (505) 628-1277 FAX: (505) 628-0177

January 15, 2001

Mr. Peter Maggiore
Cabinet Secretary
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

RECEIVED
JAN 22 2001
GROUND WATER BUREAU

Dear Mr. Maggiore:

This is a letter of introduction to tell you about myself and Westinghouse TRU Solutions LLC. As you are aware, the U.S. Department of Energy (DOE), Carlsbad Field Office, has awarded a five-year management and operating (M&O) contract for the Waste Isolation Pilot Plant (WIPP) to Westinghouse TRU Solutions LLC. Westinghouse Government Environmental Services, LLC (WGES) and Roy F. Weston, Inc. formed Westinghouse TRU Solutions LLC specifically for the WIPP, of which WGES serves as managing member.

As a result of this award, several key management positions have been filled by personnel selected by Westinghouse TRU Solutions LLC to carry out the mission and initiatives requested by the DOE in its request for proposal. These personnel appear on the enclosed brochure along with a synopsis of the experience they bring to WIPP. My new management team and I are excited to be coming on board and look forward to mutual success at the WIPP.

Westinghouse TRU Solutions LLC is presently performing transition at the WIPP site. This activity involves a few organizational changes, a revised budget, and familiarization with ongoing activities. Westinghouse TRU Solutions LLC will take over the WIPP contract starting February 1, 2001. Despite these changes, there will be no change with regard to the people with whom your staff routinely interfaces.

A Class 1 permit modification is being prepared to change the name on the Hazardous Waste Facility Permit from Westinghouse Government Environmental Services LLC, Waste Isolation Division, to Westinghouse TRU Solutions LLC, as co-permitee with DOE. This informational change will be submitted within seven (7) days from February 1, 2001, pursuant to the requirements of 40 CFR 270.42(a)(1) and Appendix I to section 270.42(A)(1).

When it is convenient with you, DOE will introduce me to you in person and brief you on the mission activities they have requested Westinghouse TRU Solutions LLC to begin performing in the coming year. Until then, please feel free to contact me at 505-628-1277 until January 31, 2001, or at 505-234-7400 after February 1, 2001. I look forward to meeting you and to discussing our mutual goals of responsible mixed waste management and disposal, which protects personnel and the environment.

Sincerely,

Henry F. Herrera

Henry F. Herrera
General Manager

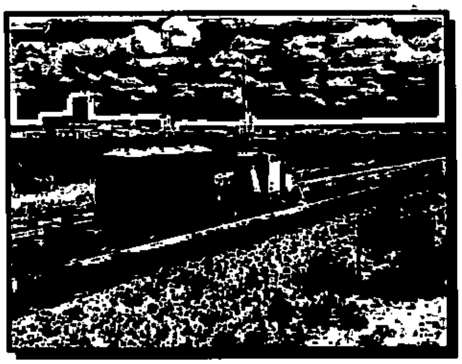
CCJ: hmp

Enclosure

cc: I. Triay, DOE/CBFO
J. Bearzi, NMED
F. Bennett, NMED
G. Blocker, NMED
D. Brinkerhoff, NMED
R. Hanson, NMED
C. Hules, NMED
M. Leavitt, NMED
C. Marshall, NMED
C. Pasteris, NMED
D. Pattengale, NMED
J. Rubio, NMED
V. Vigil, NMED
J. Volkerding, NMED
S. Zappe, NMED

TRU Solutions

Westinghouse
TRU Solutions LLC



Industry Leaders in TRU Waste Management

Fax

Name:	Clint Marshall
Organization:	NMED - Ground Water Pollution Prevention Section
Fax:	(505) 827-2965
Phone:	(505) 827-0027

From:	Jim Hollen
Organization:	Westinghouse WIPP
Date:	November 14, 2000
Fax:	(505) 234-8854
Phone:	(505) 234-8271
Subject:	DISCHARGE AUTHORIZATION
Pages:	6

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NOV 14 2000
GROUND WATER BUREAU

Comments:

Clint,

Here is some data on a waste stream we would like to discharge to the H-19 Evaporation pond. The waste water is generated in our radiochemistry lab during routine radiochemical analysis of bioassay and environmental samples.. The waste is acidic, and is neutralized and contains very low levels of radioactive constituents. The chemical and radiological components and concentrations are listed on pages 3 & 4 of 4 of the waste stream profile. The process will generate approximately 110 gallons per year. We currently have less than 150 gallons on hand. This waste stream is very similar to the one we got approval for in January of this year.

If you approve of the waste stream please sign the "NMED Authorization" block and fax it back to me. If you have any questions or need more information, please give me a call.

Thanks for your help.

Jim

Jim Hollen
Westinghouse Environmental Compliance

Working Copy

ATTACHMENT 1 Authorization to Discharge Non-hazardous Effluent into the WIPP Sewage Treatment Facility

Section 1

Date: 11/14/00

Name: Anthony Donner Signature: ______

Department/Section: Environmental Compliance

Origin of Effluent: Routine Radiochemical analysis of bioassay and environmental samples

Type of Effluent : ______
Volume (In Gallons)

Section 2 AUTHORIZATION

☑ 1. Effluent characterization is required.
(Attach sampling results to the discharge request and return to EC&S for submittal to New Mexico Environment Department [NMED] for discharge authorization signature.)

New Mexico Environment Department Groundwater Bureau
NOTE: NMED Authorization must be obtained if Box #1 was checked.

NMED Authorization: ______
Signature Date

☐ 2. Effluent has been characterized and the generation process has NOT changed.
(Attach analytical results to the discharge request and submit to Environmental Compliance and Support [EC&S] for signature.)

EC&S Authorization: ______
Signature Date

Section 3 ENVIRONMENTAL MONITORING (EM) AUTHORIZATION

NOTE: Non-hazardous effluent into the WIPP Sewage Lagoon or H-19 Evaporative Pond must be disposed of on the date indicated.

EM Authorization: ______
Signature Date

Restriction of Discharge: Discharge to H-19 Evap. Pond

Waste Profile Sheet

Sales Representative

Exhibit "B"

Profile Number

Mailing Address:
1710 W. Broadway
Andrews, TX 79714

WCS

Waste Control Specialists L.L.C.

FedEx/UPS Address:
9998 W Hwy 176
Eunice, NM 88231

WCS EPA ID # TXD988088464
WCS State ID # 50358

Corporate Office/Sales: Phone # (888) 492-7552
Fax # (281) 260-0141

Site: Phone # (888) 789-2783
Fax # (505) 394-3427

List any unacceptable treatment types:

Section 1: Generator Information

Company Name: Westinghouse Electric Corporation for the USDOE
US EPA ID #: NM4980139088
Address: P.O. Box 2078, 26 miles SE of Carlsbad
State ID #:
City, State, Zip: Carlsbad, NM 88221
Contact Name: Anthony Donner
Phone #: (505) 234-8972
Title: Associate Scientist
Fax #: (505) 234-8854
24 Hour

Certificate of Disposal ☒ Yes ☐ No Technical Contact: Anthony Donner

Status: ☐ Industrial ☒ Non-Industrial ☐ CESQG ☐ Municipal ☐ Oilfield ☐ Oilfield Non-Exempt

Section 2: Billing Information (Same as above)

Company Name: Westinghouse Electric Corporation
Contact:
Address: P.O. Box 2078, 26 miles SE of Carlsbad
Phone #:
City, State, Zip: Carlsbad, NM 88221
Fax #:

Section 3: General Description of the Waste

Waste Name: LBL01 – Low Level Liquid

Detailed Description of Process Generating Waste: Routine radiochemical analysis of bioassay and Environmental samples.

Physical State at Room Temperature: 99 % Liquid 1 % Solid ___ % Sludge ___ % Debris

Number of distinct layers/phases: ☒ 1 ☐ 2 ☐ ___ Color (s): none

For LIQUIDS only:

Turbidity: ☒ Transparent (clear) ☐ Translucent (cloudy) ☐ Opaque ☐ Other:

Viscosity: ☒ Light (water-like) ☐ Medium (syrup-like) ☐ Heavy (warm tar-like)

Analytical data provided by the Generator (attached):

☒ Volatiles ☐ Semi-Volatiles ☐ PCB's ☒ Metals ☒ Other: Radiochemistry

Container Type and Size: 55 gallon drum, lined Frequency: 2 per Year

Total Waste Quantity or Rate of Generation: Total quantity = 2.5 drums

Revised 7/22/99

Section 4: Regulatory Information

Profile

Is this waste TSCA regulated? ☐ Yes ☒ No ☐ Wastewater ☒ Non-wastewater

Proper US DOT Shipping Name ______

Class ____ UN/NA ______ PG ______ RQ ______ Poison Inhalation Hazard? ☐ Y X N

TX Waste Code # ______

Waste Classification: ☐ Hazardous ☒ Non-Hazardous (Skip to Section 5)

List all applicable EPA Waste Code numbers ______

Is this waste a debris, subject to the alternate treatment standards listed in 40 CFR 268.45? ☐ Y ☒ N

Will this waste be treated to achieve a treatment standard before it is received at WCS? ☐ Y ☒ N

If yes, please explain ______

Is this waste subject to the national emissions standards for benzene waste operations as per 40 CFR 61.330? ☐ Y ☒ N

List all Underlying Hazardous Constituents* (☒ Check if not applicable) ______

*For characteristic Wastes, it must be determined if underlying hazardous constituents are present.

TCLP CERTIFICATION (mg/L, TCLP) (☒ Check if not applicable)

CODE	COMPONENT	REGULATORY LIMIT	Check If ≥ Limit	CODE	COMPONENT	REGULATORY LIMIT	Check If ≥ Limit
D004	arsenic	5.0	☐	D024	*m-cresol	200.0	☐
D005	barium	100.0	☐	D025	*p-cresol	200.0	☐
D006	cadmium (except NiCads)	1.0	☐	D026	*mixed cresols	200.0	☐
D007	chromium	5.0	☐	D027	*p-dichlorobenzene	7.5	☐
D008	lead (except lead batteries)	5.0	☐	D028	*1,2-dichloroethane	0.5	☐
D009	mercury (for low merc)	0.2	☐	D029	*1,1-dichloroethylene	0.7	☐
D010	selenium	1.0	☐	D030	*2,4-dinitrotoluene	0.13	☐
D011	silver	5.0	☐	D031	*heptachlor and epoxides	0.008	☐
D012	*endrin	0.02	☐	D032	*hexachlorobenzene	0.13	☐
D013	*lindane	0.4	☐	D033	*hexachlorobutadiene	0.5	☐
D014	*methoxychlor	10.0	☐	D034	*hexachloroethane	3.0	☐
D015	*toxaphene	0.5	☐	D035	*methyl ethyl ketone	200.0	☐
D016	*2,4-D	10.0	☐	D036	*nitrobenzene	2.0	☐
D017	*silvex (2,4,5-TP)	1.0	☐	D037	*pentachlorophenol	100.0	☐
D018	*benzene	0.5	☐	D038	*pyridine	5.0	☐
D019	*carbon tetrachloride	0.5	☐	D039	*tetrachloroethylene	0.7	☐
D020	*chlordane	0.03	☐	D040	*trichloroethylene	0.5	☐
D021	*chlorobenzene	100.0	☐	D041	*2,4,5-trichlorophenol	400.0	☐
D022	*chloroform	6.0	☐	D042	*2,4,6-trichlorophenol	2.0	☐
D023	*o-cresol	200.0	☐	D043	*vinyl chloride	0.2	☐

Section 5: Physical and Chemical Data

Profile

COMPONENTS TABLE The whole waste consists of the following materials (total=100%)	Concentration Ranges are acceptable	Units (%, ppm)
Water	75-80	%
Nitric Acid	10	%
Hydrochloric Acid	4 – 6	%
Sodium Hydroxide	4 – 6	%
Ammonium Hydroxide	4 – 6	%
Potassium Carbonate	1	%
Acetic Acid	.1	%

Boiling Point 212 degrees F Asbestos % 0 Fuel value, BTU/lbs 0

Flash Point none degrees F pH 7.0 Density 1.0 Unit mg/cc

Describe the odor Ammonia

Reactive Sulfide Concentration 500 Mg/Kg Reactive Cyanide Concentration 250 Mg/Kg

Oxidizer as per 49 CFR	☐	Liquid Organic Peroxide	☐
*VOC's	☐	Infectious or Etiological	☐
Pyrophoric	☐	Putrescible	☐
Radioactive	☒	Autopolymerizable	☐
Explosive	☐	None of the above	☐

*Please include specific VOC's, if any, in the components table above.

Section 6: Radioactive Characteristics ☐ Mixed* ☒ Radioactive

(If neither Mixed nor Radioactive, go to Section 7)

*Basis for identifying as Mixed Waste (circle): (1) Ignitable (2) Reactive (3) Corrosive (4) EP Toxicity or TCLP (5) Listed Waste

Chemical Form

Is material waste (check one): ☒ Yes ☐ No	Is material exempt (check one): ☒ Yes ☐ No (WAC section 3.2.1)
If Waste-What is Waste Class (check one): ☒ A ☐ B ☐ C or ☐ >C (see Title 10 CFR 61.55 and TRCR 21, Appendix E)	
Is material NORM (check one): ☐ Yes ☒ No	Does Material contain technologically enhanced Radium (check one): ☐ Yes ☒ No
Is material Source Material (check one): ☐ Yes ☒ No	If yes, Radon emanation rate is: ___ $pCi/m^2/sec$

Grams of Special Nuclear Material (Total for Profile): Pu N/T U-233 N/T U-235 N/T

Highest Dose Rate in mR/hr: On Contact 0.0 At 1 ft. 0.0

Is the material overpacked? ☐ Yes ☒ No

Describe the packaging: 55 gallon drums

Revised 7/22/99

00622

L. ~~

Section 6: Radioactive Characteristics Continued

Profile Number

Radioactive Constituents:

(List all radionuclides present in the waste, the concentrationin pCi/gm and the total activity in milli Curies.)
[Attach additional sheets if necessary- please list the information below in table format]

Nuclide	Concentration Range (pCi/gm)			Total Activity (mCi)
	Min	Max	Avg	
U-232	.0000	.005	.0001	2.0E-8
U-234	.0000	.005	.000762	3.16E-7
U-235	.0000	.002	.000078	3.2E-8
U-238	.0000	.005	.00087	3.6E-7
Pu-239	.0000	.005	.000023	8.0E-9
Pu-242	.0000	.005	.00001	4.0E-9
Am-241	.0000	.005	.000172	7.0E-8
Am-243	.0000	.005	.0002442	1.0E-8

Section 7: Safety Related Data

If the handling of this waste requires the use of special protective equipment, please explain

Section 8: Attached Supporting Documents (Analytical should be noted in Section 3)

Please list all documents, notes, or other data that are being attached to this form as part of the waste approval Package.

Section 9: Generator's Certification

The information contained herein is based on X generator knowledge and/or X analytical data. I hereby certify that the above and attached description is complete and accurate to the best of my knowledge and ability to determine that no deliberate or willful omissions of composition properties exist and that all known or suspected hazards have been disclosed. I certify that the materials tested are representative of all materials described by this document.

Authorized Signature Anthony D Donner Date 10/16/00

Title: Associate Scientist Printed Name: Anthony Donner

Department of Energy
Carlsbad Area Office
P. O. Box 3090
Carlsbad, New Mexico 88221
September 5, 2000

RECEIVED
SEP 11 2000
GROUND WATER BUREAU

Mr. Clint Marshall
Ground Water Pollution Prevention Section
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: Discharge of Non-hazardous Brines under Discharge Plan DP-831

Dear Mr. Marshall:

The purpose of this letter is to confirm our discussion of August 25, 2000. During this discussion DOE informed the NMED of its intent to discharge non-hazardous brine collected from the surface ventilation ductwork of the exhaust shaft into the H-19 evaporation basin under WIPP's Discharge Plan DP-831.

This water consists of brine that seeps into the exhaust shaft and then follows one of two pathways. The brine either falls to the base of the exhaust shaft where it is collected in a catch basin or it becomes entrained in the exhaust shaft's air stream and collects in the exhaust fan ductwork.

The brine has been sampled and analyzed for total metals, and the analytical data demonstrate that the brines collected in the exhaust fan ductwork are consistently non-hazardous (Please see the attached data). Because these waters are non-hazardous brine, their discharge into the H-19 Evaporation Pond is allowed by WIPP's existing Discharge Plan. No change is required to the permitted volume of the H-19 Evaporation Pond.

In addition to the brine that collects in the exhaust shaft ductwork, WIPP intends to dispose of other non-hazardous brines that meet the Discharge Plan requirements. This includes the non-hazardous brine that falls into the catch basin at the bottom of the exhaust shaft. Since this brine has exceeded hazardous constituent limits in the past, it will be sampled each time it is removed from the catch basin to assure that it is non-hazardous. The volumes discharged to H-19 will be reported in the quarterly discharge monitoring report. The analytical data and the brine volumes generated will be maintained at the WIPP site.

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If you have any questions regarding this request or require any additional information, please feel free to contact me at (505) 234-7462, or Cynthia Zvonar, CAO Environmental Compliance Manager at (505) 234-7495.

Sincerely,

Mr. Jody Plum
Acting Assistant Manager
Office of Regulatory Compliance

Enclosures

cc: Steve Zappe, NMED

CAO:OR&C:HP:KJB: 00-1030 UFC5400

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SEP 11 2000

GROUND WATER BUREAU

1998 EXHAUST DUCTWORK CONDENSATE/FLYWATER

Sample ID	Sample Date	Location	Analyte	Value	Units	Qualifier
WST98246	08/13/98	Ductwork Condensate	Arsenic	0.01	mg/L	U
WST98246	08/13/98	Ductwork Condensate	Barium	3.97	mg/L	B
WST98246	08/13/98	Ductwork Condensate	Cadmium	0.09	mg/L	B
WST98246	08/13/98	Ductwork Condensate	Chromium	2.20E-03	mg/L	U
WST98246	08/13/98	Ductwork Condensate	Lead	0.81	mg/L	B
WST98246	08/13/98	Ductwork Condensate	Mercury	2.00E-03	mg/L	UN
WST98246	08/13/98	Ductwork Condensate	Selenium	0.28	mg/L	B
WST98246	08/13/98	Ductwork Condensate	Silver	4.40E-03	mg/L	UN
WST98247	08/13/98	Ductwork Condensate	Arsenic	0.01	mg/L	U
WST98247	08/13/98	Ductwork Condensate	Barium	3.83	mg/L	B
WST98247	08/13/98	Ductwork Condensate	Cadmium	0.01	mg/L	U
WST98247	08/13/98	Ductwork Condensate	Chromium	2.20E-03	mg/L	U
WST98247	08/13/98	Ductwork Condensate	Lead	0.55	mg/L	B
WST98247	08/13/98	Ductwork Condensate	Mercury	2.00E-03	mg/L	UN
WST98247	08/13/98	Ductwork Condensate	Selenium	0.28	mg/L	B
WST98247	08/13/98	Ductwork Condensate	Silver	4.40E-03	mg/L	UN
WST98248	08/21/98	Ductwork Condensate	Arsenic	0.01	mg/L	U
WST98248	08/21/98	Ductwork Condensate	Barium	1.68	mg/L	BN
WST98248	08/21/98	Ductwork Condensate	Cadmium	0.04	mg/L	BN
WST98248	08/21/98	Ductwork Condensate	Chromium	2.20E-03	mg/L	UN
WST98248	08/21/98	Ductwork Condensate	Lead	0.63	mg/L	BN
WST98248	08/21/98	Ductwork Condensate	Mercury	2.00E-03	mg/L	U
WST98248	08/21/98	Ductwork Condensate	Selenium	0.23	mg/L	B
WST98248	08/21/98	Ductwork Condensate	Silver	0.03	mg/L	B
WST98249	08/21/98	Ductwork Condensate	Arsenic	0.01	mg/L	U
WST98249	08/21/98	Ductwork Condensate	Barium	1.61	mg/L	BN
WST98249	08/21/98	Ductwork Condensate	Cadmium	0.02	mg/L	UN
WST98249	08/21/98	Ductwork Condensate	Chromium	2.20E-03	mg/L	UN
WST98249	08/21/98	Ductwork Condensate	Lead	0.6	mg/L	BN
WST98249	08/21/98	Ductwork Condensate	Mercury	2.00E-03	mg/L	U
WST98249	08/21/98	Ductwork Condensate	Selenium	0.23	mg/L	B
WST98249	08/21/98	Ductwork Condensate	Silver	4.40E-03	mg/L	U

1999 EXHAUST DUCTWORK CONDENSATE/FLYWATER

Sample ID	Sample Date	Location	Analyte	Value	Units	Qualifier
WST99101	06/24/99	Ductwork Condensate	Arsenic	0.58	mg/L	
WST99101	06/24/99	Ductwork Condensate	Barium	1.00	mg/L	U
WST99101	06/24/99	Ductwork Condensate	Cadmium	0.01	mg/L	U
WST99101	06/24/99	Ductwork Condensate	Chromium	0.05	mg/L	U
WST99101	06/24/99	Ductwork Condensate	Lead	0.53	mg/L	
WST99101	06/24/99	Ductwork Condensate	Mercury	0.01	mg/L	U
WST99101	06/24/99	Ductwork Condensate	Selenium	0.05	mg/L	U
WST99101	06/24/99	Ductwork Condensate	Silver	0.05	mg/L	U

QUALIFIERS:

B - The reported value was obtained from a reading that was less than the Required Detection Limit (RDL) but greater than or equal to the actual Detection Limit (DL).

U – The analyte was not detected. The value reported is the DL corrected for any dilution in the sample preparation process and for the percent solids if the sample is a solid.

N – Spiked sample recovery is not within control limits.

1999 EXHAUST DUCTWORK CONDENSATE/FLYWATER

Volume Generated and Disposal Cost

DATE GENERATED	VOLUME GENERATED	# 55 GAL. DRUMS	DISPOSAL COST @ $225/DRUM
01/07/99	55	1	$225
03/01/99	55	1	$225
03/22/99	55	1	$225
03/29/99	55	1	$225
04/14/99	110	2	$450
05/03/99	165	3	$675
05/18/99	55	1	$225
05/24/99	220	4	$900
06/03/99	220	4	$900
06/10/99	55	1	$225
06/21/99	220	4	$900
06/22/99	275	5	$1,125
06/23/99	440	8	$1,800
07/07/99	165	3	$675
07/08/99	55	1	$225
07/19/99	110	2	$450
07/29/99	110	2	$450
08/10/99	110	2	$450
08/16/99	55	1	$225
08/30/99	165	3	$675
09/09/99	165	3	$675
09/13/99	110	2	$450
09/21/99	110	2	$450
10/06/99	55	1	$225
10/19/99	55	1	$225
11/08/99	55	1	$225
11/15/99	110	2	$450
12/08/99	55	1	$225
1999 TOTAL VOLUME (gallons)	3,465		
1999 TOTAL 55-gal. DRUMS		63	
1999 DISPOSAL COST			$14,175

1998 EXHAUST DUCTWORK CONDENSATE/FLYWATER

Volume Generated and Disposal Cost

DATE GENERATED	VOLUME GENERATED	# 55 GAL. DRUMS	DISPOSAL COST @ $225/DRUM
1998	55	1	$225
1998	55	1	$225
07/07/98	110	2	$450
07/31/98	110	2	$450
08/18/98	110	2	$450
08/21/98	110	2	$450
08/26/98	110	2	$450
08/28/98	55	1	$225
09/01/98	110	2	$450
1998	55	1	$225
1998	55	1	$225
1998	55	1	$225
1998 TOTAL VOLUME (gallons)	990		
1998 TOTAL 55-gal. DRUMS		18	
1998 DISPOSAL COST			$4,050

FIELD TRIP REPORT
GROUND WATER POLLUTION PREVENTION SECTION

Date: 2/3/2000 Inspector(s): Clint Marshall

FACILITY

Facility Name: Waste Isolation Pilot Plant (WIPP) Contact: Jim Holland
Location:
Discharge Plan Number: DP-831 UIC Related? (Yes/No): No
Type of Operation: Nuclear Waste Depository

INSPECTION SUMMARY

Purpose:

___ a. Evaluation of Proposed Discharge Plan
✓ b. Compliance Inspection (Complete Checklist on Reverse Side)
___ c. Other (specify):

ACTIVITIES

a. Inspection of Facilities or Construction (specify): Sewage disposal ponds, H-19 evaporation pond, laboratory

Flow Measurement: Type: Flow meters Condition: New - just installed

b. Effluent Sample(s) (provide sampling location): None taken

No. of Ponds: 8 No. in Use: 8 Condition of Ponds: good
Condition of Pond Liner (s): Synthetic - good

c. Ground Water Sample(s) (provide well name and location): No monitoring required.

No. of Monitoring Wells: -0- Well Condition:

d. Other (specify):

OBSERVATIONS AND INFORMATION OBTAINED

Sewage ponds (1A, 1B, 2A, 2B) and evaporation ponds 1, 2, 3 and H-19 evaporation pond all in excellent condition. New flow meter just installed. H-19 pond has been recieving most of brine from the site as well as compressor + air conditioner condensate.

ACTION REQUIRED

WATER QUALITY INSPECTION & SAMPLING CHECKLIST
Reference: Regulation No. HED 86-14 (EID)

ENTRY CONFERENCE:

_____ Was facility representative informed of EID's right of entry and authority: (To access records, inspect monitoring equipment or methods and sample effluents under Section 74-6-9.E of the New Mexico Water Quality Act (NMSA 1978)?

_____ Was EID identification presented?

_____ Were potential or suspected violations which prompted inspection listed?

_____ During the inspection, was the facility representative immediately advised or addition potential violations?

EXIT CONFERENCE

_____ Were the preliminary inspection results summarized?

_____ Was the facility representative advised if violations discussed during the entry conference remain under investigation?

_____ Were other potential violations discovered during the inspection discussed?

_____ Was a date provided as to when EID expects to complete consideration of potential violations.

WATER QUALITY SAMPLING

_____ Was the facility representative offered a reasonable opportunity to obtain split/replicate samples, perform simultaneous tests, measurements or photographs?

_____ Were copies of EID's results (sampling, testing, photos) requested? If yes, copies must be provided within ten working days after such results are in EID's possession.

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

PETER MAGGIORE
SECRETARY

PAUL RITZMA
DEPUTY SECRETARY

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Z-434-831 600

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to K.S. Donovan, Manager	
Street & Number Waste Isolation Pilot Plant	
Post Office, State, & ZIP Code Carlsbad, New Mexico 88221	
Postage	$

January 24, 2000

K. S. Donovan, Manager
Waste Isolation Pilot Plant
P.O. Box 2078
Carlsbad, New Mexico 88221

RE: Discharge Plan Amendment, DP-831, Waste Isolation Pilot Plant

Dear Mr. Donovan:

Pursuant to Water Quality Control Commission (WQCC) Reg. 3109, the application for amendment for DP-831, submitted by K. S. Donovan for the discharge of 100 gallons per year of buffered acidic solution to the approved treatment and disposal system of Waste Isolation Pilot Plant (WIPP) is hereby approved, subject to the condition listed below. The discharge plan was renewed and modified on July 3, 1997. The facility is located approximately 26 miles east of Carlsbad in Sections 28 and 29, T22S, R31E, Eddy County. In approving this discharge plan amendment, the New Mexico Environment Department (NMED) has determined that the requirements of WQCC Reg. 3109.C have been met.

The approved amendment to the treatment and disposal system of the WIPP is briefly described as follows:

The WIPP will generate a waste stream of 20.8 gallons of acid per year as a result of conditioning virgin resins used in laboratory separation columns. The acid waste stream consists of 75% hydrochloric acid and 25% nitric acid. The acid will be neutralized to a pH between 6 and 8 prior to discharge resulting in a final annual volume of 100 gallons. The neutralized acid will be discharged to the synthetically lined domestic wastewater lagoons resulting in an addition of 5.4 lbs. of nitrogen annually.

However, approval of this amendment to your discharge plan does not relieve you of your responsibility to comply with any other conditions or requirements of the approved discharge plan, DP-831, or any other applicable federal, state, and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

SPECIFIC REQUIREMENTS

This discharge plan amendment contains specific requirements which are summarized in the discharge plan renewal and modification dated July 3, 1997 and the specific requirement listed below.

1. WIPP will verify and record the volume and pH of each batch of neutralized acid prior to release in the wastewater lagoons. The volume and pH of each release will be submitted to NMED in the quarterly monitoring reports.

OTHER REQUIREMENTS

Please be advised that approval of this discharge plan amendment does not relieve the U.S. Department of Energy of liability should your operation result in actual pollution of surface or ground water which may be actionable under other laws and/or regulations.

PERIOD OF APPROVAL

This amendment approval expires on July 3, 2002, the same date as the original plan, and you should submit an application for renewal at least 120 days before that date.

If you have any questions, please contact Clint Marshall of the Ground Water Pollution Prevention Section staff at 827-0027.

Sincerely,

Marcy Leavitt, Chief
Ground Water Quality Bureau

ML:CLM/clm

cc: Pat Pattengale, District Manager, NMED District 4
James Smith, NMED Carlsbad Field Office
Paul Saavedra, Office of the State Engineer

Westinghouse

Government Services Group

WASTE ISOLATION DIVISION

P.O. BOX 2078
CARLSBAD, NEW MEXICO 88221
PHONE: (505) 234-7200 FAX: (505) 234-7083

RECEIVED
DEC 07 1999
GROUND WATER BUREAU

DA:99:02387
UFC:5487.00

December 7, 1999

Mr. Clint Marshall
Ground Water Pollution Prevention Section
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: PERMIT AMENDMENT/MODIFICATION REQUEST FOR DP-831

Dear Mr. Marshall:

With this letter the Waste Isolation Pilot Plant (WIPP) requests an amendment/modification to the applicable sections of Discharge Plan DP-831 for a minor waste stream to be discharged to the site sewage facility.

The waste stream is generated as a result of the use of nitric and hydrochloric acids to condition virgin resins used in laboratory separation columns. The quantities of acids are 50 mL of 8N nitric acid and 150 mL of 9N hydrochloric acid per column. The resin columns are conditioned in batches of twelve. Using 200 mL of acids per column, times twelve columns, and an estimated 36 batches per year, the process will generate approximately 86.4 liters, or 20.8 gallons of waste acid per year.

After in-container neutralization to a pH between 6 and 8 the estimated waste stream volume will be 100 gallons per year. Prior to discharge the laboratory personnel verify and record the volume and pH. These values will be reported in the quarterly discharge monitoring report.

Approximately 2,420 grams, or 5.4 pounds, of total nitrogen from the nitric acid will be discharged to the sewage system annually. With the annual permitted flow to the sewage system being over 8 million gallons the additional nitrogen will have no adverse effect.

If you have any questions about this request or require any additional information, please contact Mr. Dan Robertson at (505) 234-8459, or Mr. Jim Hollen at (505) 234-8271.

Sincerely,

for

K. S. Donovan, Manager
Environment, Safety, and Health

JRH:ccg

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

June 12, 1998

Z 128 813 337
US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail *(See reverse)*

Sent to George Dials	
Street & Number U.S. Department of Energy Waste Isolation Pilot Plant	
Post Office, State, & ZIP Code P.O. Box 3090 Carlsbad, NM 88221-3090	
Postage	$

George Dials, Manager
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Discharge Plan Amendment Approval, DP-831, Waste Isolation Pilot Plant (WIPP)

Dear Mr. Dials:

Pursuant to Water Quality Control Commission (WQCC) Reg. 3109, the May 1, 1998 application for amendment for DP-831, submitted by K.S. Donovan for changes in the monitoring plan for the approved treatment and disposal system of the WIPP is hereby approved, subject to the condition listed below. The discharge plan was renewed on July 3, 1997. The facility is located approximately 26 miles east of Carlsbad in Sections 28 and 29, T22S, R31E, Eddy County. In approving this discharge plan amendment, the New Mexico Environment Department (NMED) has determined that the requirements of WQCC Reg. 3109.C have been met.

The approved amendment to the treatment and disposal system of WIPP is briefly described as follows:

Monitoring for Radium 226 and 228 will be replaced with monitoring for Plutonium 238, 239/240, Americium 241, Uranium 234, 235, and 238, and Strontium 90 for the east evaporation pond (Pond A), the north evaporation pond (Pond B), the south evaporation pond (Pond C), and the H-19 evaporation pond.

However, approval of this amendment to your discharge plan does not relieve you of your responsibility to comply with any other conditions or requirements of the approved discharge plan, DP-831, or any other applicable federal, state, and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

CONDITIONS FOR APPROVAL

Condition No. 2 of the July 3, 1997 discharge plan renewal shall be replaced with Specific Requirement No. 7 as follows:

2. WIPP shall sample and analyze the inflow the to the facultative lagoon system for nitrate as nitrogen (NO_3-N), total Kjeldahl nitogen (TKN), total dissolved solids (TDS), Plutonium 238, 239/240, Americium 241, Uranium 234, 235, 238, Strontium 90 and gross alpha particle activity (including Radium 226 but excluding Radon and Uranium). WIPP shall sample and analyze the north evaporation pond (Pond B), the south evaporation pond (Pond C), and the H-19 evaporation pond for total dissolved solids (TDS), Plutonium 238, 239/240, Americium 241, Uranium 234, 235, 238, Strontium 90 and gross alpha particle activity. If gross alpha particle activity is greater than 15pCi/l then additional samples for radioactivity, as combined Radium 226 and Radium 228, will be collected and analyzed within 30 days of the initial analysis. Reports of the analyses shall be submitted to NMED by January 31, April 30, July 31 and October 31 of each year.

OTHER REQUIREMENTS

Please be advised that approval of this discharge plan amendment does not relieve U.S Department of Energy of liability should your operation result in actual pollution of surface or ground water which may be actionable under other laws and/or regulations.

PERIOD OF APPROVAL

This amendment approval expires on July 3, 2002, the same date as the original plan, and you should submit an application for renewal at least 120 days before that date.

If you have any questions, please contact Clint Marshall of the Ground Water Pollution Prevention Section staff at 827-0027.

Sincerely,

Marcy Leavitt, Chief
Ground Water Quality Bureau

ML:CLM/clm

cc: Gary McCaslin, District Manager, NMED District 4
James Smith, NMED Carlsbad Field Office

MEMORANDUM

To: DP-831 File

From: Clint Marshall, GWPPS *Cm*

Subject: June 12, 1998 Discharge Plan Amendment for DP-831

Date: June 12, 1998

A discharge plan amendment to change the monitoring requirements for DP-831 was approved on June 12, 1998. WIPP requested to amend their monitoring plan to sample and analyze for Pu 238, 239/240, Am 241, U 234, 235, 238, Sr 90 and gross alpha particle activity instead of Ra 226 and 228. This change is being requested because sampling and analysis for Ra is complex and expensive while analysis of Pu, U, Am and Sr can be conducted onsite at less expense. As an alternative, the parameters listed above will be good indicators of impacts to the wastestream by radionuclides. WIPP has proposed that if gross alpha particle activity exceeds 15 mg/l, then analysis for Ra 226 and 228 will be conducted.

From: Hollen, Jim <HollenJr@wipp.carlsbad.nm.us>
To: 'CLINT_MARSHALL@NMENV.STATE.NM.US' <CLINT_MARSHALL@edser.nmenv.state.nm.us>
Date: Wednesday, June 03, 1998 1:32 PM
Subject: Amendment to DP-831

Clint,

After much discussion with our radiochemists, this is the language we came up with to trigger radium-226 and 228 sampling. It is a combination of drinking water standards found at New Mexico Title 20, Chapter 7, Part 1, Subpart 2, Section 206 and the ground water regulations at Title 20, Chapter 6, Part 2, Subpart 3, Section 3103(A).

* If gross alpha particle activity (including radium-226 but excluding radon and uranium) is greater than 15 pCi/l then additional samples for radioactivity, as combined radium 226 and radium 228, will be collected and analyzed in accordance with section 3103(A) of the current New Mexico Water Quality Control Commission Regulations.

If these words are OK use them, if not let me know and we can do something else.

Please contact me if I can be of assistance.

Thanks for your help.

Jim Hollen
Environmental Compliance and Support
Westinghouse Electric Co.
Waste Isolation Pilot Plant
P. O. Box 2078, MS-170
Carlsbad, New Mexico 88221
hollenjr@wipp.carlsbad.nm.us
Phone: (505) 234-8271
Fax: (505)234-8854

DA:98:2262
UFC:5487.00

Westinghouse Electric Corporation

Government Operations

Waste Isolation Division

Box 2078
Carlsbad New Mexico 88221

May 1, 1998

RECEIVED

MAY 12 1998

GROUND WATER BUREAU

Mr. Clint Marshall
Ground Water Pollution Prevention Section
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Subject: AMENDMENT TO DISCHARGE PLAN DP-831

Dear Mr. Marshall:

With this letter the Waste Isolation Pilot Plant requests an amendment to the sampling and analyses required in Part 2 of the Conditions for Approval of the current discharge plan, DP-831.

Specifically, we are asking that the sample and analysis requirements for radium 226 and 228 in the three evaporation cells and the H-19 evaporation pond be removed and replaced with the same radionuclide suite specified for the inflow to the facultative lagoon system. The radiochemical analysis for the inflow to the facultative lagoon system, the three evaporation cells and the H-19 evaporation pond would then consist of the following radionuclides:

- Plutonium 238, 239/240
- Americium 241
- Uranium 234, 235, 238
- Strontium 90

Since these radionuclides make up the major percentage of the radioactive waste stream at the WIPP, we feel that this analysis will provide better target parameters for the evaporation cells and the H-19 evaporation pond than radium analysis. Historically, during the more than five years of analysis, radium 226 and 228 have been at, or below detection limits.

We are also requesting that we be allowed to composite the radionuclide samples for the three evaporation cells. The H-19 evaporation pond would be sampled and analyzed separately.

If you have any questions about this request or require any additional information, please contact Mr. S. C. Kouba at (505) 234-8332, or Mr. J. R. Hollen at (505) 234-8271.

Sincerely,

K. S. Donovan SCB

K. S. Donovan, Manager
Environment, Safety, and Health

JRH:ccg

cc: M. H. McFadden, DOE/CAO GSA-224

Mr. C. Marshall May 1, 1998 DA:98:2262

bcc: <u>WID Distribution</u>

G. J. Barnes	GSA-202
S. N. Bakhtiar	MS-180
B. Hooda	MS-195
S. B. Jones	MS-195
J. L. Lee	MS-115

MEMORANDUM OF MEETING OR PHONE CONVERSATION

☑ Telephone ☐ Meeting | Time 1:10 | Date 1/30/98

Individuals Involved

Jim Hollen   Clint Marshall

Subject Liner Repair - Pond A

Discussion They found hole in liner in Pond A. Want to pump the pond down 4 inches to repair the liner. The effluent will be pumped to the H-19 Pond. The total volume will be approximately 100,000 gallons.

Conclusions Told them to go ahead with the repairs. Activity will be reported on the next quarterly report.

Distribution

Initialed CM

3.99

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau

Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

10/23 P 181 649 919

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail (See reverse)
U.S. Dept of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, NM 88221-3090
Postage $

October 23, 1997

George Dials, Manager
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, NM 88221-3090

RE: Revised Discharge Plan Summary

Dear Mr. Dials:

Please find enclosed a revised Discharge Plan Summary Sheet to replace the one that accompanied your discharge plan renewal and modification, dated July 3, 1997. During a telephone conversation with Jim Hollen on October 23, 1997, it was brought to our attention that the monitoring requirements outlined in the summary were not consistent with the requirements stated in Condition No. 2 of the permit. Therefore we are issuing a revised summary to correct the error.

Thank you for your attention to this matter. If you have any questions, please contact me at 505-827-0027.

Sincerely,

Clint Marshall

Clint Marshall, Geologist
Ground Water Quality Bureau

Enclosure: Discharge Plan Summary Sheet

MEMORANDUM OF MEETING OR PHONE CONVERSATION

☑ Telephone ☐ Meeting | Time 1:50 PM | Date 10/23/97

Individuals Involved

Jim Hollen | Clint Marshall

Subject Discharge Volumes at WIPP and other misc. issues.

Discussion Jim called to discuss 3 issues as follows

1) They have still not located the source of excessive water entering the sewage lagoons. However in investigating the problem they have discovered that the metering system which measure flows is inaccurate. They are checking + calibrating the meters and will let us know what they find.

2) They want to discharge purge water from monitoring wells to the stormwater retention structures instead of the H-19 pond

~~Conclusions~~ Told them to send me an NOI.

3) Condition #2 of the Renewal + Mod ~~does no~~ is not consistent with the ~~a~~ DP summary. I told them I would check and send them a new summary sheet.

Distribution

Initialed CM

8/89

DA:97:2376
UFC:5487.00

Westinghouse Electric Corporation **Government Operations**

Waste Isolation Division

Box 2078
Carlsbad New Mexico 88221

October 8, 1997

Mr. Clint Marshall, Ground Water Pollution Prevention Section
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Subject: TRANSFER OF BRINE FROM WIPP SEWAGE SYSTEM B EVAPORATION POND TO THE H-19 EVAPORATION POND

Dear Mr. Marshall:

As follow up to your September 26, 1997, telephone conversation with Mr. J. R. Hollen, the following actions occurred to alleviate the high level condition experienced at the WIPP sewage system facility:

- An emergency contract was initiated with a local provider for the installation of a pump, and installation of approximately 6,700 feet of 3-inch plastic temporary pipeline (Fas-Line) from the WIPP sewage system B evaporation pond to the WIPP H-19 evaporation pond. Both facilities are currently permitted under New Mexico Environment Department Discharge Permit DP-831.

- From Friday September 26, through Friday October 3, 1997, approximately 300,000 gallons were transferred from the B evaporation pond to the H-19 evaporation pond.

- An investigation is underway to determine where and how the additional water is entering the sewage system.

It is not anticipated that additional fluid will be transferred from the sewage facility evaporation pond to the H-19 evaporation pond; however, should this become necessary you will be notified prior to any action.

If you have any questions about this report or require any additional information, please contact Mr. J. R. Hollen at (505) 234-8271.

Sincerely,

Ken Donovan

K. S. Donovan, Manager
Environment, Safety, and Health

RECEIVED
OCT 16 1997
GROUND WATER BUREAU

JRH:clw

cc: M. E. Bennington DOE/CAO

MEMORANDUM OF MEETING OR PHONE CONVERSATION

☑ Telephone	☐ Meeting	Time 9:25 AM	Date 9/23/97

Individuals Involved

Jim Hollen	Clint Marshall
WIPP	NMED

Subject Discharge increase to sewage lagoons

Discussion Jim called to inform us that the sewage lagoons have been filling up due to an increase in discharge from the WIPP facility. They are currently investigating where the increase is coming from and put it in a ~~[illegible]~~ letter to NMED. There is still two feet of freeboard in pond B however they want to pump out some water ~~[illegible]~~ and take it to the H-19 pond as a precautionary measure. I approved this action.

Conclusions Written notification coming next week.

Distribution

Initialed Clu

8/89

00645

ACKNOWLEDGEMENT OF RECEIPT
OF CHECK/CASH

I hereby acknowledge receipt of Check No. 45205 dated 7/17 or cash, received in the amount of $ 1,150.00 from ________ for WIPP (Facility Name) 831 (DP No.)

Submitted to ASD by: Lora Salazar Date: 7/23/97

Received in ASD by: ______________ Date: ________

Filing Fee [ ] New Facility [ ] Renewal [✓]

Modification [✓] Other [ ] (Explain) ________

Organization Code 530340 Applicable FY 98

To be deposited in the Ground Water Section Discharge Plan Fees.

Full Payment [X] or Annual Increment [ ]

Westinghouse Electric Corporation
Waste Isolation Pilot Plant Project
P.O. Box 2078
Carlsbad, NM 88221

Under U.S. Department of Energy Contract

The Carlsbad National Bank
P.O. Box 1359
Carlsbad, N M 88220

95-179/1122

07/17/97

Check Number: 45205

Amount of Check

**********************1,150.00

Pay To Order Of

New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Authorized Signature

CHIEF FINANCIAL OFFICER

WIPP DP-831

⑈045205⑈ ⑆112201797⑆ 51225⑈

AA:97:01095
UFC:5487.00

Westinghouse
Electric Corporation

Government and Environmental
Services Company

Waste Isolation Division

Box 2078
Carlsbad New Mexico 88221

RECEIVED

JUL 23 1997

GROUND WATER BUREAU

July 18, 1997

New Mexico Environment Department
Ground Water Pollution Prevention Section
Harold Runnel Building, Rm. N2250
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: DISCHARGE FEE INVOICE FOR DP-831

Dear NMED:

Enclosed is Check No. 45205 in the amount of $1,150 dollars for discharge fee payment for renewal and modification of Discharge Plan DP-831.

If you have any questions or concerns, please contact Mr. J. R. Hollen at (505) 234-8271.

Sincerely,

J. L. Epstein
General Manager

JRH:clw

Enclosures

cc: E. K. Hunter, DOE/CAO
M. E. Bennington, DOE/CAO

Westinghouse Electric Corporation, Waste Isolation Pilot Plant Project
P.O. Box 2078, Carlsbad, NM 88221

CHECK No. 045205

P.O. No.	YOUR INVOICE OR FREIGHT PRO. No.	INVOICE DATE	OUR REF. No.	GROSS AMOUNT	DISCOUNT AMOUNT	NET AMOUNT
	DP-831	07/14/97	56372	1,150.00	0.00	1,150.00

RECEIVED
JUL - 3 1997
GROUNDWATER BUREAU

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

P 181 649 897

US Postal Service
Receipt for Certified Mail
No Insurance Coverage Provided.
Do not use for International Mail (See reverse)
Sent to
George Dials, Mgr.
Street & Number
US Dept. of Energy Waste Isolation Pilot Proj.
Post Office, State, & ZIP Code
P.O. Box 3090 Carlsbad, NM 88221-3090
Postage $

CERTIFIED MAIL - RETURN RECEIPT RE

July 3, 1997

George Dials, Manager
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Discharge Plan Renewal and Modification, DP-831, Waste Isolation Pilot Plant

Dear Mr. Dials:

Pursuant to Water Quality Control Commission (WQCC) Regulation 3109, the application for discharge plan renewal and modification for DP-831, submitted by George Dials for the discharge of 33,000 gallons per day of sewage effluent and non-hazardous brine water from the Waste Isolation Pilot Plant (WIPP) is hereby approved, subject to the conditions listed below. The facility is located approximately 26 miles east of Carlsbad in Sections 28 and 29, T22S, R31E, Eddy County. In approving this discharge plan, the New Mexico Environment Department (NMED) has determined that the requirements of WQCC Regulation 3109.C have been met.

The approved WIPP treatment and disposal system is briefly described as follows:

Up to 23,000 gallons per day of sewage effluent is discharged to a series of 5 synthetically lined ponds for settling and evaporation (facultative lagoon system). Up to 2,000 gallons per day of non-hazardous brine water is discharged to a synthetically lined evaporation cell (north evaporation cell). The modification consists of discharging an additional 8,000 gallons per day of non-hazardous brine water generated from mine dewatering activities, pumping of groundwater wells, and from other non-hazardous sources to a synthetically lined evaporation pond (H-19 evaporation pond). Ground water below the site is at a depth of approximately 608 feet and has a total dissolved solids concentration of approximately 3,920 to 218,000 milligrams per liter.

The approved discharge plan renewal and modification consists of the materials submitted by George Dials dated December 16, 1996. In addition, the discharge plan includes information and materials submitted as part of the original discharge plan approved on January 16, 1992, and materials for discharge plan amendment, dated August 28, 1995. The discharge shall be managed in accordance with the approved plan and is subject to the conditions listed below.

However, renewal and modification of this discharge plan does not relieve you of your responsibility to comply with any conditions or requirements of the previously approved discharge plan, DP-831, and the New Mexico Water Quality Act, WQCC Regulations, any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

CONDITIONS FOR APPROVAL

This discharge plan renewal and modification is subject to the following conditions for the following reasons:

1. WIPP shall measure the volume of sewage effluent discharged to the facultative lagoon system and the volumes of non-hazardous brine water individually discharged to the north evaporation cell and the H-19 evaporation pond. The origins of all waters discharged to the north evaporation cell and the H-19 evaporation pond shall be specifically described and reported. Reports of the volumes and water sources will be submitted to NMED by January 31, April 30, July 31 and October 31 of each year.

   The reason for this condition is to comply with WQCC Regulation 3106 by measuring the amount of effluent discharged.

2. WIPP shall sample and analyze the inflow to the facultative lagoon system for nitrate as nitrogen (NO_3-N), total Kjeldahl nitrogen (TKN), total dissolved solids (TDS), plutonium 238, 239 and 240, americium 241, uranium 234, 235 and 238, and strontium 90. WIPP shall sample and analyze the east evaporation pond (Pond A), the north evaporation pond (Pond B), the south evaporation pond (Pond C), and the H-19 evaporation pond for total dissolved solids (TDS), and Radium 226 and 228. Reports of the analyses shall be submitted to NMED by January 31, April 30, July 31, and October 31 of each year.

3. WIPP shall notify NMED of the volume and origin all wastewater to be discharged that is derived from miscellaneous non-hazardous sources. NMED may require more comprehensive laboratory analyses of such wastewater prior to discharge when

NMED determines that additional information is needed.

The reasons for Conditions 2 and 3 are to comply with Regulations 3106 and 3107 by monitoring the quality of effluent discharged.

SPECIFIC REQUIREMENTS

The terms and conditions of this renewal and modification contain specific requirements which are summarized below.

1. WIPP is authorized to discharge up to 23,000 gallons per day of sewage effluent 5 synthetically lined lagoons for solids settling and evaporation.

2. WIPP is authorized to discharge up to 2,000 gallons per day of non-hazardous brine water to the synthetically lined north evaporation cell.

3. WIPP is authorized to discharge up to 8,000 gallons per day of non-hazardous brine water to the synthetically lined H-19 evaporation pond.

4. WIPP will maintain all berms surrounding the facultative lagoon system to protect against stormwater runon and runoff.

5. WIPP will implement the contingency plan, dated December 16, 1996 in the event of a failure of the wastewater treatment and disposal system. The plan includes daily inspection and repair of pond liners as necessary, containment and investigation of all spills and releases, and submittal of a remediation plan to address contamination.

6. WIPP will implement the closure plan, dated December 16, 1996 when the facility is decommissioned. The plan includes the pumping or evaporation of all wastewater ponds, removal of all solids, and recontouring and revegetation of the site.

GENERAL DISCHARGE PLAN REQUIREMENTS

In addition to any other requirements provided by law, approval of discharge plan, DP-831, is subject to the following general requirements:

Monitoring and Reporting

Monitoring and reporting shall be as specified in the discharge plan and supplements thereto. These requirements are summarized on the attached sheet(s). Any inadvertent omissions from this summary of a discharge plan monitoring or reporting requirement shall not relieve you of responsibility for compliance with that requirement.

Record Keeping

1. The discharger shall maintain at the facility, a written record of ground water and wastewater quality analyses.

The following information shall be recorded and shall be made available to the NMED upon request.

a. The dates, exact place and times of sampling or field measurements.

b. The name and job title of the individuals who performed the sampling or measurements.

c. The dates the analyses were performed.

d. The name and job title of the individuals who performed the analyses.

e. The analytical techniques or methods used.

f. The results of such analyses, and

g. The results of any split sampling, spikes or repeat sampling.

2. The discharger shall maintain a written record of any spills, seeps, and/or leaks of effluent, leachate and/or process fluids not authorized by this discharge plan.

3. The discharger shall maintain a written record of the operation, maintenance and repair of facilities/equipment used to treat, store and/or dispose of wastewater; to measure flow rates; and/or to monitor water quality. This will include repairs, replacement or calibration of any monitoring equipment and repairs or replacement of any equipment used in WIPP's waste or wastewater treatment and disposal system.

4. The discharger shall maintain a written record of the amount of wastewater discharged.

Inspection and Entry

In accordance with § 74-6-9.B & E NMSA 1978 and WQCC Regulation 3107.D., the discharger shall allow the Secretary or his authorized representative, upon the presentation of credentials, to:

1. Enter at regular business hours or at other reasonable times upon the discharger's premises or where records must be kept under the conditions of this discharge plan.

2. Inspect and copy, during regular business hours or at other reasonable times, any records required to be kept under the conditions of the discharge plan.

3. Inspect, at regular business hours or at other reasonable times, any facility, equipment (including monitoring and control equipment), practices or operations regulated or required under this discharge plan.

4. Sample or monitor, at reasonable times for the purpose of assuring discharge plan compliance or as otherwise authorized by the New Mexico Water Quality Act, any effluent at any location before or after discharge.

Duty to Provide Information

In accordance with § 74-6-9.B NMSA 1978 and WQCC Regulation 3107.D., the discharger shall furnish to the NMED, within a reasonable time, any relevant information which it may request to determine whether cause exists for modifying, terminating and/or renewing this discharge plan or to determine compliance with this plan. The discharger shall furnish to the NMED, upon request, copies of records required to be kept by this discharge plan.

Spills, Leaks and Other Unauthorized Discharges

This approval authorizes only those discharges specified in the discharge plan. Any unauthorized discharges violate WQCC Regulation 3104, and must be reported to the NMED and remediated as required by WQCC Regulation 1203. This requirement applies to all seeps, spills, and/or leaks discovered from the pipelines, disposal ponds and evaporation ponds.

Retention of Records

The discharger shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by this discharge plan, and records of all data used to complete the application for this discharge plan, for a period of at least five years from the date of the sample collection, measurement, report or application. This period may be extended by request of the Secretary at any time.

Enforcement

Failure to grant the Secretary or his authorized representative access to the records required to be kept by this discharge plan or to allow an inspection of the discharge facilities or to the collection of samples is a violation of this discharge plan and the WQCC Regulations. Such violations as well as other violations of the discharge plan, may subject the discharger to a compliance order, a compliance order assessing a civil penalty or an action in district court pursuant to § 74-6-10 NMSA 1978, and/or modification or termination of this discharge plan pursuant to § 74-6-5.L NMSA 1978. Penalties assessed as part of a compliance order shall not exceed $15,000 per day for violations of the terms of this permit or the requirements of § 74-6-5 NMSA 1978, and shall not exceed $10,000 per day for violations of other sections of the Water Quality Act.

Modifications and/or Amendments

The discharger shall notify NMED, pursuant to WQCC Regs. 3107.C, of any modifications or additions to the WIPP's wastewater disposal system, including any increase in wastewater flow rate or wastewater storage and disposal management changes to the system as approved under this discharge plan. The discharger shall obtain NMED's approval, as a discharge plan modification, prior to any increase in the quantity or concentration of constituents in the leachate above those approved in this plan. Please note that WQCC Regs. 3109.E and F provide for possible future amendment of the plan.

Other Requirements

Please be advised that the approval of this plan does not relieve Department of Energy of liability should your operation result in actual pollution of surface or ground water which may be actionable under other laws and/or regulations.

RIGHT TO APPEAL

If the Department of Energy is dissatisfied with this action taken by NMED, the Department of Energy may file a petition for hearing before the WQCC. This petition shall be in writing to the Water Quality Control Commission within thirty (30) days of the receipt of this letter. Unless a timely request for hearing is made, the decision of the NMED shall be final.

TRANSFER OF DISCHARGE PLAN

Pursuant to WQCC Regulation 3111, prior to any transfer of ownership, the discharger shall provide the transferee a copy of the discharge plan, including a copy of this approval letter and shall document such to the NMED.

PERIOD OF APPROVAL

Pursuant to WQCC Reg. 3109.G.4., this discharge plan approval is for a period of 5 years. This approval will expire July 3, 2002, and you must submit an application for renewal at least 120 days before that date.

Sincerely,

Marcy Leavitt, Chief
Ground Water Quality Bureau

ML:CLM/clm

Enclosures: Discharge Plan Summary

xc: Garrison McCaslin, Dist. Manager, NMED Dist. 4
NMED Hobbs Field Office

Clint

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Protection and Remediation Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

I N V O I C E

DATE: July 3, 1997

TO: WIPP
Jim Hollen
P.O. Box 3090
Carlsbad, NM 88221-3090

RE: Discharge Plan Renewal & Modification (DP-831)

A discharge fee payment in the amount of $1150.00 is past due for the renewal & modification of your Discharge Plan (DP-831) for the WIPP. The required flat fees or discharge fees may be paid in a single payment or in equal installments over the expected duration of the discharge plan. If your payment has already been submitted, please disregard this notice and retain it for your records.

Total Due $1150.00

Please make your check payable to: **New Mexico Environment Department**

Send check to: **NMED/Ground Water Pollution Prevention Section**
Harold Runnels Bldg., Rm. N2250
P. O. Box 26110
Santa Fe, NM 87502

Cl t

M E M O R A N D U M

To: Steve Zappe, HRMB

From: Clint Marshall, Geologist 3, GWPPS CM

Through: Dale Doremus, HPM, GWPPS DM
Marcy Leavitt, Chief, GWQB ML

Subject: Comments to the WIPP Biennial Environmental Compliance Report (BECR)

Date: February 21, 1997

The following comments are in response to the BECR as required under the WIPP Land Withdrawal Act of 1992, as amended. The reporting period for this BECR is from April 1, 1994 to March 31, 1996; however additional comments are included on the current compliance status of WIPP as it applies to the New Mexico Water Quality Act.

<u>April 1, 1994 to March 31, 1996</u>: To the best of my knowledge WIPP has not been in violation of any of the requirements of their discharge permit during this time period.

<u>April 1, 1996 to present</u>: Regarding 20 NMAC 6.2 Section 3104, WIPP is currently in violation of their discharge plan, DP-831, because they are discharging without an approved discharge plan. WIPP failed to renew their discharge permit within the required time period, therefore the permit expired on January 16, 1997. WIPP is required to submit a request for renewal 120 days prior to expiration. NMED received a request for discharge plan renewal and modification on December 16, 1996 and is currently reviewing the request.

In addition to reporting on the compliance status, I would like to make the following comments on the Chapter 30 of the BECR report regarding requirements under the NM Water Quality Act.

Section 30.2.5 on page 30-5 states, "The discharge of 2,000 gpd of nonhazardous brine water at WIPP is authorized by NMED Discharge Plan approval, DP-831."

It should be noted that the discharge plan approval also authorizes the discharge of 32,000 gpd of domestic wastewater in addition to the 2,000 gpd of brine water.

Section 30.2.9 on page 30-6 states, "Since the approval of discharge may not exceed seven years from the date of issuance of the Discharge Plan approval, it will be necessary to find an alternative means of disposal for the nonhazardous brine solution currently being discharged."

Even though the approval period for a discharge permit is for a limited period of time, the permit can be renewed. Pursuant to 20 NMAC 6.2 Section 3106.F, the applicant may apply for renewal of the discharge permit which, upon approval, may extend the approval period for up to five additional years.

Clint - deadline. ML

State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous & Radioactive Materials Bureau
2044 Galisteo
P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-1557
Fax (505) 827-1544

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
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EDGAR T. THORNTON, III
DEPUTY SECRETARY

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GROUNDWATER BUREAU

M E M O R A N D U M

November 18, 1996

To: Distribution

From: Benito J. Garcia, Chief
Hazardous and Radioactive Materials Bureau

Subject: WIPP Biennial Environmental Compliance Report

The Carlsbad Area Office of the U.S. Department of Energy (DOE/CAO) recently delivered to the State two copies of the 1996 *Waste Isolation Pilot Plant Biennial Environmental Compliance Report (BECR)*. This report is mandated under Section 9(a) of the federal WIPP Land Withdrawal Act of 1992, as amended [Public Law 102-579].

DOE/CAO must submit to the State of New Mexico and the U.S. EPA, on a biennial basis, documentation of WIPP's compliance with certain laws, regulations, and permit requirements listed in the WIPP Act. The *WIPP BECR* is DOE/CAO's documentation of WIPP's compliance.

It is important to note that the WIPP Act makes the following directive: "The [EPA] Administrator or the State, as appropriate, shall determine not later than 6 months after receiving [the Biennial Environmental Compliance Report] whether the [DOE] Secretary is in compliance with the laws, regulations, and permit requirements..." listed in the WIPP Act. The deadline for EPA and the State to make their determinations is April 30, 1997.

Enclosed are key sections of the report which fall under the purview of your bureau, along with a copy of the Introduction and a partial Table of Contents. Please identify an individual within your bureau who will review and comment on the enclosed sections, and provide their name to Steve Zappe of my staff (827-1561), who will be coordinating the review for NMED. Please review these materials, and provide comments and/or recommendations on the *WIPP BECR* to Mr. Zappe no later than March 1, 1997.

The full report is available in our office at 2044A Galisteo if you wish to review it or check it out for an extended period. Please contact me at 827-1557 if you have any further questions. Thank you for your assistance in this effort.

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GROUND WATER BUREAU

Distribution:

Neil Weber, Bureau Chief
DOE Oversight Bureau
Chapter 13 Atomic Energy Act and the U.S. Department of Energy
Chapter 14 National Environmental Policy Act and the U.S. Department of Energy

Peter Maggiore, Acting Bureau Chief
Underground Storage Tank Bureau
Chapter 25 Section 25.2.6, Compliance With the UST Regulatory Requirements under 20 NMAC, Chapter 5

Gerald Silva, Bureau Chief
Solid Waste Bureau
Chapter 26 New Mexico Solid Waste Act

Marcy Leavitt, Bureau Chief
Ground Water Protection and Remediation Bureau
Chapter 28 New Mexico Ground Water Protection Act
Chapter 30 New Mexico Water Quality Act

Cecilia Williams, Bureau Chief
Air Quality Bureau
Chapter 29 New Mexico Air Quality Control Act

Robert Gallegos, Bureau Chief
Drinking Water Bureau
Chapter 31 New Mexico Drinking Water Regulations

Gary McCaslin, District Manager
NMED District Four
Information Only

28.0 NEW MEXICO GROUND WATER PROTECTION ACT

28.1 Summary of the Law

The Ground Water Protection Act (GWPA; § 74-6B NMSA 1978) was enacted in 1990 in response to the threat facing public health and safety and the environment from pollution of ground-water resources from leaking USTs. The purpose of this act includes the provision of substantive direction that allows the State of New Mexico to take corrective action at sites contaminated by leakage from USTs.

The GWPA is implemented by the regulations of the NMED, NMED-92-1, *Ground Water Protection Act Corrective Action Fund Regulations*. These regulations provide guidelines for the payment or reimbursal of the costs of a minimum site assessment and corrective action and specify the requirements for owners or operators of leaking USTs.

The GWPA is also implemented by the GWPA regulations, which are provided in the New Mexico USTR as Part XV. These regulations are discussed in Chapter 25. WIPP has installed two new UST systems that meet the new standards and requirements for USTs. Procedures are in place for routine operations regarding the tanks and for dealing with any spills or releases from the UST systems. Two sections in Chapter 25 (25.2.6.84 and 25.2.6.85) deal specifically with the applicable New Mexico GWPA regulations.

28.2 Compliance Status of the Regulatory Requirement

Table 28-1 summarizes the general regulatory requirement and its compliance status under the implementing regulation of the New Mexico Ground Water Protection Act. See also Sections 25.2.6.84 and 25.2.6.85 for the applicable portions of the Ground Water Protection Act Regulations.

TABLE 28-1. New Mexico Ground Water Protection Act - Summary of Regulatory Compliance Status

CITATION	REQUIREMENT	COMPLIANCE STATUS
New Mexico Environment Department 92-1, *Ground Water Protection Act Corrective Action Fund Regulations*		
NMED 92-1	Reimbursement of costs from corrective actions for spills/releases from USTs	**NOT APPLICABLE** No spills or leaks from new UST systems [Section 28.2.1]

28.2.1 Corrective Action for Spills/Releases From USTs, NMED-92-1

The owners or operators of USTs that release a regulated substance must take appropriate corrective action. The NMED will reimburse certain costs associated with performing a minimum site assessment and other corrective actions taken for spills or releases from USTs.

The WIPP will take appropriate corrective actions if a regulated substance is released from a UST.

30.0 NEW MEXICO WATER QUALITY ACT

30.1 Summary of the Law

With the enactment of the New Mexico Water Quality Act (WQA; 74-6-1 through 74-6-17 NMSA 1978), a mechanism was provided at the state level to establish water-quality standards that are consistent with the CWA. The state act created the Water Quality Control Commission (WQCC) and directed the WQCC, as the state's water-pollution-control agency for all purposes of the CWA, to adopt a comprehensive water quality management program and water quality standards. The *New Mexico Water Quality Control Commission Regulations* include water-quality standards for ground and surface water and regulations regarding discharges to surface-water courses and ground water.

Pursuant to the regulations of § 3-109, *Director Approval, Disapproval, Modification, or Termination of Proposed Discharge Plans*, the Discharge Plan submitted by the DOE for the discharge of 23,000 gallons per day (gpd) of sewage effluent and up to 1,500 gpd of nonhazardous brine water from the WIPP was approved in 1992. On August 28, 1995, the WID submitted a request to the NMED requesting a minor amendment to DP-831 increasing the amount of nonhazardous brine for disposal to 2,000 gpd. On October 4, 1995, the NMED approved the amendment to the Discharge Plan. The increase was required, not because additional brine was being generated but because on days the observation wells were pumped, greater than 1,500 gallons were produced, necessitating that the brine be disposed of over two days' time.

The WQA was formerly implemented by WQCC 82-1. It is now implemented by Chapter 6 of Title 20 of the NMAC.

Title 20 NMAC 7.4 defines public water supply systems and public wastewater facilities. Under these definitions, and because of the size of the population served, the WIPP is classified as a Class 1 public wastewater facility and a Class 2 public water supply system. Since these systems require certified operators, the WIPP facility employs operators and supervisors certified to the requirements of Subpart II of this Part.

30.2 Compliance Status of the Regulatory Requirements

Table 30-1 summarizes the regulatory requirements and their compliance status under the New Mexico Water Quality Act. Following the table, the text gives more detail on the compliance status for each requirement.

TABLE 30-1. New Mexico Water Quality Act - Summary of Regulatory Compliance Status

CITATION	REQUIREMENT	COMPLIANCE STATUS
20 NMAC 6.2, *New Mexico Water Quality Control Commission Regulations*		
20 NMAC 6.2, § 1-201	NOI to discharge	**ACHIEVED** NOI filed as required [Section 30.2.1]
20 NMAC 6.2, § 1-202	Filing of plans and specifications--sewerage systems	**ACHIEVED** Submitted to NMED [Section 30.2.2]
20 NMAC 6.2, § 1-203	Notification of discharge--removal: requirements for notification, corrective action, and reporting in the event of an unauthorized discharge of oil or other water contaminant that could have adverse effects	**UP TO DATE** *RCRA Contingency Plan* [Section 30.2.3]
20 NMAC 6.2, § 2-101	General discharge limitations and sampling/analytical requirements	**UP TO DATE** Specified in NMED Discharge Plan approval [Section 30.2.4]
20 NMAC 6.2, § 3-104	Authorization only of effluent(s)/leachate(s) as specified in Discharge Plan	**UP TO DATE** Authorization granted [Section 30.2.5]

CITATION	REQUIREMENT	COMPLIANCE STATUS
20 NMAC 6.2, § 3-106	Application for Discharge Plan approval	**ACHIEVED** Application sent to NMED [Section 30.2.6]
20 NMAC 6.2, § 3-107	Monitoring, reporting, and other requirements	**UP TO DATE** Monitoring reports filed [Section 30.2.7]
20 NMAC 6.2, § 3-108	Public notice and participation	**ACHIEVED** Public notice published [Section 30.2.8]
20 NMAC 6.2, § 3-109	Director approval, disapproval, modification, or termination of proposed Discharge Plans	**UP TO DATE** Discharge plan to be revised if necessary [Section 30.2.9]
20 NMAC 6.1	Water quality standards for interstate and intrastate streams in New Mexico	**NOT APPLICABLE** No streams affected by WIPP [Section 30.2.10]
20 NMAC 7.4	Utility Operator Certification	**UP TO DATE** Operators and supervisors undergo recertification and training every three years [Section 30.2.11]

Not for long - Permit expires 1/16/97

3109. G.4

30.2.1 Notice of Intent to Discharge, 20 NMAC 6.2, § 1-201

Any party intending to make a new water contaminant discharge or to alter the character or location of an existing water contaminant discharge, unless the discharge is being made or will be made into a community sewer system or subject to the Liquid Waste Disposal Regulations adopted by the New Mexico Environmental Improvement Board, shall file a notice with the Water Pollution Control Bureau of the New Mexico Environment Department (NMED).

NOIs to discharge have been filed as required. The latest filing occurred on August 28, 1995.

30.2.2 Filing of Plans and Specifications - Sewerage Systems, 20 NMAC 6.2, § 1-202

Any party proposing to construct a sewerage system or proposing to modify any sewerage system in a manner that will change the quantity or quality of the discharge from the system substantially must file plans and specifications for the construction or modification with the Water Pollution Control Bureau of the NMED.

Sewerage system plans and specifications were included in the transmittal of the Discharge Plan application to the NMED.

30.2.3 Notification of Discharge - Removal, 20 NMAC 6.2, § 1-203

Requirements for reporting, notifications, and corrective action with respect to any discharge from any facility of oil or other water contaminant, in such quantity as may with reasonable probability injure or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property are specified.

In the event of an unauthorized discharge of oil or other potentially harmful water contaminants, notification and reporting will be performed and corrective action taken according to WID procedures and the *RCRA Contingency Plan*. The discharge will be reported to the Chief of the Groundwater Bureau of the NMED within 24 hours. A written report will be submitted within seven days, as required under this regulation.

30.2.4 General Requirements, 20 NMAC 6.2, § 2-101

General discharge limitations and sampling/analytical requirements for the discharge of effluents to a watercourse must be met.

These limitations and requirements are specified in the NMED's Discharge Plan Approval DP-831. The discharge limitations and the sampling/analytical requirements are met. Reports are submitted quarterly to the NMED.

30.2.5 Discharge Plan Required, 20 NMAC 6.2, § 3-104

No party shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless the discharge meets the requirements of a discharge plan approved by the Director. When a plan has been approved, discharges must be consistent with the terms and conditions of the plan.

The discharge of 2,000 gpd of nonhazardous brine water at WIPP is authorized by NMED Discharge Plan approval, DP-831.

30.2.6 Application for Discharge Plan Approval, 20 NMAC 6.2, § 3-106

Any party who intends to begin discharging any listed water contaminants or any toxic pollutant so that they may move directly or indirectly into ground water must submit a Discharge Plan as required.

A Discharge Plan application was submitted to the NMED on November 14, 1991. The NMED approved the plan on January 16, 1992; it will expire on January 16, 1997.

30.2.7 Monitoring, Reporting, and other Requirements, 20 NMAC 6.2, § 3-107

Requirements include notification of the NMED of any facility expansion, production increase, or process modifications that would result in the discharge of water contaminants.

Monitoring reports are filed quarterly according to the following schedule: January 16, April 16, July 16, and October 16.

30.2.8 Public Notice and Participation, 20 NMAC 6.2, § 3-108

Within 30 days of filing of a proposed discharge plan, or modification or renewal of an approved discharge plan, the

NMED must ensure that the public and affected governmental agencies are notified.

The NMED made public notice of the Discharge Plan on December 15, 1991. No comments were received from the public.

30.2.9 Director Approval, Disapproval, Modification, or Termination of Proposed Discharge Plans, 20 NMAC 6.2, § 3-109

If the monitoring data submitted indicate that these regulations are being or may be violated or that the standards in 20 NMAC 6.2, § 3-102, "Standards for Ground Water of 10,000 mg/L TDS [total dissolved solid] Concentration or Less," are being or will be exceeded in ground water at any place of withdrawal for the present or reasonably foreseeable future due to the discharge, it may be necessary to modify the Discharge Plan.

If the monitoring data submitted indicate that the Discharge Plan conditions or the standards are being or will be exceeded, the plan may be revised.

7 Since the approval of discharge may not exceed seven years from the date of issuance of the Discharge Plan approval, it will be necessary to find an alternative means of disposal for the nonhazardous brine solution currently being discharged.

30.2.10 Water Quality Standards for Interstate and Intrastate Streams in New Mexico, 20 NMAC 6.1

The State has set a number of water-quality standards for interstate and intrastate streams in New Mexico.

The water-quality standards for interstate and intrastate streams in New Mexico do not apply to WIPP because there are no streams, either intermittent or permanent, that will be affected by WIPP.

30.2.11 Utility Operator Certification, 20 NMAC 7.4

The State requires that operators of public water supply systems and public wastewater facilities be certified to the educational and experience requirements of Subpart II of Part 4.

Under these regulations, the WIPP is considered a public water supply system, which is defined as a system for the provision to the public of piped water for human consumption or domestic purposes, and the system regularly serves an average of at least 25 individuals at least 60 days of the year; it includes any water supply source and any treatment, storage, and distribution facilities. The WIPP is classified as a Class 2 public water supply system because of the population served, 501 to 5,000, and the treatment process being chlorination.

The WIPP is also considered a Class 1 public wastewater facility because of the population served and the treatment process being raw wastewater lagoons.

Since these systems at WIPP require certified operators, the WID's Facility Operations Section employs operators and supervisors certified to the section's requirements. All operators undergo recertification and training every three years; training and certification records are maintained by Facility Operations.

30.3 Compliance Status of the Permit Requirements

Table 30-2 summarizes the specific and general requirements from the Discharge Plan for WIPP and their compliance status. Additional information is provided in the text.

TABLE 30-2. New Mexico Water Quality Act - Summary of Compliance Status of Permit Requirements

CITATION	REQUIREMENT	COMPLIANCE STATUS
Approval DP-831, *New Mexico Discharge Plan for the WIPP*		
DP-831 Specific Requirement (SR) #1	Monitoring and quarterly reports	**UP TO DATE** Monitoring conducted and reports submitted quarterly [Section 30.3.1]
DP-831 SR #2	Submittal of water quality analysis with quarterly report	**UP TO DATE** Analysis submitted quarterly [Section 30.3.2]
DP-831 SR #3	Quarterly sampling of each evaporation lagoon	**UP TO DATE** Sampling and results reported quarterly [Section 30.3.3]

CITATION	REQUIREMENT	COMPLIANCE STATUS
DP-831 SR #4	Maintenance of berms protecting the lagoon system from precipitation runoff and run-on	**UP TO DATE** Performed quarterly [Section 30.3.4]
DP-831 SR #5	Completion of proposed evaporation ponds	**ACHIEVED** Completed July 16, 1993 [Section 30.3.5]
DP-831 General Requirement (GR)--Record-keeping	Records to be kept and made available to the NMED upon request	**UP TO DATE** Information recorded and available [Section 30.3.6]
DP-831 GR - Inspection and Entry	Allowing inspections, entry, sampling, and monitoring by NMED personnel	**UP TO DATE** Activities allowed on site [Section 30.3.7]
DP-831 GR - Duty to Provide Information	Providing information relevant to Discharge Plan/records required by Discharge Plan that has been requested by NMED	**UP TO DATE** No information requested to date [Section 30.3.8]
DP-831 GR - Spills, Leaks, and Other Unauthorized Discharges	Reporting and remediation of any spills, leaks, and any other unauthorized discharges	**UP TO DATE** Reports to be made if unauthorized discharges occur; no reporting required to date [Section 30.3.9]
DP-831 GR - Retention of Records	Retention of all monitoring information, Discharge Plan reports, and data used to complete the Discharge Plan application for at least five years	**UP TO DATE** Documentation being retained [Section 30.3.10]

CITATION	REQUIREMENT	COMPLIANCE STATUS
DP-831 GR - Modifications and/or Amendments	Notification of NMED of any modifications or additions to the wastewater disposal system; approval by NMED required prior to increasing the quantity or concentration of constituents in waste water above those approved in the plan	**UP TO DATE** Approval to be obtained as required [Section 30.3.11]

30.3.1 Requirements for Monitoring and Quarterly Reports, DP-831 Specific Requirement (SR) #1

The applicant shall monitor the quantity of brine water pumped into the evaporation ponds monthly and submit a quarterly report to the Ground Water Section's Office.

The monitoring required by the NMED Discharge Plan Approval DP-381 has been conducted as required. The results have been submitted in the quarterly Discharge Monitoring Reports required by the Discharge Plan, which are prepared in accordance with a WID procedure.

30.3.2 Requirement for Water Quality Analysis Submitted with Quarterly Report, DP-831 SR #2

A water quality analysis shall be submitted with the quarterly report mentioned above in SR #1.

Water quality analyses have been submitted with the quarterly reports.

30.3.3 Requirement that the Evaporation Lagoon be Sampled and the Results Reported, DP-831 SR #3

Each evaporation lagoon shall be sampled quarterly for total dissolved solids (TDS) and the results submitted in the quarterly report.

Each evaporation lagoon has been sampled quarterly, and the results provided in the quarterly reports.

30.3.4 Requirement for Berm Maintenance, DP-831 SR #4

Berms protecting the lagoon system shall be maintained to protect it from precipitation runoff and runon.

Maintenance of the berms is performed quarterly.

30.3.5 Requirement for Completion of Proposed Evaporation Ponds, DP-831 SR #5

The applicant has 18 months from the date of approval to complete construction of the proposed evaporation ponds. The applicant can discharge brine waters into the existing salt pile evaporation pond until the new evaporation ponds are completed.

The evaporation ponds were completed by July 16, 1993, as required.

30.3.6 General Requirement, *Record-keeping*, DP-831

The discharger must maintain a written record of ground-water and wastewater quality analyses at the facility. The information must be recorded and made available to the NMED upon request.

Monitoring, reporting, and record-keeping requirements are met as specified in the Discharge Plan.

30.3.7 General Requirement, *Inspection and Entry*, DP-831

The discharger shall allow the NMED Secretary or her authorized representative, upon the presentation of credentials, to enter the discharger's facility during regular business hours or at other reasonable times under the conditions of this discharge plan.

NMED personnel are allowed on site to conduct inspections, sampling, and monitoring during normal business hours.

30.3.8 General Requirement, *Duty to Provide Information*, DP-831

The discharger shall furnish to the NMED, within a reasonable time frame specified by the NMED, any relevant information which it may request to determine whether cause exists for modifying, terminating, and/or renewing this *discharge plan or to determine compliance with this plan. The discharger shall furnish to the NMED, upon request, copies of records required to be kept by this Discharge Plan.*

No requests have been received from the NMED to provide information relevant to the Discharge Plan. Similarly, the NMED has not requested copies of the records to be maintained under the terms of the Discharge Plan.

30.3.9 General Requirement, *Spills, Leaks, and other Unauthorized Discharges*, DP-831

Any unauthorized discharges must be reported to the NMED and remediated as required. This requirement applies to all seeps, spills, and/or leaks discovered from the sewerage lagoons or that may directly or indirectly leave the boundaries of the WIPP site.

Any spills, leaks, and other unauthorized discharges will be reported to NMED and remediated in accordance with WIPP procedures.

30.3.10 General Requirement, *Retention of Records*, DP-831

The discharger shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by this discharge plan, and records of all data used to complete the application for this discharge plan, for a period of at least 5 years from the date of the sample collection, measurement, report, or application.

All monitoring information, analytical results, Discharge Plan reports, and data used to complete the Discharge Plan application will be retained for at least five years.

30.3.11 General Requirement, *Modifications and/or Amendments*, DP-831

The discharger must notify the NMED of any modifications or additions to the applicant's wastewater disposal system, including any increase in wastewater flow rate and wastewater storage and disposal management changes to the system as approved under this discharge plan. The discharger shall obtain the NMED's approval, as a discharge plan modification, prior to any increase in the quantity or concentration of constituents in the wastewater above those approved in this plan.

If any modifications or additions to the wastewater disposal system are planned for WIPP that would increase the quantity and/or the concentration of constituents in the waste water above those approved in the discharge plan, the NMED will be notified. No work will be initiated until the NMED approves the modification or addition.

1.0 INTRODUCTION

This *Biennial Environmental Compliance Report* (BECR) addresses regulatory compliance at the Waste Isolation Pilot Plant (WIPP), a research and development facility designed to demonstrate the safe disposal of transuranic (TRU) radioactive waste. As required by the WIPP Land Withdrawal Act (LWA) (Public Law [PL] 102-579), the BECR documents WIPP's compliance with applicable federal laws implemented by the U.S. Environmental Protection Agency (EPA) and applicable New Mexico laws, regulations, and permit conditions.

The BECR also addresses compliance with some federal laws implemented by other United States agencies including the Council on Environmental Quality, Department of Energy (DOE), Nuclear Regulatory Commission, Department of Transportation, Department of Interior Bureau of Land Management and Fish and Wildlife Service, and the Advisory Council on Historic Preservation.

1.1 Background of the Waste Isolation Pilot Plant (WIPP)

The WIPP Project was authorized by the DOE National Security and Military Applications of Nuclear Energy Authorization Act of 1980 (PL 96-164). This legislation mandated that DOE provide a research and development facility to demonstrate the safe disposal of radioactive waste resulting from U.S. defense activities and programs. Initially, the WIPP mission was to include experimentation with high-level wastes, but subsequent legislation has restricted the radioactive waste to TRU waste. TRU waste is radioactive waste that contains alpha-emitting radionuclides of atomic number greater than 92 with half-lives longer than 20 years which are present in concentrations greater than 100 nanocuries per gram of waste. Most of this waste is generated from plutonium reprocessing and fabrication.

In January 1981, the DOE announced its decision to proceed with a phased development of the WIPP, to be located in Eddy County in southeastern New Mexico, 26 miles east of the city of Carlsbad. The decision called for the WIPP to be designed to accommodate approximately 6.2 million cubic feet of contact-handled (CH) TRU waste and 0.25 million cubic feet of remote-handled (RH) TRU waste. The WIPP LWA has limited the total WIPP capacity to 6.2 million cubic feet of transuranic waste.

After completing a site and preliminary design validation (SPDV) phase, the construction phase at the WIPP began in 1983. At present, surface and underground facilities to support waste handling and emplacement operations have been constructed. Of the nine surface buildings, the largest structure is the Waste Handling Building, which includes areas for the receipt, inventory, inspection, and transfer of waste to the underground. The WIPP underground facility, which is 2,150 feet below the land surface in a 2,000-foot-thick bedded salt formation, consists of four shafts, the waste disposal area, the experimental area (for repository safety and mine performance studies), an equipment and maintenance facility, and connecting tunnels. Only a few waste disposal rooms have been mined at present because of the natural phenomenon of salt creep, which causes eventual room closure. Additional waste disposal rooms will be mined prior to permanent waste emplacement.

Originally, the construction phase was to have been followed by the pilot plant phase. Following the preparation of the Supplement Environmental Impact Statement (SEIS) in 1990, the DOE decided that the construction phase was to be followed by the test phase, during which tests with TRU waste would have been conducted underground at the WIPP. However, on October 21, 1993, the DOE announced its decision not to conduct TRU waste tests underground at the WIPP facility, but to conduct enhanced laboratory tests at existing DOE facilities elsewhere. Thus no TRU or TRU-mixed waste (radioactive waste with hazardous constituents) will be sent to WIPP until after the initiation of the disposal phase. The disposal phase will be followed by the decontamination and decommissioning phase.

More detailed information on the background of the WIPP project can be found in the DOE's *Final Environmental Impact Statement, Waste Isolation Pilot Plant* (FEIS; DOE, 1980); the DOE's 1981 Record of Decision (ROD) to the FEIS (DOE, 1981); the 1990 *Final Supplement Environmental Impact Statement, Waste Isolation Pilot Plant* (SEIS; DOE, 1990a); and the 1990 ROD to the SEIS (DOE, 1990b).

A second supplemental environmental impact statement (SEIS-II) is presently being prepared to address information that has become available since 1990. Further information is also available in documents referenced by the SEIS-II.

1.2 Biennial Environmental Compliance Report under the WIPP Land Withdrawal Act

This BECR provides the documentation required by the 1992 LWA. The LWA specifies that :

> *The Secretary shall, not later than 2 years after the date of the enactment of this Act, and biennially thereafter, submit documentation of continued compliance with the laws, regulations and permit requirements described in paragraph (1) to the Administrator, and, with the law described in paragraph (1)(C), to the State [§ 9(a)(2)].*

Paragraph (1) requires that the WIPP comply with Subpart A of 40 *Code of Federal Regulations* (CFR) Part 191; the Clean Air Act; the Solid Waste Disposal Act (SWDA); the Safe Drinking Water Act; the Toxic Substances Control Act; the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); "all other applicable Federal laws pertaining to public health and safety or the environment;" and "all regulations promulgated, and all permit requirements" under these laws.

1.3 Regulatory Requirements Hierarchy

The first step in documenting regulatory compliance is the identification of all applicable regulatory requirements. This section describes the interrelationships among laws, regulations, and permit conditions and identifies the origins of the detailed regulatory requirements discussed in this report.

1.3.1 Federal/State Laws

Laws result from legislative processes at either the federal, state, or local level. This report will summarize the purpose of each relevant law and discuss its applicability and importance to the WIPP.

1.3.2 Implementing Regulations

Once a law has been enacted, it must be implemented. Authority for implementation of each new act is usually assigned to a particular agency. That agency is responsible for developing regulations to implement the act. At the federal level, these regulations are first published in the *Federal Register* (FR) as "proposed" for comment from interested groups and individuals. The implementing agency must then respond appropriately to the comments and prepare the final regulations. These final regulations are again published in the *Federal Register*, along with a discussion of the comments, and are inserted into the appropriate part(s) of the Code of Federal Regulations (CFR).

New Mexico agencies use a similar process in the promulgation of regulations, with the proposed and final regulations published in the *New Mexico Register*. Many state environmental laws evolve from federal statutes, many of which allow that the state become authorized to administer and enforce its own regulatory program in lieu of the federal program as long as the state regulations are no less stringent than the federal requirements. In these cases, the state must send its "final" regulations to the governing agency, such as the EPA, for approval. The governing agency may approve all, part, or none of the final regulations. After agency approval, notification of the agency's authorization of the state program is published in the *Federal Register*.

Local laws or ordinances that apply to the WIPP are limited to those under the authority of the county commission. The only local laws or ordinances applicable to the facility are zoning ordinances. These do not affect the facility's ability to protect human health and the environment. Therefore, these laws and ordinances are not included in this report.

This report identifies specific requirements from federal/state implementing regulations that apply to the WIPP facility. In some cases where implementing regulations have not been promulgated or where a particular statute requirement is not covered by the implementing regulations, this report identifies specific requirements directly from the statute.

1.3.3 Permit Conditions

A number of federal/state implementing regulations include permit programs. Because many implementing regulations are couched in general terms, permits and permit programs allow the regulatory agency to regulate individual facilities and stipulate site-specific conditions that must be met by a specific facility to meet the statutory goals of protection of the public and the environment. Thus, permits are used to regulate discharges and activities (construction, modifications, and/or operations) of a facility. This report identifies site-specific permit conditions that apply to the WIPP.

1.4 Regulatory Compliance at the WIPP

The DOE and the Westinghouse Electric Corporation's Waste Isolation Division (WID), the Prime Contractor for the WIPP, are fully committed to conducting operations at the WIPP in a way that achieves and demonstrates compliance with applicable regulations and permit conditions. Both organizations have implemented plans and procedures to achieve and maintain compliance with the regulations and have established aggressive assessment programs to validate continued successful implementation of these activities.

In a number of areas throughout this document, it is noted that procedures and manuals are in place to guide and direct WIPP personnel in the performance of specific job tasks which have or could have a direct impact on the compliance status in a given situation. These procedures and manuals are in place to supplement personnel training, education, and qualifications and to promote the operation of the WIPP facility in a safe and environmentally sound manner. Because this is the intended purpose of these documents, they are continually evaluated and revised to ensure that they are effective and current with respect to both regulatory and operational changes. For this reason, specific procedures and manuals are not referenced in the body of this document.

In addition, a number of reports (especially those reports which are a result of regulatory requirements) are referenced throughout the document. Due to the continual update and revision requirements for reports of this nature, they are referenced only by the report title or by the citation that requires their submittal rather than by document numbers.

1.4.1 Organizational Structure

The organizational structure of the DOE Carlsbad Area Office (CAO) and WID reflect the importance of regulatory compliance at the WIPP and the commitment of both organizations to achieving and maintaining full compliance.

The CAO's organizational structure consists of the Area Manager, who oversees three major branches: the Office of Program Support and Assurance, the Office of

Regulatory Compliance, and the Office of National TRU Waste Operations. These branches function together to ensure that the WIPP's day-to-day and long-term environmental compliance programs remain exemplary. The Office of Program Support and Assurance interprets environment, safety, health, and quality assurance requirements applicable to WIPP. The Office of Regulatory Compliance develops the overall strategy and criteria to demonstrate and validate long-term compliance for the disposal of TRU waste. The Office of National TRU Waste Operations manages the day-to-day operation of the WIPP facility.

WID's commitment to compliance is also represented in their organizational structure, consisting of the General Manager, the Deputy General Manager, and eight department managers. The department manager of Environment, Safety, and Health reports directly to the General Manager and manages the WID's environmental compliance activities including document preparation, monitoring, analysis, and oversight. The department manager for Quality and Regulatory Assurance provides support to ensure that compliance activities are managed and performed in a manner consistent with WID's commitment to compliance.

1.4.2 Compliance Assurance

Compliance includes a wide range of activities, ranging from the preparation of plans, procedures, reports, or permit applications to hands-on actions such as record keeping, monitoring, sampling and analysis, performing assessments or audits, and housekeeping.

There are three programs to assess WIPP programs and activities that have an impact on the WIPP's environmental compliance status. These include the WID Environmental Compliance Assessment Program (ECAP), the WID Quality Assurance Programs, and the CAO Assurance Plan.

The ECAP provides a comprehensive system to appraise compliance with applicable environmental laws and regulations, and identifies environmentally sound corrective action measures for any findings or observations identified. The ECAP assessments are used to identify and eliminate deficiencies that could lead to the following unacceptable events:

- Permit violations
- Regulatory noncompliance
- Safety and health risks to WIPP site workers and/or the general public
- Spills, releases, or discharges of environmental pollutants

Complimenting the ECAP are the CAO and WID Quality Assurance Programs. Quality Assurance Program surveillances, audits, and assessments of WIPP activities are designed to verify compliance with quality assurance requirements and determine the adequacy and effectiveness of the activities. Elements of these oversight activities include:

- Monitoring work in progress
- Documenting compliance or non-compliance with established requirements and procedures
- Identifying actual and potential conditions adverse to quality
- Obtaining timely corrective action commitments from cognizant managers.
- Providing notification to responsible managers of the status and performance of work under assessment
- Verifying timely implementation of corrective actions.

1.5 Organization of and Reporting Period for the Report

The organization of and reporting period for the BECR are discussed in the following subsections.

1.5.1 Organization of the Report

This report organizes the pertinent regulatory requirements into 14 parts, each of which corresponds to a federal or state agency that is authorized to administer regulatory programs. Under each agency, separate chapters identify and discuss each law administered by the agency that is relevant to the WIPP facility. For example, the first part contains pertinent regulatory programs administered by the EPA. Within this part, ten chapters correspond to the ten environmental laws and sets of regulations that apply to the WIPP for which the EPA is responsible (Chapters 2 through 11).

Each of the following 37 chapters summarizes a law and its implementing regulations and briefly describes its applicability to the WIPP. For ease in identifying compliance status, summary tables in each chapter provide a synopsis of WIPP's compliance with each specific requirement and a cross-reference to the more detailed discussion in the text. Each section of the text summarizes a requirement and addresses its compliance status.

The WIPP is subject to oversight by a number of regulatory agencies. The scope of the BECR chapters includes the documentation of occasions in which the WIPP may have received a notice of violation by a regulatory agency. Audits, appraisals, and assessments conducted by regulatory agencies did not result in notices of violation during this reporting period.

Within the BECR summary tables the compliance status is identified as "achieved," "up to date," or "not applicable."

ACHIEVED Items with the status of "achieved" are requirements that have been met and do not require any further action. They are essentially "one-time" occurrences.

Example: As a generator of hazardous waste, WIPP must obtain an EPA ID number; this requirement has been achieved.

UP TO DATE Items with the status of "up to date" are requirements that require some type of ongoing activity to maintain compliance.

Example: The DOE must file a biennial hazardous waste report; these reports are up to date.

NOT APPLICABLE Items with the status of "not applicable" were evaluated and determined not to be applicable to the WIPP either during this reporting. period or throughout the duration of the project.

Example: Since the WIPP disposes of its construction and demolition debris at a landfill located on DOE property and in accordance with the applicable regulations, the requirement for obtaining a permit is not applicable.

Following the list of references, Appendix A presents an index of the specific requirements discussed in the report by regulating agency. Appendix B indexes the specific requirements in terms of their technical subject areas (for example, waste management requirements, water quality requirements, historic preservation requirements).

1.5.2 Reporting Period

The first BECR, issued October 24, 1994, addressed the status of WIPP compliance programs and activities for the period from the congressional approval of the WIPP LWA on October 30, 1992 to March 31, 1994. This BECR addresses the compliance status of WIPP programs and activities for the reporting period beginning April 1, 1994, and ending on March 31, 1996.

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NEW MEXICO DEPARTMENT OF PUBLIC SAFETY

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Based on the presently available information in your letter, dated February 2, 2005, a discharge permit is not being required for the discharges described above. A discharge permit is not being required because the discharges conform to the numerical ground water standards in 20.6.2.3103 NMAC and do not contain any toxic pollutants as defined in 20.6.2.1101.TT NMAC, and therefore are exempt from the discharge permit requirement under 20.6.2.3105.A NMAC.

If at some time in the future WIPP intends to change the amount, the character, or location of the discharges so that they will not be as described, or if observation or monitoring shows that the discharges are threatening ground water quality, you must file a new request for exemption with the NMED.

If you have any questions, please call Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027.

Sincerely,

Bill Olson

William C. Olson, Chief
Ground Water Quality Bureau

WCO/CLM

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office

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Waste Isolation Pil
U.S. Dept. of Energy
P.O. Box 3090

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

December 28, 2004

L.L. Piper, Acting Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Corrective Action Approval, DP-831, Condition 5, Operational Freeboard of the Sewage Lagoons and H-19 Evaporation Pond, Waste Isolation Pilot Plant

Dear Mr. Piper:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received Written Notification and Corrective Action Reports, submitted by the U.S. Department of Energy Waste dated October 28, November 23, and December 10, 2004. The reports address the reduction in operating freeboard of the Sewage Lagoon System and H-19 Evaporation Pond at the Waste Isolation Pilot Plant (WIPP) in accordance with Condition 5 of Discharge Permit 831 (DP-831) renewed on April 29, 2003. Freeboard levels rose above permitted levels due to heavy rainfall from September through early December.

Heavy rainfall in September and October 2004 caused water levels in the Sewage Lagoon System to rise above the permitted freeboard allowances. Subsequent water management activities restored the permitted freeboard in the lagoon system by November 7, 2004.

Additional rainfall in mid November 2004 caused the evaporation ponds of the Sewage Lagoon System to rise above the permitted freeboard levels. As a corrective action, WIPP proposed to monitor water levels daily until the two feet of freeboard is restored. If freeboard becomes less than 12 inches, water will be pumped from the evaporation ponds upstream to the settling and polishing ponds of the lagoon system or transferred to the H-19 Evaporation Pond.

Heavy rainfall in early December caused the water levels in the H-19 pond to rise above the permitted two feet of freeboard. As a corrective action, WIPP proposed to temporarily operate the H-19 Pond with one foot of freeboard under weekly inspections until two feet of freeboard is restored.

The corrective action reports are hereby approved with the following conditions.

1. WIPP is authorized to operate each pond in the Sewage Lagoon System and the H-19 Evaporation Pond with one foot of freeboard until June 30, 2005.

2. Until June 30, 2005, WIPP shall notify NMED by the last day of each month of the freeboard level in each pond of the Sewage Lagoon System and the H-19 Evaporation Pond.

3. Until June 30, 2005, WIPP shall notify NMED within 24 hours and submit a corrective action plan if freeboard in any pond becomes less than 12 inches.

If additional information becomes available indicating these corrective actions are inadequate, then additional actions may be required. Approval of this corrective action report does not relieve you of your responsibility to comply with any other applicable federal, state and/or local laws and regulations.

If you have any questions, please call Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027.

Sincerely,

William C. Olson, Chief
Ground Water Quality Bureau

WCO/CLM

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

DEC 1 5 2004

December 10, 2004

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: H-19 Evaporation Pond and Permit Condition 5 of the Discharge Permit, DP-831, Renewed on April 29, 2003, Maintain Two Feet of Freeboard in All Lagoons at all Times

Dear Mr. Marshall:

The purpose of this letter is to follow-up on the November 24, 2004, phone conversation in which you were notified that recent precipitation has resulted in the H-19 Evaporation Pond rising to a level that is slightly above the two feet of freeboard. Uncommonly high precipitation rates resulted in the loss of freeboard in the H-19 Evaporation Pond. You're office has already been notified of the effect of the high precipitation rates on freeboard capacity in the sewage lagoons in letters dated October 28, 2004, and November 23, 2004.

During the phone conversation notifying you of the status of the H-19 Evaporation Pond on November 24, 2004, you:

(1) verbally authorized us to temporarily operate the H-19 Evaporation Pond with one foot of freeboard;

(2) requested that we send you a letter regarding the H-19 Evaporation Pond; and,

(3) stated that you would provide a combined response addressing the November 23, 2004, letter proposing corrective actions for the sewage lagoon system and this notice regarding the H-19 Evaporation Pond.

As part of our corrective actions for the lack of freeboard at the H-19 Evaporation Pond, we will continue weekly inspections and inspect the pond following significant precipitation events (greater than one inch). We will notify your office when all ponds are returned to a level that maintains two feet of freeboard, if continued precipitation results in the need for additional corrective actions, or of any event in which wastewater is released from the H-19 Evaporation Pond.

Thanks for your assistance in this matter. If you have any questions or require additional information, please contact Mr. H. L. Plum of my staff at (505) 234-7495.

Sincerely,

Lloyd L. Piper
Acting Manager

cc:
J. Kieling, NMED *ED
J. Bearzi, NMED *ED

*ED denotes electronic distribution
CBFO:AMO:HLP:GS:04-1759:UFC 5486.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
November 23, 2004

NOV 30 2004

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Permit Condition 5 of the Discharge Permit, DP-831, Renewed On April 29, 2003, Maintain Two Feet of Freeboard in All Lagoons At All Times

Dear Mr. Marshall:

We notified you in a phone conversation on September 30, 2004, that two feet of freeboard was not maintained in the Sewage Lagoons following 6.48 inches of rain during the last week of September 2004. All ponds in the sewage lagoon system were returned to an operating level with a minimum of two feet of freeboard by November 7, 2004. We notified you of our corrective actions in a letter dated October 28, 2004.

The purpose of this letter is to confirm our notification to you by phone last week that an additional 3.04 inches of rain between Saturday, November 13 and Tuesday, November 16, 2004, resulted in Evaporation Ponds A, B and C of the sewage lagoon system rising to a level that is approximately two to three inches above the two feet of freeboard level. The ponds still have at least 21 inches of freeboard.

In accordance with Condition 5 of DP-831, we propose corrective actions of monitoring the water level in each pond daily until the ponds return to a level that maintains two feet of freeboard. If the freeboard becomes less than 12 inches, we will either:

(1) pump water from the evaporation ponds to upstream settling or polishing ponds which are currently at two feet of freeboard (maintaining at least one foot of freeboard); or

(2) request temporary authorization to transfer water from the sewage lagoons to the H-19 Evaporation Pond. Due to the 3:1 side slopes, we believe that 12 inches of freeboard is more than adequate to prevent the release of wastewater due to wave action. As you know, prior to the April 2003 DP-831 renewal, the sewage lagoons were operated at one-foot of freeboard for more than 15 years without overflowing.

We will notify your office when all ponds are returned to a level that maintains two feet of freeboard, if continued precipitation results in the need for additional corrective actions, or of any event in which wastewater is released from the sewage lagoon system.

If you have any questions or require additional information, please contact Mr. H. L. Plum of my staff at (505) 234-7495.

Sincerely,

Lloyd L. Piper
Acting Manager

cc:
J. Kieling, NMED *ED
J. Bearzi, NMED *ED

*ED denotes electronic distribution
CBFO:AMO:HJP:GS:04-1755:UFC 1000.00

BILL RICHARDSON
Governor

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

RON CURRY

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Sent To
Lloyd Piper, Acting
US Dept. of Energy
Waste Isolation Pilo
Street, Apt. No.; or PO Box No. PO Box 3090
City, State, ZIP+4 Carlsbad, New Mexico
PS Form 3800, June 2002
7002 2410 0004 2504 1231

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

November 18, 2004

Lloyd Piper, Acting Manager
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Approval of Extension Request for Salt Pile Infiltration Controls Construction Schedule, DP-831, U.S Department of Energy Waste Isolation Pilot Plant

Dear Mr. Piper:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received a November 12, 2004 letter from the U.S. Department of Energy Waste Isolation Pilot Plant (WIPP) requesting an extension of completion of the scheduled activities for construction of infiltration controls referenced in the discharge permit application, DP-831. WIPP cites inclement weather and low evaporation rates as reasons why the activities have been delayed. The revised schedule presented in the November 12, 2004 request is hereby approved.

If you have any questions regarding this matter please contact me at 505-827-2919 or Clint Marshall at 505-827-0027.

Sincerely,

William C. Olson, Chief
Ground Water Quality Bureau

xc: Charles Lundstrom, Director, WWMD
Carlos Romero, District Manager, NMED District 4
Carlsbad Field Office

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
November 12, 2004

RECEIVED
NOV 1 7 2004

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Request for an Extension for the Salt Pile Infiltration Controls Construction Schedule, Discharge Plan - 831

Dear Mr. Marshall:

The purpose of this letter is to request an extension for completion of the scheduled activities for construction of the infiltration controls referenced in Discharge Plan – 831 (DP-831). The schedule contains six items which were to be completed by November 2004. Five of those six items have been completed on or before the scheduled date as reflected in the table below.

The construction and lining of the Salt Storage Extension, Salt Pile Evaporation Pond and Salt Storage Evaporation Basin with High Density Polyethylene (HDPE) and the placement of a HDPE cap to cover the Salt Pile have been completed. The remaining work includes the lining of the salt pile run-off ditches with HDPE, the placement of native soils and vegetative cover on the old Salt Pile, and the lining of Evaporation Basin A and Ponds 1 and 2 with HDPE. This work was anticipated to be complete in late September or early October, 2004. However, an unexpected 5.22 inches rain on the weekend of September 24-26, 2004 prevented the completion of these tasks. Due to the rainfall events that have occurred at the site, considerable rework will have to be done before the installation of HDPE material in these locations or placement of soil can resume.

Continued wet weather and low evaporation rates have prevented resuming construction activities. The completion of the salt pile run-off ditches will not be able to be completed as scheduled in November 2004. Stormwater Evaporation Basin A may not be able to be completed by the scheduled date of January 2005. The lining of Evaporation Ponds 1 and 2 remain on schedule for completion in April 2005.

For the reasons stated above we are requesting that the infiltration controls schedule be amended. The table below illustrates the scheduled dates referenced in DP-831 and a proposed schedule that we believe can be met.

Construction Activity	Existing Schedule Referenced in DP-831	Proposed Schedule
Place Contract	September 2003	NA (Task Accomplished)
Begin On-Site Construction	October 2003	NA (Task Accomplished)

CBFO:AMO:HLP:GS:04-1752:UFC 5487.00

Stormwater Diversion Berm Completion	December, 2003	NA (Task Accomplished)
Begin Storage of Mined Salt in Cell A	May 2004	NA (Task Accomplished)
Salt Pile 1) Completion of pond 2) Completion of ditches 3) Completion of liner cap	 1) November 2004 2) November 2004 3) November 2004	 1) NA (Task Accomplished) 2) April 2005 3) NA (Task Accomplished)
Stormwater Evaporation Basin A	January 2005	April 2005
Stormwater Evaporation Basin B (Ponds 1 and 2)	April 2005	April 2005
Salt Storage Extension Cell B	Begin Construction: May 2006 Completion: October 2006	Begin Construction: May 2006 Completion: October 2006

We have made a good faith effort to complete the installation of the infiltration controls in accordance with the schedule referenced in DP-831, as amended. The revised schedule presented herein is based on the following factors:

1) The difficulty associated with predicting when the area will be dry enough to resume construction activities considering we are entering the winter season when evaporation rates are low;

2) Acknowledgement that the liner subcontractor has several jobs that have been postponed due to the wet weather which will complicate scheduling once conditions are suitable for construction; and,

3) Completing the soil cover and reclamation activities associated with establishing vegetation on the covered salt pile will require a considerable volume of dry, screened soil material.

Currently, salt is stored in Cell A of the Salt Storage Extension Area and run-off from this area is contained in the Salt Storage Evaporation Basin, both of which are lined with HDPE. The old salt pile is capped with a HDPE material. We believe that these structures virtually eliminate the contribution of salt contact water to the subsurface.

Your consideration of our revised schedule is appreciated. If you have any questions or require additional information, please contact Mr. H. L. Plum at (505) 234-7495.

Sincerely,

Lloyd Piper
Acting Manager

CBFO:AMO:HLP:GS:04-1752:UFC 5487.00

cc:

C. Lundstrom, NMED	*ED
J. Bearzi, NMED	*ED
J. Kieling, NMED	*ED

*ED denotes Electronic Distribution

CBFO:AMO:HLP:GS:04-1752:UFC 5487.00

bcc:

L. Piper, CBFO	*ED
G. Basabilvazo, CBFO	*ED
J. Plum, CBFO	*ED
D. Mercer, CBFO	*ED
S. Anderson, WTS	*ED
G. Johnson, WTS	*ED
D. Reber, WTS	*ED
S. Warren, WTS	*ED
S. Youngerman, WTS	*ED
D. Bignell, WRES	*ED
R. Kehrman, WRES	*ED
S. Kouba, WRES	*ED
R. Chavez, WRES	*ED
S. Jones, WRES	*ED
R. Reeves, WRES	*ED
J. Siegel, WRES	*ED
R. Galbraith, WRES	*ED
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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
October 28, 2004

RECEIVED
NOV 03 2004

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: New Mexico Environment Department Discharge Plan-831, Condition 5

Dear Mr. Marshall:

The purpose of this letter is to confirm our verbal notification to you on September 30, 2004, that two feet of freeboard was not maintained in sewage lagoons operated at the Department of Energy's (DOE) Waste Isolation Pilot Plant (WIPP) as required by Discharge Plan – 831, Condition 5. The cause of this condition is believed to be significant rainfall events that occurred between September 24 and 30, 2004. Total rainfall during this period was 6.48 inches. We believe these rainfall events caused the effluent level in the settling ponds (Ponds 1A and 2A) and polishing ponds (Ponds 1B and 2B) of the sewage lagoon system to rise above the level required to maintain two feet of freeboard as required by DP-831, Condition 5. The measurements for freeboard remaining on September 30, 2004 were:

Pond	Freeboard
Settling Pond 1A (off line)	1.16 feet
Settling Pond 2A (on-line)	0.90 feet
Polishing Pond 1B	1.34 feet
Polishing Pond 2B	0.92 feet.

The high lagoon levels were noted during an inspection of the lagoons on Sunday, September 26, 2004. On Monday, September 27, 2004 the valve between Evaporation Pond A and Evaporation Pond C was opened to lower the water levels in Settling Ponds 1A and 2A and Polishing Ponds 1B and 2B, which are upstream of Evaporation Pond A. Evaporation Pond C was out of service at the time of the rain and its additional capacity of about 425,000 gallons allows us to lower the levels in the ponds that are filled beyond their freeboard requirements. On Thursday, September 30, we began mechanical pumping of effluent from Evaporation Pond A to Evaporation Pond C to accelerate the corrective action. For your convenience a diagram of the sewage lagoon system is enclosed.

As we discussed, an evaluation of the sewer and storm water drainage systems is being conducted to determine whether storm water from within the plant or adjacent roads and parking areas is significantly contributing to the volume of effluent directed to the sewage lagoons.

Additional engineering surveys will be conducted to determine if operational practices or plant adjustments can be made to maintain lower effluent levels in the lagoons and prevent the loss of required freeboard during future precipitation events. We are also evaluating the means used to measure depth of effluent in the lagoons and calculate remaining freeboard to confirm the adequacy of this procedure.

Additional rain and overcast days with high humidity have occurred subsequent to September 30, 2004 and these conditions have exacerbated our efforts to lower levels of effluent in the lagoons to the required levels. As of October 18, 2004, all settling and polishing ponds in the sewage lagoon system have been restored to greater than two feet of freeboard. As of Octobedr 26, 2004 evaporation Pond A has less than the required two feet of freeboard. If evaporation Pond A is not within the freeboard limit by October 29, 2004 mechanical pumping from evaporation Pond A to evaporation Pond B or C will occur until a minimum of two feet of freeboard is achieved.

No release or threat to human health or the environment occurred as the result of the elevated effluent levels in the sewage lagoons. There was no release of effluent from the sewage lagoon system. If you have any questions or require additional information, please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

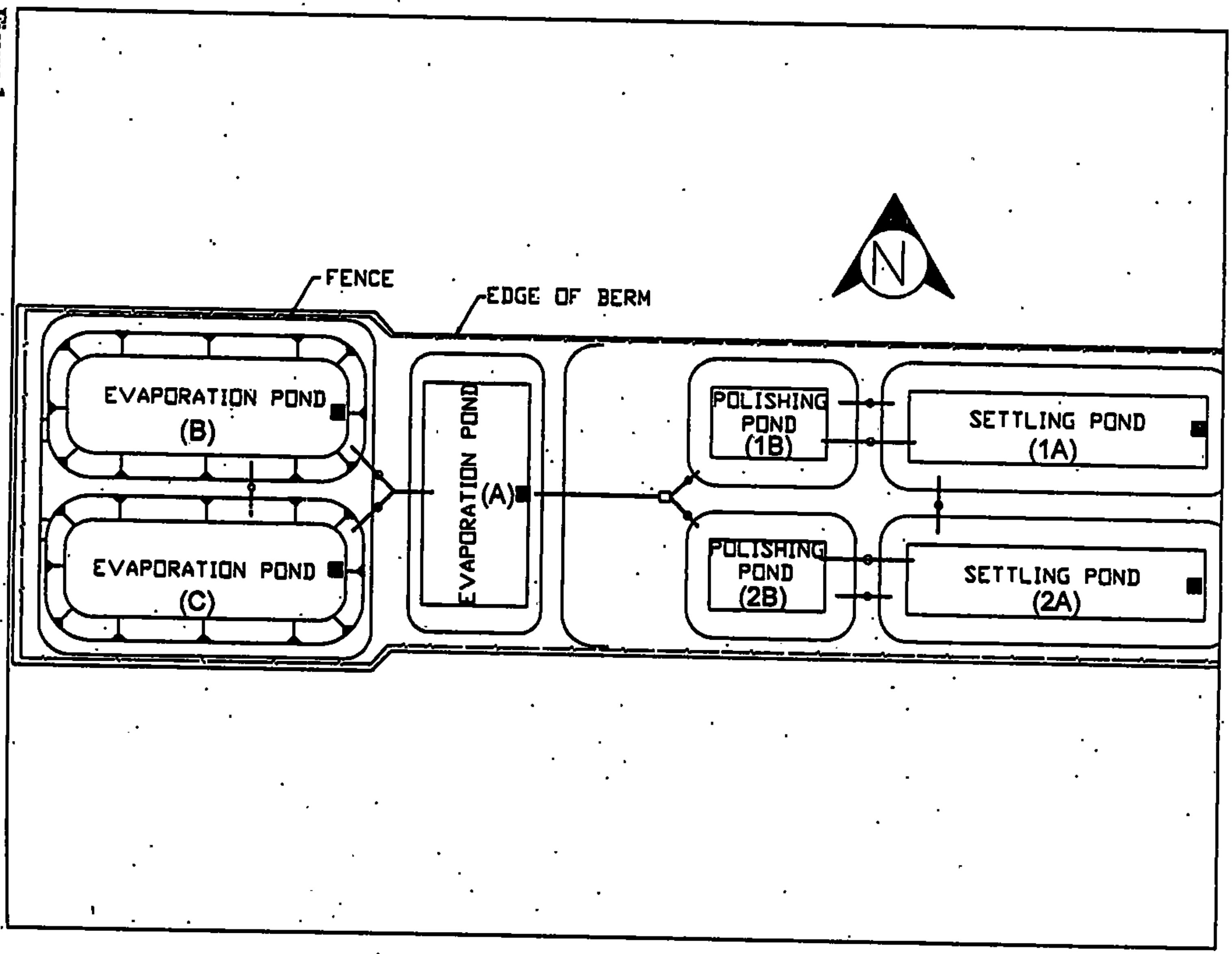
R. Paul Detwiler for
Acting Manager

Enclosure

cc: w/enclosure
Mary Ann Menetry, Mining and Environmental Compliance

Figure 1

WASTE ISOLATION PILOT PLANT FACULTATIVE LAGOON SYSTEM



BILL RICHARDSON
Governor

State of New Mexico
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Ground Water Quality Bureau
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(505) 827-2918 phone
(505) 827-2965 fax

RON CURRY
Secretary

DERRITH WATCHMAN-MOORE
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

September 8, 2004

R. P. Detwiler, Acting Manager
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Discharge Permit Modification Required, DP-831, Waste Isolation Pilot Plant

Dear Mr. Detwiler:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) renewed the Discharge Permit, DP-831, for the U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP) on April 29, 2003. At the time of the renewal, the permit primarily covered discharges to a domestic waste lagoon system, and miscellaneous industrial and brine discharges to evaporation ponds. On April 25, 2003, WIPP submitted an application to modify DP-831 to construct and incorporate storm water control systems to reduce subsurface seepage from runoff at the plant facility, and particularly from salt tailings stored north of the facility. The storm water control systems include the lining of storm water runoff collection basins, installing a cover on the existing salt tailings and construction of a new salt storage facility. The discharge permit modification was issued on December 22, 2003.

NMED conducted an inspection of the WIPP facility on August 11, 2004, to inspect facility components covered under the discharge permit, and to observe the construction activities on the storm water control systems addressed under the permit modification. NMED raised questions about the ultimate disposition of the salt tailings during the inspection, however WIPP personnel indicated uncertainty about final closure. NMED has conducted a file review and determined that the closure plan included in the discharge permit only addresses the domestic waste lagoons and does not include final closure measures for other evaporation ponds, storm water control systems and the salt tailings.

UNIQUE #	DOE UFC	DATE RCVD	ADDRESSEES
040859	5487.00	SEP 14 2004	P. Detwiler K. Watson L. Piper J. Plum R. Nelson R. Chavez WIPP Ops Records

Upon conducting the file review, NMED has also determined that potential sources of ground water contamination exist on the facility property that were not included the permit modification of DP-831. Specifically, a salt storage facility located on the east side of the WIPP facility, identified as the SPDV Salt Storage Area, was not addressed for its potential to contaminate ground water. According to a May 1994 document titled *Assessment of Solid Waste Management Units at the Waste Isolation Pilot Plant* (NMED/WIPP 93-001), this storage area contains approximately 155,000 cubic yards of salt covering approximately 7 acres. NMED is concerned that the presence of salt in this storage area has the same potential to contaminate ground water as the salt tailings WIPP is mitigating on the north side of the plant.

NMED requires that all discharge permits for mining facilities include a comprehensive closure plan to ensure the prevention and/or abatement of ground water contamination after the facility is closed. Water Quality Control Commission (WQCC) Regulation 20.6.2.3107.A(11) NMAC authorizes the NMED Secretary to require a closure plan to prevent the exceedence of standards of Section 20.6.2.3103 NMAC or the presence of a toxic pollutant in ground water after cessation of operation, which includes: a description of closure measures, maintenance and monitoring plans, post-closure maintenance and monitoring plans, financial assurance, and other measures necessary to prevent and/or abate such contamination.

NMED also requires that discharge permits address all components at the facility that have the potential to contaminate ground water. WQCC Regulation 20.6.2.3104 NMAC states that no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless he is discharging pursuant to a discharge permit issued by the secretary. Discharges from the SPDV Salt Storage Area must be addressed because it is not covered by DP-831.

NMED has determined that further permitting actions are necessary to address additional potential contamination sources at the WIPP facility and to incorporate all potential sources into a comprehensive closure plan. Pursuant to WQCC Regulation 20.6.2.3104, 20.6.2.3109.E(1) and 20.6.2.3107.A(11) NMAC, and NMSA 1978 § 74-6-5.L(5) of the Water Quality Act, NMED hereby requires WIPP to modify its discharge permit, DP-831 to include all potential contamination sources at the facility and a comprehensive closure plan that addresses all facility components covered under DP-831.

Potential contamination sources to be addressed under this permit modification must include all active and inactive salt storage areas and waste disposal areas located within the WIPP property boundary defined by the Land Withdrawal Act. To the extent practicable, full disclosure of the contents of these facilities must be included. The closure plan must address closure of all evaporation ponds used to dispose of industrial and brine discharges as well as domestic waste discharges. The plan must also address final closure of all active and inactive salt tailings storage areas and waste disposal facilities not presently included in DP-831. An alternatives analysis must be conducted that examines different closure scenarios for all salt tailing storage facilities. Such scenarios must include removal of the salt tailings from the site as well as onsite closure options.

Within 120 days of this letter, WIPP must submit an application for the modification of DP-831. The application may reference current activities and existing documents, plans and specifications that apply towards final closure of facility components covered under DP-831.

Any appeal from this determination must be made to the New Mexico Water Quality Control Commission within 30 days, in accordance with Section 20.6.2.3112.B NMAC.

If you have any questions, please call Clint Marshall, 505-827-0027, or Mary Ann Menetrey, 505-827-2944, of the Mining Environmental Compliance Section.

Sincerely,

George Schuman

George Schuman, Acting Chief
Ground Water Quality Bureau

GS/CLM

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office

Clint Marshall

To: Roush, Parrish - WRES

Subject: RE: Salt Haul Road Construction

Parrish,

This response to your e-mail is to confirm the September 9, 2004 conversation regarding stormwater runoff from the haul road. NMED understands that WIPP will be using salt as a base for the haul road, and that stormwater runoff from the haul road will enter the Salt Pile Evaporation Pond (SPEP). The SPEP is lined with a 60 mil HDPE liner. The relatively minor salt contribution to the total stormwater discharge to this pond does not warrant a permit modification or amendment by NMED at this time.

> -----Original Message-----
> **From:** Roush, Parrish - WRES [mailto:Parrish.Roush@wipp.ws]
> **Sent:** Tuesday, September 14, 2004 2:15 PM
> **To:** 'clint_marshall@nmenv.state.nm.us'
> **Cc:** Jones, Stewart - WRES
> **Subject:** Salt Haul Road Construction
>
> Clint,
>
> The purpose of this e-mail is to document our conversation at 1:00 pm on September 9, 2004. As discussed during your August 11, 2004 inspection of the WIPP Site, you informed me that a permit modification would not be necessary for using salt as a road base on the salt haul road. You acknowledged that our permit application dated April 24, 2003 stated that the Salt Storage Extension Basin will be the only drainage element receiving salt water contact run-off. Further you stated that your supervisor Mary Ann Menetrey (Supervisor of the Mining Environmental Compliance Section) concurred that a permit modification would not be necessary for this action. You stated that if we wanted documentation of this determination, we could send you an e-mail or write you a letter referencing this discussion.
>
> We would appreciate it if you could take the time to respond to this e-mail acknowledging your receipt of this e-mail and concurrence that I have accurately restated your position on this matter. Thanks for your assistance.
>
> B. Parrish Roush
> Washington Regulatory and Environmental Services
> 505-234-8078

SEP 1 0 2004

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

SEP 0 9 2004

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Change in the Design for the Infiltration Controls Project and Map of the Paved and Unpaved Areas at the WIPP Site

Dear Mr. Marshall:

The purpose of this letter is to provide notification of changes relating to the substitution of the geotextile cushion under the high density polyethylene (HDPE) liner with a soil cushion for the salt pile infiltration controls and a map illustrating the paved and unpaved areas within the fenced area at the WIPP Site. You requested that this information be provided within 30 days of your August 11, 2004 visit to the WIPP site.

The April 24, 2003 Discharge Plan Modification Application for the infiltration controls project stated that:

- Mined salt would be used to shape the crown to a minimum two percent slope. In some cases native soil may be used for reshaping the salt pile crown and side slopes; and,

- A 16-ounce geotextile cushion would be emplaced at the salt contact with a 60-millimeter textured HDPE liner on the salt-pile. The drawings contained in the permit application specified a double-sided textured liner.

The double-sided textured liner provides better friction angles and improves slope stability on the 3:1 side slopes. Prior to installation it was determined that the double textured liner tends to snag the geotextile while positioning the liner during installation causing folds and displacement of the geotextile cushion. It was concluded that the use of salt or soil would provide an adequate base and equivalent cushion for the liner and improve the installation process for the textured liner. For this reason, the design was modified to require a liner base of soil or salt sized such that no material is larger than 0.5 inches in size and all material is free of trash and debris. One to two inches of screened soil was added to the salt surface, except where the salt could be prepared to meet the liner base specification.

This design change improves constructability of the overall liner system, provides adequate and equivalent protection of the liner, and is consistent with the base material used in the construction of the other infiltration controls (i.e., evaporation ponds and the Salt Storage Area).

CBFO:OEC:HLP:JGW:04-1720:UFC:5486

Finally, a map illustrating the paved and unpaved areas of the site that you requested during the August 11, 2004 visit to the WIPP site is enclosed, drawing number 24-028-W1, Revision W. If you have any questions or require additional information, please contact Mr. Daryl Mercer at (505) 234-7495.

Sincerely,

R. Paul Detwiler fr
Acting Manager

Enclosure

cc: w/o enclosure
J. Kieling, NMED
J. Bearzi, NMED
CBFO M&RC

CBFO:OEC:HLP:JGW:04-1720:UFC:5486

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

BILL RICHARDSON
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RON CURRY
Secretary

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Restricted Delivery Fee (Endorsement Required)
Total Postage & Fees $
R.P. Detwiler, Act
US Dept. of Energy
Waste Isolation Pl
P.O. Box 3090
Carlsbad, New Mexi
PS Form 3800, June 2002

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

September 8, 2004

R. P. Detwiler, Acting Manager
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Discharge Permit Modification Required, DP-831, Waste Isolation Pilot Plant

Dear Mr. Detwiler:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) renewed the Discharge Permit, DP-831, for the U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP) on April 29, 2003. At the time of the renewal, the permit primarily covered discharges to a domestic waste lagoon system, and miscellaneous industrial and brine discharges to evaporation ponds. On April 25, 2003, WIPP submitted an application to modify DP-831 to construct and incorporate storm water control systems to reduce subsurface seepage from runoff at the plant facility, and particularly from salt tailings stored north of the facility. The storm water control systems include the lining of storm water runoff collection basins, installing a cover on the existing salt tailings and construction of a new salt storage facility. The discharge permit modification was issued on December 22, 2003.

NMED conducted an inspection of the WIPP facility on August 11, 2004, to inspect facility components covered under the discharge permit, and to observe the construction activities on the storm water control systems addressed under the permit modification. NMED raised questions about the ultimate disposition of the salt tailings during the inspection, however WIPP personnel indicated uncertainty about final closure. NMED has conducted a file review and determined that the closure plan included in the discharge permit only addresses the domestic waste lagoons and does not include final closure measures for other evaporation ponds, storm water control systems and the salt tailings.

Upon conducting the file review, NMED has also determined that potential sources of ground water contamination exist on the facility property that were not included the permit modification of DP-831. Specifically, a salt storage facility located on the east side of the WIPP facility, identified as the SPDV Salt Storage Area, was not addressed for its potential to contaminate ground water. According to a May 1994 document titled *Assessment of Solid Waste Management Units at the Waste Isolation Pilot Plant* (NMED/WIPP 93-001), this storage area contains approximately 155,000 cubic yards of salt covering approximately 7 acres. NMED is concerned that the presence of salt in this storage area has the same potential to contaminate ground water as the salt tailings WIPP is mitigating on the north side of the plant.

NMED requires that all discharge permits for mining facilities include a comprehensive closure plan to ensure the prevention and/or abatement of ground water contamination after the facility is closed. Water Quality Control Commission (WQCC) Regulation 20.6.2.3107.A(11) NMAC authorizes the NMED Secretary to require a closure plan to prevent the exceedence of standards of Section 20.6.2.3103 NMAC or the presence of a toxic pollutant in ground water after cessation of operation, which includes: a description of closure measures, maintenance and monitoring plans, post-closure maintenance and monitoring plans, financial assurance, and other measures necessary to prevent and/or abate such contamination.

NMED also requires that discharge permits address all components at the facility that have the potential to contaminate ground water. WQCC Regulation 20.6.2.3104 NMAC states that no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless he is discharging pursuant to a discharge permit issued by the secretary. Discharges from the SPDV Salt Storage Area must be addressed because it is not covered by DP-831.

NMED has determined that further permitting actions are necessary to address additional potential contamination sources at the WIPP facility and to incorporate all potential sources into a comprehensive closure plan. Pursuant to WQCC Regulation 20.6.2.3104, 20.6.2.3109.E(1) and 20.6.2.3107.A(11) NMAC, and NMSA 1978 § 74-6-5.L(5) of the Water Quality Act, NMED hereby requires WIPP to modify its discharge permit, DP-831 to include all potential contamination sources at the facility and a comprehensive closure plan that addresses all facility components covered under DP-831.

Potential contamination sources to be addressed under this permit modification must include all active and inactive salt storage areas and waste disposal areas located within the WIPP property boundary defined by the Land Withdrawal Act. To the extent practicable, full disclosure of the contents of these facilities must be included. The closure plan must address closure of all evaporation ponds used to dispose of industrial and brine discharges as well as domestic waste discharges. The plan must also address final closure of all active and inactive salt tailings storage areas and waste disposal facilities not presently included in DP-831. An alternatives analysis must be conducted that examines different closure scenarios for all salt tailing storage facilities. Such scenarios must include removal of the salt tailings from the site as well as onsite closure options.

Within 120 days of this letter, WIPP must submit an application for the modification of DP-831. The application may reference current activities and existing documents, plans and specifications that apply towards final closure of facility components covered under DP-831.

Any appeal from this determination must be made to the New Mexico Water Quality Control Commission within 30 days, in accordance with Section 20.6.2.3112.B NMAC.

If you have any questions, please call Clint Marshall, 505-827-0027, or Mary Ann Menetrey, 505-827-2944, of the Mining Environmental Compliance Section.

Sincerely,

George Schuman

George Schuman, Acting Chief
Ground Water Quality Bureau

GS/CLM

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office

Field Trip Report
Ground Water Pollution Prevention Section

Date: August 11, 2004

Inspector (s)
Clint Marshall

Facility

Facility Name: Waste Isolation Pilot Plant (WIPP) Contact: Parrish Rouch, Jody Plum, Jon Gailbraith, Daryl Mercer

Location: Approx. 40 miles east of Carlsbad, Eddy County

Discharge Plan Number: DP- 831 UIC Related? Yes No

Type of Operation: Low level nuclear waste storage and disposal facility

Inspection Summary

Purpose:

a. Evaluation of Discharge Plan: Yes

b. Compliance Inspection: Yes

c. Other (Specify):

Activities

a. Inspection of Facilities or Construction (specify): Piezometers, stormwater controls, exhaust fans, exhaust shaft (underground), existing salt pile, new salt storage facility, H-19 pond, domestic waste lagoon system.

b. Effluent Sample (s): (provide sampling location): None
No. of Ponds: 12 No. in Use: 9 Condition of Ponds: good to excellent
Condition of Pond Liner (s): Good to excellent; 3 ponds currently under construction and not yet lined.

c. Ground Water Sample (s) (provide well name and location): None
No. of Monitor Wells: 17 Well Condition: Good

Observations and Information Obtained:

The facility grounds were walked to observe locations of piezometers, and paved and unpaved areas. The #700 exhaust fan system which draw air through the underground facility were also observed. The area around the exhaust fans was observed not to be paved. WIPP personnel indicated the stormwater diversion pathways for different areas of the facility. WIPP and NMED personnel discussed how the collection and disposal of condensate water from the #700 fan system to the H-19 evaporation pond. Mr. Rouch stated that the water has been sampled up to 3 times annually, however there is no regular sampling schedule. The H-19 pond is sampled semi-annually under DP-831. Rick Salness, hydrologist for WIPP, explained his interpretation of why TDS concentrations in the shallow subsurface water (SSW) are lower in the south part of the facility. Stormwater collection ponds #1, #2 and Evaporation Basin A were observed to be excavated, but not yet lined.

WIPP and NMED entered the underground waste storage area to observe the collection of seepage water that occurs at the base of the exhaust shaft. Two HDPE receptacles were located beneath shaft and contained solids and water. WIPP personnel stated that the receptacles are emptied of water periodically. A new receptacle system is being designed and will be installed in the near future. It was observed that the edges of the existing receptacle were not flush with the edges of the shaft and a gap of approximately 9-12 inches was present on both sides. Due to low lighting, the back of the receptacle was not visible.

After lunch, WIPP and NMED staff viewed a video recording of the subsurface water seeping into the exhaust shaft. WIPP personnel emphasized that the video we watched was not representative of typical seepage rates into the shaft, but did show seepage events that were easy to view. The seepage was seen coming through cracks in a concrete liner that covers the shaft walls. Most of the seepage was occurring in a zone ranging from 60 to 80 feet below ground surface.

The Salt Storage Area (SSA) was inspected with the assisitance of Kent Aveson (WTS) beginning with the Salt Pile Evaporation Pond (SPEP). The dimensions of the SPEP were reported to have been altered slightly to accommodate a haul road located east of the pond. The pond contained a newly installed 60 mil HDPE liner with four anchor trenches to keep the liner intact. The Salt Storage Extension (SSE) Evaporation Pond has been installed directly north of the SPEP. The pond contains a double 60 mil HDPE synthetic liner with a leak detection system. Slopes are constructed at 3:1. Immediately east of the SSE Evaporation Pond is Cell A of the Salt Storage Extension. This storage area is lined with a 60 mil HDPE liner and the liner has been covered with two feet of soil for protection. A French drain has been installed through the center of the cell running east to west. Seepage collected in the drain empties into the SSE Evaporation Pond to the west. Cell B of the SSE is being constructed adjacent to Cell A on the east side. Salt is presently being deposited in Cell A of the newly constructed SSE (see attached photo). The old salt pile is located immediately south of the SSE and a cover is presently being installed on the salt pile. The cover consists of a 60 mil HDPE membrane covered by two feet of soil, which will be vegetated. Lined ditches around the perimeter of the salt pile divert runoff to the SPEP located west of the pile. WIPP personnel stated that a geotextile, originally specified to be installed under the HDPE membrane, was instead replaced with several inches of soil or sand. It was reported that the soil provided better protection for the liner. I informed WIPP personnel that NMED should have been contacted in advance of the change in specifications. I requested that WIPP submit a letter detailing the change.

The H-19 evaporation pond located south of the facility was visited next. The pond is lined with 36 mil Hypalon. The pond was approximately half full of water at the time of the inspection. This pond receives non- hazardous condensate water from the #700 exhaust fan system and non-hazardous seepage water from the exhaust shaft catchment. WIPP personnel reported that seepage water from the catchment system that fails TCLP testing is shipped offsite to an approved hazardous waste disposal facility.

The domestic sewage lagoon system was the last facility to be inspected. The system contains seven synthetically lined (36 mil hypalon) ponds, six of which contained effluent. The south evaporation pond was dry and WIPP personnel stated that three of the ponds are being decommissioned because the system is oversized. I requested that WIPP submit a plan within 6 months to fully inspect the liners in all of the lagoons.

Actions Required:

At the closing meeting I requested three submittals from WIPP:

1. A letter detailing the specification change to the cover on the salt pile. Due September 11, 2004.
2. A map showing all unpaved areas at the facility. Due September 11, 2004.
3. A plan to fully inspect the synthetic liners at the domestic sewage lagoon system. Due February 11, 2005.

Comments and Suggestions Relating to the New Mexico Environment Department Oversight and Monitoring of the Waste Isolation Pilot Plant Operations
George Anastas, June 23, 2004

The Waste Isolation Pilot Plant is well into operations. Key activities are either underway or on the horizon. There are a number of concerns relating to the operation of the WIPP. These include, but are not limited to:

Department of Energy proposed changes to New Mexico State regulations relating to the waste that can be disposed at the WIPP,

Transportation, handling and emplacement of remote handled transuranic (RH TRU) waste,

Occupational radiation safety,

Underground mine safety,

Industrial safety,

Compliance Recertification by the US Environmental Protection Agency,

Radioactive releases to the environment (note that in June 2003 a small release of Pu was detected from the exhaust shaft) and related doses to the public, and

Increasing number of waste shipments over New Mexico highways.

Important Items for Oversight and Monitoring of WIPP Operations

I. Based upon the extant and planned activities at the WIPP, the NMED reviews and evaluations shall focus on the technical, scientific and procedures in the areas such as, but not necessarily limited to, the following:

1. New information on site characterization (for example, the effect of the water flow into the exhaust shaft on site characterization).
2. Compliance with the regulatory requirements of the US Environmental Protection Agency.
3. All WIPP facilities, programs and issues either directly or indirectly relating to:
    a. Ventilation,
    b. Hoists,
    c. Engineered barriers,
    d. Plugging and sealing,
    e. Quality assurance and quality control,
    f. Effluent monitoring systems,
    g. Effluent filtration and other safety systems,
    h. Waste handling,
    i. Occupational radiation control,
    j. Hazardous materials control,
    k. Unusual and routine occurrences relating to potential or real impact on public health and safety or the environment, and
    l. Transportation of waste to the WIPP.

4. Operational on-site and off-site environmental monitoring (including the right to either take samples independently or to take split samples).
5. Decontamination activities.
6. Decommissioning plans.
7. Closure and post-closure plans.
8. The WIPP Waste Acceptance Criteria.
9. Waste inventories
10. Evaluation of any waste transportation, storage or disposal containers.
11. Compliance with the health and safety or environmental protection requirements of the Department of Energy, Department of Transportation, Nuclear Regulatory Commission, Environmental Protection Agency, and such other federal agencies, including the Congress, that have promulgated regulatory requirements that have a bearing on the health and safety or environmental protection.
12. Such other WIPP activities, programs or plans as may arise from time to time that have either a direct or indirect bearing on health and safety or environmental protection.

II. The Department of Energy, its contractors and subcontractors, including the Department of Energy Generator Sites and the contractors operating the Sites, shall:

1. Provide the NMED with free, timely and unencumbered access to information and data relating to health, safety or environmental protection issues associated with the operations of the WIPP.
2. Provide the NMED with such preliminary reports relating to health, safety or environmental issues at the WIPP germane to the oversight of the WIPP by the NMED.
3. Provide the NMED with access to all meetings with regulatory agencies relating to health, safety or environmental issues at the WIPP. Written notification of such meetings shall be at least 2 weeks in advance.
4. Provide the NMED with access to all meetings with expert panels and peer review groups relating to health, safety or environmental issues at the WIPP. Written notification of such meetings shall be at least 2 weeks in advance.
5. Provide the NMED with at least one hard copy of all Department of Energy or Department of Energy Contractor reports that relate to the NMED oversight of the Waste Isolation Pilot Plant.
6. Provide the NMED access to ORPS and other routine reports on operational issues at the WIPP or Generator Sites that have a bearing on WIPP operations.
7. Provide the NMED with access to the WIPP Waste Information System (WWIS) ands such other information services relating to the WIPP operations or planning as may be determined from time to time by the NMED.

Oversight-management by overseeing the performance or operation of a person or group, watchful care
Monitoring-Periodic or continuous surveillance or testing to determine the level of compliance with statutory requirements

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

BILL RICHARDSON
Governor

RON CURRY
Secretary

DERRITH WATCHMAN-MOORE

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US. Dept. of Energ
Waste Isolation P
P.O. Box 3090

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

December 22, 2003

Inez Triay, Manager
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Discharge Permit Modification, DP-831, Waste Isolation Pilot Plant (WIPP)

Dear Ms. Triay:

The New Mexico Environment Department (NMED) issues the enclosed Discharge Permit Modification, DP-831 to the Department of Energy Waste Isolation Pilot Plant (WIPP) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978§§74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

The Discharge Permit Modification contains terms and conditions that shall be complied with by WIPP and are enforceable by NMED pursuant to WQCC 20.6.2.3104, WQA, NMSA 1978 § 74-6-5 and §74-6-10. Issuance of this Discharge Permit Modification does not relieve WIPP of its responsibility to comply with the WQA, WQCC Regulations, or any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

Pursuant to 20.6.2.3109.H.4 NMAC, this Discharge Permit Modification shall expire on **April 29, 2008**, the same day the Discharge Permit, DP-831 will automatically terminate. You must submit an application for renewal at least 120 days before the permit expiration date.

Sincerely,

Jerry Schoeppner, Chief
Ground Water Quality Bureau

JS:MAM:clm

Enclosure: Discharge Permit Modification

xc: Carl Stubbs, District Manager, NMED District 4
NMED Carlsbad Field Office

GROUND WATER DISCHARGE PERMIT MODIFICATION
U.S. DEPARTMENT OF ENERGY, DP-831
WASTE ISOLATION PILOT PLANT (WIPP)

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Modification to the Discharge Permit, DP-831, to U.S. Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit Modification, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the WIPP into ground and surface water, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses and protect public health. In issuing this Discharge Permit Modification, NMED has determined that the requirements of Section 20.6.2.3109.C NMAC have been met.

The activities which produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics of the discharge were described in the Discharge Permit issued April 29, 2003, as follows:

> Up to 23,000 gallons per day of sewage effluent is discharged to a series of seven synthetically lined ponds for treatment and evaporation (facultative lagoon system). Up to 2,000 gallons per day of non-hazardous brine water is discharged to a synthetically lined evaporation cell (north evaporation cell). Up to 8,000 gallons per day of non-hazardous brine water generated from mine dewatering activities, pumping of groundwater wells, and from other non-hazardous sources is discharged to a synthetically lined evaporation pond (H-19 evaporation pond). Up to 100 gallons per year of neutralized acid waste will also be discharged to the facultative lagoon system.

The Discharge Permit Modification to the WIPP wastewater disposal system is briefly described as follows:

> In addition to the daily discharge of 33,100 gallons per day of sewage effluent, brine and neutralized acid waste approved in the April 29, 2003 Discharge Permit Renewal, WIPP will be authorized to discharge up to 3,231,260 gallons per day of storm water runoff as a result of rainfall events that occur at the site. The runoff occurs from the plant facility and approximately 17 acres of excavated salt (salt piles) stored on the north side of the facility. The purpose for containing the storm water runoff is to minimize infitration into the subsurface, which has resulted in the accumulation of shallow subsurface water (SSW) below the WIPP facility. During the term of this permit additional salt storage capacity and associated storm water controls will be constructed immediately north of the existing salt pile. Storm water runoff from the Salt Storage Area (SSA) will be contained in the Salt Storage Extension Basin for evaporation. The remaining three basins will

collect storm water not specifically associated with the SSA, but from other areas around the WIPP facility.

The facility is located approximately 26 miles east of Carlsbad in Sections 28 and 29, T22S, R31E, Eddy County. Regional ground water below the site is at a depth of approximately 608 feet and has a total dissolved solids concentration of approximately 3,920 milligrams per liter. The shallow subsurface water (SSW) below the site is at a depth of approximately 60 – 80 feet.

The WIPP Discharge Permit Modification consists of the materials submitted by the DOE dated October 30, 2002, April 24, 2003, and July 24, 2003. In addition, the discharge plan includes information and materials submitted as part of the original discharge plan approved on Janurary 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998, amended on January 24, 2000, and renewed on April 29, 2003. The discharge shall be managed in accordance with the discharge plan as conditioned by the Discharge Permit approved April 29, 2003, and this Discharge Permit Modification.

Issuance of this Discharge Permit Modification does not relieve the DOE of its responsibility to comply with any conditions or requirements of the Discharge Permit, DP-831, approved April 29, 2003, the WQA, WQCC Regulations, any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

The following abbreviations may be used in this permit modification:

Abbreviation	Explanation		Abbreviation	Explanation
DOE	Department of Energy		TDS	total dissolved solids
NMAC	New Mexico Administrative Code		WIPP	Waste Isolation Pilot Plant
NMED	New Mexico Environment Department		WQCC	Water Quality Control Commission

II. FINDINGS

In issuing this Discharge Permit Modification, NMED finds:

1. The DOE is discharging effluent or leachate from the WIPP facility so that such effluent or leachate may move directly or indirectly into ground water within the meaning of Section 20.6.2.3104 NMAC.

2. The DOE is discharging effluent or leachate from the WIPP facility so that such effluent or leachate may move into ground water of the State of New Mexico which has an existing concentration of 10,000 milligrams per liter or less of total dissolved solids within the meaning of Section 20.6.2.3101.A NMAC.

III. CONDITIONS

The following conditions of this Discharge Permit Modification shall be added to the requirements of the Discharge Permit renewal approved on April 29, 2003. The following conditions shall be complied with by the DOE and WIPP (permittee) and are enforceable by NMED:

OPERATIONS

1. The permittee is authorized to discharge up to 3,231,260 gallons per day of storm water runoff from the WIPP site to five synthetically lined retention basins for evaporation. [20.6.2.3104 NMAC]

Storm Water Controls:

2. The permittee shall install infiltration control measures, including synthetically lined impoundments, to mimimize infiltration of storm water runoff into the subsurface at the WIPP facility. The primary control structures include Evaporation Basin A, Pond 1, Pond 2, the Salt Storage Extension (SSE) (Cells A and B), the Salt Storage Extension Evaporation Basin, the Salt Pile Evaporation Pond (SPEP), and berms and ditches associated with these structures. The installation of the storm water control structures shall be in accordance with the application for discharge permit modification dated April 24, 2003, or in accordance with subsequent design and specification amendments subject to approval by NMED. The structures shall be completed according to the schedule dated July 24, 2003. Extensions may be granted per written request for good cause shown. [20.6.2.3109 NMAC]

MONITORING AND REPORTING

4. The permittee shall conduct the following monitoring, reporting, and other requirements listed below in accordance with the WQCC Regulations at 20.6.2.3107 NMAC and the monitoring plan submitted by the permittee dated July 25, 2003. A summary of monitoring requirements is attached to this permit as Table 1. A monitoring schedule is attached as Table 2. [20.6.2.3107 NMAC]

Sampling and Field Measurements:

5. Storm Water Collection Ponds – The permittee shall sample the SPEP, the SSE Evaporation Basin, Evaporation Basin A, Pond 1, and Pond 2 as follows:

   A. The permittee shall record the water depth to the nearest hundredth of a foot (0.01 ft), and the approximate volume of stormwater in each of the four storm water collection ponds once per year after a storm event where sufficient quantity of water has collected in the respective basins, during the same storm event in which water quality sampling is conducted (Condition 5B).

B. The permittee shall collect samples from each of the four storm water collection ponds once per year following a single storm event where water quantity has been measured (Condition 5A), and analyze for the water parameters listed in Conditions 7B and 7C below.

Analytical results and water level measurements shall be reported as required in Condition 9 below. [20.6.2.3107 NMAC]

6. Ground Water Monitoring Wells – The permittee shall sample the following monitoring wells and piezometers:

A. Monitoring Wells/Piezometers PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-6, PZ-7, PZ-8, PZ-9, PZ-10, PZ-11, PZ-12, C-2505, C-2506, C-2507, C-2811 and WQSP-6A shall be sampled as follows:

1) The permittee shall record the depth to the water table to the nearest hundredth of a foot (0.01 ft) above msl, quarterly.

B. Monitoring Wells/Piezometers PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, C-2507, C-2811 and WQSP-6A shall be sampled as follows:

1) The permittee shall collect samples from each well semi-annually and analyze the samples for the water parameters listed in Conditions 7A, 7B and 7C below.

Analytical results and water level measurements shall be reported as required in Condition 9 below. [20.6.2.3107 NMAC]

Analysis:

7. The permittee shall analyze samples of ground water and storm water for the parameters listed below. Samples of ground water from monitoring wells and piezometers shall be analyzed for dissolved concentrations of the analytes listed below. Samples of storm water shall exclude field parameters and shall be analyzed for dissolved and total concentrations of the analytes listed below. [20.6.2.3107 NMAC]

A. Field parameters (analysis to be performed in the field): pH, temperature and specific conductance.

B. General chemistry parameters: nitrate, sulfate, chloride, and total dissolved solids.

C. Trace metals: selenium, chromium

Methodology:

8. Unless otherwise approved in writing by NMED, the permittee shall conduct sampling

and analysis in accordance with the most recent edition of following documents:

A. American Public Health Association, *Standard Methods for the Examination of Water and Wastewater.*

B. U.S. Environmental Protection Agency, *Methods for Chemical Analysis of Water and Waste.*

C. U.S. Geological Survey, *Techniques for Water Resource Investigations of the U.S. Geological Survey.*

D. American Society for Testing and Materials, *Annual Book of ASTM Standards*, Part 31. Water.

E. U. S. Geological Survey, et al., *National Handbook of Recommended Methods for Water Data Acquisition.*

F. NMED Guidance, *Use of Low-Flow and Other Non-TradtionalSampling Techniques for RCRA Compliant Groundwater Monitoring.*

G. Surface water monitoring must also be conducted according to test procedures approved under Title 40 Code of Federal Regulations Part 136. [20.6.2.3107B NMAC]

Reporting:

9. The permittee shall submit to NMED a semi-annual report by the last day of January and July of each year. Reports shall use the following format:

A. A summary of all activities related to the discharge during the preceding 6 month period. Activities may include general operations, construction or demolition of structures, maintenance and repairs, water management, water quality and ground water level trends, and precipitation patterns.

B. A single table in a paper and electronic format (EXCEL spreadsheet) of water level measurements and water quality data with only those constituents analyzed and water levels measured during a single event shown in columns. Tabulated electrical conductivity shall include the measured field values and corrected values to 25 degrees Celsius. Monitoring sites shall be shown in rows. Values exceeding standards shall be bolded. Any constituent not analyzed for a particular site shall be shown as "NA", any site not sampled shall be shown as "NS" with an associated reason, and any site not measured for water levels shall be shown as "NM" with an associated reason.

C. Copies of the signed laboratory analyses sheet shall be provided semi-annually.

D. A potentiometric map for the WIPP facility area shall be submitted annually. The map shall incorporate the most recent water level data for all monitoring wells and piezometers installed in the shallow subsurface water (SSW). [20.6.2.3107 NMAC]

GENERAL TERMS AND CONDITIONS

10. In addition to any other requirements provided by law, approval of this Discharge Permit Modification is subject to the General Requirements as specified in the Discharge Permit approved on April 29, 2003. Refer to the Discharge Permit Renewal, DP-831, approved April 29, 2003, for specific information on the following General Requirements

    Monitoring and Reporting
    Record Keeping
    Inspection and Entry
    Duty to Provide Information
    Spills, Leaks and Other UnAuthorized Discharges
    Retention of Records
    Enforcement
    Modification and/or Amendments

Compliance with Other Laws:

11. Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of its obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders. [20.6.2 NMAC]

Right to Appeal:

12. The permittee may file a petition for hearing before the WQCC on this Discharge Permit Modification. Such petition shall be in writing to the WQCC within thirty (30) days of the receipt of this Discharge Permit Modification. Unless a timely petition for hearing is made, the decision of NMED shall be final. [74-6-5.N WQA]

Transfer of Permit:

13. Prior to any transfer of ownership, control, or possession of this permitted facility or any portion thereof, the permittee shall notify the proposed transferee in writing of the existence of this Discharge Permit and include a copy of this Discharge Permit with the notice. The permittee shall deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee. [20.6.2.3111 NMAC]

Term:

14. The term of this Discharge Permit Modification expires on **April 29, 2008,** the same day the Discharge Permit will automatically terminate. To renew the Discharge Permit, the permittee must submit an application for renewal at least 180 days before the termination date. [20.6.2.3109(H) NMAC, 74-6-5.H WQA]

ISSUED: December 22, 2003

EXPIRES: April 29, 2008

JERRY SCHOEPPNER
Chief, Ground Water Quality Bureau
New Mexico Environment Department

WASTE ISOLATION PILOT PLANT, DP-831
DISCHARGE PERMIT MODIFICATION
MONITORING SUMMARY
Monitoring Reports are due by: 31-JAN, 31-JUL

Table 1: Monitoring Summary

Annual Sampling Frequency	Annual Reporting Frequency	Number of Sites	Sampling Description
1	1	5	Depth and approximate volume of water in each of 5 storm water collection ponds.
1	1	5	NO_3, SO_4, Cl, TDS, TDS, Se & Cr annually in 5 storm water collection ponds.
4	2	17	Water levels in 17 monitoring wells and piezometers.
2	2	11	NO_3, SO_4, Cl, TDS, Se & Cr semi- annually in 11 monitoring wells and piezometers.
12		12	Monthly inspections of all ponds.
1	1	1	Potentiometric map submitted annually.
2	2	1	Activities report submitted semi-annually

Table 2: Ground Water Monitoring Schedule

Area		Sampling					
Sub-area	Well Number	type	Q1	Q2	Q3	Q4	Notes
South and West of Laguna Grande							
	PZ-1	pz	W	WABC	W	WABC	
	PZ-2	pz	W	W	W	W	
	PZ-3	pz	W	W	W	W	
	PZ-4	pz	W	W	W	W	
	PZ-5	pz	W	WABC	W	WABC	
	PZ-6	pz	W	WABC	W	WABC	
	PZ-7	pz	W	WABC	W	WABC	
	PZ-8	pz	W	W	W	W	
	PZ-9	pz	W	WABC	W	WABC	
	PZ-10	pz	W	WABC	W	WABC	
	PZ-11	pz	W	WABC	W	WABC	
	PZ-12	pz	W	WABC	W	WABC	
	C-2505	mw	W	W	W	W	
	C-2506	mw	W	W	W	W	
	C-2507	mw	W	WABC	W	WABC	
	C-2811	mw	W	WABC	W	WABC	
	WQSP-6A	mw	W	WABC	W	WABC	

Explanation to Abbreviations and Symbols

Type: mw = monitoring well pz = piezometer	Sampling Quarter: Q1 = Jan-Mar Q2 = Apr-Jun Q3 = Jul-Sep Q4 = Oct-Dec
Sampling Analytical Suites: A = Field parameters: Temp, pH, specific conductance B = General chemistry parameters: SO_4, Cl, TDS, NO_3, C = Metals: Se, Cr W = Depth to water measurement to the nearest 0.01 foot.	

Submit all monitoring reports to: Clint Marshall
Ground Water Quality Bureau
P.O. Box 26110
Santa Fe, New Mexico 87502

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

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Secretary

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R.P. Detwiler, Acting Manager
US Dept. of Energy/PO Box 3090
Waste Isolation Pilot Plant
Carlsbad, New Mexico 88221-3090

PS Form 3800, June 2002 See Reverse for Instructions

CERTIFIED MAIL – RETUR

June 9, 2004

R. P. Detwiler, Acting Manager
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Corrective Action Approval, DP-831, June
Pilot Plant

Dear Mr. Detwiler:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received the Written Notification and Corrective Action Report, submitted by the U.S. Department of Energy on June 8, 2004. The report addresses a discharge of domestic sewage at the Waste Isolation Pilot Plant (WIPP) that was discovered on June 3, 2004. The corrective action report is hereby approved for ground water related concerns pursuant to the New Mexico Water Quality Control Commission (WQCC) Regulations, Section 1203.A.6 NMAC.

The incident is briefly described as follows:

On June 2, 2004, during the grading and lining of an evaporation pond on the southwest side of the facility, construction crews using heavy equipment damaged a buried sewer line. The spill was discovered at 6:30 am on June 3, 2004. The top portion of the 8-inch sewer line was damaged allowing approximately 300 gallons of domestic sewage to be released into adjacent soils.

The corrective actions are summarized as follows:

The upstream manhole on the sewer line was blocked by sandbags to prevent further releases from the damaged pipe. Contractors using protective gear replaced an 81-foot length of pipe. Calcium hypochlorite was placed on the backfilled soil after repairs were complete.

If additional information becomes available indicating these corrective actions are inadequate, then additional actions may be required. Approval of this corrective action report does not relieve you of your responsibility to comply with any other applicable federal, state and/or local laws and regulations.

If you have any questions, please call Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027.

Sincerely,

Jerry Schoeppner, Chief
Ground Water Quality Bureau

JS/CLM

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUN 10 2004

JUN 08 2004

Mr. Clint Marshall
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Follow-Up Report Required By 20.6.2.1203 (3) NMAC And 15 Day Corrective Action Report Required by 20.6.2.1203 (6) NMAC for the June 2 and 3, 2004 Domestic Sewage Release at WIPP

Dear Mr. Marshall:

On June 3, 2004, the Department of Energy provided verbal notification of a release of domestic sewage from a broken sewer line at the WIPP Site. The purpose of this letter is to provide the seven-day follow-up report required by 20.6.2.1203 (3) NMAC and the 15-day corrective action report required by 20.6.2.1203 (6) NMAC.

The release was discovered at approximately 6:30 a.m. on June 3, 2004. Contractors responsible for grading and lining Evaporation Pond A on the southwest side of the facility discovered the leak. The sewer line had apparently been damaged on the afternoon of June 2, 2004 by heavy equipment that had been operating in the area supporting construction activities. No visible sign of leaking sewage was apparent until the following morning. The release posed no significant threat to the environment and every precaution was taken to protect construction personnel from exposure to raw sewage. All construction personnel involved in the repair of the sewer line were provided Hepatitis B and Tetanus shots. Additionally, response personnel wore Ty-Vek® coveralls, rubber boots and gloves. Calcium hypochlorite was added to the spill area as a disinfectant in accordance with your recommended corrective action.

The following information is provided as required by 20.6.2.1203 (3) and (6) NMAC:

1. Name, address, and telephone number of the person or persons in charge of the facility, as well as the owner and/or Operator of the facility:

Facility Owner:	United States Department of Energy
Person in Charge of the Facility:	R. P. Detwiler, Acting Manager Carlsbad Field Office
Address:	P.O Box 3090 Carlsbad, NM 88221
Phone Number:	505-234-7300
Facility Operator	United States Department of Energy
Responsible Individual:	George Basabilvazo
Address:	P.O Box 3090 Carlsbad, NM 88221
Phone Number:	505-234-8103

CBFO:OEC:HJP:JGW:04-0382:UFC:5486

2. Name and address of the Facility:

   Waste Isolation Pilot Plant
   26 miles E-SE of Carlsbad, NM.

3. Date, time and location of the discharge:

   Afternoon of June 2, 2004 through 3:50 pm June 3, 2004 (approximately 24-hours)

4. The estimated volume of the discharge:

   A conservative estimate of the volume of sewage released is 300 gallons based on a visual observation of the pooled sewage. The release occurred within the excavation of a newly constructed pond with highly compacted soil that was being prepared for the installation of a synthetic liner.

   Based on the totalizing sewage effluent flow meter an average of 148 gallons per hour was discharged over the 24-hour period that sewage was released. This equates to 3,562 gallons for the duration of the discharge. The majority of this water was not released to the environment but continued to flow through the portion of the sewer line that remained intact.

5. Any actions taken to mitigate immediate damage from the discharge:

   Upon discovery of the release, notifications were made and plans prepared for the repairs. The contractor responsible for the repairs had 8-inch pipe, fittings, and safety equipment delivered from Carlsbad, NM. Personnel began excavating the dirt covering the pipe. The affected pipe ran a length of 81 feet. One hundred feet of pipe was excavated to ensure all damaged pipe was replaced. Sandbags were placed in the upstream manhole to prevent the release of solids and minimize the sewage released while the new pipe was installed. By 3:50 p.m. on June 3, 2004, the new pipe was connected. Calcium hypochlorite was placed on the contaminated back-filled soil after repairs were complete.

Please advise us if you have any questions, or require any additional information. Please direct any inquiries to Mr. H. L. Plum, of my staff at (505) 234-7462.

Sincerely,

R. P. Detwiler, Acting Manager
Carlsbad Field Office

cc:
H. Johnson, CBFO
L. Piper, CBFO
H. Plum, CBFO
C. Zvonar, CBFO
S. Martin, NMED
J. Kieling, NMED
S. Colt, CBFO
V. Waldram, CBFO

CBFO:OEC:HJP:JGW:04-0382:UFC:5486

bcc:
D. T. Bignell, WRES
G. J. Johnson, WTS
R. F. Kehrman, WRES
R. D. Reeves, WRES
S. D. Warren, WTS

CBFO:OEC:HJP:JGW:04-0382:UFC:5486

Memorandum of Meeting or Phone Conversation

☒ Telephone ☐ Meeting	**Time:** 10:00 AM	**Date:** 6/3/04

Individuals Involved

Parrish Roush, Stuart Jones, Jody Plum	☒ called	Clint Marshall
	☐ returned call to	
	☐ teleconference	
	☐ other:	

Subject: Sewage Spill at the WIPP Site

Discussion:

WIPP called to report a spill that was discovered the morning of 6/3/04. It was believed to have occurred the day prior when heavy equipment being used to excavate Pond A accidentally crushed a sewer line. The line was an 8-inch concrete pipe that transferred sewage waste to the facultative lagoons from the WIPP site. Approximately 300 gallons spilled on the ground immediately surrounding the damaged pipe. Much of the spilled liquid eventually moved back into the pipe, which was caved in from above. Contractors were called in to repair the line in the afternoon of 6/3/04.

Conclusions:

A report will be sent detailing the characteristics of the spill and actions to mitigate and repair the damaged line.

Distribution:

Initialed [signature]

New Mexico En   nment Department
Ground Water Quality Bureau

Memorandum of Meeting or Phone Conversation

Memorandum of Meeting or Phone Conversation

☐ Telephone ☐ Meeting	Time: 3:00 PM	Date: 4/22/04

Individuals Involved

Parrish Rouch, Dave Emory, Harold Johnson, Steve Travis, Stuart Jones

☐ called — Clint Marshall

☐ returned call to

☒ teleconference

☐ other:

Subject: Proposal to Store Well Development Water in the Domestic Wastewater Lagoons

Discussion:

A teleconference took place to discuss a proposal from WIPP to store development water from several wells in part of the facultative lagoon system at WIPP. The wells will be drilled into the Culebra Formation over the next several months. The development water will be primarily brine. WIPP wants to decommission three of the domestic facultative lagoons and - convert them to storage facilities for the brine that will be produced from the wells. The H-19 pond will also be used for this purpose. They want to begin this process soon, so we discussed WIPP obtaining a temporary permission for 120 days while the permit was being modified. I informed them that I was concerned with the apparent "shortcuts" they seemed to be taking to save costs for water storage. I also expressed my concerns for the integrity of the liners in the lagoon system. Since subsurface seepage is already a problem at the sight, I would like to see a full inspection of the liners in all of the lagoons prior to setting up the system they propose. I envisioned decommissioning one side, inspecting and repairing leaks, then switching the effluent to the repaired lagoons and repeating the process for the other side.

WIPP will be submitting requests for temporary permission and a permit modification.

Conclusions:

Distribution: File DP-831

Initialed Clm

ate of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2900
Fax (505) 827-2965

BILL RICHARDSON
Governor

RON CURRY
Secretary

DERRITH WATCHMAN-MOORE
Deputy Secretary

December 22, 2003

Steve Travis
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 2078
Carlsbad, New Mexico 88221-2078

RE: Disposal of Well Development Water at Controlled Recovery, Inc.

Dear Mr. Travis,

The U.S. Department of Energy Waste Isolation Pilot Plant (WIPP) recently contacted the New Mexico Environment Department (NMED) concerning the ground water discharge permit for the Controlled Recovery, Inc. (CRI) landfarm facility. WIPP inquired whether the permit for CRI authorized the facility to receive water from the development of several monitoring wells being drilled at the WIPP facility.

CRI is authorized to receive well development water for disposal at their facility. However, due to the expected high TDS and chloride content, CRI is not allowed to land apply the water. The water must be evaporated in synthetically lined impoundments or steel tanks.

The discharge permit for CRI is currently in the process of being renewed. Final approval is expected by the end of the month. If you have any questions regarding this matter, please contact me at 505-827-0027.

Sincerely,

Clint Marshall, Hydrologist
Mining Environmental Compliance Section
Ground Water Quality Bureau

xc: Carl Stubbs, District Manager, NMED District 4
Ken Marsh, Controlled Recovery, Inc., P.O. Box 388, Hobbs, NM 88241

03-161

Analysis of Observed Deviations from the Steady-State Model
of the Culebra Aquifer, Waste Isolation Pilot Plant

Lawrence E. Allen
Environmental Evaluation Group
Albuquerque, NM

Matthew K. Silva
Environmental Evaluation Group
Albuquerque, NM

ABSTRACT

The Waste Isolation Pilot Plant (WIPP) is a geologic repository for disposal of transuranic waste and is operated by the US Department of Energy (DOE). The repository is located at a depth of 655 m in the Permian age salt beds of the Salado Formation, 40 km east of Carlsbad, NM. The site began receiving waste in March 1999, following initial certification by the Environmental Protection Agency (EPA). The WIPP Land Withdrawal Act requires a recertification of the project every five years.

Observed increases in the monitoring well head values have raised concerns about the validity of the steady-state flow model used for performance assessment during the initial certification. The DOE is revisiting the modeling of the Culebra Member, and the Environmental Evaluation Group (EEG), in its oversight role, has begun an independent analysis of the flow and transport system and its ramifications on recertification.

INTRODUCTION

The Waste Isolation Pilot Plant (WIPP), a geologic repository for disposal of defense transuranic waste, was built and is operated by the US Department of Energy (DOE). The WIPP Land Withdrawal Act (LWA) required initial certification of compliance of the WIPP by the US Environmental Protection Agency (EPA) (LWA 1992). In addition, a recertification decision is required by the LWA every five years, dated from the initial receipt of waste. Recertification of compliance must consider new information resulting from operating experience of the facility and ongoing scientific investigation. The first recertification is due by March 2004.

The Culebra dolomite unit of the Rustler Formation is acknowledged as a likely pathway for breach of the WIPP repository. In the original WIPP Compliance Certification Application (CCA), the importance of the Culebra Aquifer to certification was noted, "Major emphasis is placed on the Culebra Member of the Rustler Formation because this is by far the most transmissive geologic layer in the disposal system" (DOE 1996).

The water level in the Culebra began increasing in April 1988 (Beauheim 1990; Silva 1996) and continues to rise. At the time of the CCA, water level increases in the vicinity of the WIPP were attributed to recovery in response to shaft sinking. Increases occurring to the north of the site were thought to be related to infiltration from potash recovery operations. The increases to the south were left unexplained (DOE 1996). However, even after recovery due to site construction is assumed to be completed, the levels have continued to increase.

Since the increasing water heads were thought to be short-lived, the modeling performed in support of the CCA assumed steady-state conditions and the aquifer was conceptualized as two-dimensional and non-leaky. However, the continued increases have forced the DOE to reconsider those assumptions for the first recertification of the WIPP. The DOE has identified several possible causes for these increases, but additional data and modeling is necessary in determining the source. It has become apparent that the time necessary for this work would likely push back resolution of this issue until after the first recertification date.

The Environmental Evaluation Group (EEG), in their role of providing independent technical oversight of the WIPP project on behalf of the State of New Mexico, has reviewed the work to date on resolving this issue and has conducted independent modeling analyses. To date, this has included: 1) a review of the hydrogeologic framework, 2) an analysis of the transmissivity regression model, 3) a review of the transmissivity field simulation, and 4) an assessment of the uncertainty associated with the simulation technique. Sandia National Laboratories (SNL) performed the original interpretations and analyses on behalf of the DOE.

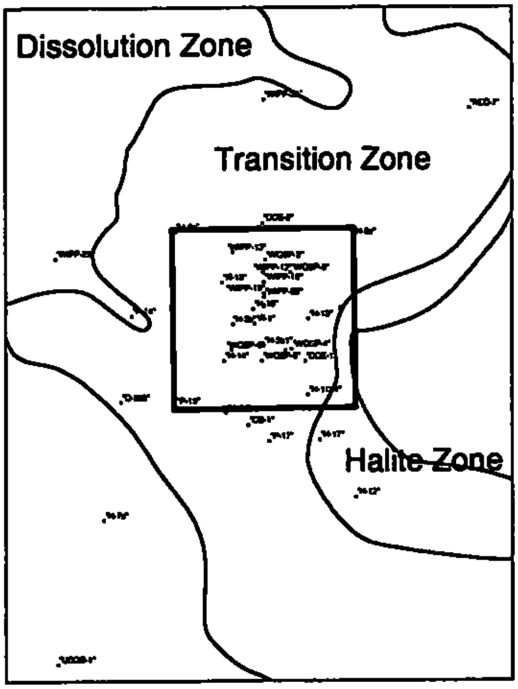
HYDROGEOLOGIC FRAMEWORK

The WIPP resides in the Salado Formation, approximately 655 m below the surface. Overlying the Salado Formation is the Ruster Formation, the most transmissive formation in the vicinity of the WIPP (Mercer and Gonzalez 1981). This Permian age formation consists of anhydrite, siltstone, mudstone, halite, and dolomite members: the Magenta and Culebra. The Culebra is the most transmissive unit located above the repository and has been the focus of much study because of its potential for transport of radionuclides if the repository were breached.

To the west of the WIPP is a large zone of Salado Formation dissolution. This dissolution fractured the various Rustler strata, resulting in increased hydraulic conductivity of the Culebra. East of the WIPP the halite is mostly intact, resulting in a broad area of low hydraulic conductivity. Interpretation of these boundaries in relation to the WIPP is shown in Figure 1. In addition, the depth to the Culebra increases to the east, with fracture apertures decreasing with the increasing overburden and the number of fractures decreasing with distance from the dissolution zone (Holt 2002). Thus the WIPP lies in a transition zone of variable transmissivity bounded by the high transmissivity dissolution zone on the west and the low transmissivity halite zone on the east.

Therefore, while the well-defined high and low transmissivity zones bounding the WIPP can be delineated through geological interpretation, the localized

Figure 1
Interpreted Geological Boundaries



areas of high and low transmissivity within the transitional zone cannot. Transmissivity in this zone is controlled by a complicated history of fracturing with associated gypsum precipitation and dissolution within the fractures. Well-interconnected fractures create high transmissivity zones (Holt 2002).

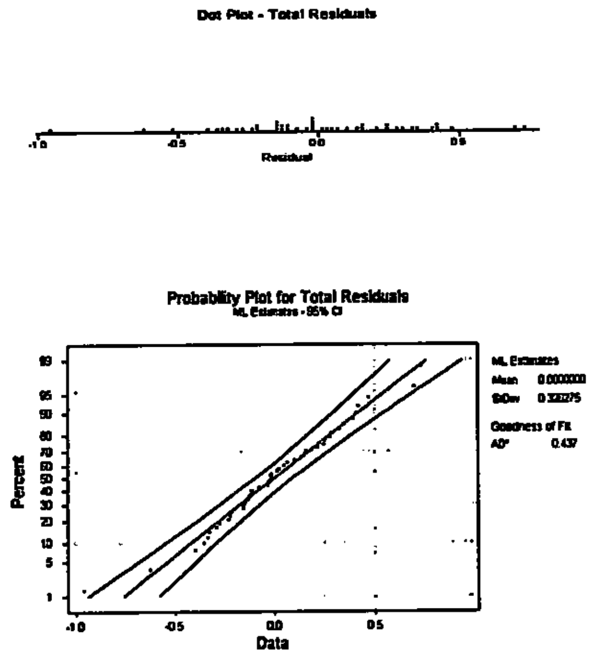
TRANSMISSIVITY REGRESSION MODEL

A regression model was developed by SNL for estimation of grid transmissivity values by regressing the log transform of transmissivity against depth from the surface to the Culebra (Holt 2002). This model considers three populations: 1) low transmissivity locations, 2) high transmissivity locations resulting from Salado dissolution, and 3) high transmissivity locations in the transition, or middle, zone caused by well-interconnected fractures. Data from 46 wells were used in this model. EEG assessed this model through an analysis of residuals.

While analysis of residuals does not result in a model necessarily being confirmed, it is a means for determining whether modeling assumptions appear to be violated (Draper and Smith 1981). Residuals of spatial data are further examined to ascertain the existence of spatial bias. This may include non-random zones of over- or under-estimation which may reflect poorly on a model's ability to represent local conditions. This may also highlight geological zones that have not been previously delineated or that are delineated improperly, e.g. boundary problems.

The mean of each of the residual populations is 0.000 m^2/sec. This would be expected from a regression model and desired as a first indicator of non-biasness. Figure 2 shows residual statistics for the various populations. The dot plots show relatively low spread with data generally concentrated about the mean while the probability plots suggest that the distributions of residuals are approximately normal. All of these statistics and plots show that the sub-populations are statistically "well behaved". This condition is generally referred to as conditional unbiasedness and is a first check on delineation of geological zones and assessment of local estimation (Isaaks and Srivastava 1989).

Figure 2
Residual Statistical Plots



Finally, the residuals were plotted and the positive versus negative values were delineated. It would be desirable for the spatial distribution of positive and negative values to be random. Spatial groupings of positive and negatives or groupings of high residuals may suggest poor local estimation or insufficient geological delineation. Some groupings of positives and negatives exist, which may indicate that local definition of zones is not satisfactory.

GEOSTATISTICAL SIMULATION

SNL designated a 0/1 indicator to represent low versus high transmissivity for each well location. Only wells located in the middle zone, between the dissolution zone on the west and the halite zone on the east, were used. Transmissivity was log-transformed (log T) for this analysis. Wells with a log T value greater than -5.4 were assigned a "1" and those less than -5.4 were assigned a "0". A variogram was then computed on these indicator transforms.

EEG conducted a cross validation analysis to check the robustness of the variogram model. In cross validation the measured log T value at a particular location is temporarily ignored and that location is estimated using ordinary kriging. As this is done for each well location, a distribution of errors, or residuals, is developed. This distribution can be analyzed both statistically and visually to determine the adequacy of the variogram function and kriging parameters for use in the simulation process.

The distribution of validation errors suggests global non-biasness. However, mapping of overestimation versus underestimation suggest systematic spatial bias. This bias probably results from unevenly spaced data and suggests poor local estimation, resulting in considerable uncertainty. The conditional simulation method used by SNL would be appropriate for capturing this uncertainty.

Using the indicator transformed data from the well locations and the variogram model, one hundred realizations of high/low zones were generated by SNL using sequential indicator simulation. These simulations were confined to the interpreted transition zone. Grid nodes were simulated on a 50 m spacing.

One hundred realizations of T-fields were then generated by the regression model using the high/low realizations, the interpreted salado and halite boundaries, and the depth to Culebra map.

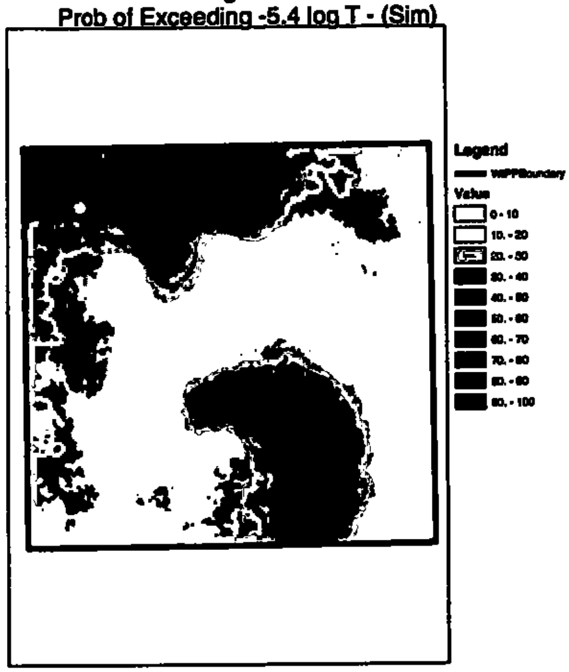
ASSESSMENT OF UNCERTAINTY

Uncertainty was assessed by EEG in two ways: 1) a probability map was constructed from the 100 SNL generated simulations, and 2) an alternative technique was used to estimate transmissivity for comparison to the simulated results.

Probability Mapping

Probability mapping is a means of visualizing multiple realizations on one map (Goovaerts 1997). At each simulated grid node, the probability of exceeding a given threshold is the proportion of simulated realization values above that threshold. Thus the 100 SNL realizations were post-processed and probabilities at each grid node were computed by EEG. The probability of exceeding the -5.4 log T threshold within the WIPP boundary is shown in Figure 3.

Figure 3
Prob of Exceeding -5.4 log T - (Sim)



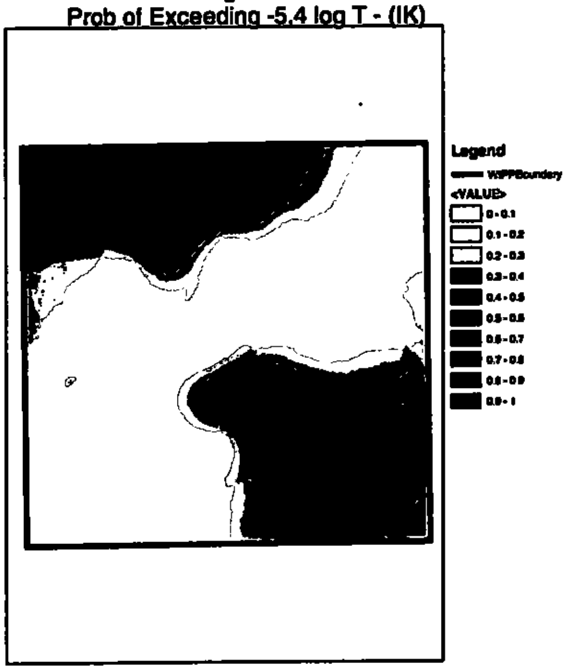
Multiple Indicator Kriging

Another means of assessing uncertainty is comparison of the simulated results with those generated by an appropriate estimation technique. EEG estimated non-transformed transmissivity using multiple indicator kriging, a non-parametric technique suitable for highly skewed distributions. This technique was applied as follows:

1) Nine threshold values were selected, dividing the distribution of transmissivities into deciles. These thresholds are: 1.58×10^{-7}, 1.99×10^{-7}, 2.51×10^{-7}, 3.16×10^{-7}, 6.31×10^{-7}, 1.0×10^{-6}, 3.98×10^{-6}, 1.26×10^{-5}, and 3.16×10^{-5} m^2/sec.
2) Indicator variograms were computed for the nine thresholds where a "0" was assigned for transmissivity values greater than or equal to the threshold, and a "1" for values less than the threshold.
3) Ordinary indicator kriging was used to generate cumulative indicator functions and compute the probability estimates for grid nodes, spaced at 50 m. The search parameters were the same as those used by SNL during conditional simulation.

A probability map was then generated from the local grid distributions for comparison to that from the SNL simulations. This map is shown in Figure 4. The probability map resulting from indicator kriging shows the same general trends as seen from the simulations. However, it is much smoother, extending the high and low zones into the areas of low data density. This method provides a reasonable check on the simulation method, but simulations provide a better characterization of uncertainty.

Figure 4
Prob of Exceeding -5.4 log T - (IK)



CONCLUSIONS

Development of geologically based T-fields using a well conceived hydrogeologic framework is a good first step towards the understanding of the hydrologic system and determining the source of increasing heads. This is important for evaluation of potential transport of radionuclides within the Culebra.

The results of the regression residual analysis do not contradict the assumptions of the SNL model. It appears that the model can satisfactorily estimate transmissivity at grid nodes, assuming proper geological delineation of the zones. The simulation technique used for generation of multiple transmissivity field realizations appears reasonable, generally agreeing with a multiple indicator kriging estimate of the transmissivity field.

Future work includes validation of calibrated transmissivity fields. This work could then be extended to a multi-layered hydrological model to assist in determining the source of increasing heads.

REFERENCES

Beauheim, Richard. 1990. January 12 report on recent rise in the Culebra water levels around the WIPP site to the Sandia National Laboratories Fluid Flow and Transport Division 6344. Albuquerque (NM): Sandia National Laboratories.

[DOE] US Department of Energy. 1996. Title 40 CFR 191 compliance certification application for the Waste Isolation Pilot Plant, October 1996. Carlsbad (NM): Carlsbad Area Office. DOE/CAO-1996-2184. 21 volumes.

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Silva, Matthew. 1996. Fluid injection for salt water disposal and enhanced oil recovery as a potential problem for the WIPP. Proceedings of a June 1995 workshop and analysis. Albuquerque (NM): Environmental Evaluation Group. EEG-62.

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

NOV 19 2003

RECEIVED
NOV 24 2003

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Drive
PO Box 26110
Santa Fe, NM 87502

Subject: Estimated Schedule for Engineered Controls for Infiltration Project

Dear Mr. Marshall:

On September 16, 2003, several members of our management team presented, to you and Mr. Jerry Schoeppner, the status of the "Shallow Subsurface Water at WIPP" in regard to Water Budget Analysis Source Controls. Included in the presentation and discussion was our estimated completion of all engineered controls being December 2004. On November 6, 2003, you requested specific completion dates for each of the engineered controls. Our estimated completion dates are as follows:

SSE Pond	January 2004
Cell A	April 2004
Cell B	To be determined
Salt Pile Cover & Ditches	August 2004
Salt Pile Pond	September 2004
Basin A	September 2004
Pond 1	October 2004
Pond 2	November 2004

If you recall, WIPP originally provided an estimated completion date for Cell B in July of 2006. At our last meeting we discussed possibly accelerating that date. It now appears that budget constraints may not allow the planned accelerated completion of Cell B. Completion of Cell B is required for newly mined salt only after Cell A is filled with newly mined salt. We will let you know the schedule for construction of Cell B once that schedule is established.

We will keep you informed of any schedule changes, if any, and engineered control completion dates.

Sincerely,

David D. Emery
Site Environmental Compliance Manager

CBFO:OEC:DDE:VW:03-3169:UFC:5400

cc:
L. Piper, CBFO
H. Johnson, CBFO
J. Gilbert, CBFO
D. Galbraith, CBFO
S. Warren, WTS
M. Friend, WTS
D. Bignell, WRES
CBFO M&RC

CBFO:OEC:DDE:VW:03-3169:UFC:5400

Notice is hereby given pursuant to 20.6.2.3108.G. NMAC, the following proposed ground water discharge permit applications have been proposed for approval or disapproval. To review the draft permit, please contact the Ground Water Quality Bureau office in Santa Fe. Prior to ruling on any proposed discharge permit or its modification, the NM Environment Department will allow thirty (30) days after the date of publication of this notice to receive written comments and during which a **public hearing may be requested** by any interested person including the applicant. Requests for public hearing shall set forth the reasons why the hearing should be held. A hearing will be held if the NM Environment Department determines that there is significant public interest. Requests for hearing should be submitted to the Ground Water Quality Bureau at the address below.

DP #	Facility/Applicant	Closest City	County	Notice	NMED Permit Contact
1402	Hidden Valley RV Park Robert Ponto, Owner 9505 Deneen, NW Albuquerque, NM 87114	Tijeras	Bernalillo	Hidden Valley RV Park, Robert Ponto, Owner, proposes to discharge up to 11,580 gallons per day of domestic waste. Primary contaminants associated with this type of discharge include nitrogen compounds. The facility is located in Tijeras in Section 7, T10N, R6E, Bernalillo County. Up to 11,580 gallons per day of wastewater will be discharged from the Hidden Valley RV Park to a sewerage system consisting of nine separate septic tank/leachfields. Ground water most likely to be affected is at a depth of approximately 173 feet and has a total dissolved solids concentration of approximately 908 milligrams per liter.	Kurt Vollbrecht
706	Rajen Dairy Randy Vander Dussen 948 CR O Clovis, NM 88101	Clovis	Curry	Rajen Dairy, Randy Vander Dussen, Owner, proposes to renew and modify the discharge permit for the discharge of dairy wastewater. The modification is to increase the discharge volume from 160,000 gallons per day to 200,000 gallons per day. Primary contaminants associated with this type of discharge include nitrogen compounds. The facility is located 4 miles west of Clovis in Sections 17 and 20, T02N, R35E, Curry County. Up to 200,000 gallons per day of dairy wastewater is discharged through two concrete solids separators to a clay-lined lagoon, then pumped through another solids separator before land application by center-pivot irrigation to 224 acres of irrigated cropland. Ground water most likely to be affected is at a depth of approximately 270 feet and has a total dissolved solids concentration of approximately 350 milligrams per liter.	Pamela Homer
831	Waste Isolation Pilot Plant	Carlsbad	Eddy	Waste Isolation Pilot Plant, Inez Triay, Manager, proposes to modify the discharge permit for the discharge of up to	Clint Marshall

	Dave Reber PO Box 3090 Carlsbad, NM 88221			3,264,360 gallons per day of domestic, industrial and mining waste. Primary contaminants associated with this type of discharge include nitrate, chloride and total dissolved solids. The facility is located 26 miles east of Carlsbad in Sections 20, 28 and 29, T22S, R31E, Eddy County. Up to 23,000 gallons per day of sewage effluent is discharged to a series of seven synthetically lined ponds for treatment and evaporation (facultative lagoon system). Up to 2,000 gallons per day of non-hazardous brine water is discharged to a synthetically lined evaporation cell (north evaporation cell). Up to 8,000 gallons per day of non-hazardous brine water generated from mine dewatering activities, pumping of groundwater wells, and from other non-hazardous sources is discharged to a synthetically lined evaporation pond (H-19 evaporation pond). Up to 100 gallons per year of neutralized acid waste will also be discharged to the facultative lagoon system. The permit modification includes authorization to discharge up to 3,231,260 gallons per day of storm water runoff to one of five synthetically lined storm water retention basins for evaporation. The runoff originates from the plant facility and approximately 17 acres of excavated salt located on the north side of the facility. During the term of this permit additional salt storage and associated storm water controls will be constructed north of the existing salt storage area. Ground water most likely to be affected is at a depth of approximately 608 feet and has a total dissolved solids concentration of approximately 3,920 milligrams per liter.	
835	Elephant Butte State Park-North David Gatterman State Parks Division PO Box 1147 Santa Fe, NM 87505	Truth or Consequences	Sierra	Elephant Butte State Park-North, David Gatterman, Parks Engineer, proposes to renew and modify the Discharge Permit for the discharge of 5,375 gallons per day of domestic waste. Wastewater from a comfort station and camp host residence is discharged to 3 septic tank/leachfield systems; wastewater from a RV dump station and the Rock Canyon Marina, septic tank pumpings, and sludge from a package treatment plant is discharged to two septic tanks with effluent conveyed to synthetically lined lagoons with reed beds before discharge to a synthetically lined wetland system; vault and chemical toilet waste are	Gerald Knutson

				discharged to a concrete lined evaporation lagoon. Primary contaminants associated with this type of discharge include nitrogen compounds. The facilities are located approximately 4 to 11 miles from Truth or Consequences in Sections 24 and 36, T12S, R04W and Section 6, T12S, R03W, Sierra County. The modification consists of increasing the discharge from 2,000 gallons per day to 5,375 gallons per day, construction of 3 septic tank leachfield systems, and the construction of a concrete lined evaporation lagoon. Ground water most likely to be affected is at a depth of approximately 95 to 150 feet and has a total dissolved solids concentration of approximately 500 to 2,122 milligrams per liter.	
1151	Quality Inn At The Butte Gerald LaFont PO Box 996 Elephant Butte, NM 87935	Elephant Butte	Sierra	Quality Inn At The Butte, Gerald LaFont, Owner, proposes to renew and modify the discharge permit for the discharge of 6,730 gallons per day of domestic waste. Primary contaminants associated with this type of discharge include nitrogen compounds, dissolved solids, and chloride. The facility is located 3 miles from Elephant Butte in Section 14, T13S, R4W, Sierra County. The Quality Inn at the Butte hotel and restaurant discharges a total of 6,730 gallons per day of domestic wastewater into two septic tank/leachfield systems: 2,880 gallons per day from the hotel and 3,850 gallons per day from the restaurant facility. The owner proposes to replace the existing restaurant system with a grease trap, new septic tank, and a newly constructed leachfield. Ground water most likely to be affected is at a depth of approximately 135 feet and has a total dissolved solids concentration of approximately 400 milligrams per liter.	John Hall
1378	Ojo Caliente Mineral Springs Sherman Scott 8114 West Hwy 90 Broussard, LA 70518	Ojo Caliente	Taos	Ojo Caliente Mineral Springs, Sherman Scott, Owner, proposes to discharge up to 30,000 gallons per day of domestic waste. Primary contaminants associated with this type of discharge include nitrogen compounds. The facility is located in Ojo Caliente in Section 24, T24N, R8E, Taos County. Ojo Caliente Mineral Springs will discharge up to 30,000 gallons per day of domestic wastewater to a package treatment plant. Treated wastewater is then	Gerald Knutson

				conveyed to a leachfield for disposal. Ground water most likely to be affected is at a depth of approximately 5 feet and has a total dissolved solids concentration of approximately 1,700 milligrams per liter.	

Any interested person may obtain further information or request to be placed on a facility specific mailing list or request a copy of the proposed approval or disapproval of an application from the Ground Water Pollution Prevention Section of the NM Environment Department, telephone (505) 827-2900, and may submit written comments to the Ground Water Pollution Prevention Section, NM Environment Department, P.O. Box 26110, Santa Fe, NM 87502.

To view this and other public notices issued by the Ground Water Quality Bureau on line, go to: http://www.nmenv.state.nm.us/Common/public_notice.htm and select Ground Water Quality Bureau

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

SEP 30 2003

SEP 29 2003

Mr. Clint Marshall
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive,
P.O. Box 26110
Santa Fe, New Mexico 87502 - 6110

Subject: Comments on the Draft Permit for Discharge Plan Modification, DP-831, Waste Isolation Pilot Plant (WIPP)

Dear Mr. Marshall:

Thank you for the opportunity to review and comment on the Draft Discharge Plan Modification, DP-831 dated September 16, 2003. We have reviewed the Draft Discharge Permit Application for accuracy and completeness and have prepared the following comments for your consideration:

1. Section I, Introduction, Paragraph 4 states, "Storm water runoff at the WIPP site will be contained in one of five synthetically lined retention basins for evaporation." WIPP respectively requests this sentence be revised to state "Storm water runoff from the Salt Storage Area (SSA) will be contained in the Salt Storage Extension Basin for evaporation. The remaining basins will contain storm water not specifically associated with the SSA, but from other areas around the WIPP facility."

2. Section III. Conditions, Item 9.A.: The permittee assumes NMED's reference to water level trends is groundwater level trends. For clarification and since only one measurement of water levels in the retention basins is to be conducted once per year, please change water level trends to groundwater level trends.

3. Section III. Conditions, Item 5.a. Storm Water Collection Ponds states, "The Permittee shall record the water depth to the nearest hundredth of a foot (0.01 ft), and approximate volume of storm water in each of the five storm water collection ponds **once per year after each storm event** in which water quality sampling is conducted (Condition 5B)." Sampling of the "Storm Water Collection Ponds" will occur once per year following a single storm event where sufficient quantity of water has collected in the respective basins. It is not WIPP's intent to sample after every storm event or after a storm event where water has not sufficiently collected in the Storm Water Collection Ponds.

CBFO:OEC:DE:IW:03-3124:UFC:5486

Therefore, we respectfully request that this section (Item III.5.A) be revised to read, "The permittee shall record the water depth to the nearest hundredth of a foot (0.01 ft), and approximate volume of storm water in each of the five storm water collection ponds once per year following a storm event where sufficient quantity of water has collect in the respective basins, during the same event in which water quality sampling is conducted (Condition 5B)" or provide further clarification.

4. Section III, Conditions, Methodology, Item 8: This section states that, unless otherwise approved in writing by NMED, the permittee must conduct the sampling and analyses in accordance with the most recent edition of the following documents." The section lists the references found in 20.6.3107.B. NMAC. The permittees respectfully request that NMED's guidance *Use of Low-Flow and Other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring* be incorporated into the approved sampling and analytical techniques outlined in Item 8. The NMED Guidance is attached.

Again, we appreciate the opportunity to provide the enclosed comments. If you have any questions, or need additional information, please contact Mr. David Emery at (505) 234-7475.

Sincerely,

Inés Triay

Dr. Inés Triay,
Manager

Enclosure
cc: w/enclosure
D. Emery, CBFO
H. Johnson, CBFO
J. Gilbert, CBFO
D. Bignell, WRES
B. Kehrman, WRES
CBFO M&RC

CBFO:OEC:DE:IW:03-3124:UFC:5486

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
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US Dept. of Energy/Waste Isolation
PO Box 3090
Carlsbad, New Mexico 88221-3090

PS Form 3800, January 2001 See Reverse for Instructions

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September 16, 2003

Inez Triay, Manager
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Draft Discharge Plan Modification, DP-831, Waste Isolation Pilot Plant (WIPP)

Dear Ms. Triay:

Please review the enclosed draft permit for Discharge Plan Modification, DP-831, Waste Isolation Pilot Plant (WIPP). The conditions in the draft permit should be reviewed for accuracy and completeness. Please pay special attention to Conditions 7 and 9, because they differ from the proposed actions in your application. Any comments, questions, or concerns should be directed towards Clint Marshall of the New Mexico Environment Department (NMED), Ground Water Quality Bureau (GWQB) at (505) 827-0027 before **October 15, 2003**. If no comments are received by this date, the NMED GWQB will issue a signed permit with conditions as written in the enclosed draft.

Sincerely,

Clint Marshall

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau

Enclosures: Draft Discharge Permit Modification

xc: Carl Stubbs, NMED District IV Field Office, Roswell
Paul Saavedra, Office of the State Engineer

GROUND WATER DISCHARGE PERMIT MODIFICATION
U.S. DEPARTMENT OF ENERGY, DP-831
WASTE ISOLATION PILOT PLANT (WIPP)
DRAFT

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Modification to the Discharge Permit, DP-831, to U.S. Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit Modification, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the WIPP into ground and surface water, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses and protect public health. In issuing this Discharge Permit Modification, NMED has determined that the requirements of Section 20.6.2.3109.C NMAC have been met.

The activities which produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics of the discharge were described in the Discharge Permit issued April 29, 2003, as follows:

> Up to 23,000 gallons per day of sewage effluent is discharged to a series of seven synthetically lined ponds for treatment and evaporation (facultative lagoon system). Up to 2,000 gallons per day of non-hazardous brine water is discharged to a synthetically lined evaporation cell (north evaporation cell). Up to 8,000 gallons per day of non-hazardous brine water generated from mine dewatering activities, pumping of groundwater wells, and from other non-hazardous sources is discharged to a synthetically lined evaporation pond (H-19 evaporation pond). Up to 100 gallons per year of neutralized acid waste will also be discharged to the facultative lagoon system.

The Discharge Permit Modification to the WIPP wastewater disposal system is briefly described as follows:

> In addition to the daily discharge of 33,100 gallons per day of sewage effluent, brine and neutralized acid waste approved in the April 29, 2003 Discharge Permit Renewal, WIPP will be authorized to discharge up to 3,231,260 gallons per day of storm water runoff as a result of rainfall events that occur at the site. The runoff occurs from the plant facility and approximately 17 acres of excavated salt (salt piles) stored on the north side of the facility. The purpose for containing the storm water runoff is to minimize infitration into the subsurface, which has resulted in the accumulation of shallow subsurface water (SSW) below the WIPP facility. During the term of this permit additional salt storage capacity and associated storm water controls will be contructed immediately north of the existing salt pile. Storm water runoff at the WIPP site will be contained in one of five synthetically lined retention basins for evaporation.

The facility is located approximately 26 miles east of Carlsbad in Sections 28 and 29, T22S, R31E, Eddy County. Regional ground water below the site is at a depth of approximately 608 feet and has a total dissolved solids concentration of approximately 3,920 milligrams per liter. The shallow subsurface water (SSW) below the site is at a depth of approximately 60 – 80 feet.

The WIPP Discharge Permit Modification consists of the materials submitted by the DOE dated October 30, 2002, April 24, 2003, and July 24, 2003. In addition, the discharge plan includes information and materials submitted as part of the original discharge plan approved on Janurary 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998, amended on January 24, 2000, and renewed on April 29, 2003. The discharge shall be managed in accordance with the discharge plan as conditioned by the Discharge Permit approved April 29, 2003, and this Discharge Permit Modification.

Issuance of this Discharge Permit Modification does not relieve the DOE of its responsibility to comply with any conditions or requirements of the Discharge Permit, DP-831, approved April 29, 2003, the WQA, WQCC Regulations, any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

The following abbreviations may be used in this permit modification:

Abbreviation	Explanation	Abbreviation	Explanation
DOE	Department of Energy	TDS	total dissolved solids
NMAC	New Mexico Administrative Code	WIPP	Waste Isolation Pilot Plant
NMED	New Mexico Environment Department	WQCC	Water Quality Control Commission

II. FINDINGS

In issuing this Discharge Permit Modification, NMED finds:

1. The DOE is discharging effluent or leachate from the WIPP facility so that such effluent or leachate may move directly or indirectly into ground water within the meaning of Section 20.6.2.3104 NMAC.

2. The DOE is discharging effluent or leachate from the WIPP facility so that such effluent or leachate may move into ground water of the State of New Mexico which has an existing concentration of 10,000 milligrams per liter or less of total dissolved solids within the meaning of Section 20.6.2.3101.A NMAC.

3. The discharge from WIPP is not subject to any of the exemptions of Section 20.6.2.3105 NMAC.

III. CONDITIONS

The following conditions of this Discharge Permit Modification shall be added to the requirements of the Discharge Permit renewal approved on April 29, 2003. The following conditions shall be complied with by the DOE and WIPP (permittee) and are enforceable by NMED:

OPERATIONS

1. The permittee is authorized to discharge up to 3,231,260 gallons per day of storm water runoff from the WIPP site to five synthetically lined retention basins for evaporation. [20.6.2.3104 NMAC]

Storm Water Controls:

2. The permittee shall install infiltration control measures, including synthetically lined impoundments, to mimimize infiltration of storm water runoff into the subsurface at the WIPP facility. The primary control structures include Evaporation Basin A, Pond 1, Pond 2, the Salt Storage Extension (SSE) (Cells A and B), the Salt Storage Extension Evaporation Basin, the Salt Pile Evaporation Pond (SPEP), and berms and ditches associated with these structures. The installation of the storm water control structures shall be in accordance with the application for discharge permit modification dated April 24, 2003, or in accordance with subsequent design and specification amendments subject to approval by NMED. The structures shall be completed according to the schedule dated July 24, 2003. Extensions may be granted per written request for good cause shown. [20.6.2.3109 NMAC]

MONITORING AND REPORTING

4. The permittee shall conduct the following monitoring, reporting, and other requirements listed below in accordance with the WQCC Regulations at 20.6.2.3107 NMAC and the monitoring plan submitted by the permittee dated July 25, 2003. A summary of monitoring requirements is attached to this permit as Table 1. A monitoring schedule is attached as Table 2. [20.6.2.3107 NMAC]

Sampling and Field Measurements:

5. <u>Storm Water Collection Ponds</u> – The permittee shall sample the SPEP, the SSE Evaporation Basin, Evaporation Basin A, Pond 1, and Pond 2 as follows:

    A. The permittee shall record the water depth to the nearest hundredth of a foot (0.01 ft), and approximate volume of stormwater in each of the five storm water collection ponds once per year after each storm event in which water quality sampling is conducted (Condition 5B).

B. The permittee shall collect samples from the five storm water collection ponds once per year following a storm event and analyze for the water parameters listed in Conditions 7B and 7C below.

Analytical results and water level measurements shall be reported as required in Condition 9 below. [20.6.2.3107 NMAC]

6. Ground Water Monitoring Wells – The permittee shall sample the following monitoring wells and piezometers:

A. Monitoring Wells/Piezometers PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-6, PZ-7, PZ-8, PZ-9, PZ-10, PZ-11, PZ-12, C-2505, C-2506, C-2507, C-2811 and WQSP-6A shall be sampled as follows:

1) The permittee shall record the depth to the water table to the nearest hundredth of a foot (0.01 ft) above msl, quarterly.

B. Monitoring Wells/Piezometers PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, C-2507, C-2811 and WQSP-6A shall be sampled as follows:

1) The permittee shall collect samples from each well semi-annually and analyze the samples for the water parameters listed in Conditions 7A, 7B and 7C below.

Analytical results and water level measurements shall be reported as required in Condition 9 below. [20.6.2.3107 NMAC]

Analysis:

7. The permittee shall analyze samples of ground water and storm water for the parameters listed below. Samples of ground water from monitoring wells and piezometers shall be analyzed for dissolved concentrations of the analytes listed below. Samples of storm water shall exclude field parameters and shall be analyzed for dissolved and total concentrations of the analytes listed below. [20.6.2.3107 NMAC]

A. Field parameters (analysis to be performed in the field): pH, temperature and specific conductance.

B. General chemistry parameters: nitrate, sulfate, chloride, and total dissolved solids.

C. Trace metals: selenium, chromium

Methodology:

8. Unless otherwise approved in writing by NMED, the permittee shall conduct sampling and analysis in accordance with the most recent edition of following documents:

A. American Public Health Association, *Standard Methods for the Examination of Water and Wastewater.*

B. U.S. Environmental Protection Agency, *Methods for Chemical Analysis of Water and Waste.*

C. U.S. Geological Survey, *Techniques for Water Resource Investigations of the U.S. Geological Survey.*

D. American Society for Testing and Materials, *Annual Book of ASTM Standards,* Part 31. Water.

E. U. S. Geological Survey, et al., *National Handbook of Recommended Methods for Water Data Acquisition.*

F. Surface water monitoring must also be conducted according to test procedures approved under Title 40 Code of Federal Regulations Part 136. [20.6.2.3107B NMAC]

Reporting:

9. The permittee shall submit to NMED a semi-annual report by the last day of January and July of each year. Reports shall use the following format:

A. A summary of all activities related to the discharge during the preceding 6 month period. Activities may include general operations, construction or demolition of structures, maintenance and repairs, water management, water quality and water level trends, and precipitation patterns.

B. A single table in a paper and electronic format (EXCEL spreadsheet) of water level measurements and water quality data with only those constituents analyzed and water levels measured during a single event shown in columns. Tabulated electrical conductivity shall include the measured field values and corrected values to 25 degrees Celsius. Monitoring sites shall be shown in rows. Values exceeding standards shall be bolded. Any constituent not analyzed for a particular site shall be shown as "NA", any site not sampled shall be shown as "NS" with an associated reason, and any site not measured for water levels shall be shown as "NM" with an associated reason.

C. Copies of the signed laboratory analyses sheet shall be provided semi-annually.

D. A potentiometric map for the WIPP facility area shall be submitted annually. The map shall incorporate the most recent water level data for all monitoring wells and piezometers installed in the shallow subsurface water (SSW). [20.6.2.3107 NMAC]

GENERAL TERMS AND CONDITIONS

10. In addition to any other requirements provided by law, approval of this Discharge Permit Modification is subject to the General Requirements as specified in the Discharge Permit approved on April 29, 2003. Refer to the Discharge Permit Renewal, DP-831, approved April 29, 2003, for specific information on the following General Requirements

    Monitoring and Reporting
    Record Keeping
    Inspection and Entry
    Duty to Provide Information
    Spills, Leaks and Other UnAuthorized Discharges
    Retention of Records
    Enforcement
    Modification and/or Amendments

Compliance with Other Laws:

11. Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of its obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders. [20.6.2 NMAC]

Right to Appeal:

12. The permittee may file a petition for hearing before the WQCC on this Discharge Permit Modification. Such petition shall be in writing to the WQCC within thirty (30) days of the receipt of this Discharge Permit Modification. Unless a timely petition for hearing is made, the decision of NMED shall be final.[74-6-5.N WQA]

Transfer of Permit:

13. Prior to any transfer of ownership, control, or possession of this permitted facility or any portion thereof, the permittee shall notify the proposed transferee in writing of the existence of this Discharge Permit and include a copy of this Discharge Permit with the notice. The permittee shall deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee. [20.6.2.3111 NMAC]

Term:

14. The term of this Discharge Permit Modification expires on **April 29, 2008**, the same day the Discharge Permit will automatically terminate. To renew the Discharge Permit, the permittee must submit an application for renewal at least 180 days before the termination date. [20.6.2.3109(H) NMAC, 74-6-5.H WQA]

ISSUED: **Approval Date**
EXPIRES: April 29, 2008

JERRY SCHOEPPNER
Chief, Ground Water Quality Bureau
New Mexico Environment Department

WASTE ISOLATION PILOT PLANT, DP-831
DISCHARGE PERMIT MODIFICATION
MONITORING SUMMARY
Monitoring Reports are due by: 31-JAN, 31-JUL

Table 1: Monitoring Summary

Annual Sampling Frequency	Annual Reporting Frequency	Number of Sites	Sampling Description
1	1	5	Depth and approximate volume of water in each of 5 storm water collection ponds.
1	1	5	NO_3, SO_4, Cl, TDS, ~~TDS~~, Se & Cr annually in 5 storm water collection ponds.
4	2	17	Water levels in 17 monitoring wells and piezometers.
2	2	11	NO_3, SO_4, Cl, TDS, Se & Cr semi- annually in 11 monitoring wells and piezometers.
12		12	Monthly inspections of all ponds.
1	1	1	Potentiometric map submitted annually.
2	2	1	Activities report submitted semi-annually

Table 2: Ground Water Monitoring Schedule

Area		Sampling					
Sub-area	Well Number	type	Q1	Q2	Q3	Q4	Notes
South and West of Laguna Grande							
	PZ-1	pz	W	WABC	W	WABC	
	PZ-2	pz	W	W	W	W	
	PZ-3	pz	W	W	W	W	
	PZ-4	pz	W	W	W	W	
	PZ-5	pz	W	WABC	W	WABC	
	PZ-6	pz	W	WABC	W	WABC	
	PZ-7	pz	W	WABC	W	WABC	
	PZ-8	pz	W	W	W	W	
	PZ-9	pz	W	WABC	W	WABC	
	PZ-10	pz	W	WABC	W	WABC	
	PZ-11	pz	W	WABC	W	WABC	
	PZ-12	pz	W	WABC	W	WABC	
	C-2505	mw	W	W	W	W	
	C-2506	mw	W	W	W	W	
	C-2507	mw	W	WABC	W	WABC	
	C-2811	mw	W	WABC	W	WABC	
	WQSP-6A	mw	W	WABC	W	WABC	

Explanation to Abbreviations and Symbols

Type: mw = monitoring well pz = piezometer	Sampling Quarter: Q1 = Jan-Mar Q2 = Apr-Jun Q3 = Jul-Sep Q4 = Oct-Dec
Sampling Analytical Suites: A = Field parameters: Temp, pH, specific conductance B = General chemistry parameters: SO_4, Cl, TDS, NO_3, C = Metals: Se, Cr W = Depth to water measurement to the nearest 0.01 foot.	

Submit all monitoring reports to: Clint Marshall
Ground Water Quality Bureau
P.O. Box 26110
Santa Fe, New Mexico 87502

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

29 SEP 2003

RECEIVED
OCT 01 2003

Mr. Clint Marshall
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive,
P.O. Box 26110
Santa Fe, New Mexico 87502 – 6110

Subject: Water Budget Analysis of Shallow Subsurface Water at the Waste Isolation Pilot Plant (WIPP)

Dear Mr. Marshall:

As requested, enclosed are two copies of the Water Budget Analysis of Shallow Subsurface Water at the Waste Isolation Pilot Plant (WIPP) for your review and retention.

If you have any questions or need additional copies, please contact Mr. David Emery at (505) 234-7475

Sincerely,

Inés R. Triay
Manager

Enclosure

cc:
H. Johnson, CBFO
D. Emery, CBFO
CBFO M&RC

CBFO:OEC:DE:IW:03-3125:UFC:5480

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OCT 0 1 2003

Water Budget Analysis of Shallow Subsurface Water at the Waste Isolation Pilot Plant

Prepared for U.S. Department of Energy
Carlsbad Field Office

September 30, 2003

00765

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Appendix

A Well Logs

List of Acronyms and Abbreviations

bgs	below ground surface
cm/s	centimeters per second
CTAC	Portage Environmental – Carlsbad Field Office Technical Assistance Contractor
DBS&A	Daniel B. Stephens & Associates, Inc.
DOE	U.S. Department of Energy
FAA	Federal Aviation Administration
ft^2	square feet
ft/d	feet per day
ft/ft	foot per foot
gpm	gallons per minute
in/yr	inches per year
K_h	horizontal hydraulic conductivity
K_{sat}	saturated hydraulic conductivity
K_v	vertical hydraulic conductivity
LAI	leaf area index
mg/L	milligrams per liter
MODFLOW	modular three-dimensional finite-difference ground-water flow model
NMED	New Mexico Environment Department
NOAA	National Oceanic and Atmospheric Administration
PNNL	Pacific Northwest National Laboratory
SSW	shallow subsurface water
TDS	total dissolved solids
UNSAT-H	computer model for calculating water and heat flow in unsaturated media
USGS	U.S. Geological Survey
WIPP	Waste Isolation Pilot Plant

Executive Summary

The water budget analysis of shallow subsurface water (SSW) underlying the central portion of the Waste Isolation Pilot Plant (WIPP) presents a comprehensive conceptual model of the SSW hydrologic characteristics. The water budget analysis was conducted for the U.S. Department of Energy (DOE) by Daniel B. Stephens & Associates, Inc. under contract to Portage Environmental — Carlsbad Field Office Technical Assistance Contractor. The water budget analysis is intended to support DOE efforts to ensure regulatory compliance at the WIPP and to provide information that will assist DOE decision-makers in determining the efficacy of proposed actions to address the SSW.

The objective of the water budget analysis was to quantify the SSW sources and consider the potential for migration and the effectiveness of planned controls. The water budget analyzed the important hydrologic processes controlling the SSW system and provided:

- An estimate of the volume of water contained within the perched zone
- Quantification of seepage inputs to the SSW from past and current practices
- A model of SSW accumulation, flow conditions, and potential long-term migration
- Determination of the effects of engineered seepage reduction measures that could be implemented at existing seepage sources

The water budget analysis focuses on the sources of water introduced to the subsurface as a result of site development at the WIPP. The SSW is considered to be anthropogenic, the result of a variety of water discharges and changes in site drainage that have occurred since on-site development of the WIPP began. Increases in recharge from the site have contributed to a saturated, perched zone within the Santa Rosa Sandstone Formation (Santa Rosa), with saturation typically found at depths of 40 to 60 feet below ground surface.

The water budget is a quantitative analysis of the primary inputs and losses of on-site water. The analyses include seepage estimates from five principal seepage sources within the WIPP surface facilities area: the Salt Storage Area, Salt Pile Evaporation Pond, Detention Basin A, and storm water retention Ponds 1 and 2. Since 1984, when the WIPP surface facilities were constructed, recharge of precipitation to the subsurface has increased because runoff from impervious surfaces is routed into retention ponds. Recharge from the Salt Storage Area occurs when precipitation falling on the salt pile infiltrates through the highly fractured surface. *

The water budget includes the following analyses:

- *Compilation of recorded discharges:* Records of past discharges were compiled to quantify the extent of discharges from activities such as drilling, shaft dewatering, water line purging, and sewage treatment.

- *Site drainage summary:* Storm water runoff calculations were completed to determine the volume of on-site storm water that drains to four storm water retention ponds, where seepage may contribute to the SSW.

- *Surface infiltration modeling:* Infiltration rates were modeled for the four storm water retention ponds and the Salt Storage Area. The model calculated evaporation and plant transpiration losses and the amount of recharge to the SSW.

- *Saturated flow modeling:* Saturated flow modeling was conducted to quantify recharge from the storm water retention ponds and Salt Storage Area and determine whether such recharge accounts for observed conditions in the SSW.

- *Long-term migration modeling:* The long-term SSW migration was modeled for a 100-year timeframe to evaluate whether the SSW has the potential to migrate to known groundwater resources. The potential for migration was examined both with and without the engineered controls planned by DOE to prevent seepage and reduce SSW migration.

The water budget results indicate that seepage from the five primary sources provide sufficient recharge to account for the observed SSW saturated lens and that the lens is expected to spread. *The water budget results quantify the following components of the SSW hydrologic system:

- The SSW saturated zone covers approximately 150 to 520 acres to a maximum saturated thickness exceeding 30 feet, and contains a total estimated volume of water in the range of 108 to 315 million gallons.

- Average annual precipitation on the 85-acre watershed surrounding the WIPP facilities area amounts to approximately 29.2 million gallons per year, and average annual storm water flow to the retention ponds and precipitation falling on the Salt Storage Area amounts to approximately 25.0 million gallons per year.

- Modeling by three independent methods produces seepage estimates in the range of 5.4 to 16.9 million gallons per year from the five primary seepage sources, which is equivalent to 18 to 58 percent of on-site precipitation.

- Records of discrete discharges from drilling and construction activities during the 1980s indicate that these discharges total approximately 6 million gallons, with evaporative losses further reducing the volume that these discharges may have contributed to the SSW.

- The estimated leakage from water lines providing input to the SSW is 0.22 million gallons per year, totaling approximately 4 million gallons of water line leakage since the WIPP facilities opened in 1984.

- Seepage into the Exhaust Shaft, which is a loss from the SSW, amounts to approximately 4 million gallons since seepage was detected in 1995.

The quantified water budget components are reasonably consistent, considering the uncertainties of the models and calculations. To develop a valid conceptual model of the SSW, multiple analysis methods were used to obtain a range of independent results, enhancing the reliability of the overall analysis.

The potential extent of long-term SSW migration was examined by expanding the saturated flow model domain to include the 16–square-mile WIPP land withdrawal area. A two-layer model was established, with the upper Layer 1 including the SSW perched lens in the Santa Rosa and the Gatuña Formations and the lower Layer 2 including the Dewey Lake Formation, which is the shallowest groundwater depth interval used for water supply near the WIPP boundary. The potential migration of SSW is a top-down process, with downward flow from the Santa Rosa moving vertically through the unsaturated upper Dewey Lake and laterally to areas where a natural water table exists in the middle Dewey Lake. The conceptual model is conservative in simulating all of the Dewey Lake recharge accumulating in a saturated lens, whereas a complex system of discontinuous saturated pathways in the predominantly unsaturated upper Dewey Lake may disperse the flow and lead to less migration. The rate of downward flow from the Santa Rosa to the Dewey Lake, controlled by the vertical hydraulic conductivity, was established by a model calibration phase that matched observed water levels for the 1996 to 2002 record. The calibrated model was then run for two predictive simulations until 2102, with seepage in Simulation 1 stopping at facility closure in 2035, and seepage in Simulation 2 stopping in 2006, after the implementation of engineered seepage controls.

The long-term migration model simulations indicate that the engineered seepage controls being planned by DOE will substantially reduce the extent of migration. The simulations predict that without seepage controls, the SSW has the potential to migrate over a 100-year time frame as far as the northern WIPP boundary and to the Dewey Lake saturated zone in the southwestern corner of the WIPP site near monitor well WQSP-6A. The predictive modeling results show that engineered seepage controls can reduce the SSW volume by more than half, from approximately 860 million gallons to 385 million gallons, and prevent migration from reaching the facility boundary.

1. Introduction

The water budget analysis presented in this report examines the sources and characteristics of the shallow subsurface water (SSW) underlying the central portion of the Waste Isolation Pilot Plant (WIPP) site near Carlsbad, New Mexico. The water budget builds on previous SSW investigations to develop a comprehensive conceptual model of the hydrogeologic conditions and flow regime. The water budget analysis was conducted on behalf of the U.S. Department of Energy (DOE) by Daniel B. Stephens & Associates, Inc. (DBS&A), under contract to Portage Environmental – Carlsbad Field Office Technical Assistance Contractor (CTAC).

1.1 Project Goals

The goal of the water budget analysis was to establish a conceptual model of the important hydrologic processes controlling the SSW hydrologic system. The water budget analysis provides:

- An estimate of the volume of water contained within the perched zone
- Quantification of seepage inputs to the SSW from past and current practices
- A model of SSW accumulation, flow conditions, and potential long-term migration
- Determination of the effects of engineered seepage controls that could be implemented at existing seepage sources

The purpose of this water budget analysis is to support DOE efforts to ensure regulatory compliance at the WIPP and to provide information that will assist DOE decision makers in determining the efficacy of proposed actions to address the SSW.

1.2 Water Budget Methodology

The concept of a water budget is to quantify the components of a closed hydrologic system. In principle, a hydrologic system can be described by a water budget that accounts for all inputs to and outputs from the system, with the difference being the change in water storage in the system.

The water budget analysis presented herein provides estimates of the primary water budget components, focusing on the sources of water introduced to the subsurface as a result of site development at the WIPP. The SSW is considered to be anthropogenic, the result of a variety of water discharges and changes in site drainage that have occurred since on-site development of the WIPP began in the 1980s. Increases in on-site recharge have contributed to a saturated, perched zone within the Santa Rosa Sandstone Formation, with saturation typically found at depths of 40 to 60 feet below ground surface (bgs). The water budget addresses only the SSW and not the deep regional groundwater systems that occur several hundred feet underground.

The primary water budget components for the SSW system include the following:

- On-site precipitation
- Infiltration below ground surface and recharge to the SSW
- Original water in the subsurface formations and overlying sediments at a moisture content less than saturation
- Downward leakage into the Dewey Lake Redbeds Formation
- Historical water discharges to surface lagoons from sources such as shaft dewatering brine, drilling fluids, showers, and water line flushing
- Leakage from on-site water and sewer lines
- Seepage into the Exhaust Shaft
- Evaporation
- Plant transpiration

The analysis builds on previous SSW site investigation activities that have been completed and considers the local conditions where the SSW has been detected and the potential for migration in the broader hydrogeologic regime. Within the WIPP surface facilities area, the increased recharge from site development was estimated from five principal seepage sources: the Salt Storage Area, Salt Pile Evaporation Pond, Detention Basin A, and storm water retention Ponds 1 and 2. The analyses performed for the water budget include:

- *Compilation of recorded discharges:* Records of past discharges were compiled to quantify the extent of discharges from activities such as drilling, shaft dewatering, water line purging, and sewage treatment.

- *Site drainage summary:* Storm water runoff calculations were completed to determine the volume of on-site storm water that drains to four storm water retention ponds that may contribute seepage to the SSW.

- *Surface infiltration modeling:* Infiltration rates were modeled for the four storm water retention ponds and the Salt Storage Area. The model results included calculated water losses to evaporation and plant transpiration and the amount of recharge to the SSW.

- *Saturated flow modeling:* Saturated flow modeling was conducted to quantify recharge from the storm water retention ponds and Salt Storage Area and to determine whether such recharge accounts for observed conditions in the SSW.

- *Long-term migration modeling:* The long-term SSW migration was modeled for a 100-year timeframe to evaluate whether the SSW has the potential to migrate to known groundwater resources. The potential for migration was examined both with and without the engineered controls planned by DOE to prevent seepage and reduce SSW migration.

The water budget analyses are described in detail in Sections 3 through 7 of this report.

The water budget is based on available data from historical records and previous site investigations. No new data were collected for the water budget, and as noted in this report, various uncertainties and data limitations were identified. Considering the uncertainties that exist, the water budget used multiple analysis approaches and, where necessary, reasonable assumptions, to develop ranges of expected results to support the development of a valid conceptual model of the SSW.

1.3 History of Shallow Subsurface Water at WIPP

Early exploratory drilling at the site (Sergent, Hauskins & Beckwith, 1979; Mercer, 1983) and geologic mapping of the WIPP Exhaust Shaft in 1984 and 1985 (Powers, 1995) did not detect saturated conditions in the Santa Rosa Sandstone Formation at the WIPP site prior to site development. Seepage into the Exhaust Shaft was first detected in 1995 (DOE, 2002), and subsurface investigations of the source of this seepage determined that a saturated zone had developed in the Santa Rosa underlying the WIPP surface facilities. The water budget analysis examines the occurrence of the SSW and the inputs to the system that have contributed to the perched zone where saturated conditions are observed.

2. Hydrologic Setting

The WIPP site is located in eastern Eddy County, New Mexico, in a remote area approximately 25 miles east of Carlsbad, New Mexico (Figure 1). The entire land withdrawal area for the WIPP site is 16 square miles, and the surface facilities area covers roughly 100 acres. A detailed site plan of the WIPP surface facilities is provided in Figure 2, and an aerial photograph of the WIPP surface facilities area from 2000 is provided in Figure 3.

2.1 Climate and Physiography

The WIPP site is located in a semiarid region of the U.S. desert southwest. The average annual precipitation for Carlsbad, New Mexico is 12.10 inches per year (in/yr), based on records beginning in 1948 for the Carlsbad Federal Aviation Administration (FAA) Airport. Annual evaporation from surface water exceeds 98 in/yr (Mercer, 1983). Native vegetation consists of mesquite, scrub oak, and other plants typical of the northern Chihuahuan Desert (Mercer, 1983). Surficial soils at the WIPP site are characterized by sand and dune sand deposits (Campbell et al., 1996).

Climatic data used in the water budget analyses were obtained from the Carlsbad FAA Airport weather station and an on-site weather station (Table 1). The detailed climatic data required for some analyses are available only for more recent years; therefore, data from various time frames, as noted in Table 1, were used in the water budget analysis.

Table 1. Precipitation Summary Statistics

Station	Start Date	End Date	Duration (years)	Annual Precipitation (inches)		
				Mean	Maximum	Minimum
Carlsbad FAA [a]	Jan-48	Dec-02	55	12.10	25.48	5.53
Carlsbad FAA [a]	Jan-84	Dec-02	19	14.40	25.48	5.82
WIPP station [b]	Jan-86	Dec-02	17	13.24	21.28	6.53
WIPP station [c, d]	Jan-96	Dec-02	7	12.54	23.91	7.72
WIPP station [c]	Jan-97	Dec-02	6	12.74	23.91	7.72

FAA = Federal Aviation Administration WIPP = Waste Isolation Pilot Plant

[a] Excludes years with more than five days missing in any month.

[b] Annual data reported by the National Oceanic and Atmospheric Administration (NOAA).

[c] Detailed electronic files with data in 15-minute intervals were available for 1997 through August 2002. Monthly precipitation totals for September 2002 through December 2002 were not available at the time the water budget analyses were initiated. Averages of the monthly total precipitation for September, October, November, and December were obtained from the WIPP site data from 1996 through 2001 and were substituted for missing data in 2002.

[d] Less detailed daily data were available from the WIPP station for 1996.

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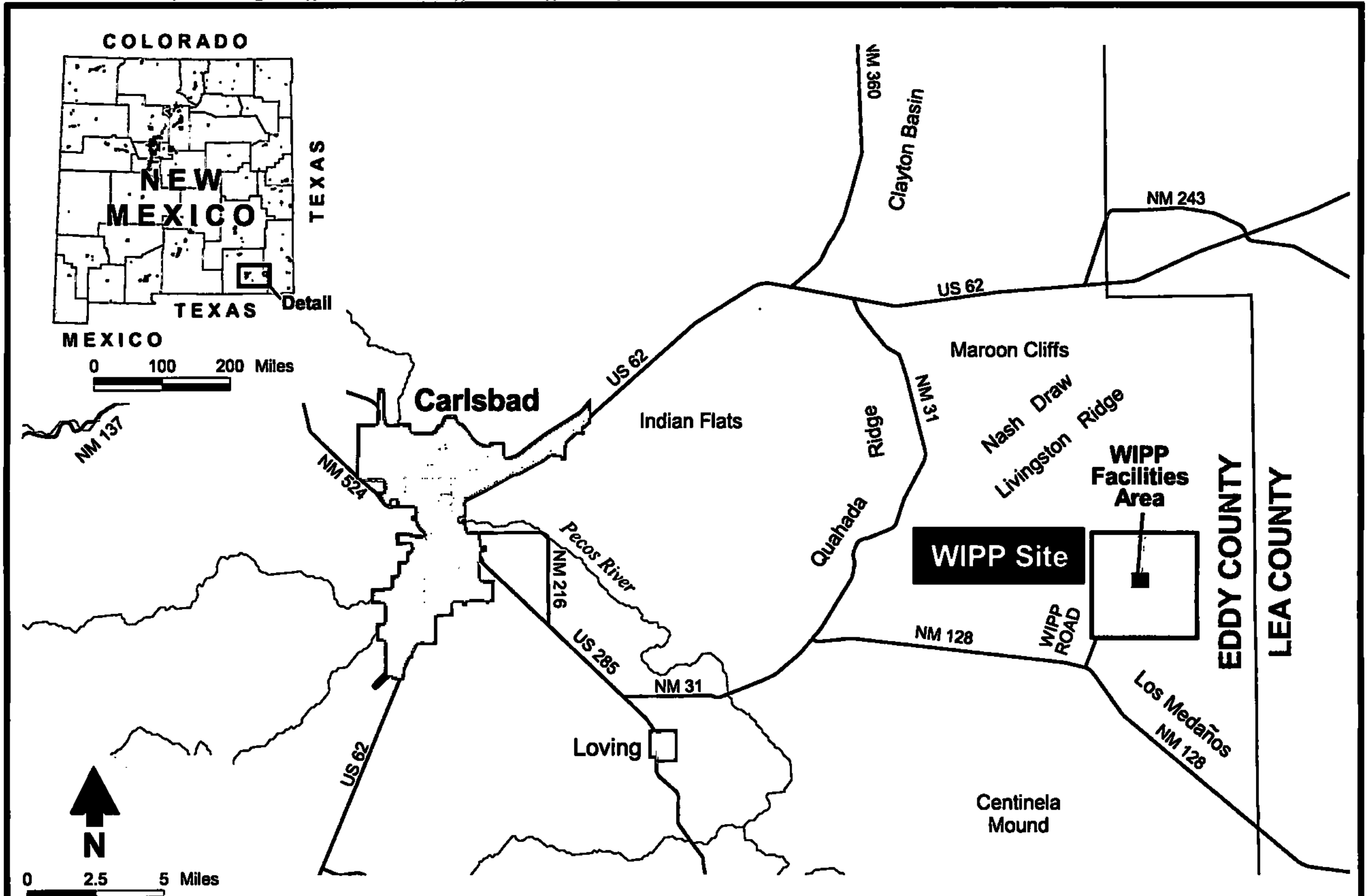

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Site Location

Figure 1

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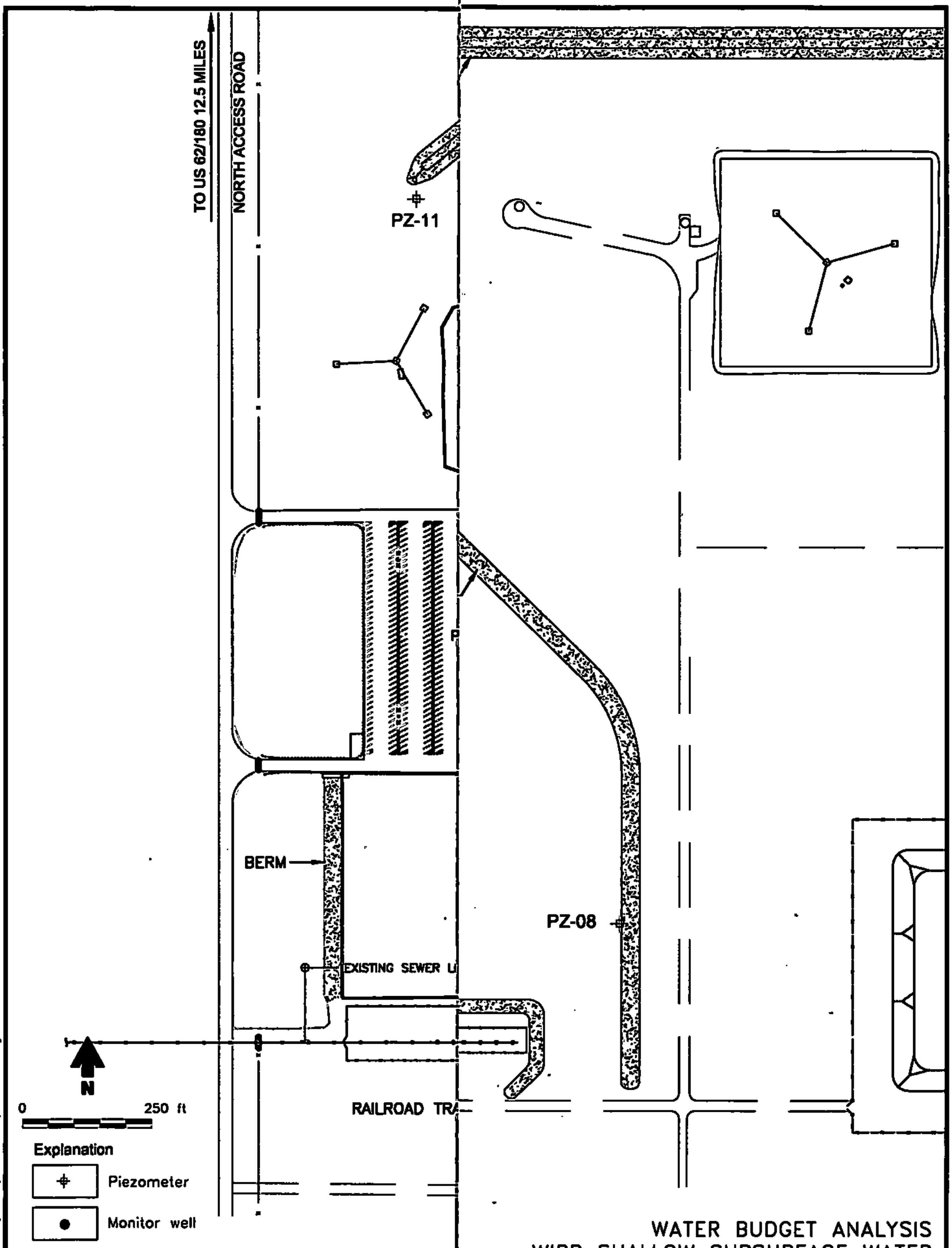
8-25-03 JN 9525



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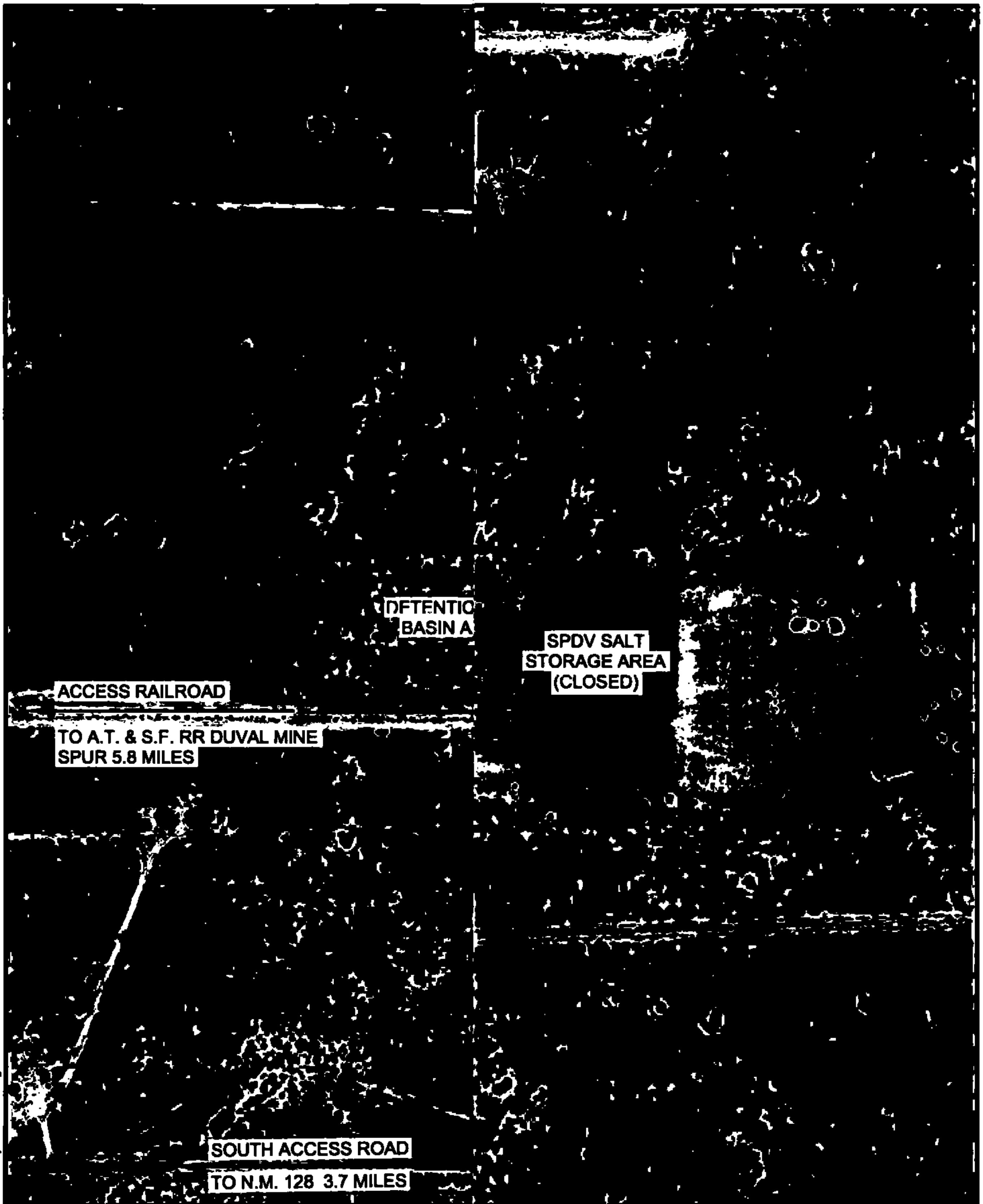
WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

es Area and Monitor Well Location Map

Daniel B. Stephens & Associates,

8-25-03

Figure 2



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WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

otograph of WIPP Facilities Area, 2000

Daniel B. Stephens & Associates,
07-11-03

Figure 3

The long-term record of precipitation data from the Carlsbad FAA Airport is illustrated in Figure 4. As shown in this figure, precipitation was below normal until around 1970 and above normal from 1984 (the year that construction of the main WIPP facilities began) to 1992. Based on the long-term precipitation records available from the Carlsbad FAA Airport, from the initial development of the WIPP facilities in 1984 through 2002, the average annual precipitation has been 14.40 in/yr, approximately 19 percent above average (Table 1).

The climatic data input to the water budget models include daily records of precipitation, temperature, relative humidity, solar radiation, and wind speed. Detailed electronic files of climatic data from the on-site weather station at the WIPP, which provide the most reliable data set for the model, were available for the period from January 1997 to August 2002. The average annual precipitation for the seven-year period when SSW water level measurements were recorded (1996 through 2002) is 12.54 in/yr (Table 1). Precipitation was particularly high in 1997 (23.91 inches).

2.2 Surface Water and Drainage

The immediate area around the WIPP slopes gradually from the northeast to the southwest at approximately 1 percent. Surficial deposits, consisting of fine- to medium-grained dune sands known locally as the Mescalero sand, cover nearly the entire WIPP site (Mercer, 1983). No significant through-flowing streams or arroyos are present at the site (Mercer, 1983). On the north and east sides of the WIPP surface facilities (Figure 2), berms have been constructed to divert overland storm water flow and prevent runoff from reaching the site. Within the WIPP surface facilities area, surface water from on-site precipitation is routed to four storm water retention ponds, as described in Section 5.

2.3 Hydrogeologic Regime

The regional hydrogeologic regime in the area of the WIPP has been described by several investigators. Comprehensive reports by Hendrickson and Jones (1952) and Bachman (1984) describe the regional geologic setting. A more detailed description of the local hydrogeologic regime at the WIPP site is provided by Mercer (1983).

At the WIPP site, Powers (1995) reports the following stratigraphic column from geologic mapping of the WIPP Exhaust Shaft:

0 to 7.5 feet bgs	Quaternary dune sand
7.5 to 17 feet bgs	Mescalero caliche
17 to 34 feet bgs	Gatuña Formation
34 to 54 feet bgs	Santa Rosa Formation
54 to 546 feet bgs	Dewey Lake Formation
546 to 851 feet bgs	Rustler Formation
851 to 2,150(+) feet bgs	Salado Formation

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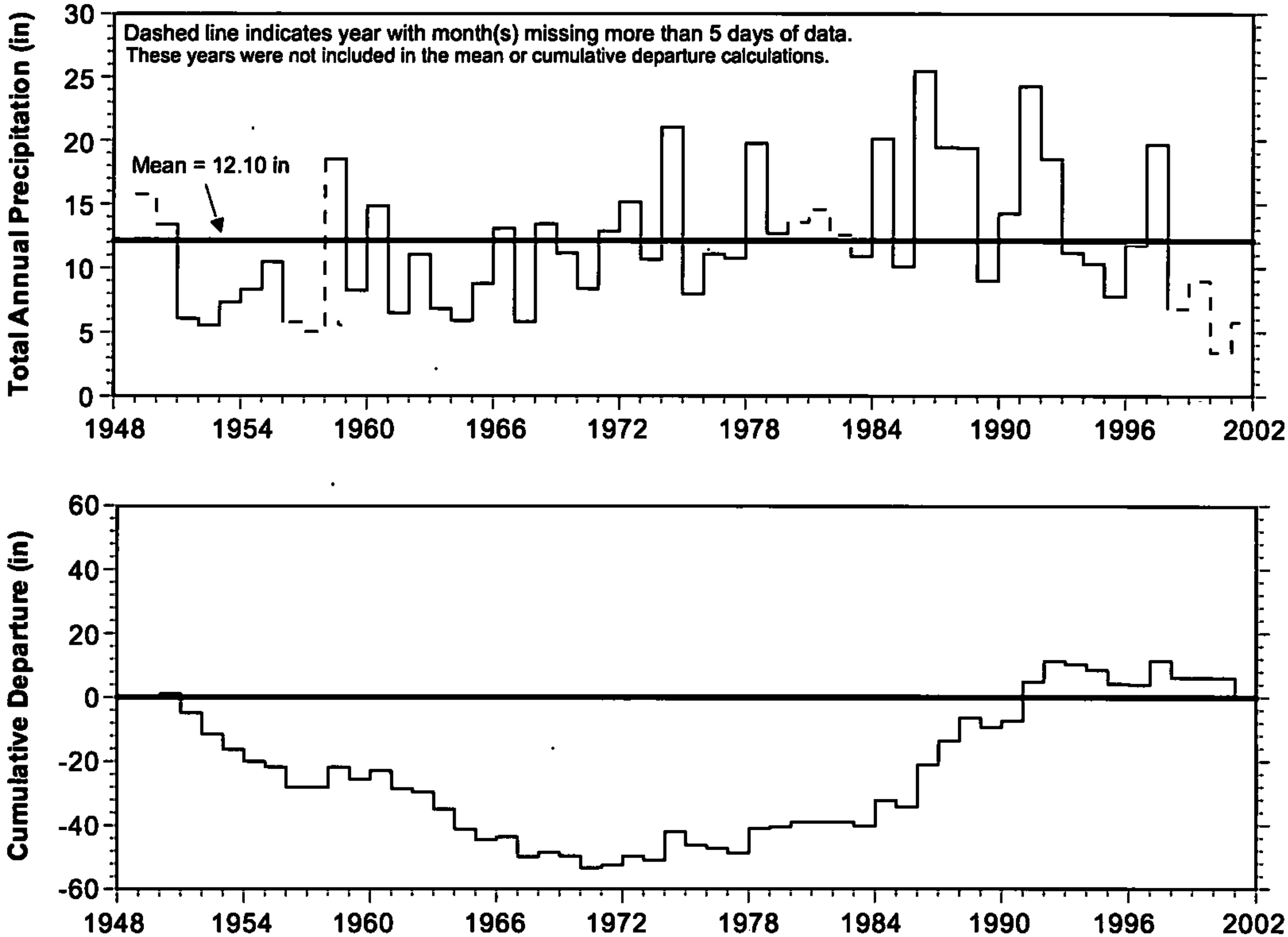


WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

Total Annual Precipitation and Cumulative Departure from Mean
Carlsbad FAA Airport, Carlsbad, NM

Figure 4

Daniel B. Stephens & Associates, Inc.
9-23-03 JN 9525

The water budget focuses on the occurrence of SSW in the formations closer to the surface. This section describes the geologic units in these shallower formations, beginning with the Dewey Lake and the overlying geologic units.

The *Dewey Lake Redbeds Formation* (hereafter referred to as *Dewey Lake)*, which consists of alternating thin beds of siltstone and fine-grained sandstone, is the deepest formation examined in the water budget. This formation is absent in some areas due to erosion before Triassic time, but is as much as 560 feet thick in eastern Eddy County and western Lea County (Bachman, 1984), near the WIPP site. Drilling within the WIPP facilities area shows that the Dewey Lake is approximately 500 feet thick (Powers, 1995). The Dewey Lake dips gently eastward and also increases in thickness to the east (Mercer, 1983).

The Dewey Lake is at the base of the SSW, with saturated conditions found in an overlying perched zone. A siliceous layer in the upper Dewey Lake at the Santa Rosa/Dewey Lake contact (Intera, 1997a; Powers, 2003b) and a sulfate (gypsum) cementation zone in the lower Dewey Lake (Powers, 2003a) form zones of reduced permeability in the otherwise more permeable sandstone. During hydrogeologic investigations undertaken during the development of the WIPP, minor thin, discontinuous saturated zones were identified in the Dewey Lake (Mercer, 1983).

In this report, the terms upper, middle, and lower Dewey Lake are used to describe the stratigraphic position in the formation along with certain characteristics of the formation that relate to the occurrence of saturated conditions. Although these horizons are not strictly defined and their thicknesses vary, the terms upper, middle, and lower are useful for the water budget to describe the hydrologic conditions.

- The upper Dewey Lake consists of a thick, generally unsaturated section.

- The middle Dewey Lake is the interval immediately above the sulfate cementation change, where saturated conditions and a natural water table have been identified in limited areas.

- The lower Dewey Lake is below the sulfate cementation change, with predominantly unsaturated conditions and low permeabilities.

Within the WIPP site, monitor well WQSP-6A, located approximately 1.25 miles southwest of the surface facilities area, intersects water in the Dewey Lake. Well WQSP-6A is screened across an interval from 189 to 214 feet bgs and has a water level measured at approximately 165 feet bgs (Stensrud, 1995). At this location, the Dewey Lake Formation occurs from a depth of 35 to 410 feet bgs (U.S. DOE, 1996), which places the saturated horizon within the middle portion of the formation.

The Dewey Lake Formation generally does not yield a water supply to wells; however, in a localized area at the James Ranch (about 1 mile south of the WIPP site boundary in T23S, R31E, Sections 6 and 7), domestic and stock supply wells produce water from the middle Dewey Lake at depths of 94 to 212 feet bgs (Mercer, 1983).

The *Santa Rosa Sandstone Formation* (hereafter referred to as *Santa Rosa),* of Triassic age, unconformably overlies the Dewey Lake. The Santa Rosa consists of gray and red sandstone with lenses of shale and conglomerate (Hendrickson and Jones, 1952). The Santa Rosa can be 200 to 300 feet thick (Hendrickson and Jones, 1952), but due to erosion, it is absent to the west of the WIPP site (Mercer, 1983). Drilling within the WIPP facilities area (Intera, 1997a) shows that the Santa Rosa ranges in thickness from 16 to 39 feet in the area of the SSW.

Shallow water in the Santa Rosa sandstone is the focus of the water budget. Earlier hydrogeologic investigations show that the Santa Rosa was generally not water-bearing at the WIPP site; however, further east, in southwestern Lea County, the Santa Rosa serves as a principal aquifer (Nicholson and Clebsch, 1961). Saturation was detected in the lower part of the Santa Rosa in two test holes drilled approximately 3 miles northeast of the WIPP surface facilities (Mercer, 1983).

Water in the Santa Rosa is perched on the relatively impermeable underlying Dewey Lake redbeds. Small amounts of water may discharge downward into the Dewey Lake through fractures and along bedding planes. However, Nicholson and Clebsch (1961) indicate that downward flow into the Dewey Lake is evident only in areas where collapse features have created significant fracturing, which is not the case at the WIPP site.

The *Gatuña Formation* (hereafter referred to as *Gatuña*), of Pleistocene age, unconformably overlies the Santa Rosa at the WIPP site. This formation consists of silt, sand, and clay, and is discontinuous, with deposits in localized depressions (Hendrickson and Jones, 1952). Boring logs from on-site drilling by Sergent, Hauskins & Beckwith (1979) describe the Gatuña as predominantly sandstone with interbedded siltstone that is highly weathered, fractured, and moderately hard. Drilling within the WIPP facilities area shows that the Gatuña ranges in thickness from 19 to 31 feet (Intera, 1997a).

The Gatuña Formation is water-bearing in some areas, with saturation occurring in discontinuous perched zones. However, because of its erratic distribution, the Gatuña Formation has no known continuous saturated zone (Mercer, 1983). Drilling at the WIPP site, including 30 exploration borings drilled between 1978 and 1979 in the surface facilities area, did not identify any saturated zones in the Gatuña.

The *Mescalero Caliche* is an informal stratigraphic unit consisting of well lithified deposits of finely crystalline limestone (caliche) that developed below the surficial soils and in the upper portion of the Gatuña Formation (Mercer, 1983). Powers (2002) indicates that the caliche is generally well developed in the vicinity of the WIPP. The Mescalero Caliche is described in detail by Phillips (1987), who indicates that although the caliche is continuous and well lithified in some areas, it is often dissected by holes, fractures, and other discontinuities. The

Mescalero Caliche is typically between 2 and 10 feet thick, with the upper contact of the caliche between 5 and 10 feet bgs (Sergent, Hauskins & Beckwith, 1979).

2.3.1 Soils

Berino series soils make up the sandy, surficial soils at the WIPP site (Bachman, 1980). These soils are developed in reddish, noncalcareous, wind-worked deposits, generally about 3 feet in thickness. The Berino soils are classified as loamy fine sands with a sandy clay loam subsoil and are very susceptible to wind and water erosion, often forming hummocks or dunes.

2.3.2 Recharge in Native Soils

Under natural conditions, recharge rates through the native soils are extremely low, and little recharge to the Santa Rosa SSW zone is likely to occur in the vicinity of the WIPP site. Most precipitation falls on rangeland and is returned to the atmosphere through evapotranspiration. Hunter (1985) estimated an evapotranspiration rate of 96 percent for a broad water balance study area encompassing 2,000 square miles in Eddy and Lea Counties. A preliminary water balance estimate for a 400-square-mile area surrounding the WIPP site determined recharge rates of 0.5 to 2 percent of precipitation, or less than 0.25 in/yr (Hunter, 1985). A study by Campbell et al. (1996) determined recharge rates for the WIPP site based on stable isotopes in soil waters and chloride mass balance analysis. These investigators estimated recharge rates in surficial soils of only 0.06 to 0.6 percent of precipitation, or less than 0.08 in/yr.

The extremely low recharge rates that occur in native soils covered with desert vegetation indicate that natural recharge around the WIPP facilities area is likely an insignificant component of the SSW water budget. However, site development at the WIPP has altered the recharge conditions by focusing storm water in retention ponds and removing vegetation over large areas, thereby increasing recharge in comparison to natural conditions.

2.4 Previous On-Site Hydrogeologic and Soils Investigations

While many hydrogeologic investigations have been conducted at the WIPP site, this section describes only the more recent investigations that focus on the SSW. SSW investigations were initiated following the May 1995 detection of fluid seeping through cracks in the Exhaust Shaft concrete liner at depths of 50 to 80 feet bgs (Intera, 1996). The locations of monitor wells installed to investigate the SSW and shaft seepage are shown in Figure 2, and copies of well logs (Intera, 1996, 1997a) are provided in Appendix A. The investigations and ongoing monitoring of these wells provide the basis for our current understanding of the SSW conditions.

A series of SSW investigation activities was conducted by Intera in 1996 and 1997 (Intera 1996, 1997a, 1997b) including:

- Geophysical survey to identify saturated zones in the subsurface

- Drilling of 3 monitor wells (C-2505, C-2506, and C-2507; 4-inch-diameter)
- Drilling of 12 piezometers (PZ-01 through PZ-12, 2-inch-diameter)
- Pumping and slug tests to determine hydrologic properties of the saturated zone
- Sampling of the SSW for water quality analysis

(Hereafter, this report refers to the 3 C-series monitor wells and the 12 PZ-series piezometers collectively as *monitor wells.*)

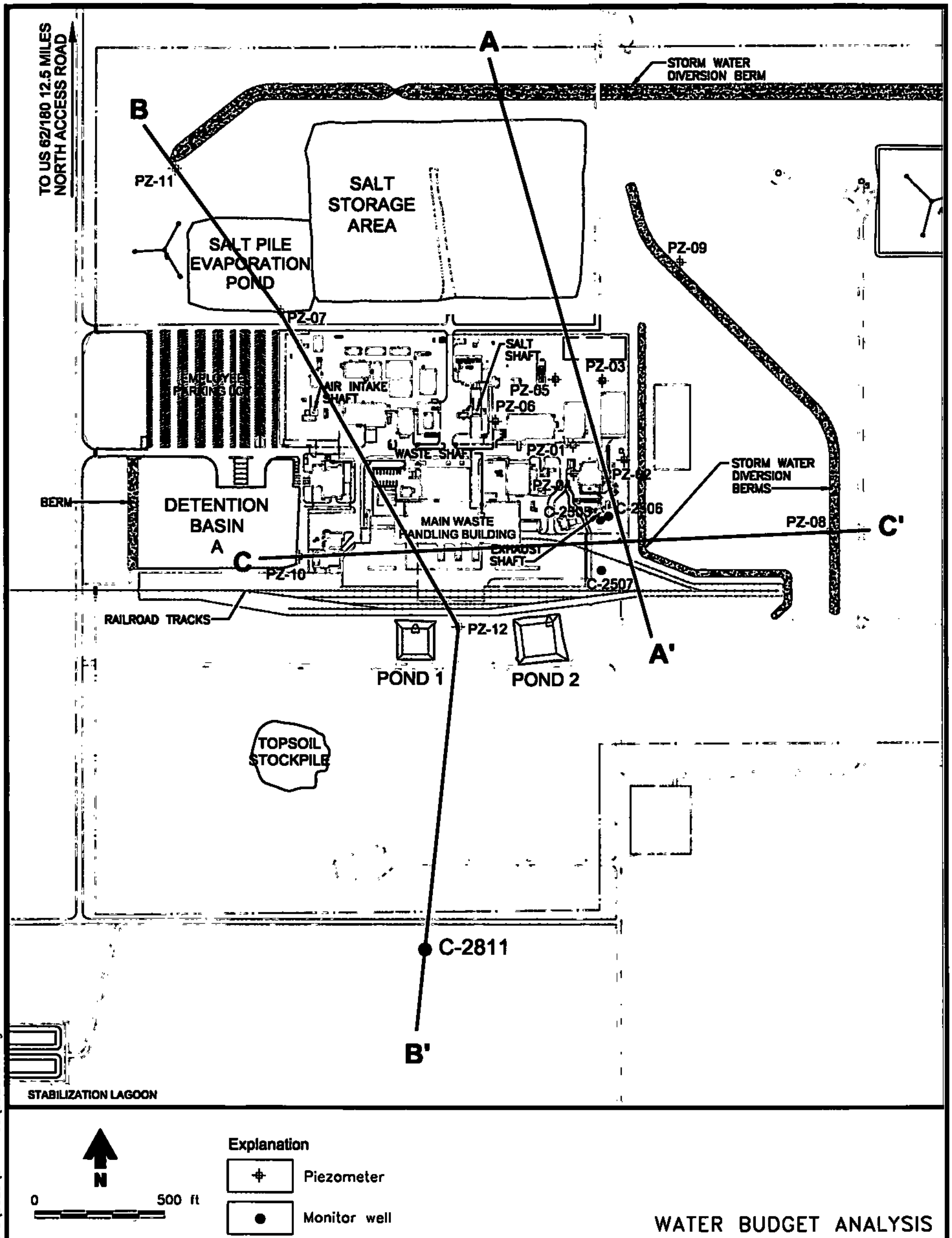
During the investigation, a saturated zone ranging from 12 to 32 feet thick was encountered in the Santa Rosa in wells completed at depths ranging from 54 to 75 feet bgs. The well screens are predominantly in the saturated interval in the lower portion of the Santa Rosa, and the wells typically penetrate approximately 5 to 10 feet into the Dewey Lake. The Dewey Lake Formation was found to be dry in the interval penetrated, although one borehole (C-2507) was reported to have saturation within the upper 5 feet of the Dewey Lake (Intera, 1996). The easternmost piezometer, PZ-08, which is located approximately 0.25 mile east of the facilities area, did not intersect SSW, suggesting a limit on the saturated zone in this area; however, the full extent of the SSW was not determined.

Water quality analysis of samples from the monitor wells and piezometers indicated total dissolved solids (TDS) concentrations ranging from 3,700 to 155,000 milligrams per liter (mg/L) (Intera, 1997a). Pumping and slug tests showed saturated hydraulic conductivity (K_{sat}) values for the Santa Rosa sandstone of 2.42×10^{-6} to 5.48×10^{-3} centimeters per second (cm/s) (Intera, 1996, 1997a).

The monitor well and piezometer installations showed that the lower portion of the Santa Rosa contains a substantial saturated zone, the areal extent of which includes the entire WIPP surface facilities area. Based on a typical porosity range of 5 to 30 percent for sandstone, Intera (1997a) estimated a total volume of SSW between 20 to 120 million gallons. Intera (1997b) concluded that the increase in water level and gradient observed between October 1996 and March 1997 indicated a significant recharge source north of the Exhaust Shaft.

Continued water quality monitoring and water level measurements have been carried out by WIPP personnel from 1997 to present. The monitoring data used in the water budget include monthly water level and TDS measurements from the 12 PZ-series piezometers and the 3 C-series monitor wells.

Water recently encountered in the upper Dewey Lake at monitor well C-2811 may be interconnected with the SSW in the Santa Rosa, although the interconnection is uncertain (Powers, 2002). Shallow monitor well C-2811, drilled in March 2001 approximately 1,300 feet south of the nearest SSW monitoring location, PZ-12 (Figure 5), was completed in the upper Dewey Lake and intersected water at a depth of approximately 60 feet bgs (Powers, 2002). According to Powers (2002), the Dewey Lake encountered at C-2811 was not saturated during



WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

Monitor Well C-2811 and Cross Section Location Map

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08-25-03 JN 9525

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Figure 5

drilling of earlier wells nearby. The thin zone of Santa Rosa, encountered from 35 to 45 feet bgs at the C-2811 location, was not water-bearing. The water quality from C-2811 is consistent with that of the SSW wells, with similar molar ratios (Powers, 2002). The TDS concentration in C-2811 was 2,630 mg/L, which is lower than the SSW wells, but follows the trend of decreasing TDS concentration toward the south.

Figures 6 to 8 show geologic cross sections through the SSW perched zone that are based on drilling logs from previous investigations (Appendix A). Cross section B-B′ (Figure 7) shows the relationship of the Santa Rosa, where the SSW is known to occur, and the shallow saturated zone encountered at well C-2811 in the predominantly unsaturated upper Dewey Lake. The saturated zone in the Dewey Lake at C-2811 is stratigraphically lower than the SSW occurring in the Santa Rosa to the north. The saturated zone at C-2811 is also both vertically and laterally distinct from the water at monitor well WQSP-6A, located about 1 mile southwest, where saturation occurs in the middle Dewey Lake (Section 2.4.3).

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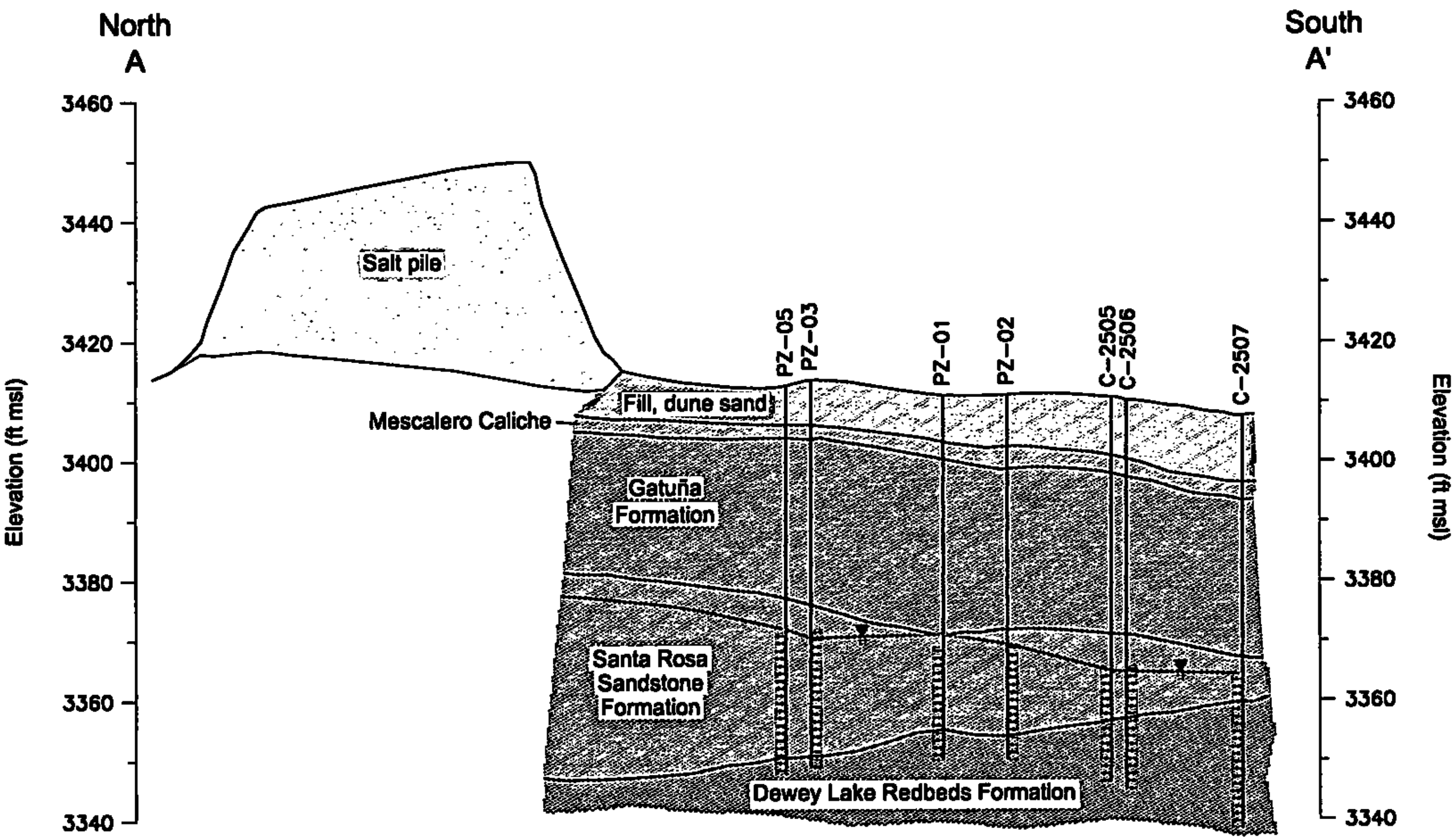

Vertical exaggeration = 10x

0 300 ft

Explanation

Water level (phreatic) surface measured November 6, 2002

Note: Monitor well and water level elevations are projected to the cross section line in Figure 5.

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Cross Section A-A'

Figure 6

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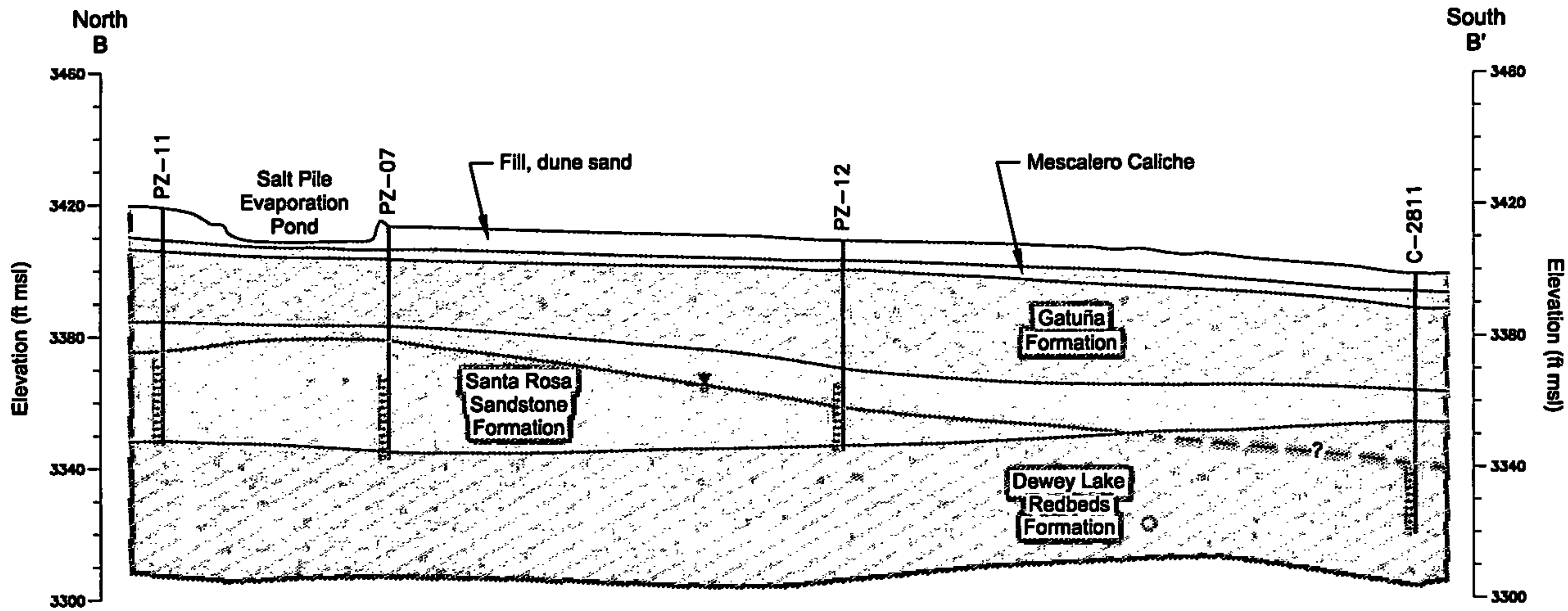

Vertical exaggeration = 10x

0 500 ft

Explanation

Water level (phreatic) surface measured November 6, 2002

? Continuity of water table uncertain in Dewey Lake Redbeds Formation

Note: Monitor well and water level elevations are projected to the cross section line in Figure 5.

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Cross Section B-B'

Figure 7

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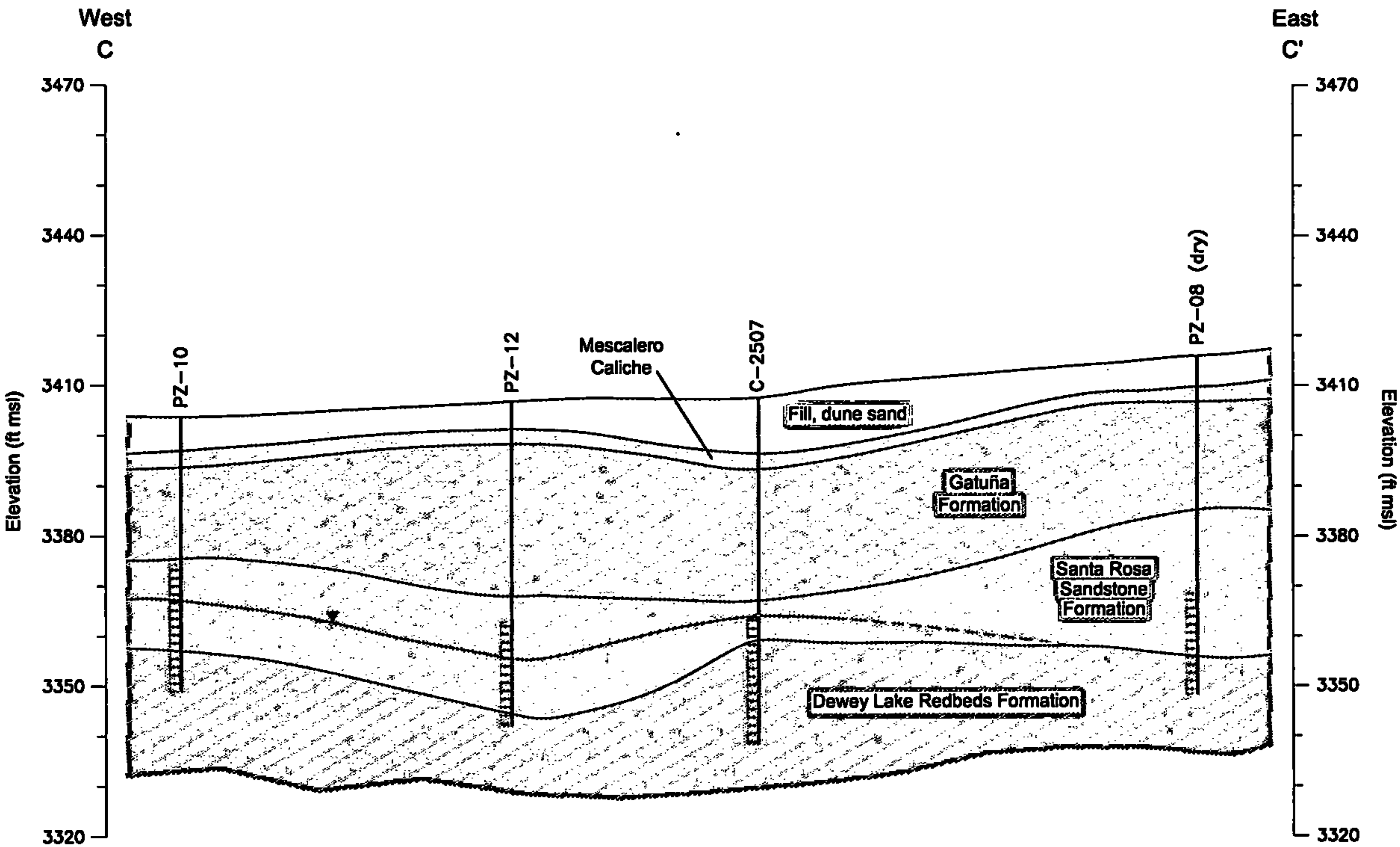

Vertical exaggeration - 10x

0 300 ft

Explanation

Water level (phreatic) surface measured November 6, 2002

Note: Monitor well and water level elevations are projected to the cross section line in Figure 5.

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Cross Section C-C'

Figure 8

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3. Characteristics of Shallow Subsurface Water

To estimate the quantity and source of recharge to the SSW, it was first necessary to determine the amount and characteristics of the water in the SSW lens. This section describes the initial assessment of water quantity and quality in the saturated lens, which provides the basis for the water budget analyses that follow.

3.1 Estimated Volume

The volume of SSW was estimated from the Santa Rosa saturated thickness measured in the on-site monitor wells (Figure 9). Water columns in the SSW monitor wells range from 4 to 34 feet thick in the Santa Rosa. The saturated thickness has been relatively constant since 1998.

The volume of SSW was calculated by estimating the area, average saturated thickness, porosity, and initial moisture conditions of the Santa Rosa Sandstone.

- The areal extent of the SSW (Figure 10) was estimated to be approximately 150 acres considering (1) the saturated thickness in the monitor wells, (2) the predominant direction of flow, and (3) the slope of the Santa Rosa/Dewey Lake contact.

- For the purpose of calculating the saturated volume, it was assumed that the Dewey Lake Redbeds Formation effectively represents an impermeable boundary beneath the Santa Rosa, giving an average saturated thickness of 16.6 feet, based on measurements made during October 1998 and October 2001.

- The only test data on the porosity of the Santa Rosa sandstone in the vicinity of the WIPP site are from a pumping test of a supply well in the Santa Rosa (Nicholson and Clebsch, 1961), which indicated an average 13 percent porosity. No test data on the Santa Rosa initial moisture content at the WIPP are available. Assuming this average 13 percent porosity and a residual moisture content of 3 percent, saturation in the SSW zone would be achieved when the remaining porosity of 10 percent is filled by additional water.

Thus, the calculated average volume of water needed to saturate the observed SSW is 83 million gallons. This amount represents only the addition of water to the SSW; adding the initial moisture content in the Santa Rosa Formation gives a total estimated SSW volume of 108 million gallons. This SSW volume estimate is based on information from on-site monitor wells and includes limited extrapolation beyond the perimeter of the monitor well network. A second estimate of the SSW volume based on MODFLOW saturated flow modeling is presented in Section 6.2.3.3.

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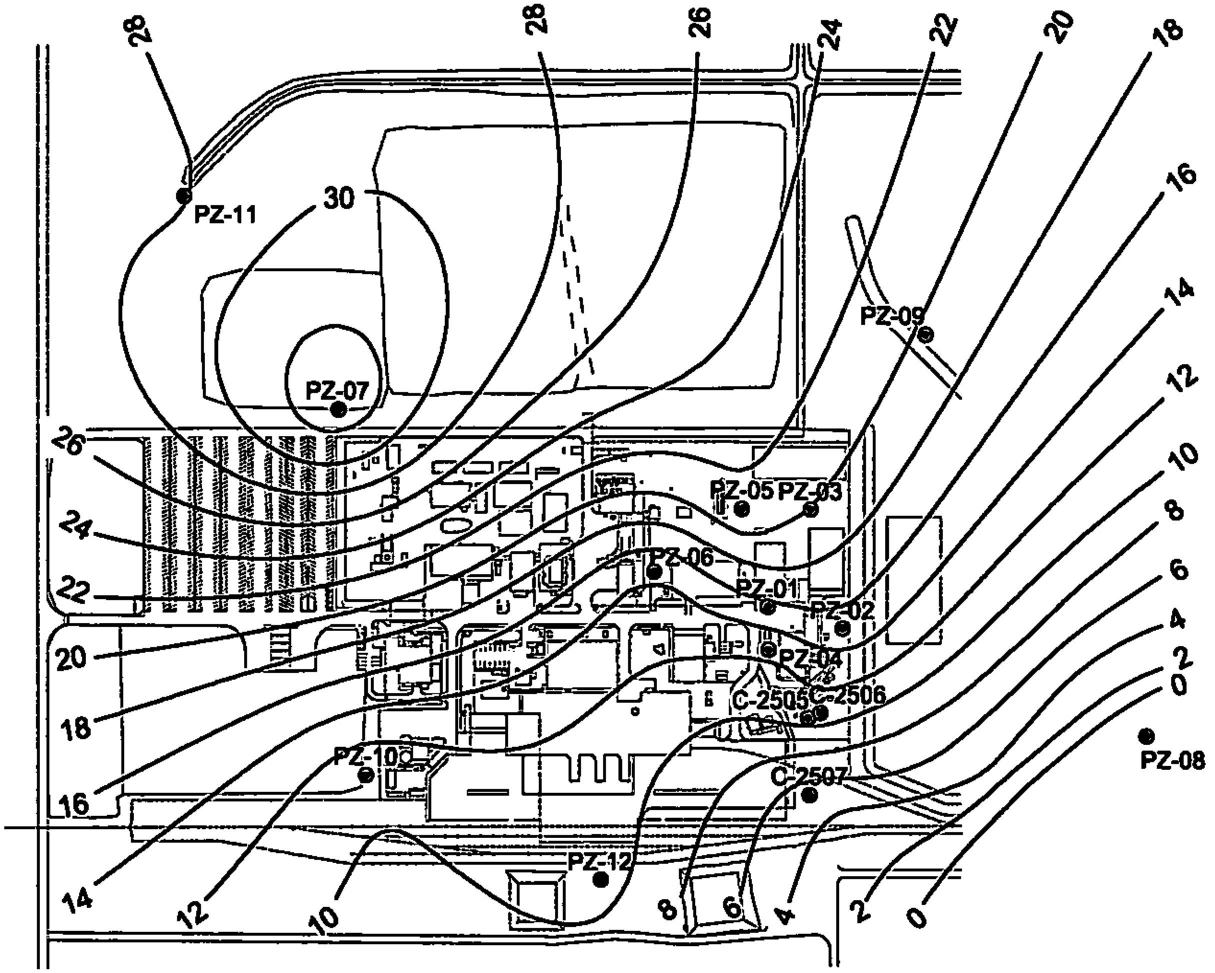

N

0 250 500 Feet

Explanation

Saturated thickness contour (ft)

Monitor well

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Saturated Thickness in the Santa Rosa
November 6, 2002

Figure 9

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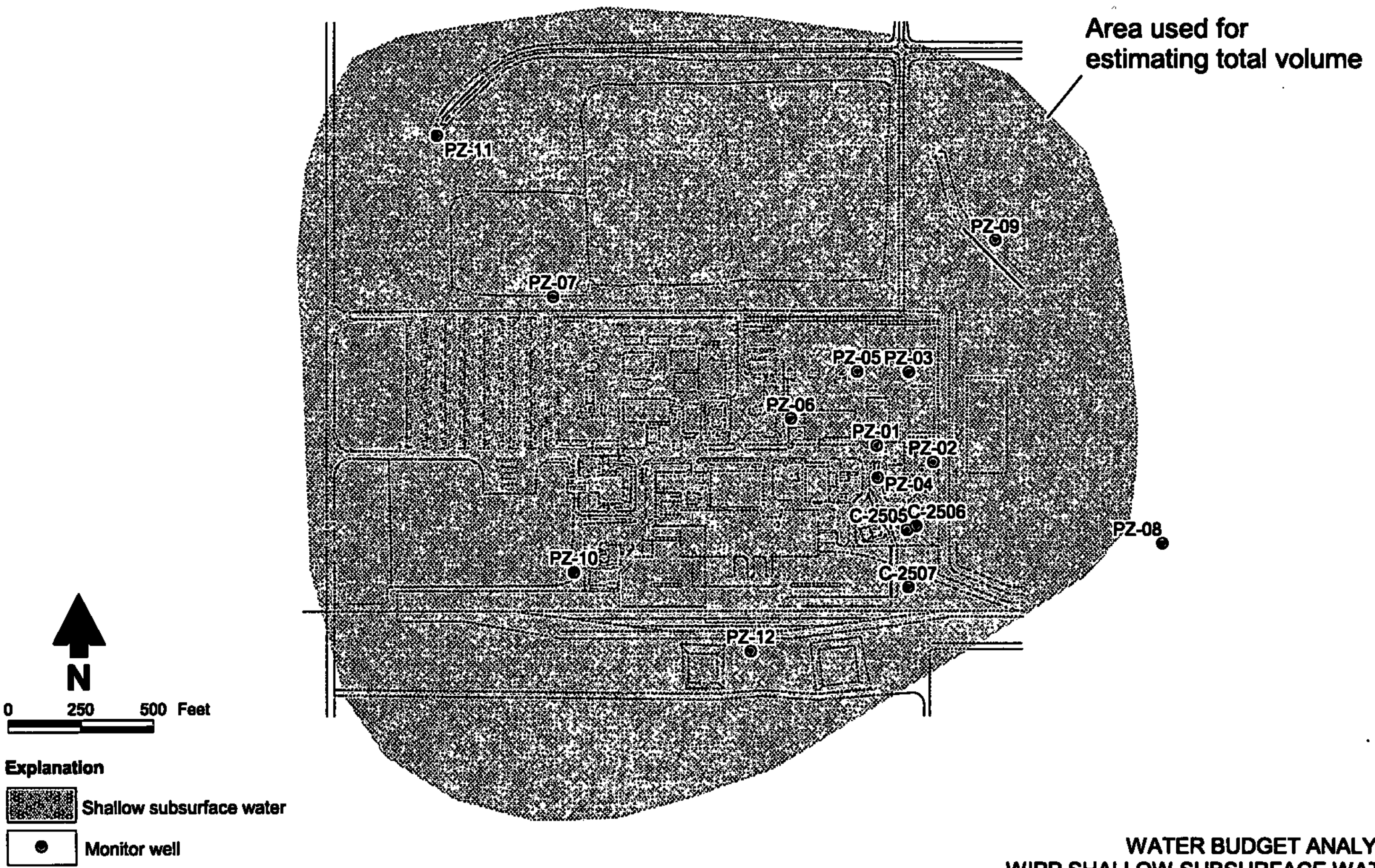

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Estimated Areal Extent of Shallow Subsurface Water

Figure 10

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3.2 Water Level Correction

Because of contrasting TDS values observed in the SSW, the measured water levels were corrected to account for water density differences. In cases where TDS concentrations were not measured during the same timeframe that water levels were measured, the first TDS concentration measured after the water level measurement was used in the correction.

3.3 Direction and Rate of Flow

A potentiometric surface contour map from October 2001 is presented in Figure 11. The contours are hand-drawn based on SSW monitor well water level measurements that have been corrected for density differences. In the northern portion of the site, limited well locations required interpretation to establish reasonable contours that consider the likely sources of significant recharge. In addition, monitor well PZ-04 was omitted from the potentiometric surface contours because measured water levels at this well have been anomalously low in relation to surrounding wells after dropping dramatically, by over 4 feet, during a one-week monitoring interval in 1997 (U.S. DOE, 2000). Omitting PZ-04 affects the water level contouring in only a localized area near the well.

The available water level data indicate that a water table mound exists near the Salt Pile Evaporation Pond and Salt Storage Area. The general SSW flow pattern suggests radial flow outward from the high point at PZ-07, with a predominantly eastward flow in the northern portion of the site and a predominantly southward flow in the southern portion. In the WIPP administrative area, where most SSW monitor wells are located, the SSW flows south and east from the apex of the water table mound. Monitor well PZ-11, located approximately 200 feet northwest of the Salt Pile Evaporation Pond, suggests a gradient to the north; however, the existing monitor well locations do not provide sufficient data to clearly demonstrate the gradient and extent of the SSW to the north of the water table mound.

The hydraulic gradient is variable, depending on the flow direction. Using the October 2001 contours (Figure 11) as a representative example, the typical hydraulic gradient beneath the WIPP administrative area is approximately 0.016 ft/ft toward the south. A typical SSW seepage velocity can then be calculated using an effective porosity of 10 percent and the geometric mean hydraulic conductivity (Intera, 1997a) of 1.5 feet per day (ft/d) for wells PZ-06, PZ-07, PZ-10, and PZ-12 (located in the central portion of the site where a relatively uniform southerly gradient is observed). The resulting seepage velocity is 0.24 ft/d, which represents a typical SSW flow velocity for current conditions.

3.4 Water Level Fluctuations

Water levels were observed to rise significantly in the SSW monitor wells during the first years of record, from 1996 to 1998. Since 1998, the water levels have remained fairly constant. A

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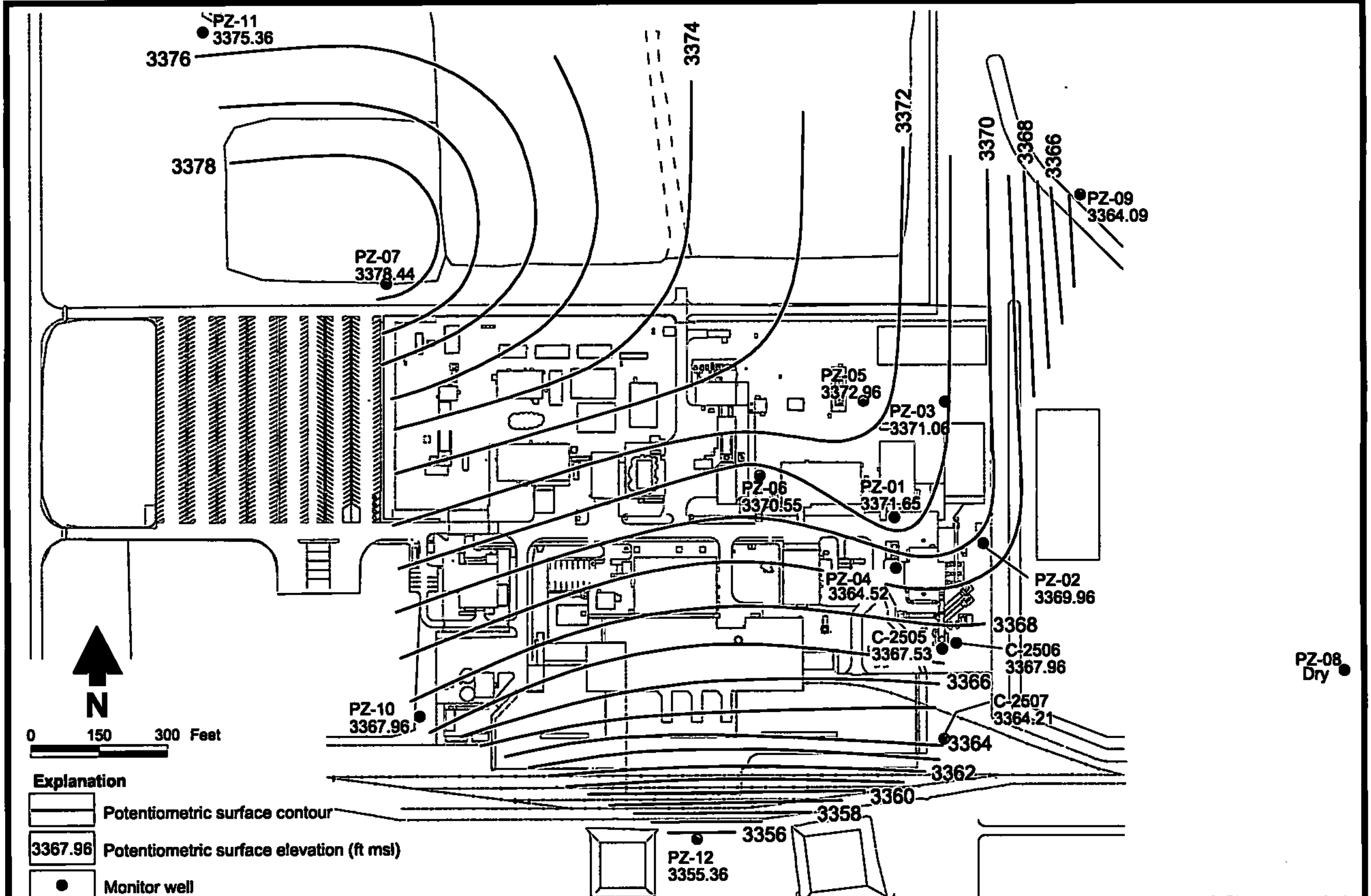

Notes:
1. Elevation from PZ-04 was omitted from contouring
2. Freshwater equivalent elevation used for contouring

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Potentiometric Surface Contours, October 2001

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Figure 11

time series analysis to examine water level trends for each of the SSW monitor wells was completed by plotting water level hydrographs along with precipitation records.

The SSW water levels appear to correlate with precipitation rates over the six-year period of record. The SSW monitor wells were installed in 1996, following a period of above average precipitation since 1984 (Figure 4). In the first year after installation of the wells (1997), when the total annual precipitation (23.91 in/yr) was nearly twice the average annual precipitation (13.24 in/yr at the WIPP weather station), SSW water levels increased sharply. In contrast, during the ensuing years (1998 to 2001), when the total annual precipitation was below the WIPP station average (Figure 4), observed water levels declined. These correlations are demonstrated in well PZ-07, located close to the Salt Pile Evaporation Pond, where the water level trends appear to be a result of high recharge rates during periods of high precipitation (Figure 12).

3.5 Water Quality

For the water budget analysis, DOE provided DBS&A up-to-date water quality monitoring data and TDS concentration contour maps for the years 1997 and 2000 (Figures 13 and 14, respectively). The highest TDS concentrations are found throughout the northern portion of the WIPP site, where much of the water encountered in the wells is classified as brine (TDS greater than 35,000 mg/L). Concentrations are much lower in the southern half of the site, but appear to be increasing over time. For example, the TDS concentration of PZ-12 was 3,140 mg/L in 1997, but increased to above 9,000 mg/L by 2000.

Time-series plots for each of the SSW monitor wells show distinct trends in the distribution of high TDS concentrations. In the vicinity of the Salt Storage Area, where TDS concentrations are most elevated, concentrations are steady or declining, consistent with the conceptual model for the SSW hydrologic characteristics. The observed water table mound, centered near the Salt Pile Evaporation Pond and Salt Storage Area, causes an outward radial flow from the mound's apex, with the high TDS plume spreading radially and increasing the TDS in wells at the periphery.

The DOE (2002) indicates that the composition of the Santa Rosa and overlying sediments does not provide a mechanism to produce naturally occurring water with the high salinities observed; thus the SSW is likely derived, at least in part, from anthropogenic saline sources.* Two potential sources of the saline zone within the SSW, the Salt Storage Area and Salt Pile Evaporation Pond, are close to the monitor wells with the highest TDS concentrations. In contrast, monitor wells near the storm water retention ponds, which are sources of fresh water recharge, exhibit the lowest TDS concentrations.

The halite (NaCl) contained in the Salt Storage Area is susceptible to dissolution by precipitation leaching through the salt. Dissolution is dependent on the rate of infiltration and the area of exposed mineral surfaces. Based on a halite solubility constant from Parkhurst (1995), water

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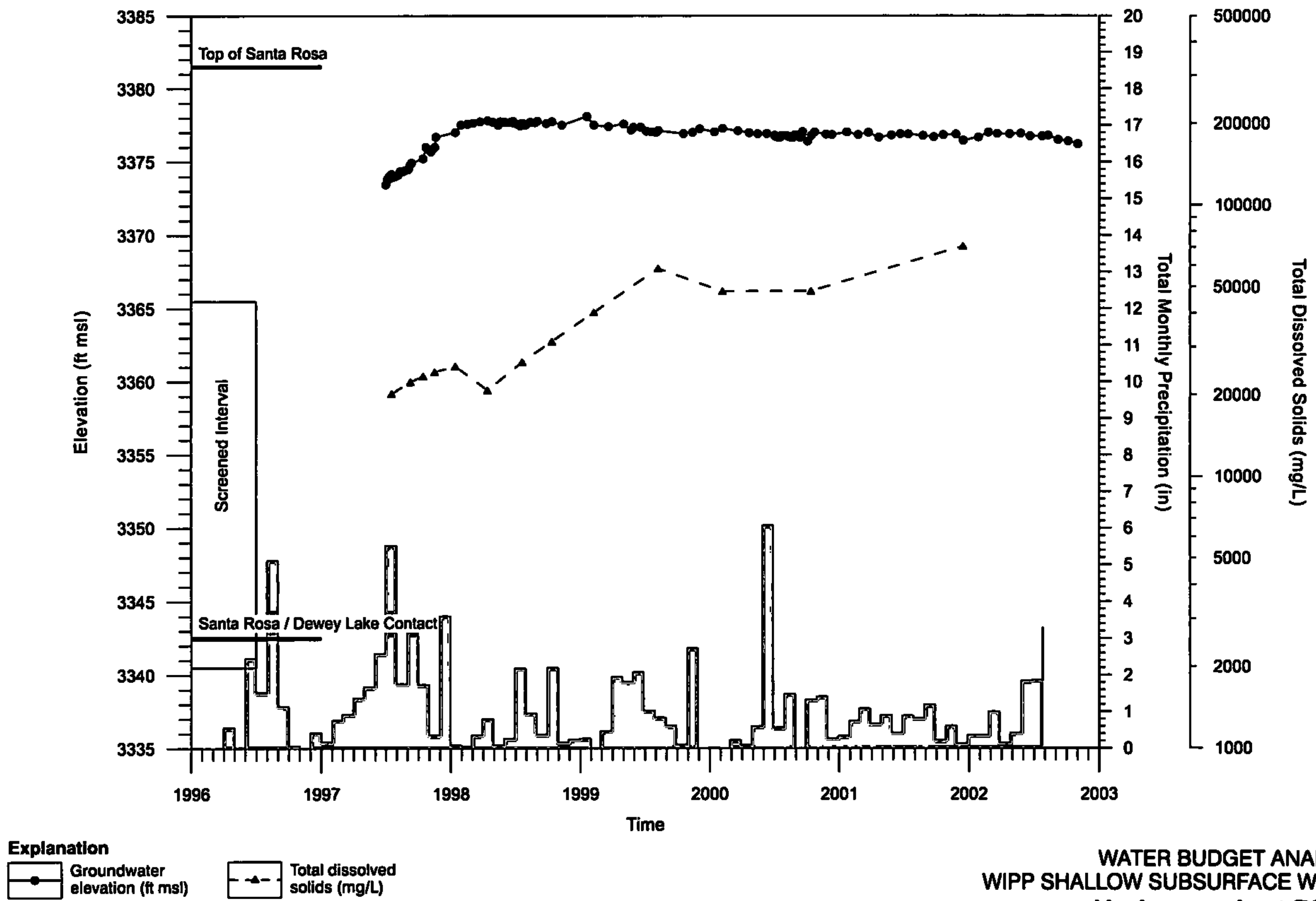

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-07
Monthly Precipitation and Total Dissolved Solids

Figure 12

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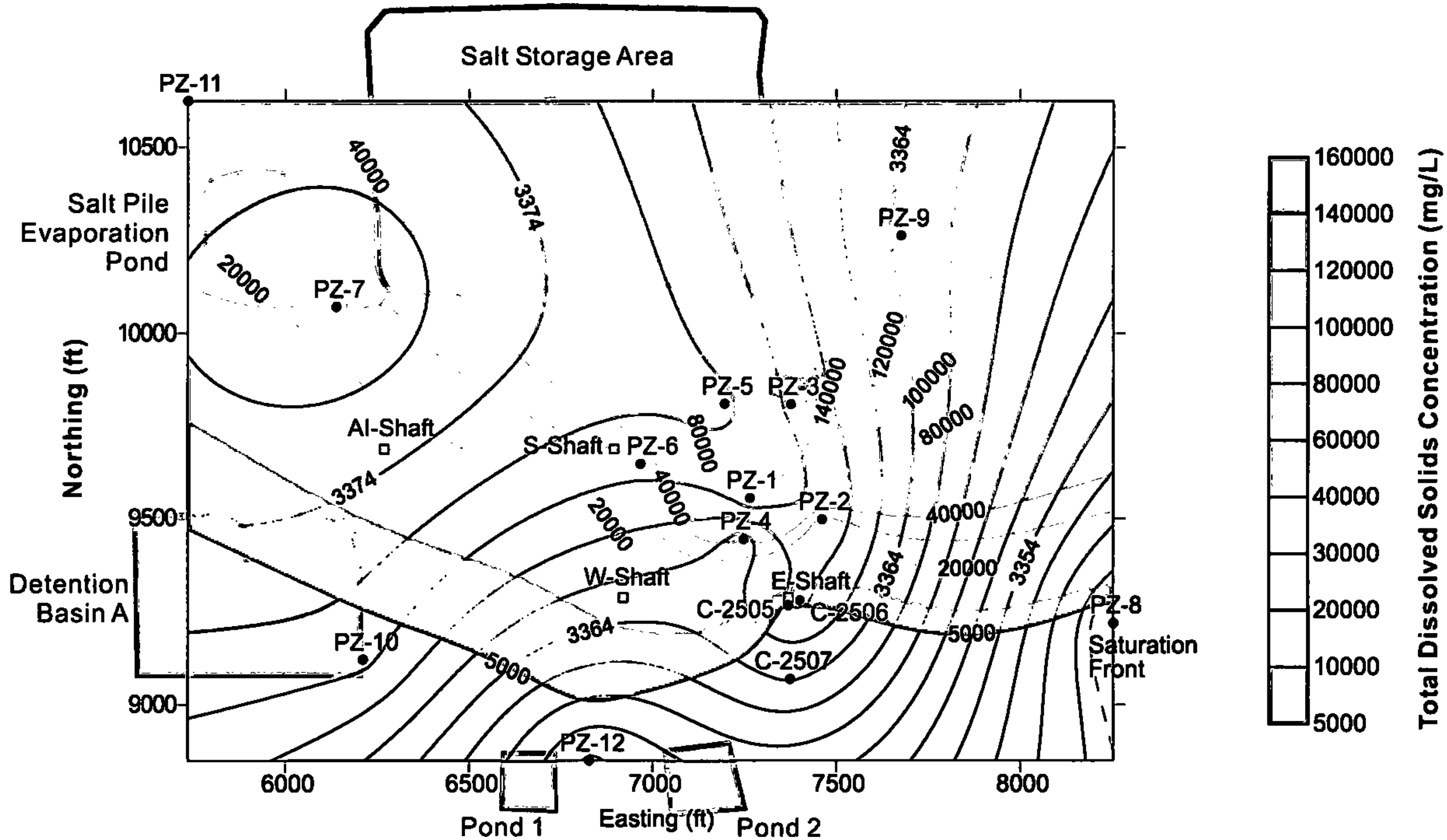

Source of drawing:
Adapted from contours provided in
Geotechnical Analysis Report for July 2000-June 2001
Volume 1, DOE/WIPP 02-3177, September 2002

Not to Scale

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Water Level Elevation and Water Quality (Total Dissolved Solids) Contour Map, February 1997

Figure 13

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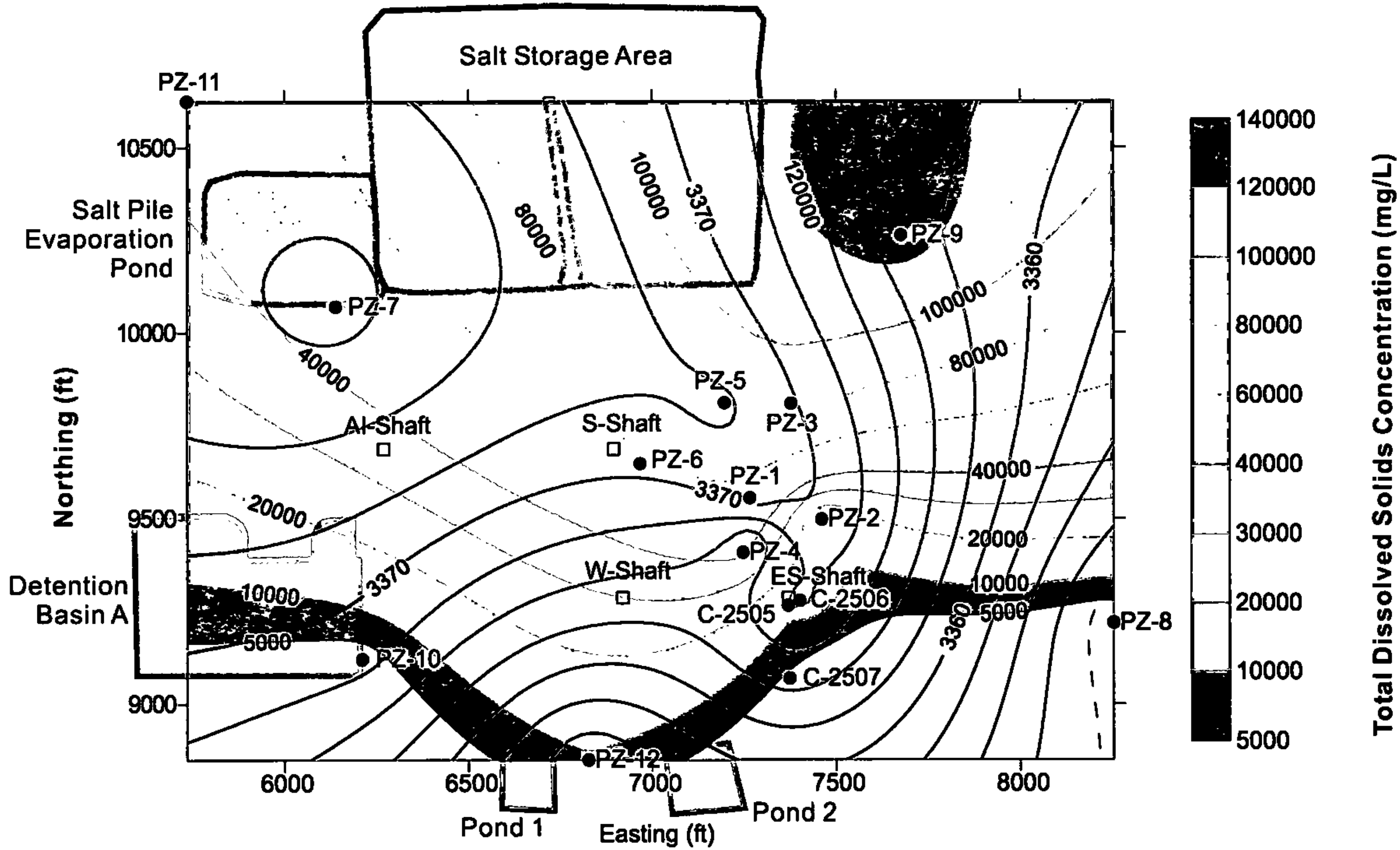

Source of drawing:
Adapted from contours provided in
Geotechnical Analysis Report for July 2000-June 2001
Volume 1, DOE/WIPP 02-3177, September 2002

Not to Scale

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Water Level Elevation and Water Quality (Total Dissolved Solids) Contour Map, October 2000

Figure 14

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saturated with halite contains 133,000 mg/L sodium and 205,000 mg/L chloride and has an approximate TDS concentration of 338,000 mg/L, depending on the exact composition of the crushed rock salt. Seepage that is near saturation with dissolved halite would have a TDS concentration approximately twice as high as the highest TDS concentration measured in the SSW. Thus, seepage from the Salt Storage Area provides a potential mechanism to generate the TDS concentrations observed in the monitor wells.

4. Operational Discharges and Losses

Numerous reports and documents describe the known and suspected water discharges and losses at the WIPP site. DBS&A compiled reported discharge rates, quantities, and sources, beginning with WIPP construction and continuing until the present. The operational discharges and water system leakage that may have contributed to the currently observed SSW are described in Sections 4.1 and 4.2, respectively. Operational-related losses from the SSW due to seepage into the Exhaust Shaft are described in Section 4.3.

4.1 Compilation of Historical Discharges

The record of historical water discharges at the WIPP site provides information on past flows of drilling fluids, fluids from shaft dewatering and water line purging, treated sewage effluent, and other discharges that occurred at various locations across the facility. Most historical discharges were not closely metered or measured, and for the water budget, discharge periods were estimated from available records to calculate total volumes. The sources, locations, and quantities of on-site discharges are summarized in Table 2.

The most significant historical discharges at the site occurred from the early to mid-1980s during drilling of the WIPP shafts, with the two largest sources of discharge being mine dewatering (1,300,000 gallons) and drilling of the Air Intake Shaft (770,000 gallons). Records from that time estimated the quantity of brine to be used during other drilling activities at more than 3 million gallons (U.S. DOE, 1980). This drilling fluid was discharged to a synthetically lined holding pond, and the amount of any release to the subsurface is uncertain. Other sources of operational discharges include flushing of the water supply pipeline (D'Appolonia Consulting Engineers, 1983), temporary showers for subsurface workers (U.S. DOE, 1980), and construction water from the Waste Handling Shaft (U.S. DOE, 1985).

The total volume of recorded on-site discharges to the ground surface is approximately 6 million gallons. Much of this was discharged into the Salt Pile Evaporation Pond, and a portion of the discharge was lost to evaporation. In comparison to the 108 million gallons of water estimated to be in the SSW saturated zone (Section 3.1), the volume of construction and operational discharges appears to provide only a minor contribution.

4.2 Estimate of Water Line Leakage

Leakage from water and sewer lines is a likely component of the overall water budget at the WIPP. Intera (1997b) indicates that several water line leaks were reported over a period of several months in 1996 and 1997. In addition to these identified leaks, a certain amount of leakage typically occurs in the underground piping network of most water systems.

Leakage rates from water systems are commonly estimated as a percentage of total use. A single water meter on the water system serving the WIPP facilities was put into service in

Table 2. Compilation of Historical Water Discharges

Source	Timeframe	Discharge: Location	Discharge: Rate[a] (gpd)	Discharge: Total Quantity[a] (gallons)	Reference
Mine dewatering[b]	August 1991 – December 1993	Salt pile evaporation pond	1,500[c]	1,280,000	U.S. DOE, 1991 NMED, 1993
Air intake shaft	December 1987 – February 1988; April 1988 – July 1988; August 1988[d]	Salt pile evaporation pond	5,000[c]	765,000	Westinghouse, 1987a, 1987b; Holt and Powers, 1990
Drilling fluid	---	---	---	2,400,000	U.S. DOE, 1980
	---	---	---	600,000	U.S. DOE, 1980
Pipeline flushing, 24-inch	September 1983 – January 1985	On-site	---	558,130	D'Appolonia, 1983
Pipeline flushing, 10-inch	September 1983 – January 1985	On-site	---	96,873	D'Appolonia, 1983
Temporary showers	October 1983 – February 1984	0.4-acre evaporation pond	1,000[c]	123,000	U.S. DOE, 1980
Waste handling shaft construction and aquifer inflow	June 1981 – March 1982	Salt pile evaporation pond	17,000 – 20,000	250,000[e]	U.S. DOE, 1985

--- = Not available   gpd = Gallons per day

a Except as noted below, rates or quantities were obtained from references cited in last column.

b The timeframe for mine dewatering was taken from the DOE 1991 request for emergency permit and from a subsequent approval by New Mexico Environment Department (NMED) for a 60-day extension dated September 16, 1993.

c Only rates were given for these discharges; total volumes were calculated using the rates and the timeframe.

d Timeframe from *Geologic mapping of the air intake shaft at the Waste Isolation Pilot Plant* (Holt and Powers, 1990).

e Total quantity for waste handling shaft construction and aquifer inflow was reported; this figure was not based on rates.

October 2000. Since that time, flow meter readings show an average water use of 6,240,000 gallons per year for 2001 and 2002. Because the WIPP water system is relatively new, leakage was estimated based on a low leakage rate of 5 percent. Since this water leaks into shallow soils, it was assumed that approximately 50 percent is evaporated at ground surface and the remainder seeps downward to the SSW zone. Leakage for a separate fire-water system at the WIPP site was determined to be 15 gallons per hour in September 2002, based on pumping of the system makeup pump (Hedin, 2002).

Estimated water line leakage to the SSW is summarized in Table 3. An estimated seepage of 222,000 gallons per year from the combined systems provides a reasonable input volume to the SSW from this source. Thus, seepage from water lines since the WIPP facilities opened in 1984 is estimated to total approximately 4 million gallons.

Table 3. Estimate of Water Line Leakage Input to Shallow Subsurface Water

Source	Annual Flow (gallons)	Leakage Rate			
		Percent of System	Hourly (gallons)	Daily (gallons)	Annual (gallons)
Water supply system	6,240,000	5	36	855	312,000
Fire-water system	NA	NA	15	360	131,000
Total annual leakage					443,000
Annual seepage to SSW [a]					222,000

[a] Calculated as 50 percent of total leakage NA = Not available

4.3 Exhaust Shaft Seepage

Seepage into the Exhaust Shaft (Figure 2) from the SSW saturated zone was first detected in May 1995 (U.S. DOE, 2002), when a scheduled inspection found water emerging from small cracks in the concrete shaft liner. Video inspections of the shaft liner show that seepage through these cracks occurs principally at depths of approximately 50 and 80 feet bgs (U.S. DOE, 2002). Measurement of the seepage rate is complicated by the fact that much of the seepage into the shaft is lost to evaporation because of air flow of up to 425,000 cubic feet per minute in the Exhaust Shaft (U.S. DOE, 2002). Although the flow has not been directly measured, DOE (2002) estimates, based on visual observations and periodic measurements of water collected at the base of the Exhaust Shaft during times of low air flow, that seepage into the shaft is about 1 to 3 gallons per minute (gpm). A flow rate of this magnitude could represent a significant loss from the SSW in the range of 0.5 to 1.6 million gallons per year.

The rate of seepage into the Exhaust Shaft is uncertain, and seepage through cracks in the shaft liner may be increasing over time. Assuming that the Exhaust Shaft seepage has occurred at a rate of 1 gpm (0.5 million gallons per year) from 1995 to 2002, the estimated loss from SSW storage amounts to approximately 4 million gallons since the time seepage was first observed.

5. Storm Water Runoff

Storm water runoff, generated by on-site precipitation, is a major component of the water budget. Much of the precipitation within the WIPP surface facilities falls on impervious areas and is routed to shallow, unlined storm water retention ponds. This section examines total storm water flows, flow paths, and fate of storm water runoff to determine the contributions of storm water to the SSW system, using the storm water runoff as input to the seepage modeling analyses (Section 6).

The runoff calculations are based in part on the original site grading and drainage plans and engineering calculations completed for the WIPP facilities design in the early 1980s: This information was supplemented with new runoff calculations completed for the water budget that reflect the most recent topographic surveys and incorporate new infrastructure that has been added since the original design calculations.

5.1 On-Site Water Retention Facilities

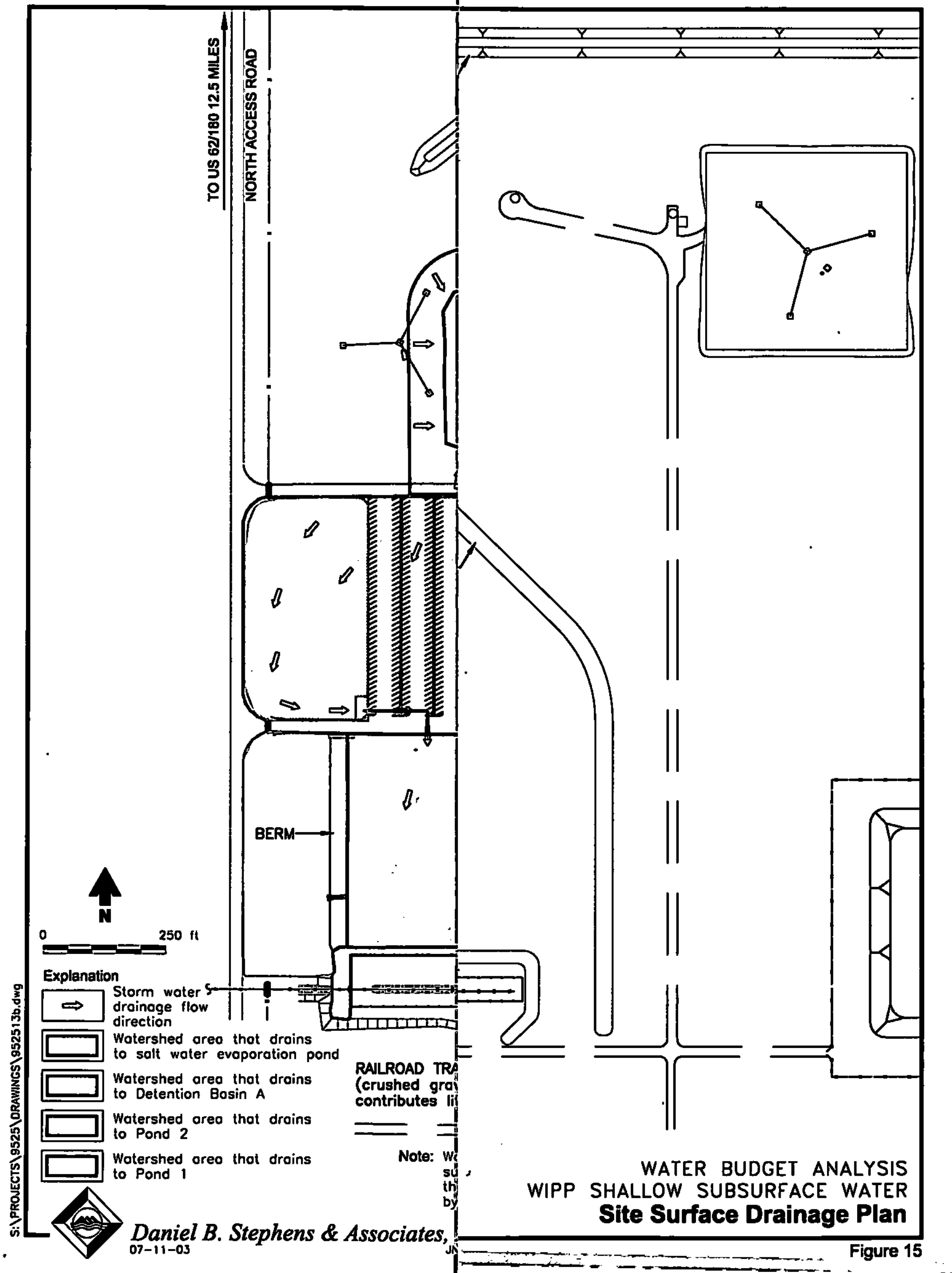
Surface water drainage at the WIPP site consists of four distinct watersheds that drain to four on-site, storm water retention ponds through a network of swales and culverts (Figure 15). The four ponds are:

- Salt Pile Evaporation Pond
- Detention Basin A
- Storm water retention Pond 1
- Storm water retention Pond 2

The areas of the ponds and watersheds, including the pervious and impervious areas, are summarized in Table 4. Figure 15 shows the ponds and their contributing watersheds. Three of the ponds receive relatively clean storm water from the surface facilities, while the Salt Pile Evaporation Pond receives runoff containing dissolved salt from the outer slopes of the Salt Storage Area. The largest watershed, located in the central portion of the facilities area, which includes the administrative area and parking area, drains to Detention Basin A. The southeast portion of the site drains to storm water retention Pond 2, while storm water retention Pond 1 collects a small amount of runoff from areas surrounding both Ponds 1 and 2.

The surface conditions of the watersheds range from relatively permeable bare ground to impermeable pavement and rooftops. Vegetation in the ponds is variable:

- Salt Pile Evaporation Pond: Sparse vegetation mainly in western half of pond
- Detention Basin A: Dense, well established vegetation
- Pond 1: No vegetation on caliche pond bottom
- Pond 2: No vegetation on caliche pond bottom



WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Site Surface Drainage Plan

Figure 15

Constructed berms to the north and east of the site prevent off-site surface water from running onto the WIPP site (Figure 15). Therefore, all of the storm water collected in the retention ponds is from on-site runoff.

Records regarding the design and construction of WIPP facilities indicate that the ponds were constructed between 1981 and 1984. The total capacity of the ponds is designed to handle the runoff from either a 100-year / 24-hour storm event (U.S. DOE, 1993) or two consecutive 10-year / 24-hour storms (Westinghouse, 1992). During 1993 to 1994, design improvements were completed on Detention Basin A and Ponds 1 and 2 to provide total storm water retention (Westinghouse, 1992).

Table 4. Summary of Watershed and Pond Areas

Pond	Pervious [a] Watershed Area		Impervious [b] Watershed Area		Entire Pond Area		Total Watershed Area	
	ft^2	acres	ft^2	acres	ft^2	acres	ft^2	acres
Salt Pile Evaporation Pond	724,393	16.6	0	0	158,024	3.63	882,417	20.3
Detention Basin A	502,172	11.5	890,778	20.4	249,956	5.74	1,642,906	37.7
Storm water retention Pond 1	119,793	2.75	16,615	0.38	21,818	0.50	158,226	3.63
Storm water retention Pond 2	98,643	2.26	222,328	5.10	32,416	0.74	353,387	8.11
Totals	1,445,001	33.1	1,129,721	25.9	462,214	10.61	3,036,936	69.7

[a] Pervious surfaces represent bare ground, gravel, and vegetated ground conditions.
[b] Impervious surfaces represent asphalt and concrete surfaces, and rooftops.
[c] Areas adjacent to the railroad tracks are excluded from the watersheds. Little runoff is expected from these gravel surfaces, which are level or in swales without an apparent discharge point.

5.2 Storm Water Runoff Calculations

For the water budget, runoff was estimated using the rational formula; a standard method that was also used for the original WIPP facility engineering design. Inasmuch as the purpose of the analysis was not to estimate peak discharge rates, but rather to estimate total runoff on a daily basis, a modified version of the rational formula was used (Wanielista et al., 1997).

Runoff was calculated using WIPP daily precipitation records from 1997 through 2002. Drainage flow paths for each watershed were determined from site topography, previous storm water calculations, and observations made during site visits. The irregular pond bottom grades were taken into account in the storm water calculations by determining the submerged area for average-size storms. Table 5 summarizes pond infiltration areas, total watershed areas, and rational method weighted average runoff coefficients used to calculate storm water runoff volumes.

Table 5. Summary of Runoff Calculation Input

Location	Pond Infiltration Area (ft^2)	Total Watershed Area (ft^2)	Total Watershed Area acres	Weighted Average Runoff Coefficient
Salt Pile Evaporation Pond	79,012	882,417	20.3	0.7507
Detention Basin A	70,222	1,642,906	37.7	0.8458
Pond 1	10,000	158,226	3.63	0.7954
Pond 2	15,624	353,387	8.11	0.9232

5.3 Discharges to Storm Water Ponds

Table 6 summarizes the total annual precipitation, runoff, and cumulative inches of storm water in each pond for the period of record from January 1997 through August 2002. The average annual precipitation rate for 1997 to 2001 is 12.7 in/yr, which translates to an average annual precipitation volume of approximately 29.2 million gallons over the 84.6-acre watershed, including the four storm water pond watersheds (24.0 million gallons of annual precipitation) and the 15-acre Salt Storage Area top deck (5.1 million gallons of annual precipitation).

The total combined runoff volume received at all four ponds for the period of record was 113.6 million gallons, and the average annual storm water runoff for 1997 to 2001 was 19.8 million gallons. The total runoff is divided among the four ponds as follows:

- Detention Basin A: 55.5 percent
- Salt Pile Evaporation Pond: 26.5 percent
- Pond 1: 5.0 percent
- Pond 2: 13.0 percent

Detention Basin A and the Salt Pile Evaporation Pond together capture more than 80 percent of storm water runoff. Detention Basin A alone captures more than half of the storm water runoff and therefore appears to be a primary source of seepage.

Table 6. Summary of Runoff Volumes

Year	Annual Precipitation (inches)	Volume of Runoff (gallons)					Cumulative Runoff Depth (inches)			
		Salt Water Evaporation Pond	Detention Basin A	Pond 1	Pond 2	Total	Salt Pile Evaporation Pond	Detention Basin A	Pond 1	Pond 2
1997	23.9	9,874,445	20,713,467	1,876,013	4,863,162	37,327,088	200	473	301	499
1998	7.7	3,188,120	6,687,669	605,700	1,570,149	12,051,639	65	153	97	161
1999	11.9	4,906,168	10,291,592	932,107	2,416,287	18,546,155	100	235	150	248
2000	12.0	4,959,757	10,404,004	942,288	2,442,679	18,748,728	101	238	151	251
2001	8.0	3,295,167	6,912,220	626,038	1,622,869	12,456,294	67	158	100	167
2002 [a]	9.3	3,820,125	8,013,416	725,773	1,881,411	14,440,726	78	183	116	193
Total	72.8	30,043,782	63,022,368	5,707,919	14,796,557	113,570,630	611	1,440	915	1,519
Annual Average [b]	12.7	5,244,731	11,001,790	996,429	2,583,029	19,825,981	107	251	160	265

[a] Data for 2002 covers only through August.
[b] Average over the years 1997 through 2001.

6. Storm Water Pond and Salt Pile Seepage

Local recharge to the SSW from potential sources of on-site seepage was analyzed using multiple calculation methods. Because impermeable surfaces cover much of the WIPP facilities area, seepage is expected to occur predominantly from the following five pervious areas, as shown on Figure 15:

- Salt Storage Area
- Salt Pile Evaporation Pond
- Detention Basin A
- Pond 1
- Pond 2

Using the calculated quantities of storm water runoff, the seepage rate was calculated for these five primary seepage sources. The calculation methods used for estimating local, focused recharge in these areas are independent approaches that can be cross-referenced to evaluate the reliability of the results. These methods include:

- *Surface infiltration model:* Calculates downward seepage based on hydraulic loading of precipitation and variably saturated flow processes in the soil/salt profile using UNSAT-H.

- *Saturated flow model:* Calculates seepage based on SSW hydrologic conditions and potentiometric surface of the saturated zone. Two types of saturated flow models were applied: (1) steady state (MODFLOW) and (2) transient flow (MODFLOW-SURFACT).

Multiple methods were used to evaluate seepage rates to provide a range of estimated results and corroboration of the general magnitude of seepage. Although the analyses were performed independently, they used many of the same input parameters to maintain consistency among the methods and ensure general reasonableness of results. The models were run with a range of input values during development, and sensitivity analyses were performed on input variables. The seepage rate estimates determined by these models were then used as input to a SSW flow model to examine long-term migration potential (Section 7). Details of the seepage analysis methods and results are described in Sections 6.1 and 6.2.

6.1 Surface Infiltration Modeling

Modeling of surface infiltration, the movement of precipitation from the ground surface to deep percolation, was conducted to estimate the volume of water contributing to SSW recharge from each of the five primary seepage sources. The UNSAT-H model (Fayer, 2000) was selected because it can consider variably saturated/unsaturated infiltration. The model accounts for the water budget losses of evaporation and transpiration and the seepage that contributes to the SSW. The UNSAT-H model can also determine the evapotranspiration losses and seepage inputs from sources with very different characteristics, such as those at the WIPP site.

Conceptually, surface infiltration occurs in cycles following storm events. Precipitation that falls on the Salt Storage Area can infiltrate below the salt pile surface through extensive fractures and dissolution channels (i.e., macropores) observed on the salt pile surface. In the storm water retention ponds, water collects to depths of a few inches to a few feet following storm events. Water levels in the basins decrease in response to combined losses of infiltration and evaporation, but ponded water may remain for days. Eventually, the ponded water will completely infiltrate and/or evaporate, and the soil in the basin will dry out as evapotranspiration and gravity drainage continue.

6.1.1 UNSAT-H Model

The UNSAT-H model uses a one-dimensional finite element version of Richard's equation to simulate infiltration in variably saturated media as a function of environmental conditions such as climate, soil type, and vegetation. The model was developed at Pacific Northwest National Laboratory (PNNL) and has been verified against analytical solutions and validated against lysimeter data by Fayer et al. (1992). More information about UNSAT-H is available from the DOE's PNNL (2002) web site.

Evapotranspiration losses from the soil profile are an important component of the water budget, and UNSAT-H provides a robust consideration of evapotranspiration. The model accounts for both downward and upward redistribution of moisture in the soil profile and changes in soil moisture storage. The model determines the seepage exiting the base of the model domain, which is assumed to migrate vertically downward and become recharge to the SSW.

6.1.2 Ponded Water Calculations

Storm water inputs to the retention ponds from the much larger watersheds result in accumulation of ponded water when storm water inflow exceeds the infiltration capacity of the ponds. To model seepage from the ponds, it was necessary to determine the depth of water (hydraulic head) in each pond after each precipitation event (the ponded water calculations did not apply to the Salt Storage Area, which receives only direct precipitation). Using the runoff volume and pond infiltration area, the depth of water in each pond was calculated for each day's runoff volume within the period of record. The ponding depth following precipitation events was calculated using the following input:

- Infiltration capacity of the soil in the pond bottom
- Weather data records from the WIPP weather station (1997 through September 2002)
- Storm water runoff calculated as described in Section 5

UNSAT-H simulated the evapotranspiration losses and infiltration of ponded water over a period of days. Calculations included daily time increments to ensure that evaporative losses were based on the actual climatic data for that day. This application of UNSAT-H produced negligible amounts of surface runoff from the ponds (3 percent of infiltration), which UNSAT-H shows as a minor mass-balance loss from the system.

6.1.3 UNSAT-H Input Data

UNSAT-H modeling was conducted for unconsolidated near-surface materials, including the Salt Storage Area and the first bedrock unit encountered, the Gatuña Formation. These materials were of four distinct types: crushed rock salt, unconsolidated sand, caliche, and the Gatuña Formation. The thickness of each unit and the four model profiles analyzed are depicted in Figures 16 and 17.

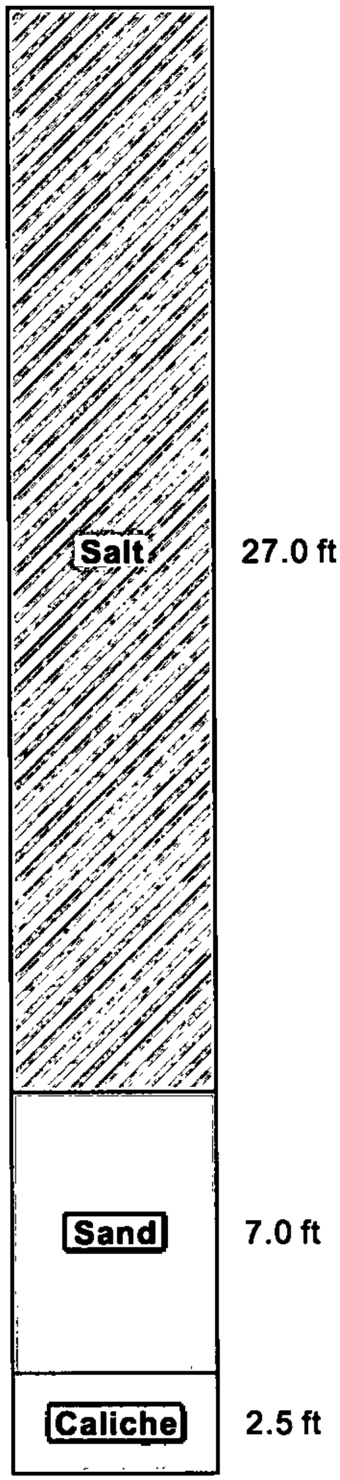
Inputs to the UNSAT-H model include climatological, soils, and vegetation data. Table 7 indicates the sources for these data, while Tables 8 and 9 indicate the data used for soil and vegetation parameters. No laboratory data are available for unsaturated flow parameters for WIPP soils or the crushed rock salt; therefore, the selected values in Table 8 are based on typical values for the general lithology of the materials.

Table 7. Sources of UNSAT-H Climatological, Vegetation, and Soil Parameters

Input Parameter	Source
Climatological data	
Precipitation	WIPP weather station
Temperature	
Solar radiation	
Relative humidity	
Wind speed	
Plant data	
Leaf area index	Neitsch et al., 2002
Rooting depth	Neitsch et al., 2002 www.wa.gov/agr/weedboard/weed_info/kochia.html http://csd.unl.edu/csd/illustrations/ra5a/plants.html
Rooting density	Ayers and Westcot, 1989 http://csd.unl.edu/csd/illustrations/ra5a/plants.html
Soil data	
Hydrologic characteristics	U.S. SCS, 1971; Carsel and Parrish (1988)
Unit thicknesses	Sergent, Hauskins & Beckwith (1979); Intera (1997a)

Prior to each simulation, the weather data for 2000 were repeated for four years in UNSAT-H runs to allow the initial soil-water conditions in the model domain to attain a steady state with respect to typical climatic conditions. The model was then run for a five-year timeframe (1997 to 2001) to determine infiltration rates and evaporative losses.

Salt Storage Area



WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

Salt Storage Area UNSAT-H Model Profile

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Figure 16

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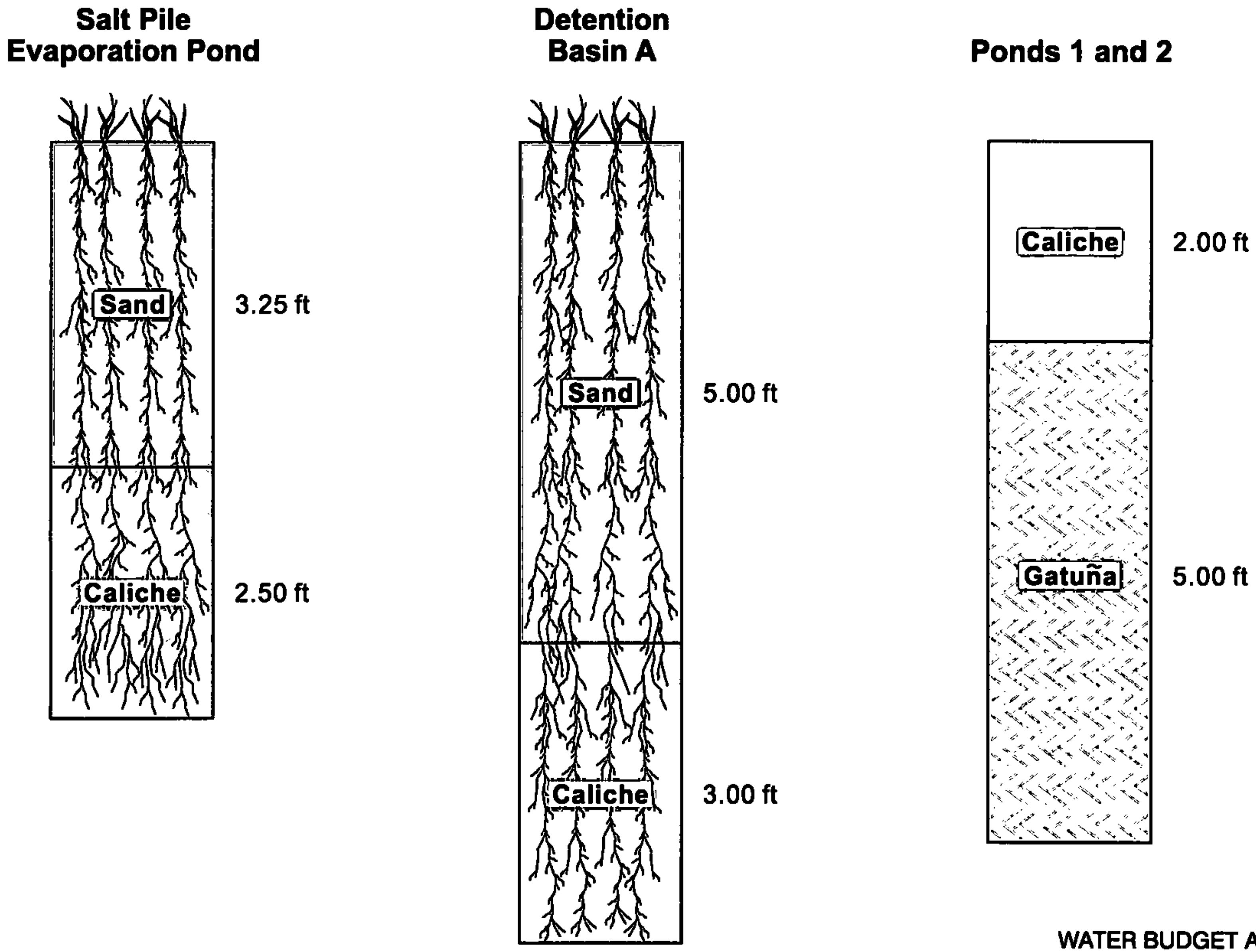

Not to Scale

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

Storm Water Retention Ponds UNSAT-H Model Profiles

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Figure 17

Table 8. Unsaturated Flow Parameters Used in UNSAT-H

Unit Parameters	Crushed Rock Salt	Sand	Caliche	Gatuña Formation
K_{sat} (cm/s)	4.30×10^{-2}	1.36×10^{-4}	6.53×10^{-4}	3.63×10^{-4}
α	0.126	0.020	0.059	0.059
N	2.27	1.41	1.48	1.48
θ_s (v/v)	0.41	0.45	0.39	0.39
θ_r (v/v)	0.057	0.067	0.100	0.100

Note: Data source references are provided in Table 7.
K_{sat} = Saturated hydraulic conductivity
cm/s = Centimeters per second
α = Fitting parameter
N = Fitting parameter
θ_s = Saturated moisture content
v/v = Volume per volume
θ_r = Residual moisture content

Table 9. Vegetation Parameters Used in UNSAT-H Modeling

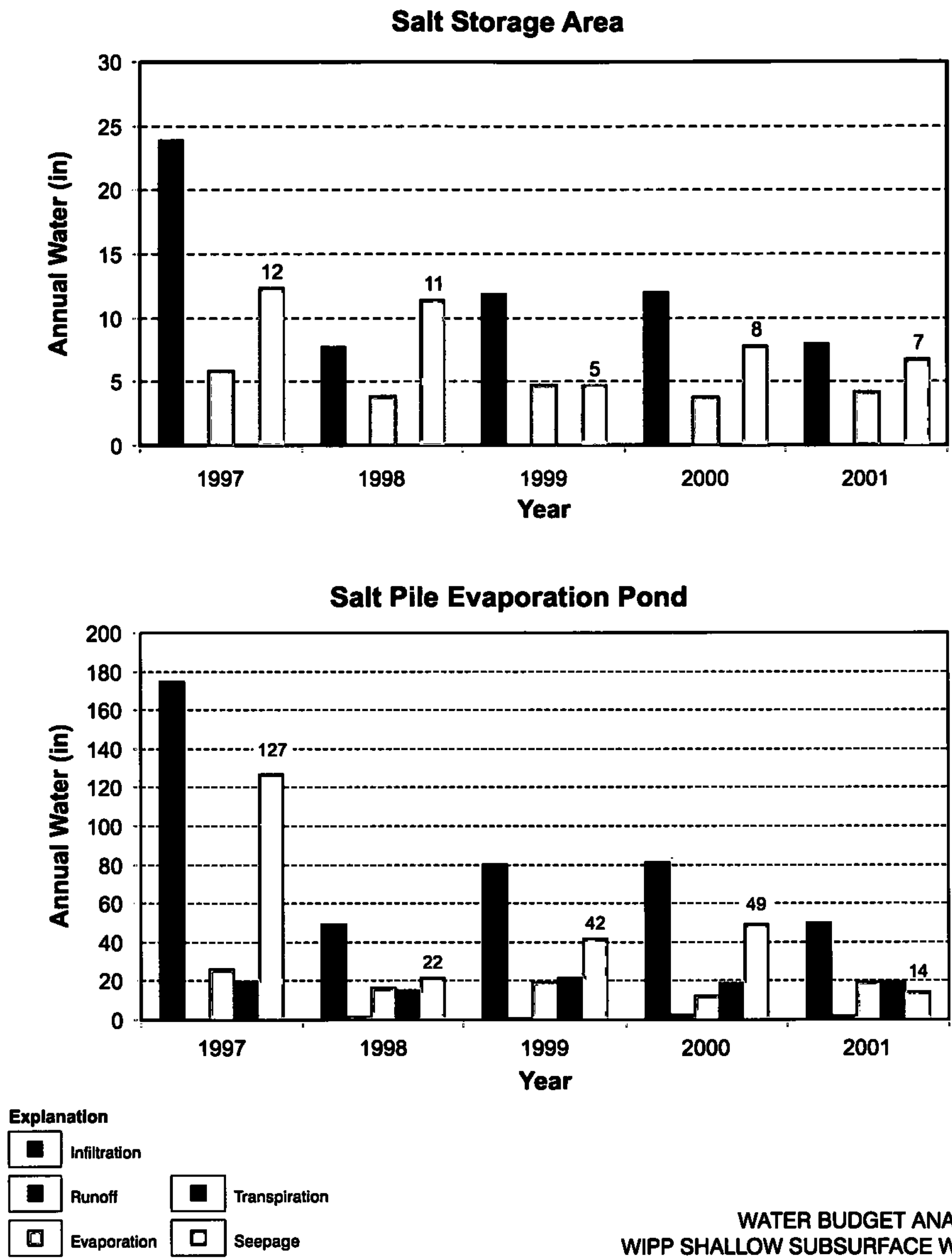
Location	LAI	HW		HD		HN		Coefficients			% Vegetation
		cm	v/v	cm	v/v	cm	v/v	a	b	c	
Salt Storage Area	---	---	---	---	---	---	---	---	---	---	0
Salt Pile Evaporation Pond	2.5	20,000	0.13	3,000	0.23	1	0.43	0.25	0.03	0.001	65
Basin A	2.5	20,000	0.13	3,000	0.23	1	0.43	0.25	0.03	0.001	95
Pond 1	---	---	---	---	---	---	---	---	---	---	0
Pond 2	---	---	---	---	---	---	---	---	---	---	0

Note: Data source references are provided in Table 7.
HW = Water content below which plants wilt and stop transpiring
HD = Water content below which plant transpiration starts to decrease
HN = Water content above which plants do not transpire because of anaerobic conditions
LAI = Leaf area index
cm = Centimeters
v/v = Volume per volume

6.1.4 UNSAT-H Modeling Results

In the UNSAT-H modeling results, infiltration represents the flux into the top surface of the model domain, and seepage represents the flux from the bottom of the model domain contributing recharge to the SSW. Bar graphs summarizing the complete water budget for each simulated profile are provided in Figures 18 and 19. UNSAT-H seepage results are summarized in Table 10 and shown in Figure 20 for the five years simulated (1997 to 2001).

The model results vary from year to year, depending on the amount of precipitation received, with seepage rates in 1997 (annual precipitation 23.91 inches) far exceeding subsequent years (Figures 18 and 19). Conversely, the amounts of water lost to evaporation and transpiration tend to change only modestly from year to year.



WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

UNSAT-H Water Budget for Salt Storage Area and Salt Pile Evaporation Pond

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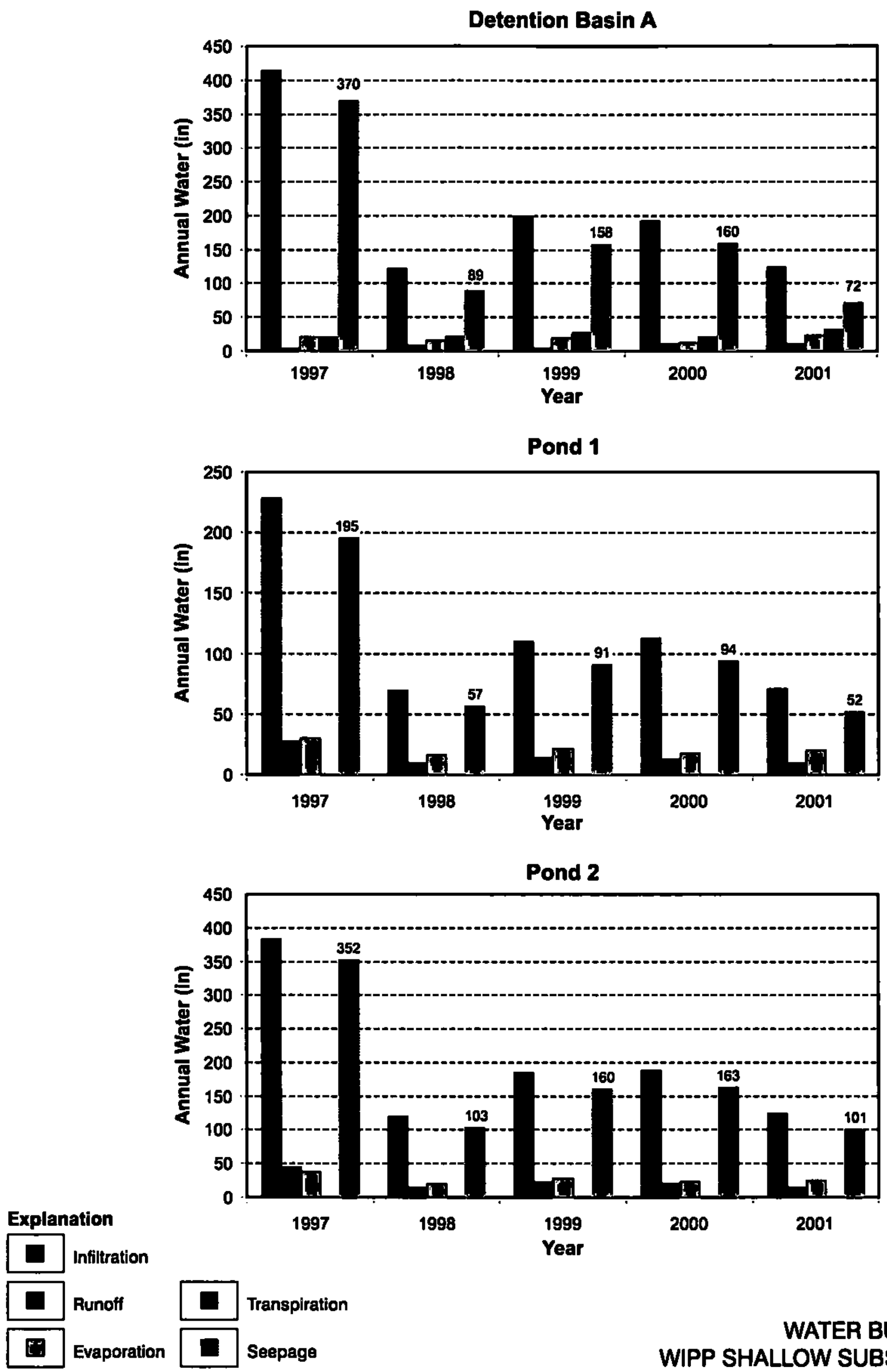
Figure 18



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WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

UNSAT-H Water Budget for Detention Basin A, Pond 1, and Pond 2

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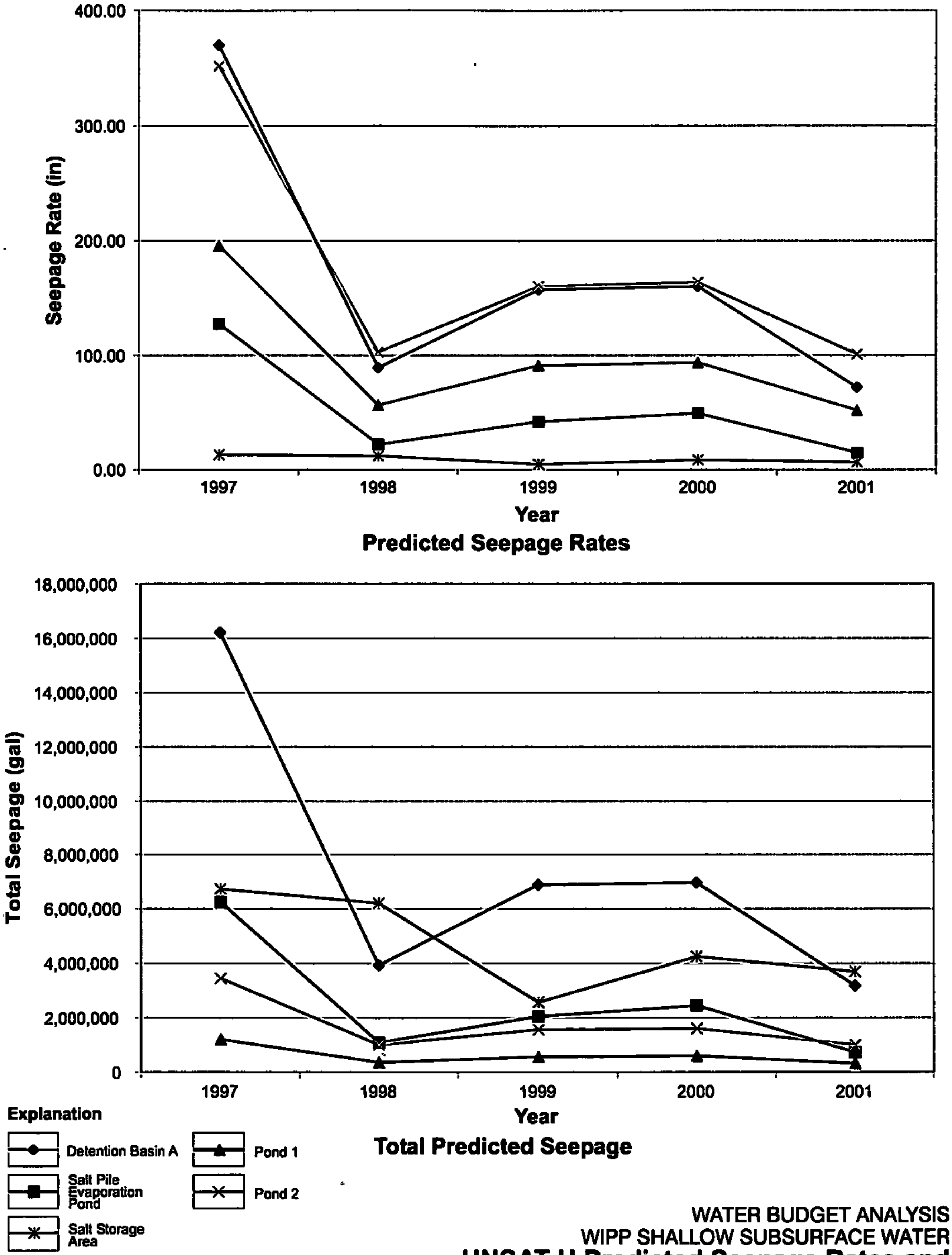
Figure 19

Table 10. UNSAT Modeling Results

Location	Year	Seepage (inches)	Total Annual Seepage (gal/yr)
Salt Storage Area	1997	12.38	6,725,103
	1998	11.42	6,203,741
	1999	4.74	2,574,971
	2000	7.81	4,238,928
	2001	6.78	3,680,342
Five-year average		8.63	4,684,617
Salt Pile Evaporation Pond	1997	127.10	6,260,879
	1998	21.66	1,067,126
	1999	41.88	2,063,154
	2000	49.39	2,432,993
	2001	14.35	706,859
Five-year average		50.88	2,506,202
Detention Basin A	1997	369.65	16,180,626
	1998	89.40	3,913,153
	1999	157.51	6,894,663
	2000	159.75	6,992,550
	2001	72.20	3,160,353
Five-year average		169.70	7,428,269
Pond 1	1997	195.28	1,219,601
	1998	56.74	354,354
	1999	91.00	568,324
	2000	93.90	586,458
	2001	51.67	322,714
Five-year average		97.72	610,291
Pond 2	1997	352.05	3,431,927
	1998	102.54	999,640
	1999	160.04	1,560,157
	2000	163.22	1,591,092
	2001	100.88	983,404
Five-year average		175.75	1,713,244

gal/yr = Gallons per year



WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

UNSAT-H Predicted Seepage Rates and Total Predicted Seepage

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Figure 20

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Table 10 presents seepage in terms of inches of water that seep vertically downward and the total seepage volume from each source. The greatest amount of seepage is from Detention Basin A, which receives the most storm water. The Salt Storage Area is the next largest seepage source, due more to its large seepage area than its seepage rate.

The model predicts seepage rates to be relatively high, with seepage generally exceeding 50 percent of the water applied. The rates are high for two reasons: (1) the storm water retention ponds receive large inflows of water, which greatly exceed rates of evapotranspiration, and (2) areas without vegetation, such as Ponds 1 and 2 and the Salt Storage Area, have no loss to transpiration, and evaporative losses remove only a small percentage of the precipitation and ponded water. Seepage rates range from a low of approximately 5 to 12 in/yr for the Salt Storage Area to a high of approximately 70 to 370 in/yr for both Detention Basin A and Pond 2.

The total seepage volumes predicted by the UNSAT-H model show substantial annual inputs to the SSW. Average annual seepage rates range from 610,000 gallons per year for Pond 1 to 7,400,000 gallons per year for Detention Basin A. The seepage rates are estimated to average approximately 70 percent of the total water applied to the ponds and basins, after other losses that occur during storm water runoff.

6.2 Saturated Flow Modeling

Saturated flow modeling of the SSW was used to estimate areally distributed seepage rates that account for the water level elevations observed at the site. This approach determines seepage based on fundamental saturated flow principles. The seepage rates are estimated by determining the recharge to the SSW necessary to sustain the observed water table mound. The model focused on a limited area centered on the primary seepage sources and the portion of the SSW lens where hydrologic conditions have been most thoroughly characterized.

The code used to model SSW flow and seepage inputs was MODFLOW (McDonald and Harbaugh, 1988; Harbaugh and McDonald, 1996), a U.S. Geological Survey (USGS) quasi-three-dimensional finite-difference groundwater flow model that has been used previously for modeling of the SSW (Duke Engineering & Services, Inc., 1999). MODFLOW can simulate a wide variety of hydrologic features and processes, and is widely accepted by regulators.

For the water budget, steady-state and transient simulations were run to determine rates and distribution of seepage that contribute to the SSW. To better simulate fluctuating water table conditions, a MODFLOW variation, MODFLOW-SURFACT (Hydrogeologic, Inc., 1999) was used for the transient analyses. This variation is more adept at handling the complete drying and re-wetting of grid cells to simulate wetting front migration.

6.2.1 Conceptual Model and Model Domain

The model simulated SSW water table conditions under the influence of variable seepage inputs from the surface. Iterative model runs were conducted to determine seepage rates that match actual water levels observed in the SSW monitor wells.

6.2.1.1 Conceptual Model

The SSW was depicted as an unconfined perched zone with superimposed seepage contributing recharge to the water table. The only sources of recharge to the model are the Salt Storage Area, Salt Pile Evaporation Pond, Detention Basin A, and storm water retention Ponds 1 and 2. The model did not consider operational discharges from drilling and construction activities, water line leakage, or the SSW losses from seepage into the Exhaust Shaft, since these are apparently relatively small contributors in the SSW water budget (Section 4). In general, the inputs and losses omitted from the model are expected to be offsetting and thus are not likely to significantly impact the simulation of recharge from the primary seepage sources.

6.2.1.2 Model Domain

This analysis used a one-layer model simulating the saturated Santa Rosa perched zone above an impermeable Dewey Lake contact at the base of the model. Contours of the Santa Rosa/Dewey Lake contact were generated based on the reported contact elevation in boring logs from piezometers and monitor wells installed on-site (Figure 21). A no-flow boundary was assumed at the top of the Dewey Lake, because within the area where the SSW monitor wells were drilled, the Dewey Lake was found to be dry within 5 feet below the contact and little downward leakage appears to occur. The Santa Rosa pinchout to the west was also assumed to represent a no-flow boundary in the model. This boundary is based on boring logs (Sergent, Hauskins & Beckwith, 1979) that show the Santa Rosa to be absent approximately 1,500 feet southwest of the known limits of the SSW.

6.2.2 Steady-State Analysis

The objective of the steady-state MODFLOW simulation was to estimate the average recharge rate that sustains the water table mound in a near steady-state condition, based on monitor well hydrographs, which show relatively uniform water levels over the past five years.

6.2.2.1 Steady State Model Approach and Calibration

The recharge rate and its spatial distribution were varied in the steady-state MODFLOW model to simulate recharge that most closely replicated the observed shape of the SSW potentiometric surface. Recharge was applied to the Salt Pile Evaporation Pond, Salt Storage Area, Detention Basin A, and Ponds 1 and 2 (Figure 22). Based on the storm water runoff calculations (Section 5.1), recharge in Detention Basin A and the Salt Pile Evaporation Pond was applied to a portion of the ponds where the predominant seepage appears to occur. Recharge rates were varied during the calibration using iterative adjustments. To maintain the expected steady outflow near

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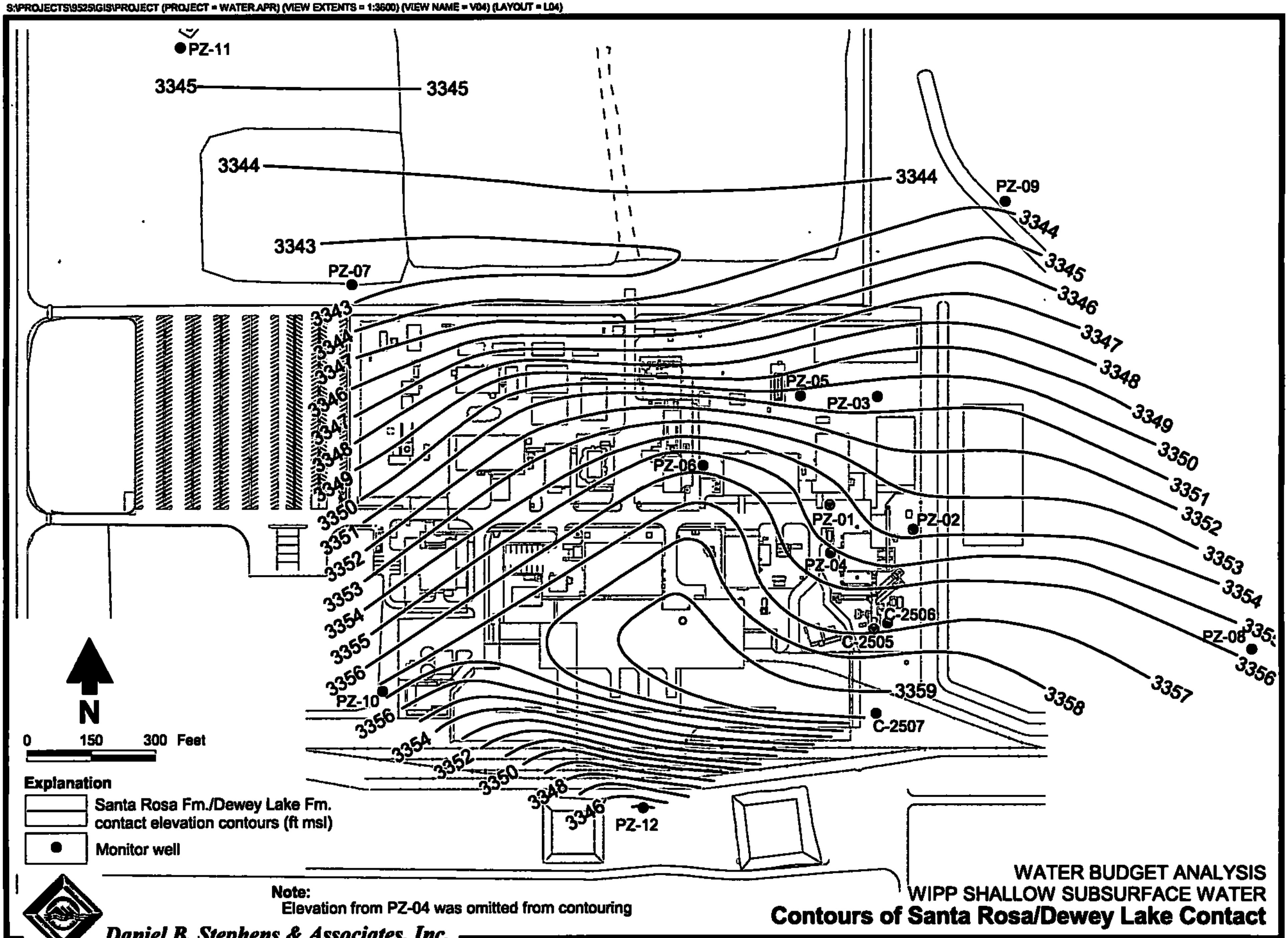

Figure 21

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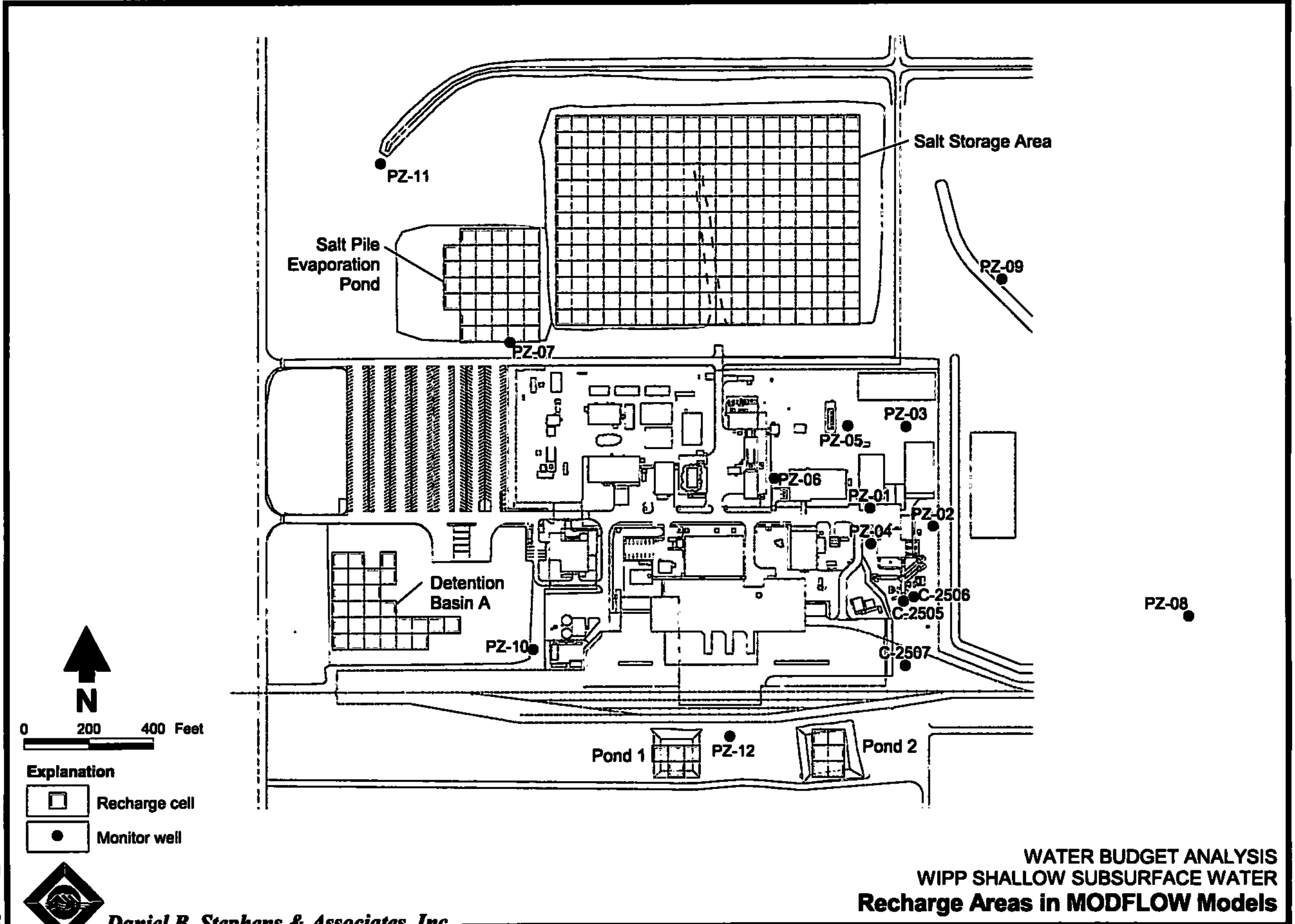

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Recharge Areas in MODFLOW Models

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Figure 22

the boundaries of the site, constant-head boundaries were placed at the estimated extent of the saturated area (Figure 23), based on the results of the calibrated transient model described in Section 6.2.3.

The spatial distribution of hydraulic conductivity of the Santa Rosa was estimated from several slug tests and pumping tests. As shown in Table 11, hydraulic conductivity values ranged from 0.007 to 15.5 ft/d. Several simulations were run using the two hydraulic conductivity zones shown in Table 11. However, the simulation that best represented observed water levels was a homogeneous hydraulic conductivity distribution using a calibrated value of 1 ft/d, which is close to the geometric mean of all the measurements (0.72 ft/d). While the calibrated hydraulic conductivity value differs significantly from some measurements at individual wells, it provides a good representation of the overall SSW flow field and observed water levels.

6.2.2.2 Steady-State Model Results

Figure 23 shows the simulated steady-state water level elevations in the Santa Rosa, and Table 12 presents the final calibrated recharge rates. The model reasonably predicts general flow directions and the steepening of the gradient to the east and south and provides reasonable estimates of recharge rates from the various seepage sources. However, the results do not represent a unique solution; simulation of other combinations of recharge rates may yield similar water level results.

The steady-state model predicts that seepage rates from the Salt Storage Area and Salt Pile Evaporation Pond dominate the seepage inputs to the SSW. This is due to the proximity of these seepage sources to the apex of the water table mound near monitor well PZ-7, in the northern portion of the observed SSW lens. At the southern edge of the site near monitor well PZ-12, the model tended to predict water levels higher than actual values, leading to relatively low predicted seepage rates for Detention Basin A and Ponds 1 and 2. A probable cause for this difference is that the field-measured hydraulic conductivity (5.98 ft/d) exceeds the values assigned to the model near this well, and the Santa Rosa/Dewey Lake contact slopes steeply southward at this location.

6.2.3 Transient Analysis

The objective of the transient analysis was to simulate the progressive saturation of the SSW due to increased recharge from the five primary seepage sources, beginning with the WIPP facilities development in 1981. The transient analysis considered variable recharge rates needed to simulate the observed water level hydrographs at the SSW monitor wells for the record available from 1996 to 2002. The results include seepage estimates for each source and estimates of the extent of the SSW saturated lens and volume in storage.

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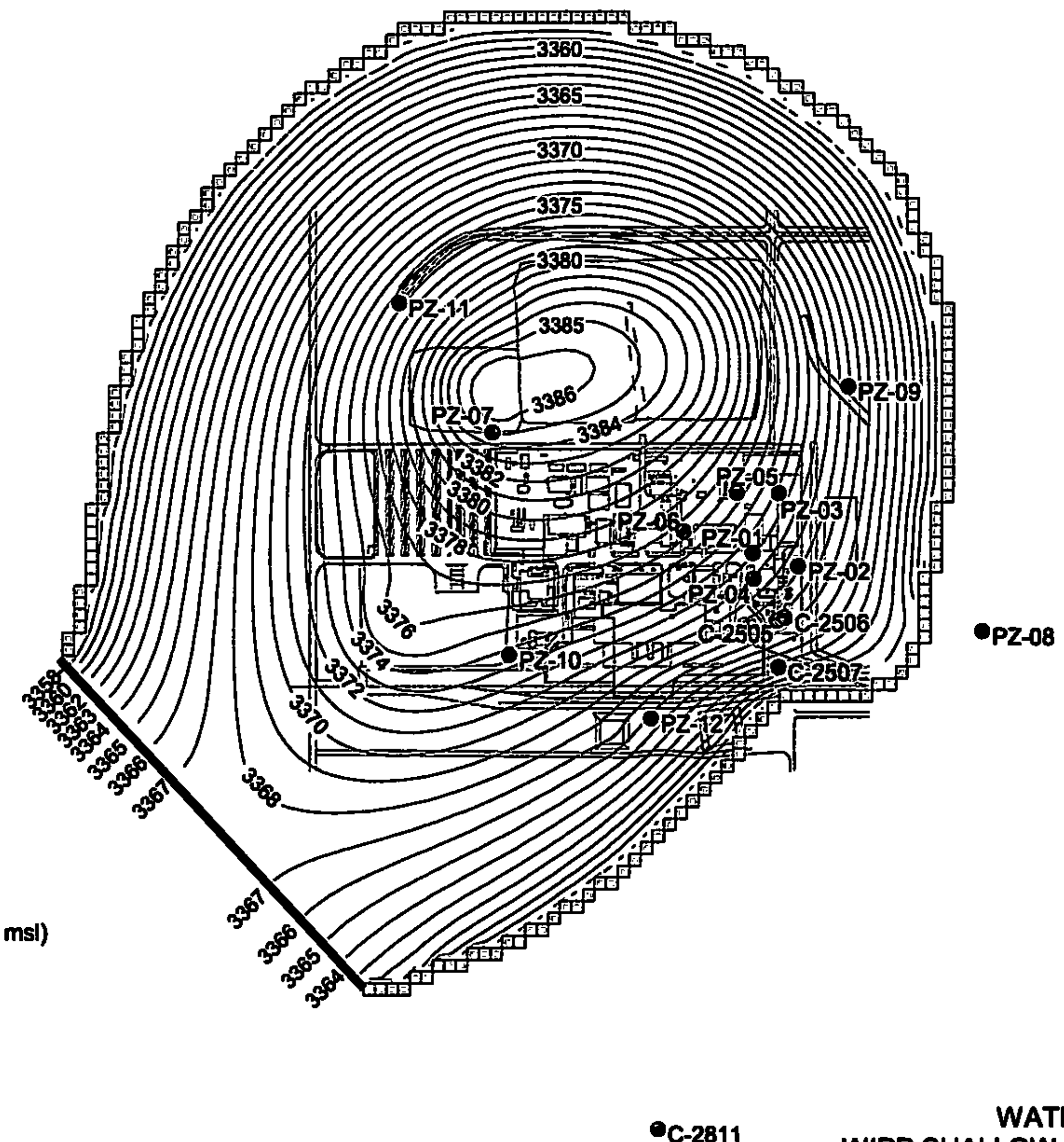

N

0 400 800 Feet

Explanation

Potentiometric surface contour (ft msl)

Constant head boundary

No flow cell boundary

Monitor well

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Simulated Potentiometric Surface
Contours for Steady-State MODFLOW Model

Figure 23

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Table 11. Hydraulic Conductivities

Well	Zone	Test Date	Hydraulic Conductivity (ft/day)	Arithmetic Average of Hydraulic Conductivity at Well (ft/day)
C-2505	1	10/17/96[a]	15.5	8.87
		03/06/97[b]	2.21	
C-2506		02/25-28/96[b]	5.64	4.92
		10/17/96[a]	4.20	
C-2507		10/17/96[a]	0.442	1.05
		09/05/97[c]	1.67	
PZ-04		09/05/97[c]	0.686	0.686
PZ-06		08/21/97[c]	1.06	1.06
PZ-07		09/07/97[c]	0.490	0.490
PZ-10		09/12/97[c]	1.47	1.47
PZ-11		09/12/97[c]	0.930	0.930
PZ-12		09/06/97[c]	5.98	5.98
Geometric Mean for Zone 1				1.723
PZ-01	2	09/05/97[c]	0.0162	0.0162
PZ-02		09/06/97[c]	0.00748	0.00748
PZ-05		08/22/97[c]	0.0394	0.0394
Geometric Mean for Zone 2				0.017
Geometric Mean for All Wells				0.72

Notes: Hydraulic testing has not been performed on PZ-03 and PZ-09.
Monitor well PZ-08 is dry.
ft/day = Feet per day

References:
[a] Intera (1996)
[b] Intera (1997b)
[c] Intera (1997a)

Table 12. Final Calibrated Recharge Rates, Steady State Model

Location	Calibrated Recharge Rate (inches per year)	Recharge Volume (gallons per year)
Salt Storage Area	9	3,500,000
Salt Pile Evaporation Pond	29	1,400,000
Detention Basin A	9	390,000
Pond 1	9	60,000
Pond 2	9	80,000

6.2.3.1 Transient Model Approach and Calibration

The transient analysis used MODFLOW-SURFACT to simulate saturated/unsaturated flow using the model's capabilities for re-wetting of dry cells to progressively saturate the SSW lens from initially unsaturated conditions. The transient model used a constant head boundary of 0.1 foot above the Santa Rosa/Dewey Lake contact on the north, east, and south borders of the model, with a "no-flow" boundary to the southwest, where the Santa Rosa pinches out. Recharge was applied at variable annual rates from 1981 to 2002 (Figure 24), beginning between 1981 and 1984 from the various seepage sources, based on records of construction of the various ponds and the Salt Storage Area.

The recharge rates at the four storm water ponds were established using a linear regression calculated between the annual precipitation rate and the recharge rate estimated from the unsaturated flow modeling (Section 6.1) and storm water runoff calculations (Section 5). Using the precipitation record from the WIPP weather station for 1991 through 2002 and from the Carlsbad FAA weather station for 1981 through 1990, the recharge to the SSW was estimated from the linear regressions. The recharge rates for the Salt Storage Area were initially set as a given percentage of precipitation and then adjusted until simulated hydrographs were in agreement with observed hydrographs during the 1996 to 2002 record.

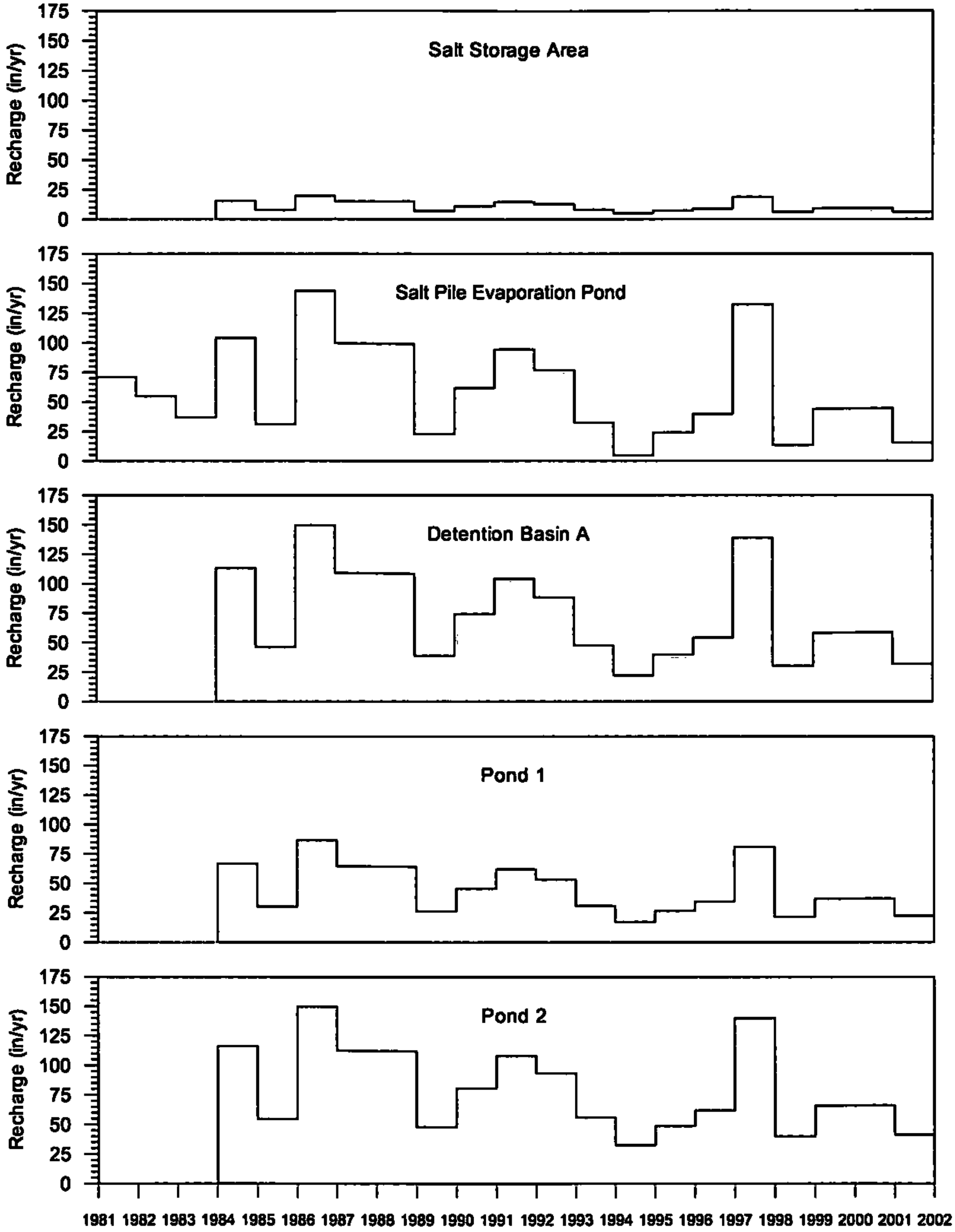
The transient model used two hydraulic conductivity zones set at 1.7 ft/d for Zone 1 and 0.017 ft/d for Zone 2 (Table 11, Figure 25). The lower hydraulic conductivity zone (Zone 2) surrounds PZ-01, PZ-02, and PZ-05 (Table 11) and was also extended around PZ-08 because the dry condition in this well may be due to a lower hydraulic conductivity that inhibits the wetting front advance.

The transient model requires the storage parameter specific yield, defined as the ratio of the volume of water that drains from saturated rock due to gravity to the total volume of rock (Fetter, 1993). A uniform specific yield of 0.1 was assigned to the entire model, based on an estimated 0.13 porosity (Nicholson and Clebsch, 1961) and an assumed 0.03 residual water content.

6.2.3.2 Transient Model Results

Results of the MODFLOW transient analysis are illustrated in Figures 26 and 27, which show the simulated potentiometric surface contours and saturated thickness contours, respectively. Comparison of the simulated water level fluctuations with the observed hydrographs for each SSW monitor well shows that the simulation tracked the observed conditions favorably at most wells, with the more significant differences occurring primarily at wells with particularly high or low hydraulic conductivities based on field test results.

The recharge rates for the retention ponds were constrained by the storm water flow calculations (Section 5), which specify relative amounts of flow to each pond. Recharge rates are variable from year to year, based on long-term precipitation records, with seepage of storm water partitioned among the primary seepage sources.



WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Recharge Rates Applied in Transient Model

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Figure 24

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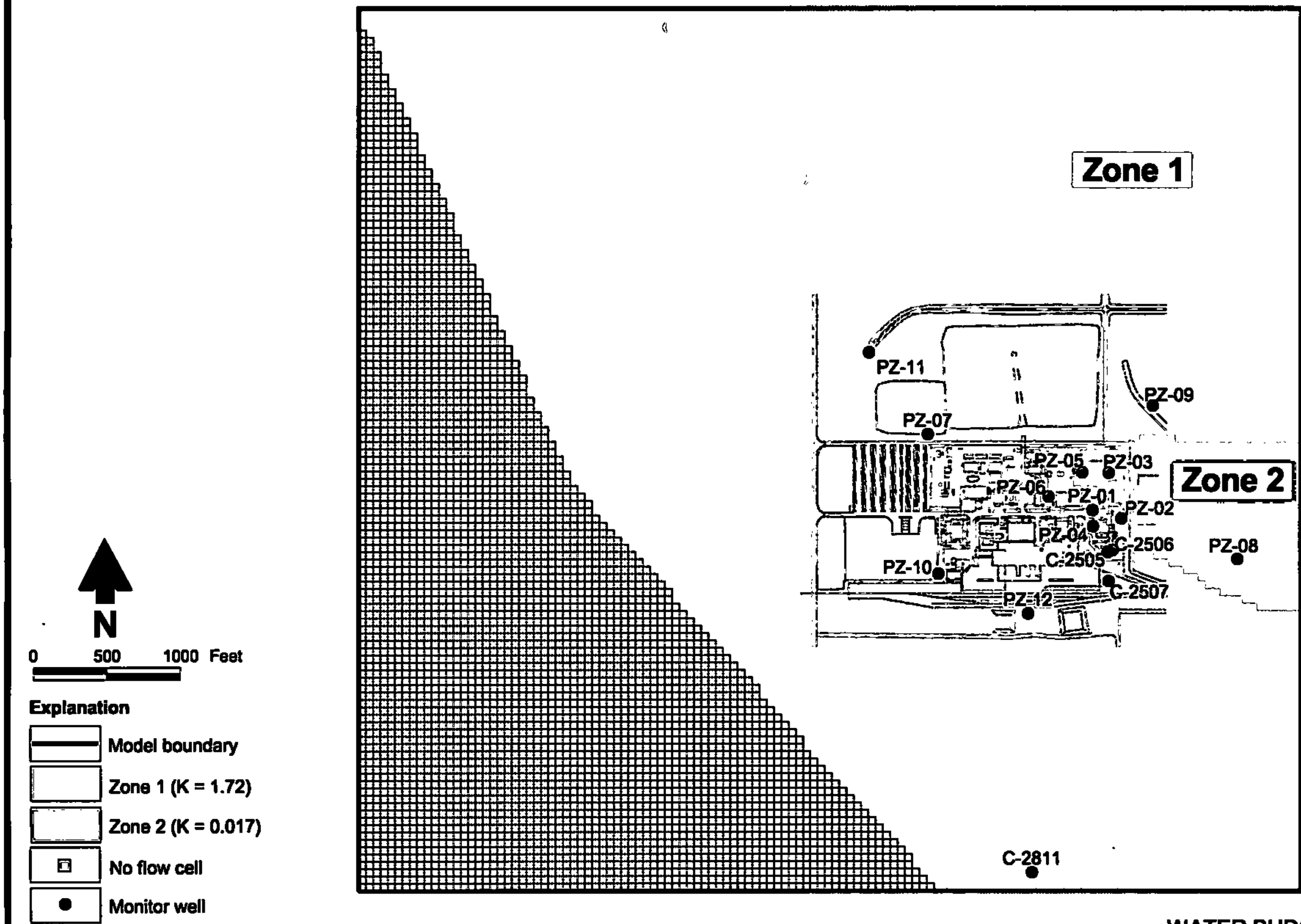

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Spatial Distribution of Hydraulic Conductivity for Transient Analysis

Figure 25

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7-9-03
JN 9525

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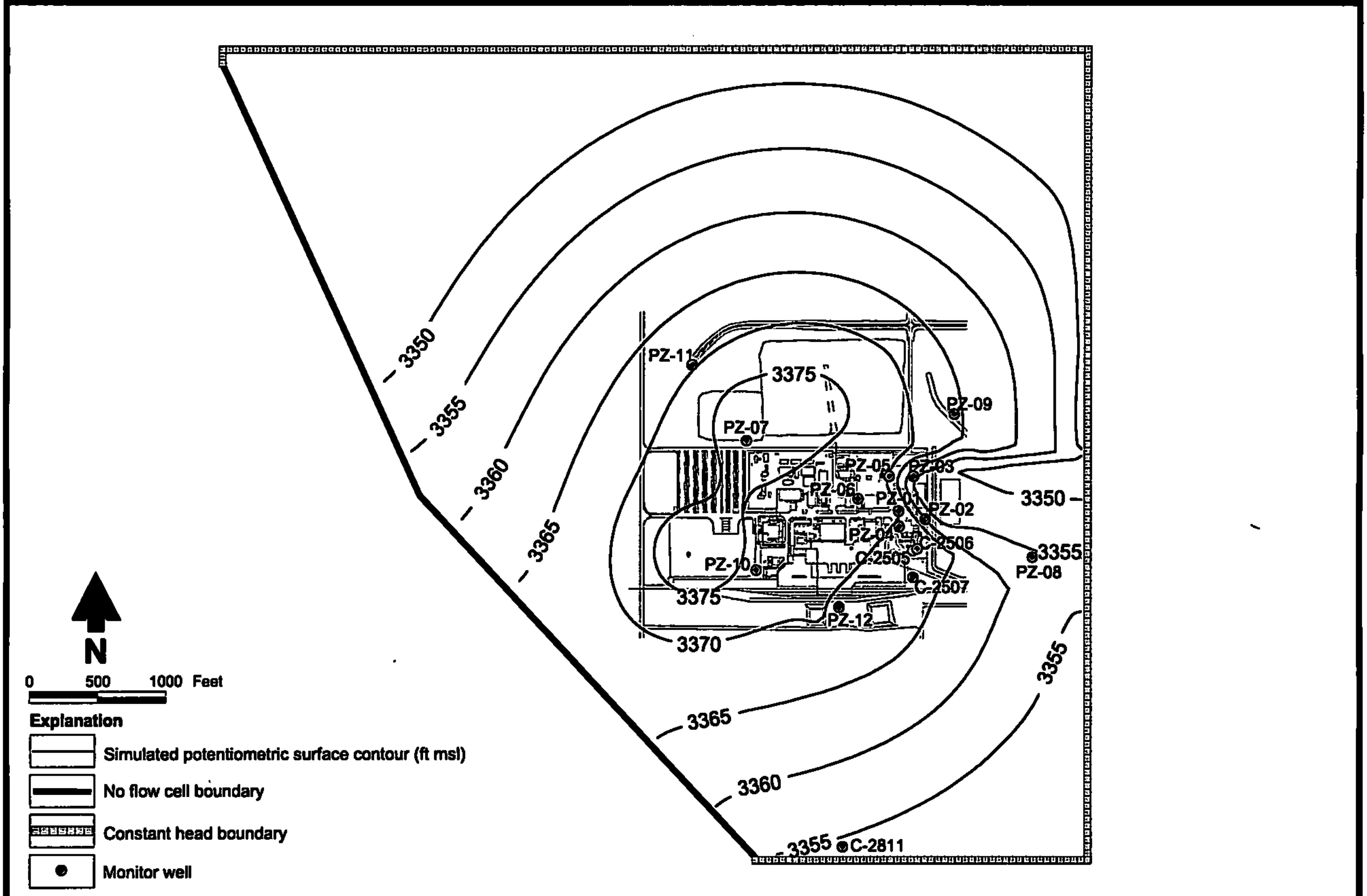

Explanation

- Simulated potentiometric surface contour (ft msl)
- No flow cell boundary
- Constant head boundary
- Monitor well

Figure 26

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WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Simulated Potentiometric Surface Contours, December 2002

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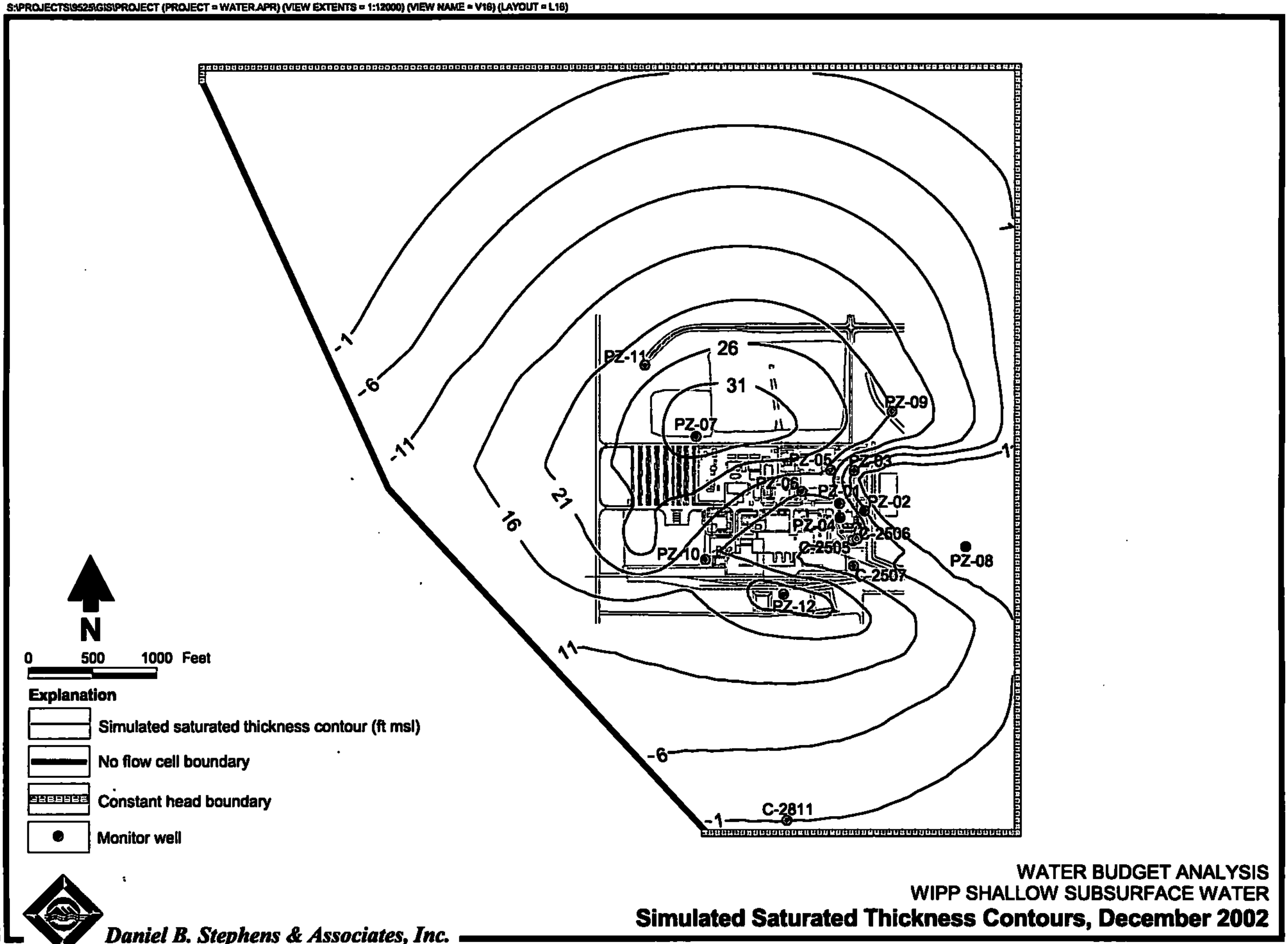

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Simulated Saturated Thickness Contours, December 2002

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7-11-03 JN 9525

Figure 27

Table 13 shows the estimated recharge rates from the transient model calibration. The transient model demonstrates that, using reasonable recharge rates, combined recharge from the five primary sources could have created the observed SSW saturated zone in the timeframe since the WIPP site was first developed. The model shows that the saturated zone is areally extensive and provides a reasonable simulation of the increasing SSW water levels over time. The seepage rates predicted by the transient model are not necessarily a unique solution, and it is possible that other combinations of parameters would provide similar results.

Table 13. Final Calibrated Recharge Rates, Transient Model

Location	Calibrated Recharge Rate[a] (in/yr) Average	Minimum Annual	Maximum Annual	Average Volume (gal/yr)
Salt Storage Area	11.0	5.1	19.9	4,200,000
Salt Pile Evaporation Pond	59.4	4.7	143.8	3,000,000
Detention Basin A	73.0	22.2	149.6	3,200,000
Pond 1	44.9	17.2	86.7	280,000
Pond 2	79.3	32.6	149.7	740,000

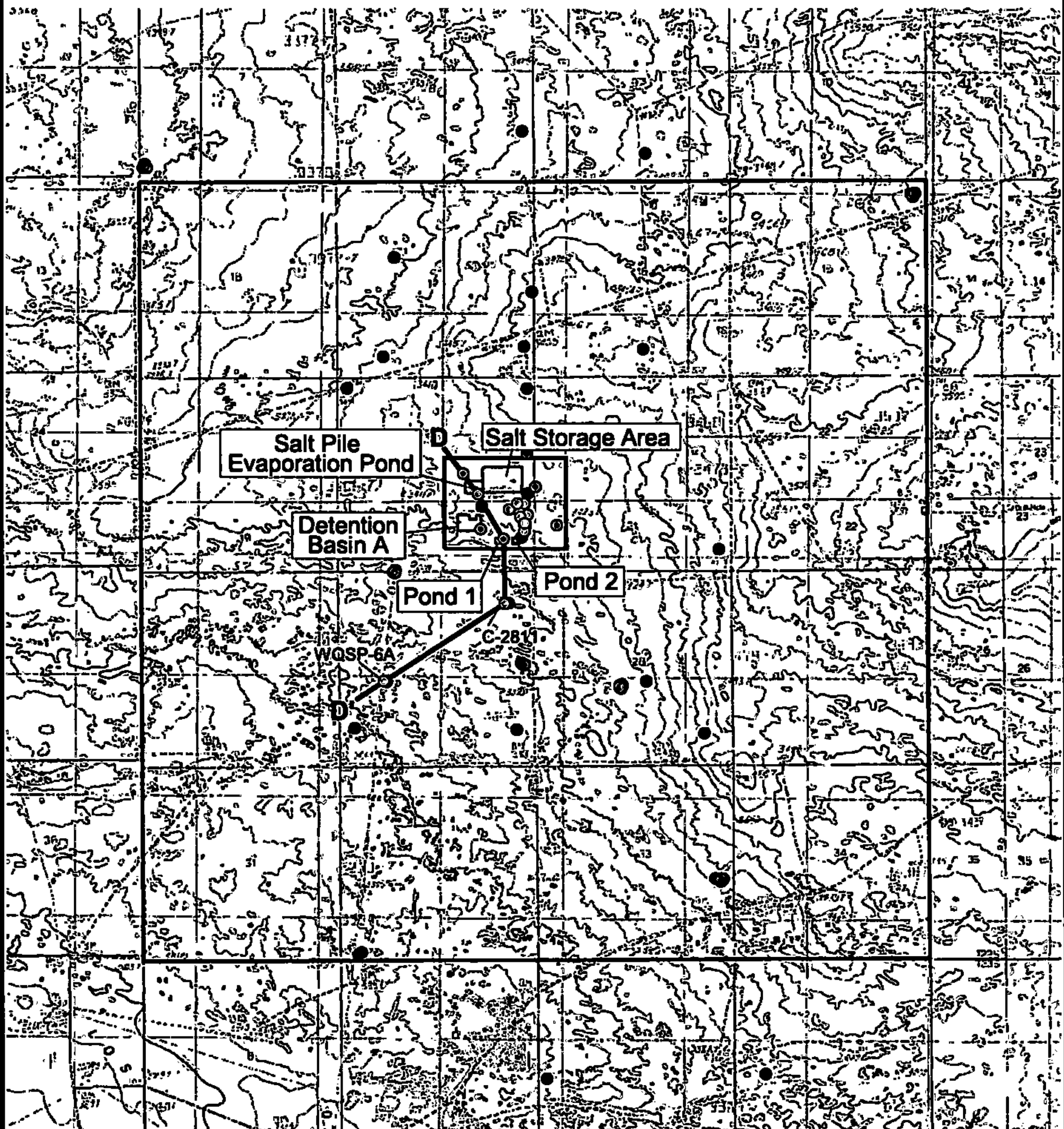
[a] Recharge rate statistics calculated for years when recharge was applied (1981 through 2002 for Salt Pile Evaporation Pond; 1984 through 2002 for all others).

in/yr = Inches per year
gal/yr= Gallons per year

6.2.3.3 SSW Volume Estimate

The simulated saturated thickness contours presented in Figure 27 provide a basis to estimate the total volume of the SSW saturated zone. The MODFLOW-SURFACT transient analysis predicts a seepage input to the SSW of 242 million gallons from 1981 to 2002. Since this input represents only seepage and does not include the initial moisture content in the Santa Rosa Formation, which is assumed to be 0.03 (based on a porosity of 0.13), the total SSW volume is estimated to be 315 million gallons.

The transient analysis projects saturation over a broad 520-acre area extending beyond the SSW monitor wells, and the estimated SSW volume is thus far higher than the estimate of 108 million gallons presented in Section 3.1, which is based more directly on the SSW saturated zone observed in on-site monitor wells. The higher SSW volume estimate from the transient analysis, however, is dependent on projecting information on the Santa Rosa's hydraulic properties considerably beyond the area where data are available, leading to added uncertainty with this estimate.



N

0 2000 4000 Feet

Explanation

- WIPP land withdrawal boundary
- WIPP facilities area
- Monitor well
- Santa Rosa or Dewey Lake monitor well
- Cross section D-D'

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Long-Term Migration Model Domain Base Map

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Figure 28

7.1.1 Conceptual Model

The conceptual model depicts potential migration of the SSW perched lens that has been identified in the Santa Rosa by previous site investigations. An upper Layer 1 includes the Santa Rosa and, where the Santa Rosa pinches out, the Gatuña, with lateral flow of the perched lens above the Dewey Lake contact. The deeper Dewey Lake is modeled as Layer 2, with downward vertical leakage providing recharge that creates a second saturated lens in the Dewey Lake. The potential migration of SSW is a top-down process, with downward flow from the Santa Rosa moving vertically through the unsaturated upper Dewey Lake and laterally to areas where a natural water table exists in the middle Dewey Lake. The saturated horizon in the middle Dewey Lake is the shallowest groundwater depth interval used for water supply near the WIPP boundary, with wells south of the boundary producing from depths of 100 to 200 feet bgs.

Downward flow from the Santa Rosa to the Dewey Lake depends on the low-permeability siliceous layer at the contact and the sulfate cementation change in the lower Dewey Lake. Downward leakage in the upper Dewey Lake is modeled using a uniform vertical hydraulic conductivity, although the downward leakage is likely to occur in a complex system of fractures and permeable zones that create a heterogeneous flow field. The conceptual model represents a conservative approach in that it routes all of the Dewey Lake recharge to accumulate in a single layer as a saturated lens in the middle Dewey Lake, whereas a complex system of discontinuous saturated pathways in the predominantly unsaturated upper Dewey Lake may disperse the flow and lead to less migration.

The predictive simulations follow a timeline for WIPP operations that is based on input provided by DOE (2003a, 2003b). DOE is pursuing implementation by 2004 of engineered seepage controls, which will include covering the Salt Storage Area and lining the storm water ponds, to virtually eliminate the sources of increased seepage, including the apparent sources of saline seepage. The WIPP operating period is planned to extend until 2035. The water budget assumes that after site decommissioning, the site will be restored in a way that eliminates the sources of enhanced seepage. The long-term model was run for an initial calibration stage from 1981 to 2002 and a 100-year migration stage from 2003 through 2102, well beyond facility closure.

7.1.2 Model Domain

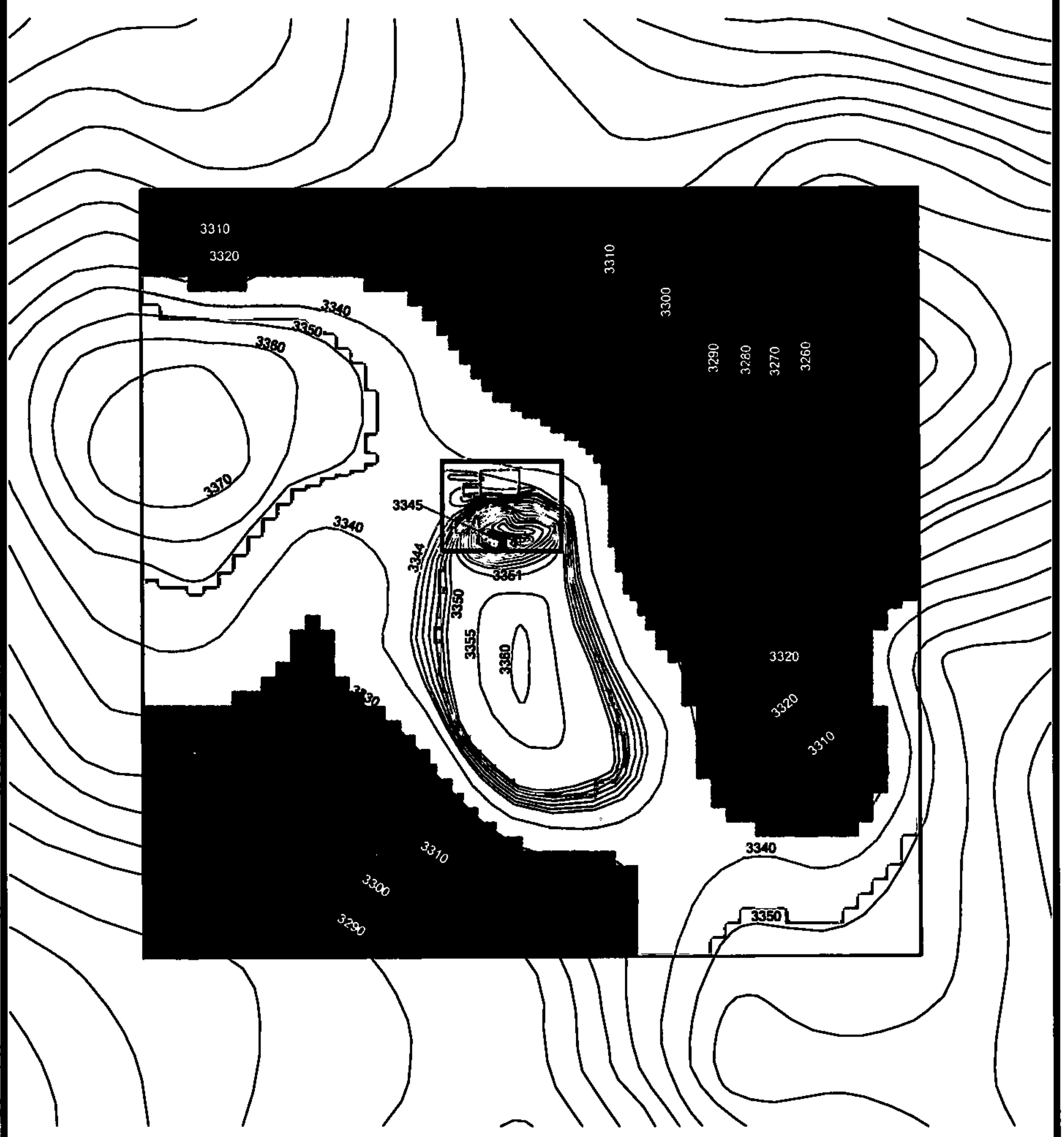
The model domain encompasses the formations where SSW has been identified and where it may potentially migrate. The domain includes the one-layer MODFLOW-SURFACT saturated flow model described in Section 6.2, which includes formation contacts developed from results of drilling near the primary seepage sources. The domain is expanded for the long-term migration model based on the structural contours and reported hydrologic characteristics of the Santa Rosa, Gatuña, and Dewey Lake Formations.

The top of Layer 1 is at ground surface, and the bottom is defined by structural contours of the top of the Dewey Lake from the WIPP Compliance Certification Application (U.S. DOE, 1996), merged with the updated contours from the PZ- and C-series wells (Figure 29). The bottom of Layer 2 was defined by the transition from carbonate to sulfate cementation in the Dewey Lake, where gypsum fracture infilling is reported to reduce porosity and permeability (Powers, 2003a). Saturated conditions are found above the cementation change in the middle Dewey Lake in the southwest corner of the WIPP site, near monitor well WQSP-6A. The conceptual model assumes the accumulation and migration of a saturated lens above the cementation change, as a conservative approach to examine the potential for SSW migration to reach naturally occurring groundwater. The elevation contours of the uppermost reported sulfate cementation are based on Powers (1997) (Figure 30), although this report suggests some uncertainty with regard to interpretation of the contours. At the boundary of the model domain, no-flow boundary conditions were set at the perimeters of Layers 1 and 2, and a no-flow boundary condition was set at the base of Layer 2. Figure 31 illustrates a cross-section of the stratigraphic boundaries that control SSW migration within the model domain.

Downward leakage from Layer 1 to Layer 2 is limited by a siliceous layer at the Santa Rosa/Dewey Lake contact, identified during drilling of the PZ- and C-series wells (Intera, 1997a; Powers, 2003b). The SSW is perched above the siliceous layer, but the layer's extent and continuity are uncertain. The model domain includes a 1-foot-thick low-permeability layer over the entire Santa Rosa/Dewey Lake contact. The vertical hydraulic conductivity of the siliceous layer is a key model calibration parameter; derived from the seepage rates estimated in Section 6 and the observed thickness of the SSW saturated lens. The low-permeability layer is absent where the Gatuña overlies the Dewey Lake.

Seepage into the Exhaust Shaft is simulated in the model as a well, where water is lost from the SSW system. The model allows seepage to continue at a constant rate until facility closure in 2035. Based on estimates reported by DOE (2002), the seepage rate was set at 1 gpm, which is conservative in retaining the most SSW storage.

The long-term migration model domain and boundary conditions are illustrated in Figure 32. This figure uses an extreme vertical exaggeration as a conceptual illustration of the model components. The actual thickness of the two-layer model is highly variable, ranging from 70 to 500 feet thick across the site. This variability is primarily a result of the irregular surface of the uppermost reported sulfate cementation change contours (Figure 30), which varies by more than 400 feet in elevation at the base of Layer 2. Layer 2 generally thins toward the northeast corner of the site and thickens in the northwest and southwest corners of the site. Layer 1, consisting of the Santa Rosa and Gatuña, is up to 270 feet thick in the eastern portion of the site, but is absent in the western portion of the site, where these formations have been removed by erosion and the Dewey Lake is covered only by thin, surficial soils.



N

0 2000 4000 Feet

Explanation

- Seepage sources
- WIPP land withdrawal area
- WIPP site facilities area
- Structure contour (10-ft interval)

Note: Contour interval 1-foot in facilities area based on geologic logs from SSW monitor wells.

Structure elevation (ft)

- 3260 - 3288
- 3289 - 3311
- 3312 - 3331
- 3332 - 3348
- 3349 - 3370

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Structure Contours on Top of Dewey Lake

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Figure 29

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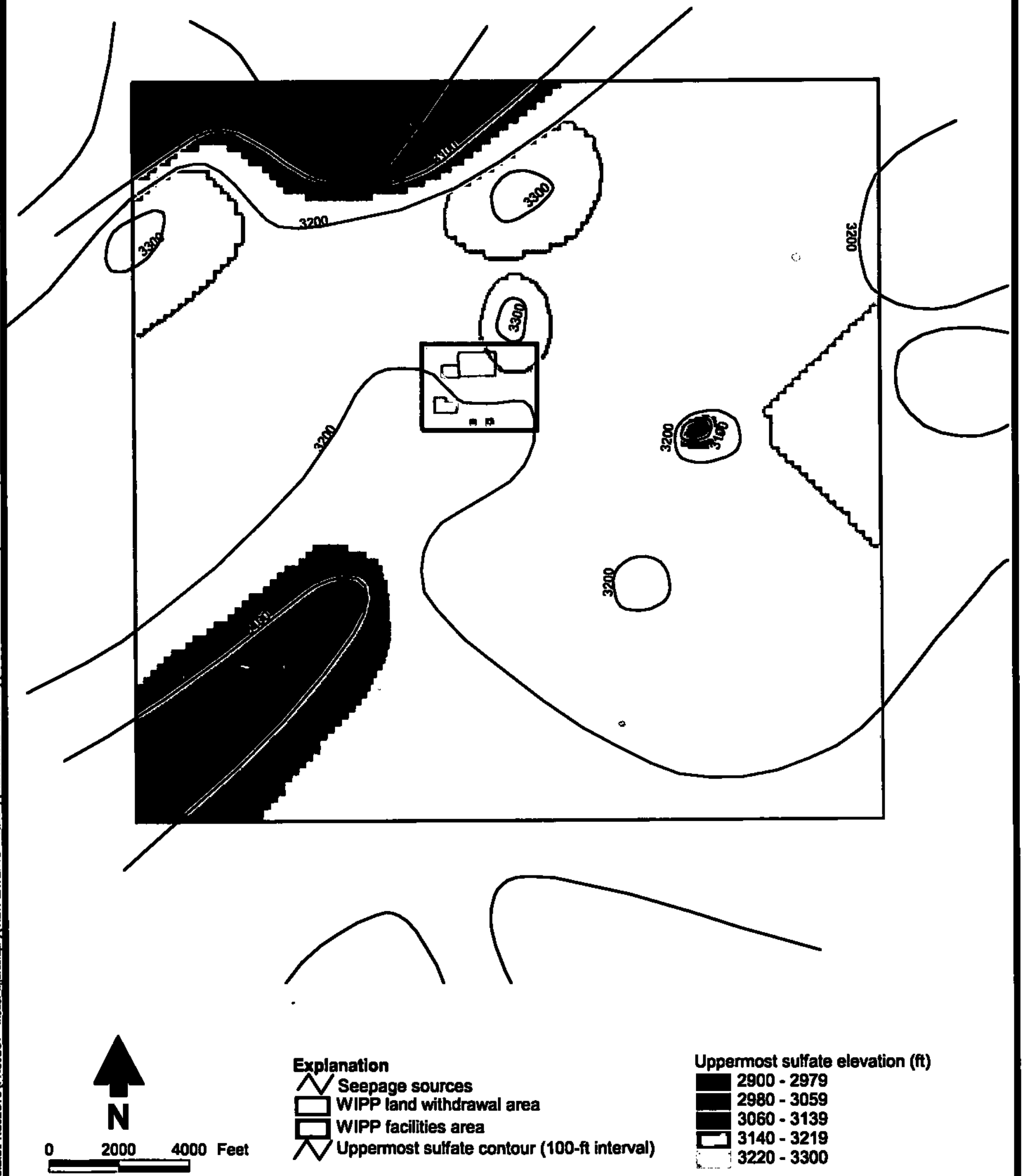

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

Uppermost Reported Sulfate Elevation

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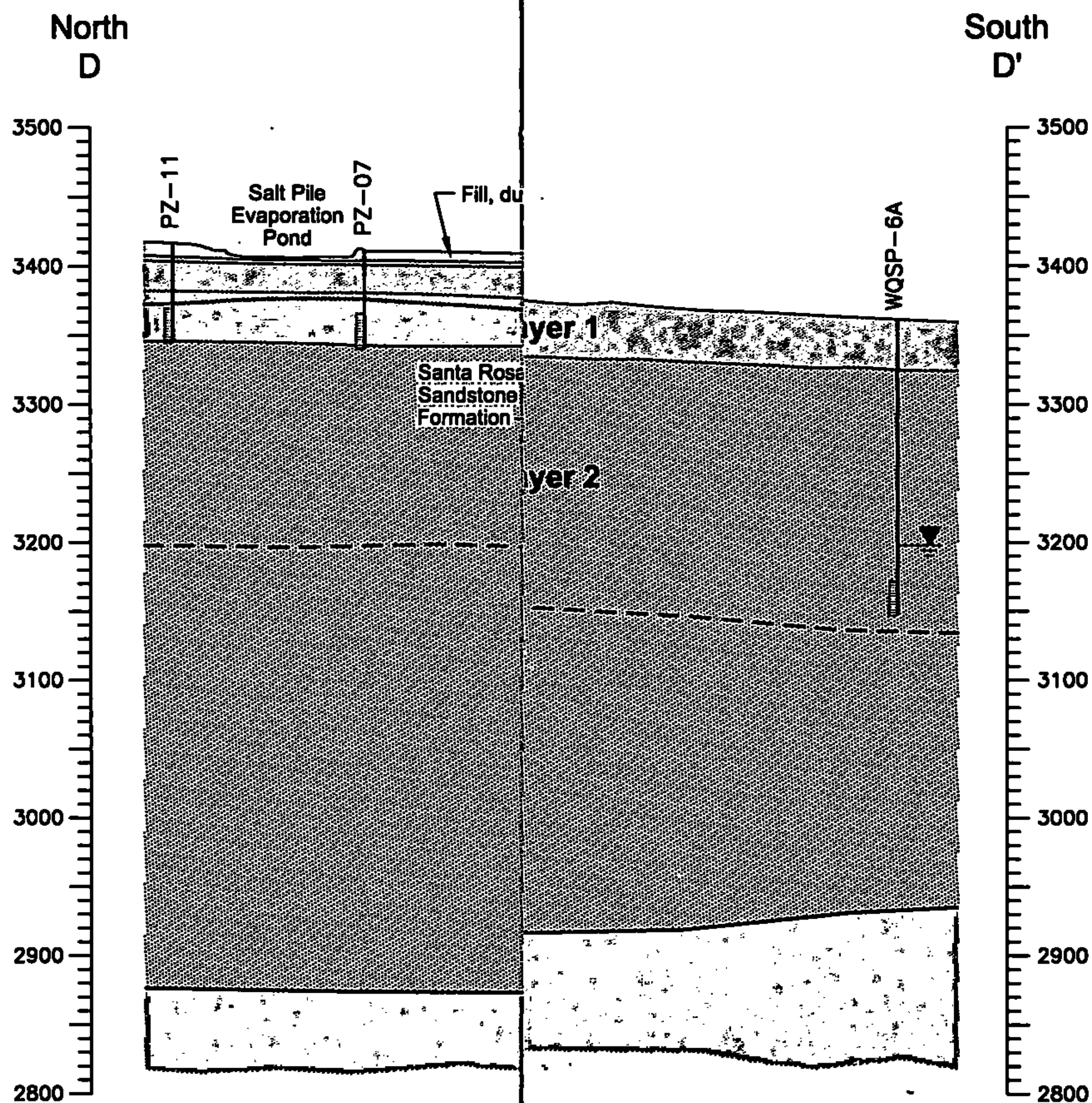
Figure 30



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Vertical exaggeration = 5x

0 600 ft

Explanation

Water level (phreatic) surface

? Continuity of water table uncertain in Dewey Lake Redbeds Formation

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Cross Section D-D'

Daniel B. Stephens & Associates,
9-8-03

Figure 31

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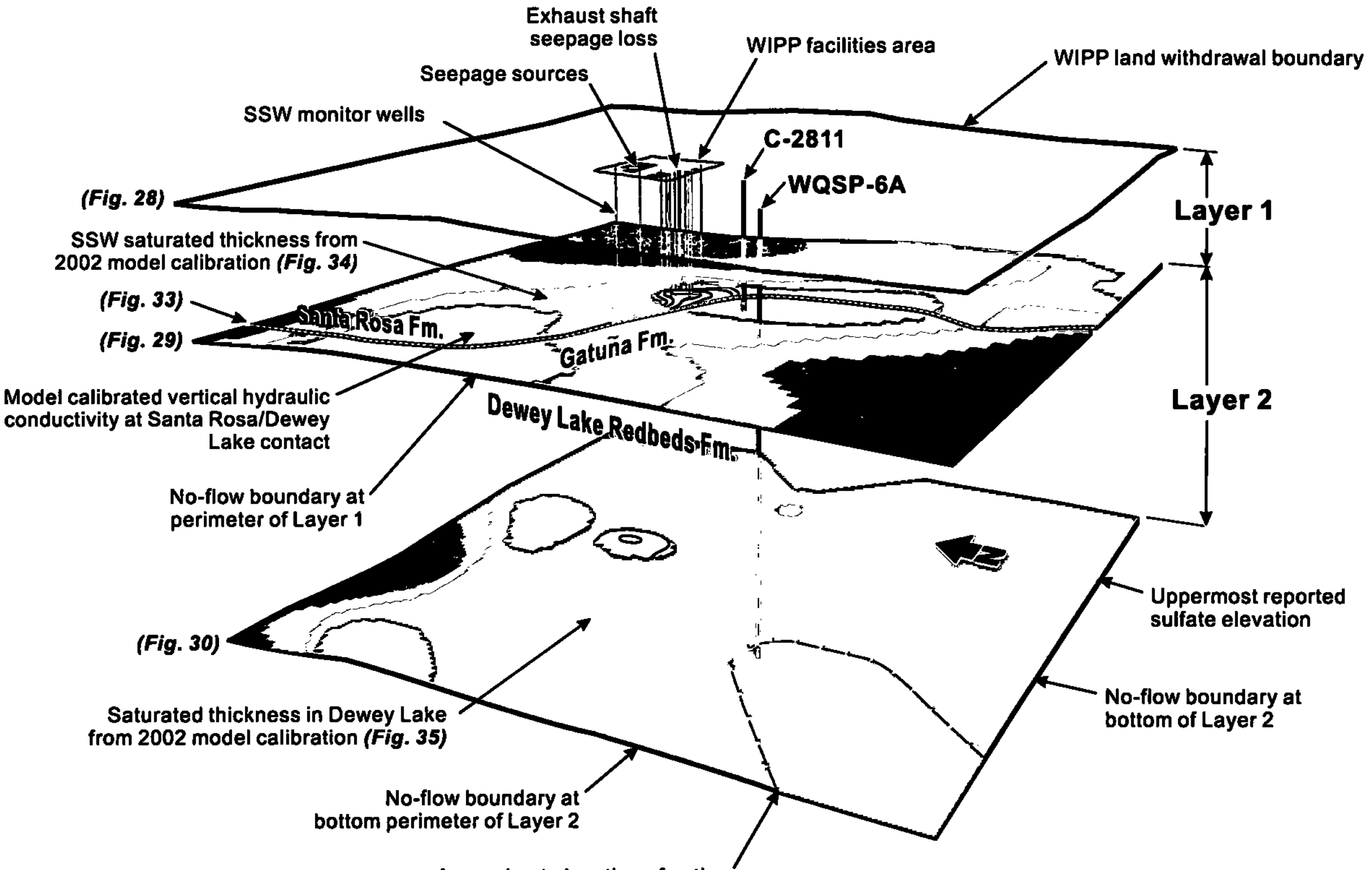

Notes:
1. Not to scale.
2. Vertical exaggeration greatly expanded for illustration.

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Long-Term Migration Model Domain and Boundary Conditions

Figure 32

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7.2 Long-Term Migration Model Approach and Calibration

The long-term migration model was used to simulate a variety of scenarios using transient MODFLOW-SURFACT simulations. The model was run for a calibration phase (1981 to 2002) and a predictive phase (2003 through 2102). Model calibration involved a series of iterative input parameter adjustments until a close match was obtained between simulated and observed water levels.

7.2.1 Input Parameters

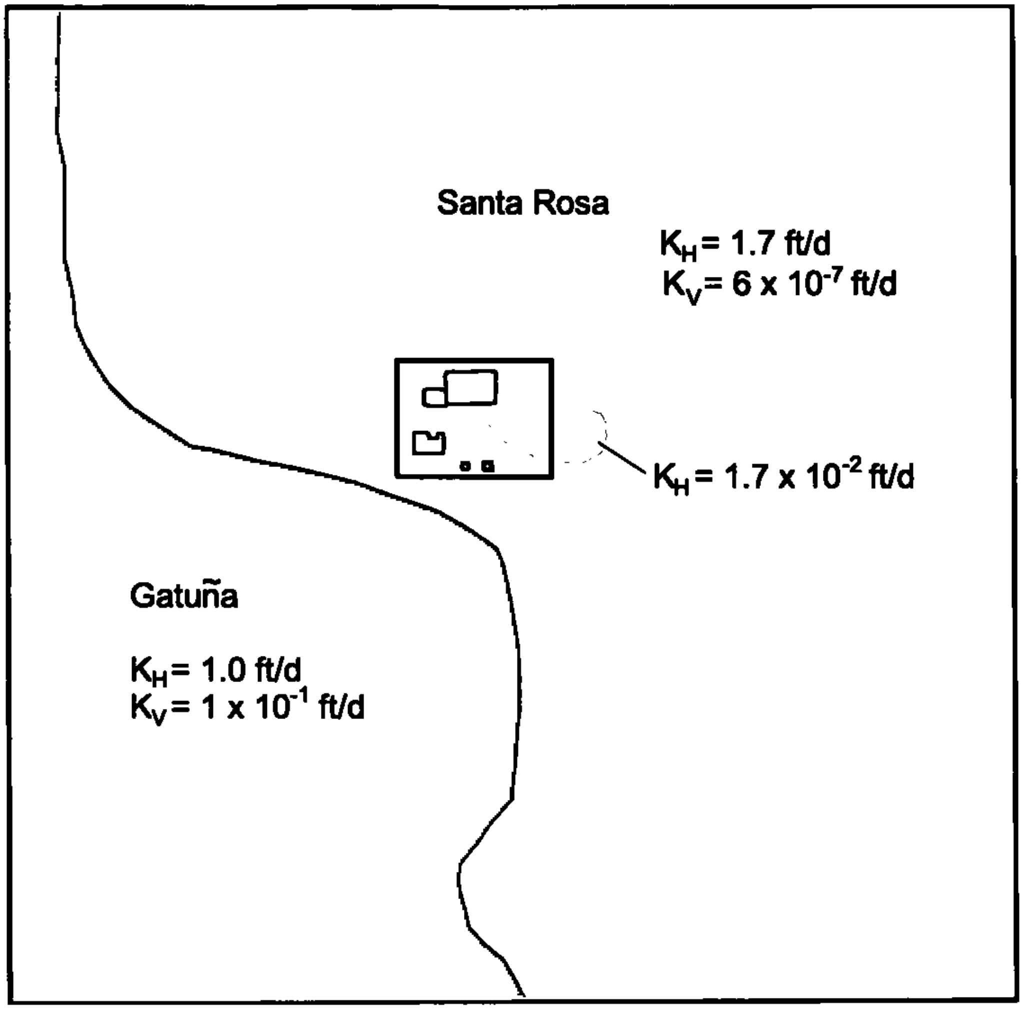
Recharge to the SSW was applied from the Salt Storage Area, Salt Pile Evaporation Pond, Detention Basin A, and Ponds 1 and 2. The very low recharge rate from desert soils across the WIPP site (Section 2.3.2) was not included in the model.

A range of seepage rates was estimated by surface infiltration unsaturated flow modeling using UNSAT-H and saturated flow modeling using MODFLOW (Section 6). The highest seepage rates were predicted by UNSAT-H; therefore, to take the most conservative approach for long-term migration modeling, seepage rates were based on the UNSAT-H model results presented in Section 6.1. The UNSAT-H results gave a linear regression relating seepage to precipitation, and the recharge to the MODFLOW-SURFACT long-term migration model was calculated based on the recorded precipitation for 1981 through 2002. The predictive scenarios calculated seepage based on the average annual precipitation of 13.24 inches from the NOAA WIPP weather station record for 1986 through 2002.

Hydrologic parameters representative of the Santa Rosa, Dewey Lake, and Gatuña Formations were reviewed and compiled from available data and reports for the WIPP site, as well as from other regional literature. Geometric mean hydraulic conductivities were calculated for the Dewey Lake (0.68 ft/d) and Gatuña Formations (1.0 ft/d), and the Santa Rosa is modeled with two hydraulic conductivity zones (1.7 and 0.017 ft/d [Figure 33), consistent with the transient saturated flow model presented in Section 6.2.3.

The vertical hydraulic conductivity must restrict downward seepage sufficiently to simulate SSW accumulation. The siliceous layer at the Santa Rosa/Dewey Lake contact has a vertical hydraulic conductivity several orders of magnitude lower than the horizontal hydraulic conductivities of either formation. The vertical hydraulic conductivity for this contact was established in the model calibration stage, based on seepage rate estimates for 1981 to 2002 (Section 6) and observed hydrographs during the 1996 to 2002 record. The calibration gave a vertical hydraulic conductivity for the siliceous layer of 4×10^{-7} ft/d to provide a close match with the observed hydrographs in the PZ- and C-series wells.

The vertical hydraulic conductivities of the Gatuña and Dewey Lake Formations were estimated as 10 percent of the horizontal hydraulic conductivity based on Domenico and Schwarz (1998), who provide representative values for horizontal and vertical hydraulic conductivities in different



N

0 2000 4000 Feet

Explanation

Ponds

WIPP land withdrawal area

WIPP facilities area

Notes:

K_H= Horizontal hydraulic conductivity

K_V= Vertical hydraulic conductivity

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

Model Layer 1
Hydraulic Conductivity Spatial Distribution

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Figure 33

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7.2.2 Predictive Simulations

The long-term migration model was used in two predictive simulations to evaluate the effects of engineered seepage controls to limit SSW migration over a 100-year timeframe. This evaluation assumes that the engineered seepage controls, including lining of storm water ponds and channels and covering the Salt Storage Area, will be effective in eliminating seepage from fresh and saline sources that exceeds the very low seepage rates that occur under natural conditions. The following timelines were established for the two predictive simulations.

- *Simulation 1:* SSW migration without seepage controls
  - Seepage continues for the WIPP operating period to 2035.
  - Seepage stops in 2036 and thereafter.
  - SSW migration is simulated through 2102.

- *Simulation 2:* SSW migration with engineered seepage controls
  - Engineered seepage controls are implemented by the end of 2004.
  - Transient drainage continues in 2005, providing continued seepage at constant rates.
  - Seepage stops in 2006 and thereafter.
  - SSW migration is simulated through 2102.

Under each simulation, seepage and SSW accumulation begins in 1981, with seepage rates varying annually based on actual precipitation records. The model is calibrated to match observed conditions in 2002, after which the predictive simulations project SSW migration over 100 years. Both simulations allow seepage into the Exhaust Shaft beginning in 1995 and continuing at a constant rate until final closure is completed in 2035 or until the region around the Exhaust Shaft can no longer sustain the specified 1-gpm flow.

7.3 Long-Term Migration Model Results

The results of the long-term migration model predictive simulations are presented in a series of figures (Figure 34 through 37) that show the extent of the SSW in the Santa Rosa and Gatuña (Layer 1) and the Dewey Lake (Layer 2). These figures illustrate the saturated thickness in each of the two layers in saturated lenses at the bottom of each layer, overlying the low-permeability cementation zones that define the bottom of each layer in the model domain.

Figures 34 and 35 show the saturated thickness in each of the two layers for 2002, at the start of the predictive simulations. These figures illustrate the calibrated model condition that simulates the observed SSW water levels, with a saturated thickness of up to 30 feet in the

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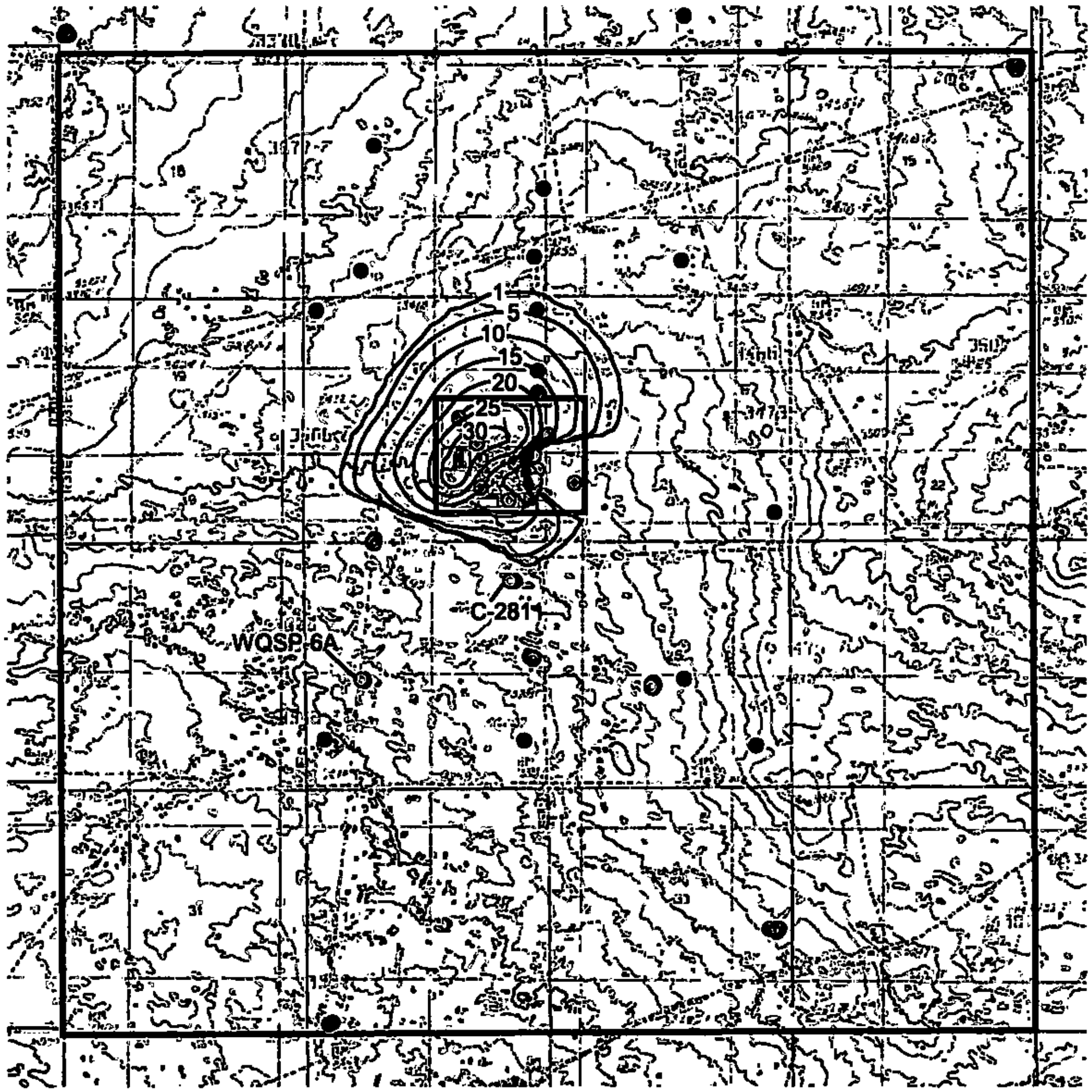

Explanation

- WIPP land withdrawal boundary
- WIPP facilities area
- Saturated thickness (ft)
- Monitor well
- Santa Rosa or Dewey Lake monitor well

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Long-Term Migration Model Calibration Phase
Santa Rosa/Gatuña Saturated Thickness in 2002

Figure 34

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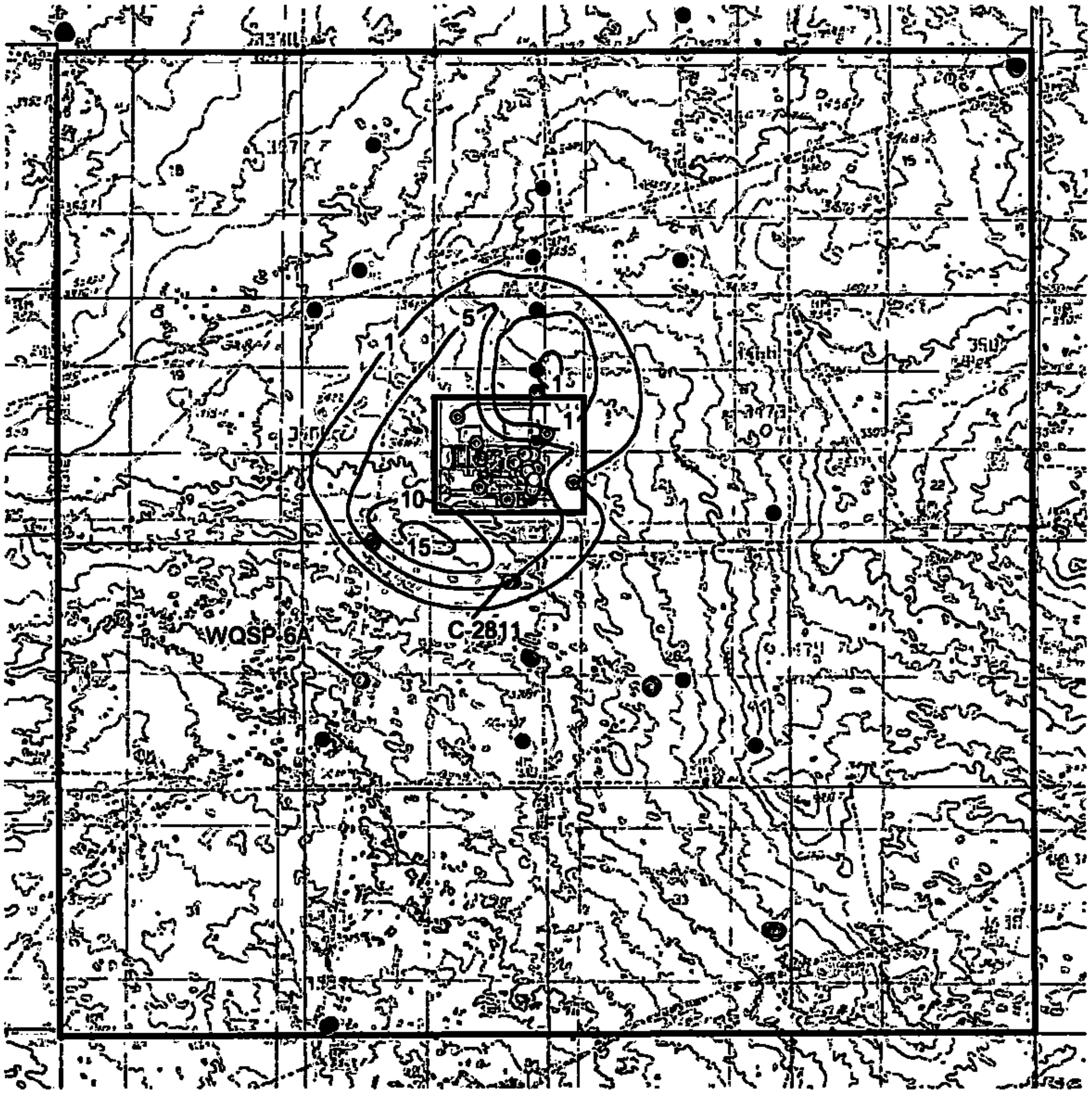

Note:
The model simulates the saturated thickness above the Dewey Lake sulfate cementation change at the base of Layer 2. Monitor well C-2811 is screened approximately 100 feet above the simulated saturation at the base of Layer 2.

N

0 2000 4000 Feet

Explanation

- WIPP land withdrawal boundary
- WIPP facilities area
- Saturated thickness (ft)
- Monitor well
- Santa Rosa or Dewey Lake monitor well

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Long-Term Migration Model Calibration Phase
Dewey Lake Saturated Thickness in 2002

Figure 35

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9-8-03 JN 9525

Santa Rosa. The model predicts that downward leakage to the Dewey Lake has begun to develop a saturated lens in the middle Dewey Lake. Although the two-layer model simulates saturation at the base of Layer 2 in the middle Dewey Lake, the results suggest a potential for the SSW to extend to monitor well C-2811, where saturation occurs in the upper Dewey Lake.

Figure 36 shows the potential extent of SSW migration without seepage controls (Simulation 1). After 100 years, the model predicts that Layer 1 will drain downward to the Dewey Lake, and the saturated lens in the Santa Rosa will not be sustained. The SSW is predicted to migrate in the middle Dewey Lake in a general radial pattern, with flow strongly influenced by the formation contours used to set up the model domain (Figures 29, 30, and 33). If seepage from the surface continues, the saturated zone in the Dewey Lake is predicted to cover an area of approximately 4.4 square miles, with a saturated thickness above the sulfate cementation change surface exceeding 20 feet. The saturated lens contributed by the surface seepage is projected to migrate as far as monitor well WQSP-6A to the south, where naturally occurring saturated conditions exist, and to just reach the WIPP land withdrawal boundary to the north.

Figure 37 shows the potential extent of the SSW with implementation of engineered seepage controls (Simulation 2). After 100 years, the model predicts that Layer 1 will again become unsaturated, with downward drainage forming a saturated lens in the Dewey Lake. With the engineered seepage controls stopping recharge, however, the extent of the SSW lens in the Dewey Lake is significantly less than in Simulation 1. The saturated zone still covers approximately 3.5 square miles, but the saturated thickness is reduced by about half, to just over 10 feet. The northern extent of migration is maintained within the WIPP land withdrawal boundary. The southern extent of migration continues to reach monitor well WQSP-6A, but the saturated thickness of the SSW reaching the naturally occurring saturated zone is diminished by about half.

The predictive simulations show that seepage losses into the Exhaust Shaft are reduced when engineered seepage controls are implemented to prevent SSW recharge from the surface. Simulation 1, with continued recharge, shows seepage to the Exhaust Shaft continuing at a steady rate of 1 gpm up to 2035. Simulation 2, with the engineered seepage controls to prevent SSW recharge, shows that seepage to the Exhaust Shaft is not sustained at 1 gpm after 2008, and in the model, seepage is stopped for the remaining years of the simulation. The reduced seepage into the Exhaust Shaft is a result of declining water levels in the SSW lens in the Santa Rosa as the lens spreads laterally and leaks downward into the Dewey Lake. This large-scale model domain does not provide the detailed analysis of Exhaust Shaft seepage necessary to reach definitive conclusions about seepage improvements; however, the modeling results suggest that the engineered seepage controls will reduce seepage into the Exhaust Shaft.

Figure 38 shows the expected reduction in the Dewey Lake saturated lens that is created by the engineered seepage controls. The saturated thickness is reduced by as much as 12 feet, and a substantial improvement in the extent of migration is expected near the northern WIPP land withdrawal boundary.

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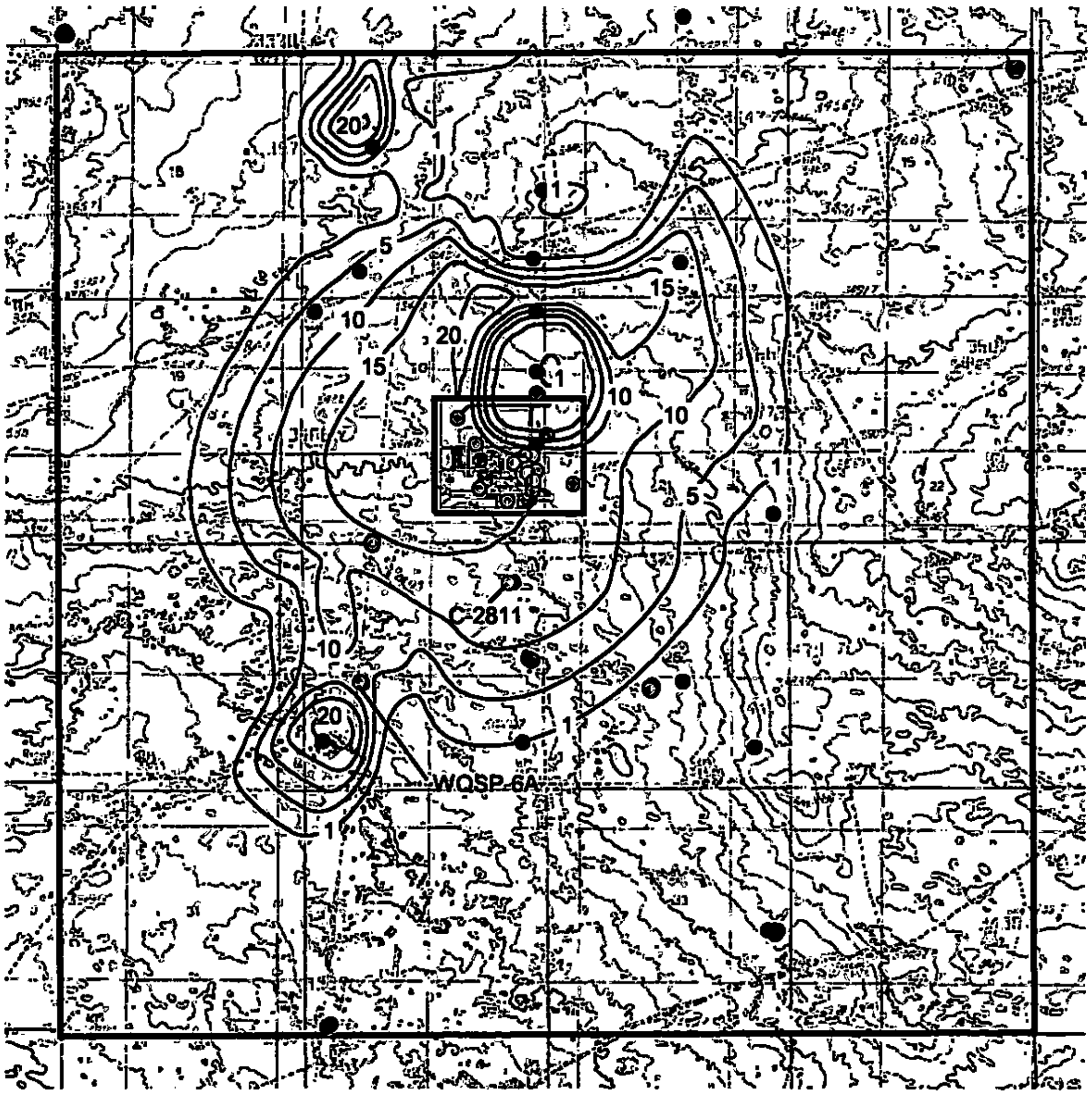

N

0 2000 4000 Feet

Explanation

WIPP land withdrawal boundary

WIPP facilities area

Saturated thickness (ft)

Monitor well

Santa Rosa or Dewey Lake monitor well

Note:
Santa Rosa/Gatuña layer is dry in 2102.

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

Predictive Simulation 1: Continued Seepage to 2035
Dewey Lake Saturated Thickness in 2102

Figure 36

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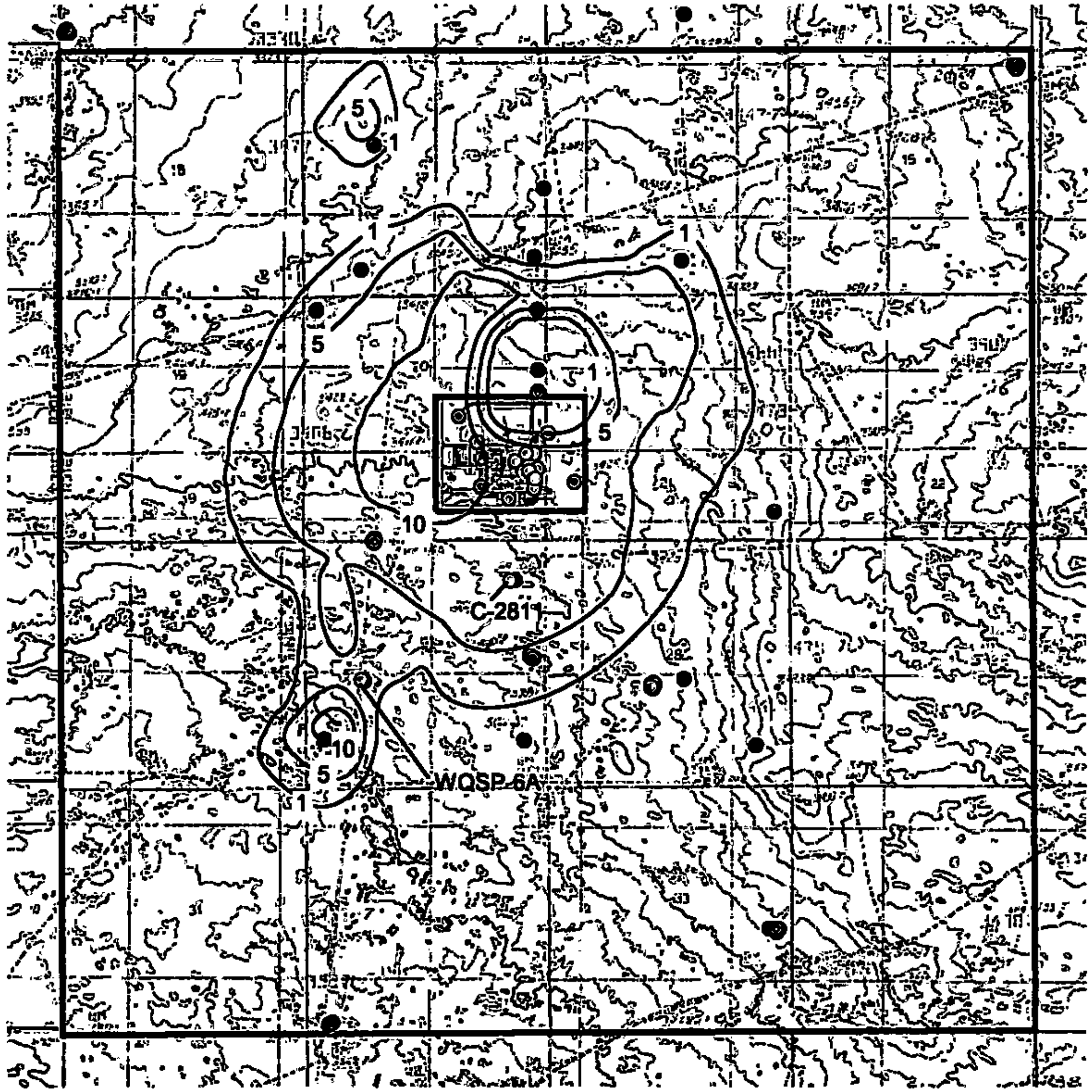
8-27-03 JN 9525

S:\PROJECTS\9525\GIS\PROJECT (PROJECT = WATER.APR) (VIEW EXTENTS = 1:48000) (VIEW NAME = V26 (LAYOUT = L26)



N

0 2000 4000 Feet

Explanation

- WIPP land withdrawal boundary
- WIPP facilities area
- Saturated thickness (ft)
- Monitor well
- Santa Rosa or Dewey Lake monitor well

Note:
Santa Rosa/Gatuña layer is dry in 2102.

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Predictive Simulation 2: Seepage Stopped in 2006
Dewey Lake Saturated Thickness in 2102

Figure 37

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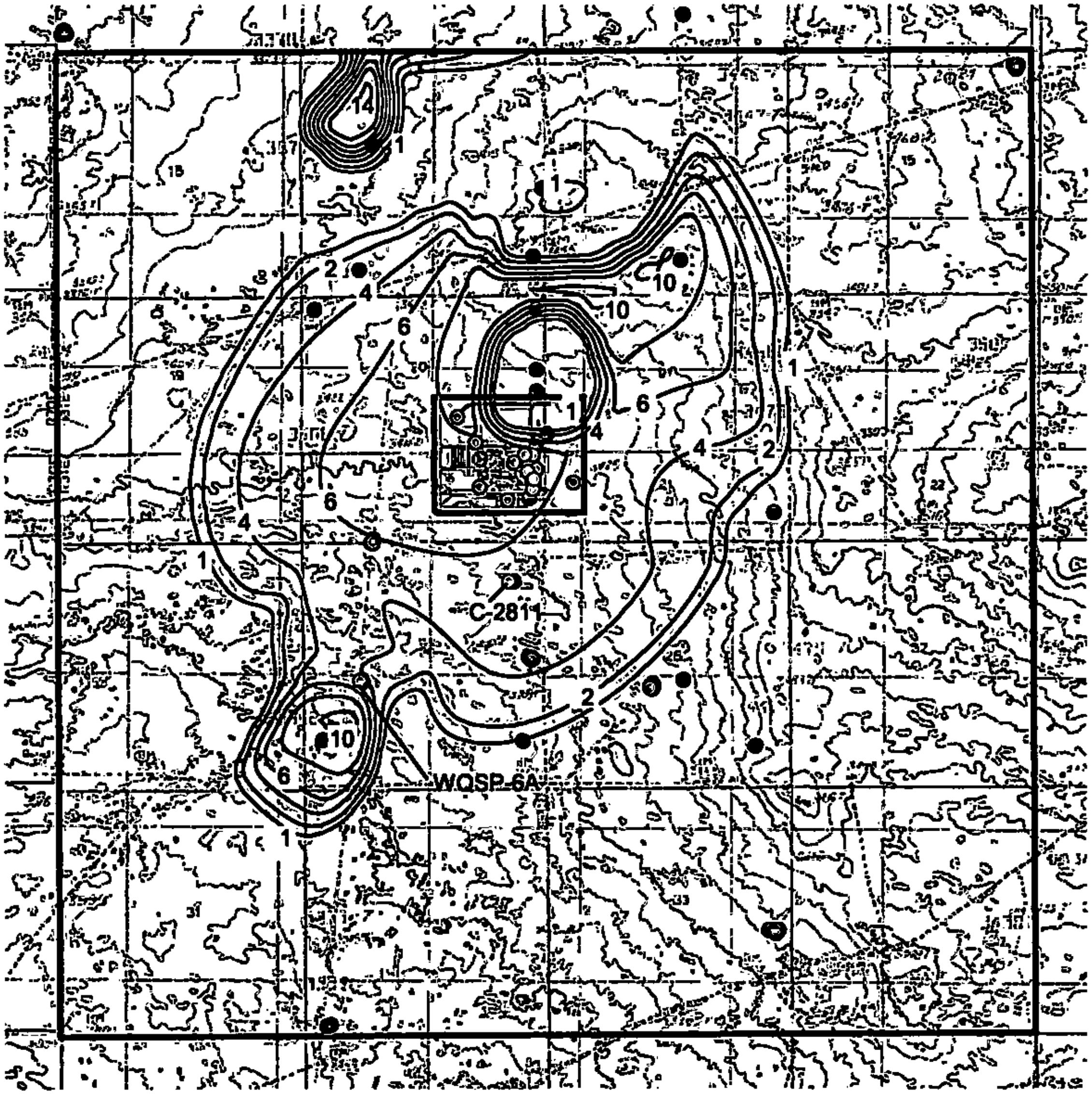

N

0 2000 4000 Feet

Explanation

WIPP land withdrawal boundary

WIPP facilities area

Decrease in saturated thickness (ft)

Monitor well

Santa Rosa or Dewey Lake monitor well

WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER

Engineered Controls Stop Seepage in 2006
Decrease in Dewey Lake Saturated Thickness in 2102

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8-27-03 JN 9525

Figure 38

The long-term migration model results are summarized in Table 14.

Table 14. Summary of Long-Term Migration Model Predictive Simulations

Simulation Result	Total Seepage Volume (millions of gallons)		
	Simulation 1 Continued Seepage	Simulation 2 Engineered Seepage Controls	Net Improvement [a]
Calibration Stage (1981-2002)			
Seepage volume	328	328	---
Volume lost to Exhaust Shaft	4	4	---
Volume in SSW storage	323	323	---
Predictive Stage (1981-2102)			
Seepage volume	882	392	490
Volume lost to Exhaust Shaft	22	7	15
Volume in SSW storage	861	385	475

[a] Simulation 1 volume minus Simulation 2 volume

The long-term migration model predicts that downward leakage to the Dewey Lake will continue, and the SSW saturated zone will continue to spread laterally. However, the predictive simulations indicate that implementation of engineered seepage controls will reduce the volume in storage by approximately 55 percent and significantly reduce the extent of saturation over the 100-year timeframe considered.

8. Summary and Conclusions

The SSW water budget for the WIPP provides information on the occurrence of shallow saturated conditions beneath the WIPP facilities area and the effects of site development on subsurface recharge. Through a quantitative analysis of the primary inputs to and losses of on-site water, the water budget examines each input and loss on a local scale and considers the potential for SSW migration in the context of the regional hydrogeologic setting.

The water budget was completed to support DOE regulatory compliance at the WIPP. Existing data and information were compiled and analyzed, but no new field data were gathered as part of the project. Certain data limitations were identified; however, existing data are sufficient to assemble a reasonable representation of the SSW water budget.

8.1 Principal Findings

The water budget used multiple analysis approaches to obtain a range of independent results that enhance the reliability of the overall analysis. The analyses focused on estimates of seepage from five principal seepage sources within the WIPP surface facilities area: the Salt Storage Area, Salt Pile Evaporation Pond, Detention Basin A, and storm water retention Ponds 1 and 2.

Since 1981, when construction of the WIPP surface facilities began, recharge of precipitation to the subsurface has increased, largely because approximately 26 acres developed for the WIPP surface facilities have been covered with impervious surfaces. Under pre-development conditions, precipitation falling on rangeland was predominantly lost to evaporation and plant uptake and transpiration, with only a small fraction (less than 1 percent) contributing to deep recharge. However, due to site development, storm water runoff is now routed to retention ponds, where focused runoff infiltrates over an area of approximately 10 acres. Another recharge source is the Salt Storage Area, where precipitation falling on the salt pile infiltrates through the highly fractured surface.

The greatest component of the water budget is precipitation that falls on-site, and based on the average annual precipitation rate, precipitation on the 85-acre watershed surrounding the WIPP facilities area amounts to approximately 29.2 million gallons per year. The resulting average annual storm water flow to the retention ponds, plus precipitation falling on the Salt Storage Area, amounts to approximately 25.0 million gallons per year. Since 1984, when the WIPP facilities were constructed, precipitation rates have exceeded the long-term average by 19 percent, with precipitation on the 85-acre watershed amounting to approximately 33 million gallons per year. Less than a year after the SSW monitor wells were installed in 1996, higher-than-normal precipitation in 1997 exceeded the long-term annual average by 98 percent, and a corresponding water level rise was observed in the SSW monitor wells. The relatively high precipitation experienced since 1984, along with the focusing of runoff in retention ponds, has resulted in significant recharge to the Santa Rosa.

On a regional basis, shallow water at depths less than 100 to 200 feet bgs is a common occurrence, and to the east of the WIPP site, the Santa Rosa Sandstone is an important aquifer. The Dewey Lake Redbeds Formation is also an aquifer that provides water supply locally from limited saturated horizons. At the time that the WIPP shafts were drilled, the Santa Rosa and Dewey Lake were unsaturated in the WIPP facilities area. Although the initial moisture content in the Santa Rosa and Dewey Lake prior to WIPP development is unknown, the increased seepage from WIPP development has contributed sufficient recharge to reach saturation and create a perched water lens 40 to 60 feet bgs in the Santa Rosa.

8.1.1 Shallow Subsurface Water Volume Estimate

The total volume of water in the SSW zone was estimated by two methods, providing a likely range of the SSW volume added to the saturated portion of the Santa Rosa. The first, based on the saturated zone observed in on-site monitor wells, yields an estimated SSW volume of 108 million gallons, covering approximately 150 acres at an average saturated thickness of 16.6 feet. The second, based on the MODFLOW transient analysis, yields an estimated SSW volume of 315 million gallons, covering approximately 520 acres with a saturated thickness from 1 to 31 feet. However, the SSW characteristics available for the estimations are limited. Certain aspects of the SSW volume estimate are reasonably well understood, including the (1) water table surface, (2) base configuration of the Santa Rosa, and (3) area where water is present in 14 of the 15 SSW monitor wells. Key uncertainties include the porosity and initial moisture content of the Santa Rosa Sandstone and the undefined limits of the SSW.

8.1.2 Operational Shallow Subsurface Water Inputs and Losses

Inputs to the SSW from on-site operational discharges were estimated from available records. Discrete discharges from drilling and construction activities since WIPP construction began in 1981 amount to approximately 6 million gallons, with evaporative losses further reducing the volume these discharges may have contributed to the SSW. The estimated leakage from water lines is approximately 0.22 million gallons per year, a total of approximately 4 million gallons since the WIPP facilities opened in 1984. These operational discharges represent a relatively small contribution to the total SSW volume.

Seepage into the Exhaust Shaft, first observed in 1995, represents a loss from the SSW; however, the seepage rate has not been directly measured. Current seepage rates may constitute a significant loss, having been estimated at rates of 0.5 to 1.6 million gallons per year (U.S. DOE, 2002). The Exhaust Shaft seepage is affected by the condition of the concrete shaft liner and the SSW hydraulic head, which suggests that seepage rates may have been lower in the past.

8.1.3 Shallow Subsurface Water Recharge Modeling

For the water budget, seepage providing recharge to the SSW was modeled using three independent methods to produce a range of seepage estimates for cross-comparison. The results are summarized in Table 15.

Table 15. Summary of Seepage Modeling Results

Location	Total Precipitation [a] (M gal/yr)	Total Storm Water [a] (M gal/yr)	Seepage Volume (M gal/yr)		
			UNSAT-H Simulation [b]	Steady-State MODFLOW Simulation	Transient MODFLOW Simulation [c]
Salt Storage Area	5.1	5.1	4.7	3.5	4.2
Salt Pile Evaporation Pond	7.0	5.2	2.5	1.4	3.0
Detention Basin A	13.0	11.0	7.4	0.39	3.2
Pond 1	1.3	1.0	0.61	0.06	0.28
Pond 2	2.8	2.6	1.7	0.08	0.74
Total	29.2	25.0	16.9	5.4	11.4
Estimated total seepage for 1984 to 2002			320	100	220

M gal/yr = Million gallons per year

[a] Volume represents the average over the years 1997 through 2002. For the Salt Storage Area, it includes direct precipitation onto the top deck. For the storm water ponds, it includes storm water runoff from the watershed and direct precipitation to the pond.

[b] Volume represents the average over the years 1997 through 2001.

[c] Volume represents the average over the years 1981 through 2002.

The UNSAT-H model, which uses a physically based approach to consider near-surface infiltration processes, predicts the highest seepage rates. The steady-state MODFLOW simulation predicts the lowest seepage rates, and the transient MODFLOW simulation predicts intermediate seepage rates. The MODFLOW simulations use SSW water levels and hydraulic testing data to determine the seepage inputs that would create the observed water levels. The MODFLOW simulations provide a reasonable, but non-unique solution; other combinations of seepage inputs may yield similar water level results.

The seepage modeling results are reasonably consistent, considering the uncertainties of each approach. All the models showed total annual seepage rates of several million gallons per year. Recharge to the SSW is estimated to be between 18 and 58 percent of the on-site precipitation. Together, the seepage volumes from the five primary seepage sources are sufficient to have contributed the volume of water necessary to create the SSW saturated zone. Although uncertainties exist in the SSW volume and seepage rates estimated for the five primary sources, it is clear that increased seepage resulting from the WIPP site development contributes significant recharge to the SSW.

8.2 Predictive Simulations

Predictive modeling simulations were used to evaluate the potential extent of long-term SSW migration and the effects of engineered controls to prevent discharges from the primary seepage sources, including the apparent sources of saline seepage. The predictive simulations used a transient saturated/unsaturated flow model that was first calibrated to match observed SSW conditions. Following calibration, the model was run in a predictive mode to evaluate (1) the potential long-term SSW migration for a 100-year timeframe and (2) the effectiveness of engineered seepage control measures in reducing SSW migration. The potential migration of SSW is a top-down process, with downward flow from the Santa Rosa moving vertically through the unsaturated upper Dewey Lake and laterally to areas where a natural water table exists in the middle Dewey Lake. The predictive simulations represent a complex hydrogeologic system as a two-layer model, which is conservative in considering the potential extent of long-term SSW migration, because all recharge to the Dewey Lake is routed to a single layer, whereas the actual heterogeneous flow field in the unsaturated upper Dewey Lake may disperse the flow and lead to less migration.

The predictive simulations examined the downward leakage from the Santa Rosa to the Dewey Lake across the low-permeability siliceous layer observed at the contact. The vertical hydraulic conductivity was established by calibrating the model to a vertical hydraulic conductivity that limits downward flow, such that SSW accumulates in the Santa Rosa perched lens as a result of seepage inputs and water level hydrographs are matched in the SSW monitor wells. The calibration was based on the highest seepage rate estimates for 1981 to 2002 and observed water level hydrographs for the 1996 to 2002 period of record. Given the calibrated vertical hydraulic conductivity, current seepage rates cause an increase in the SSW volume and water levels; however, with a cessation of anthropogenic seepage, either after engineered seepage controls are implemented (2004) or after the WIPP operating period ends (2035), downward leakage is predicted to drain the SSW from the Santa Rosa to the Dewey Lake. The 100-year predictive simulations suggest that the Santa Rosa will become unsaturated and the saturated lens in the Dewey Lake will expand laterally.

The long-term migration model, although preliminary, predicts that over a 100-year timeframe, the SSW has the potential to migrate as far as the northern boundary of the WIPP land withdrawal area. The results also show that within 100 years, SSW migration has the potential to reach monitor well WQSP-6A, where naturally occurring groundwater may be encountered. The model predicts sufficient potential for SSW migration, such that water currently present at monitor well C-2811 may be interconnected with the SSW lens.

The long-term migration model indicates that the engineered seepage controls being planned by DOE will substantially reduce the extent of SSW migration. The predictive simulations show that implementation of engineered seepage controls will reduce the volume of water in the SSW by more than half, from approximately 860 million gallons to 385 million gallons, and reduce migration to prevent the SSW from reaching the northern facility boundary, maintaining the saturated lens within the site.

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Appendix A

Well Logs

Sources of well logs included in this appendix:

PZ-series wells:

Intera. 1997a. *Exhaust shaft: Phase II hydraulic assessment data report involving drilling, installation, water-quality sampling, and testing of piezometers 1-12.* Prepared for Westinghouse. DOE/WIPP 97-2219. September 26, 1997.

C-series wells:

Intera. 1996. *Exhaust shaft hydraulic assessment data report.* Prepared for Westinghouse. DOE/WIPP 97-2219. November 1996.

Well C-2811:

Powers, D.W. 2002. *Basic data report for drillhole C-2811 (Waste Isolation Pilot Plant - WIPP).* Dennis W. Powers, Consulting Geologist. Anthony, Texas. October 2002. 24p.

Well WQSP-6A:

Stensrud, W.A. 1995. *Culebra Transport Program Test Plan: Hydraulic tests at wells WQSP-1, WQSP-2, WQSP-3, WQSP-4, WQSP-5, WQSP-6, and WQSP-6A at the Waste Isolation Pilot Plant (WIPP) Site.* Intera Inc. Austin, Texas. October 6, 1995.

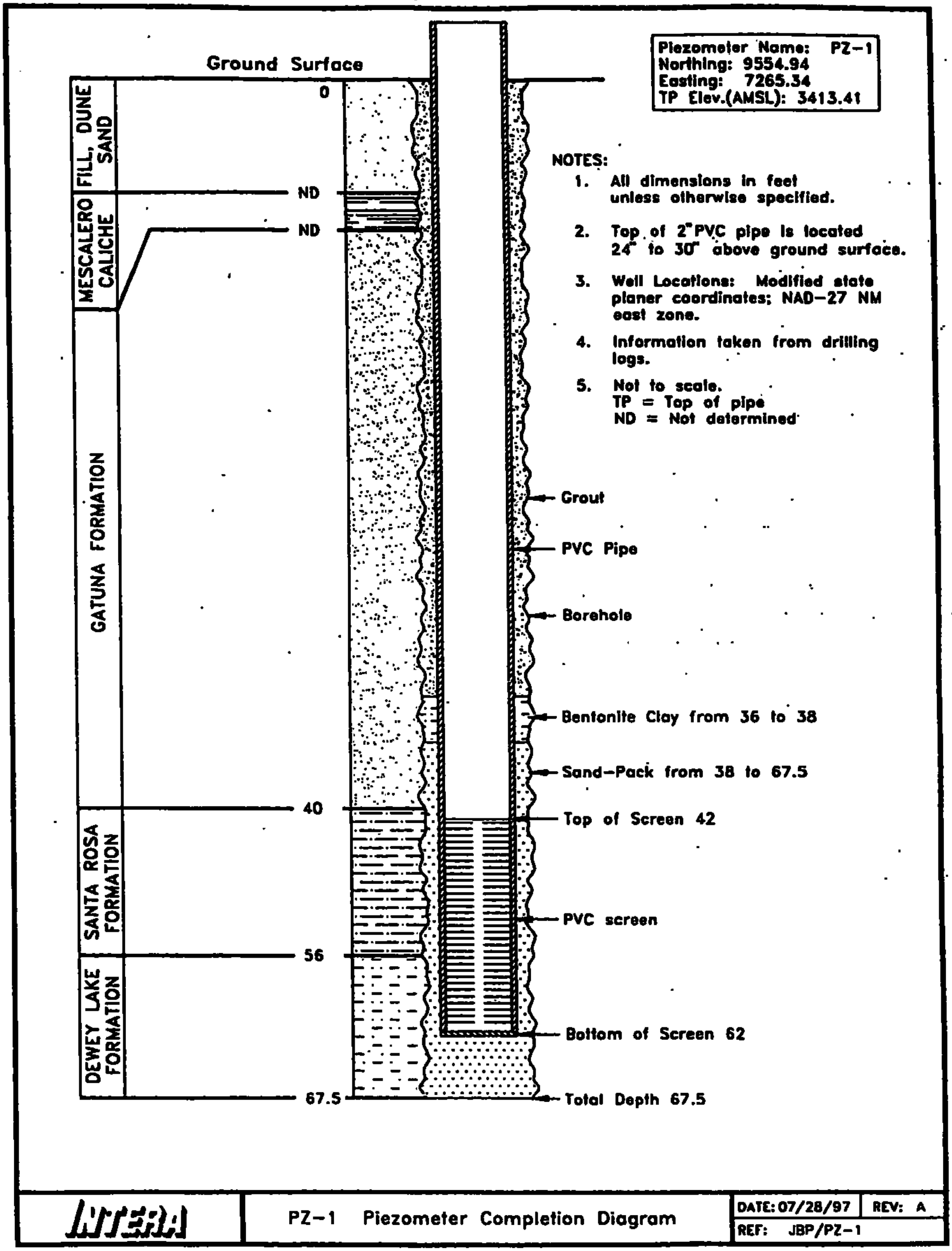


Figure 2.3 PZ-1 piezometer completion diagram

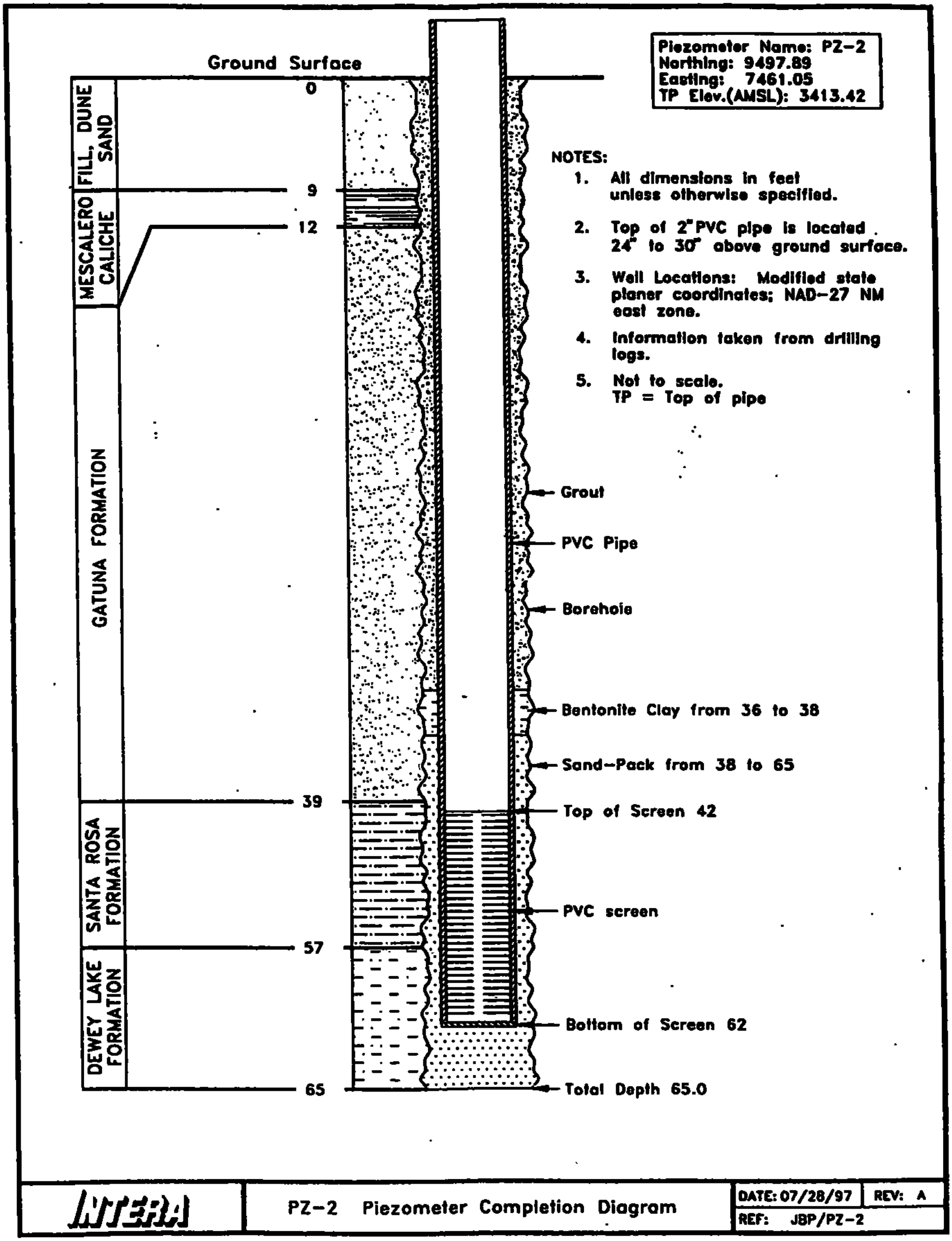


Figure 2.4 PZ-2 piezometer completion diagram

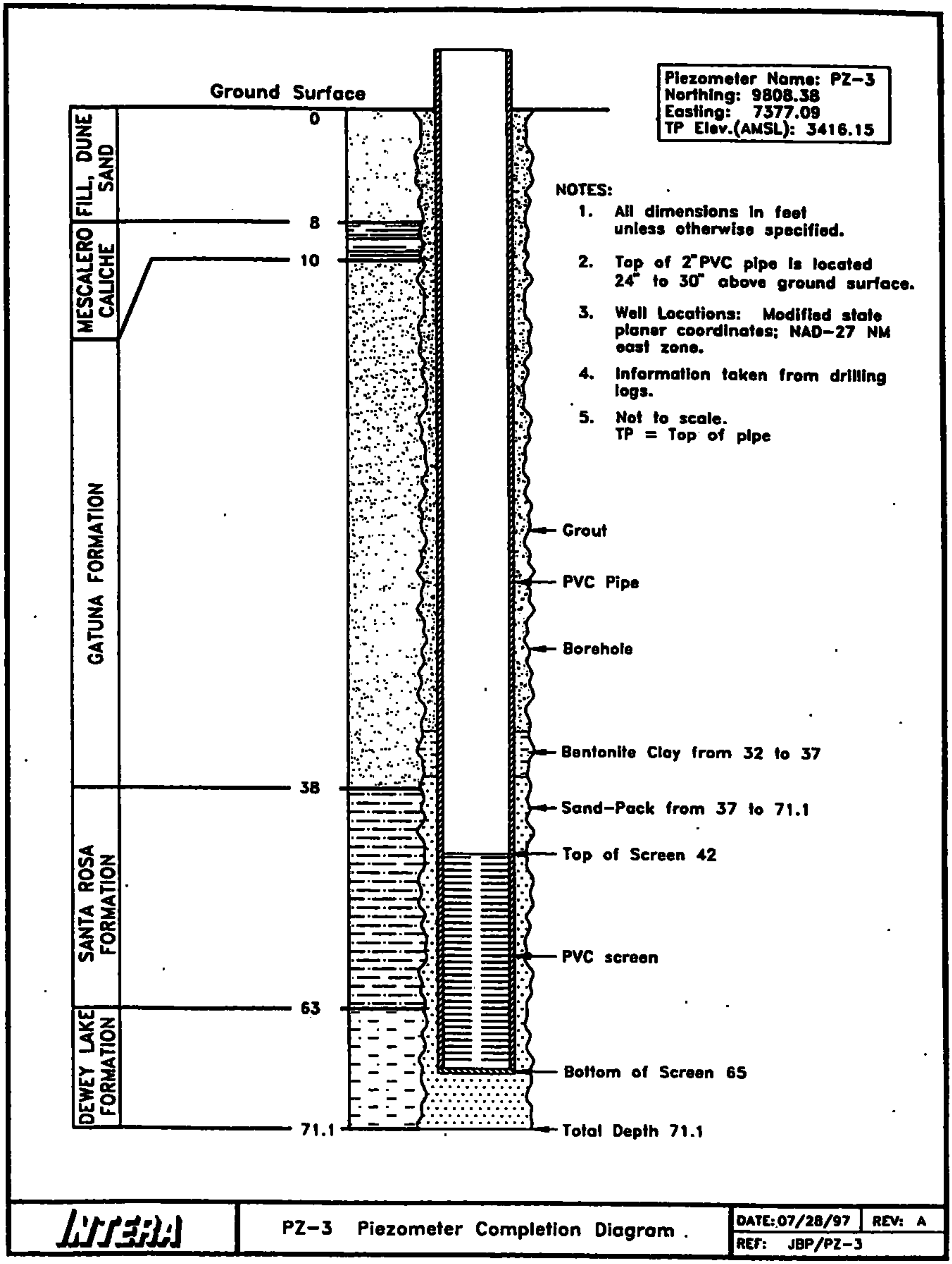


Figure 2.5 PZ-3 piezometer completion diagram

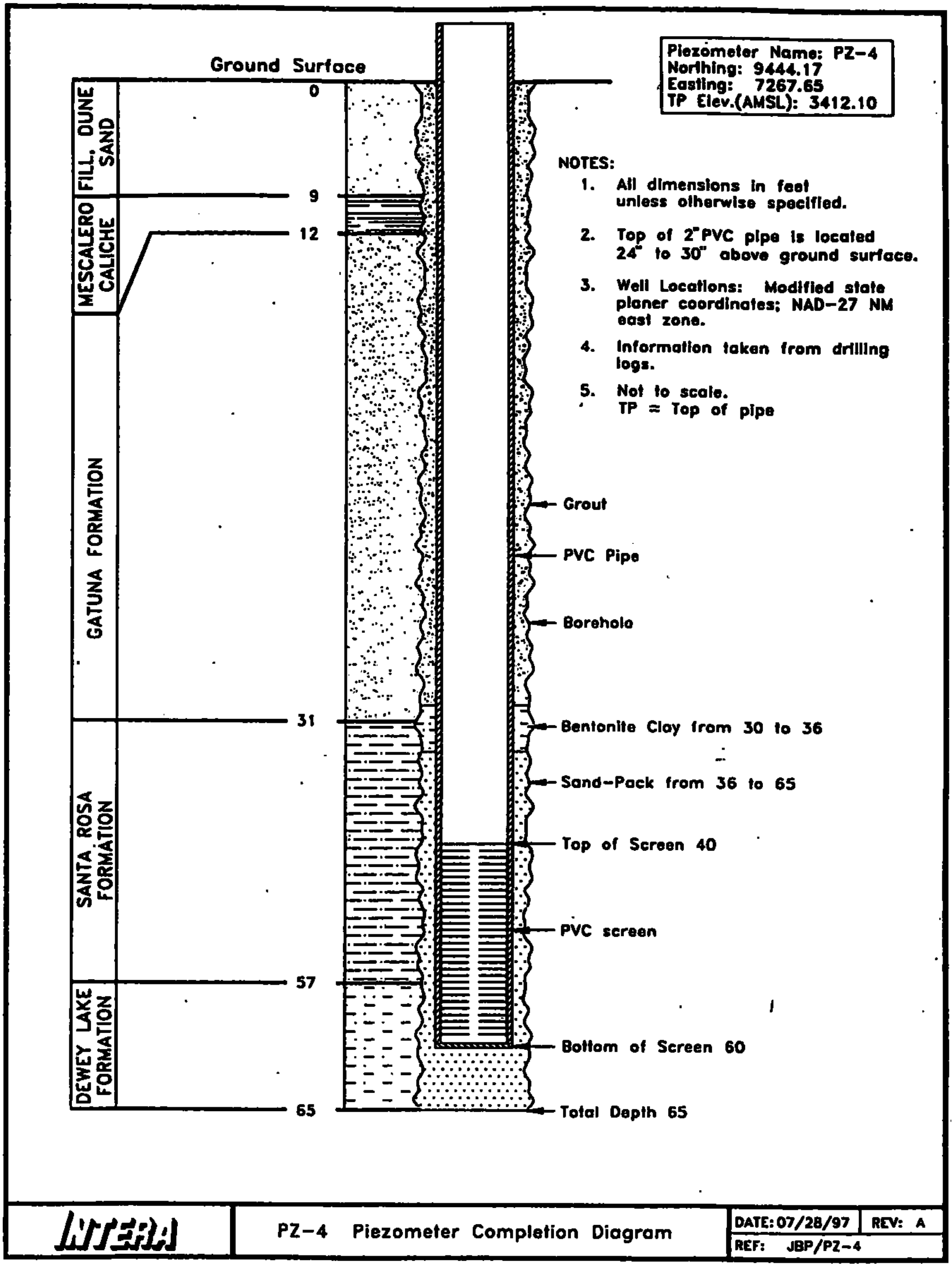


Figure 2.6 PZ-4 piezometer completion diagram

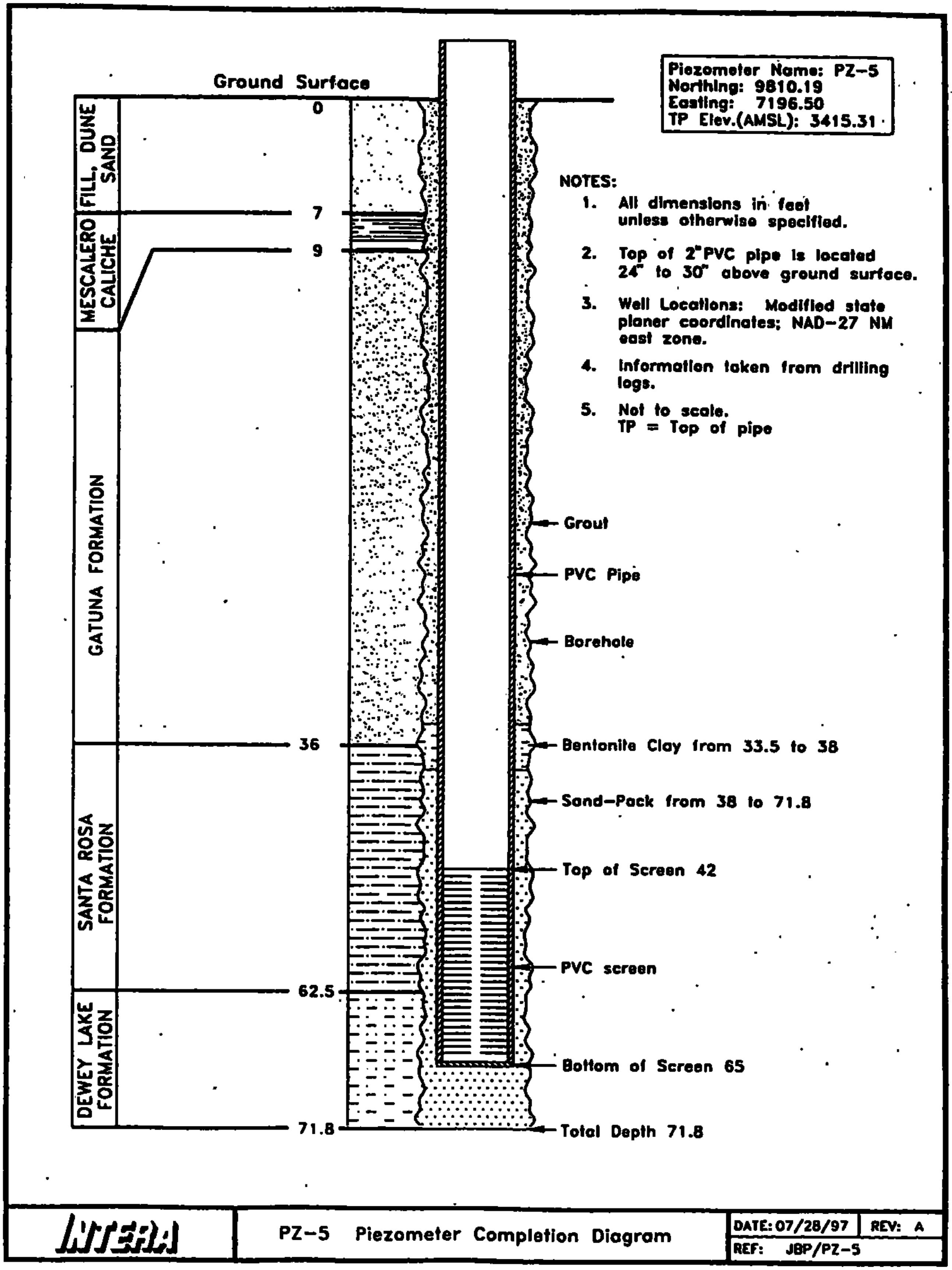


Figure 2.7 PZ-5 piezometer completion diagram

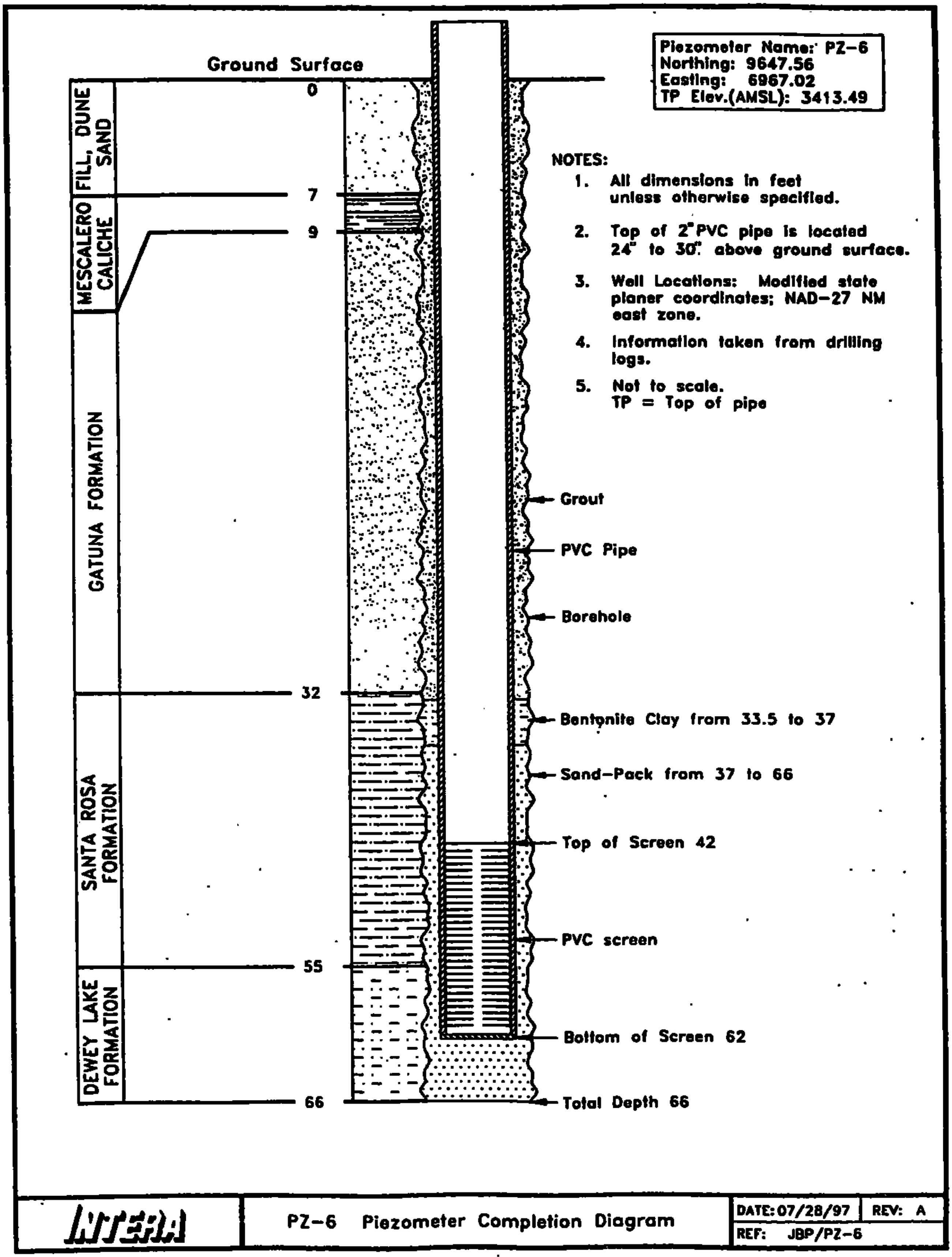


Figure 2.8 PZ-6 piezometer completion diagram

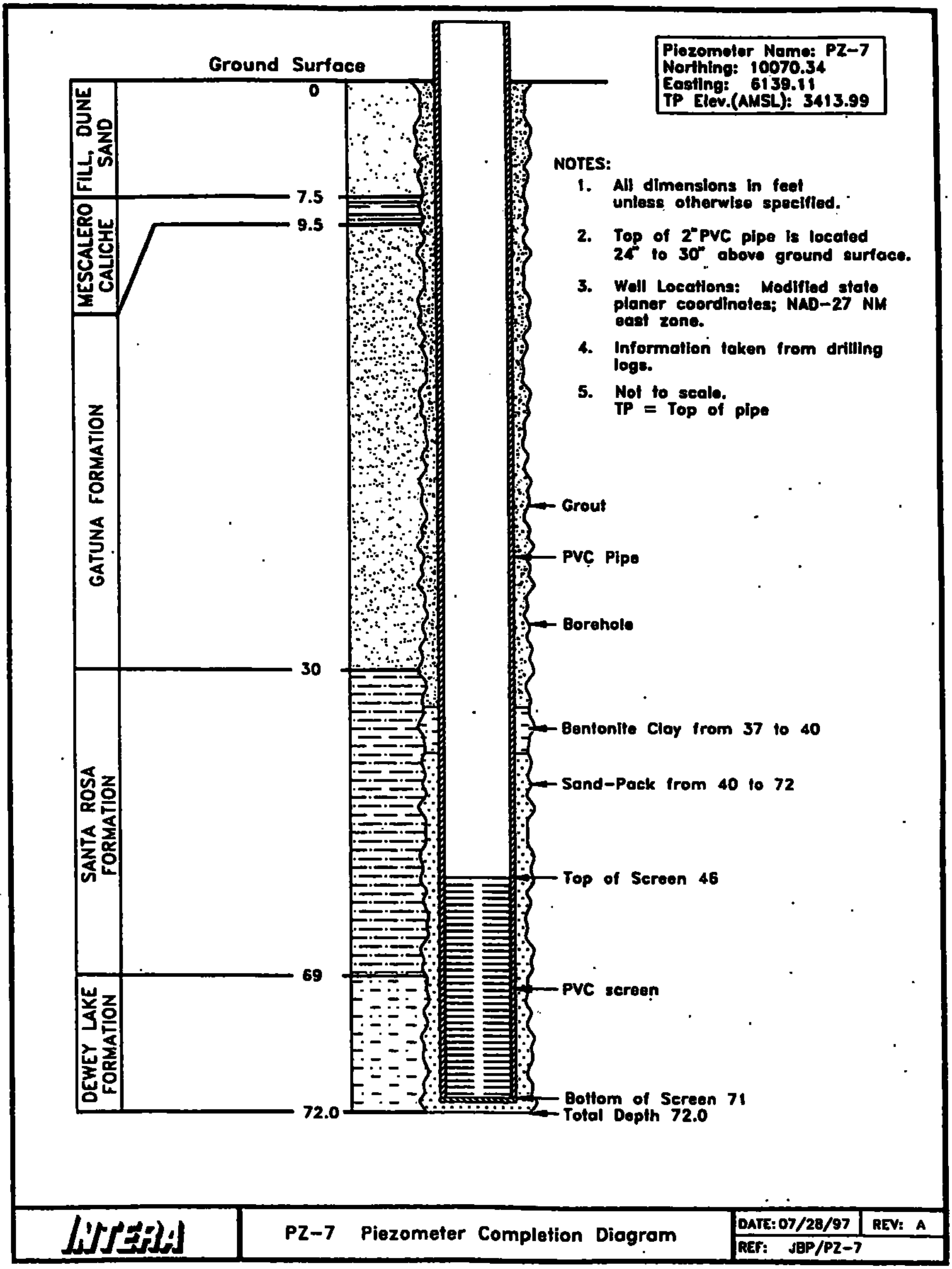


Figure 2.9 PZ-7 piezometer completion diagram

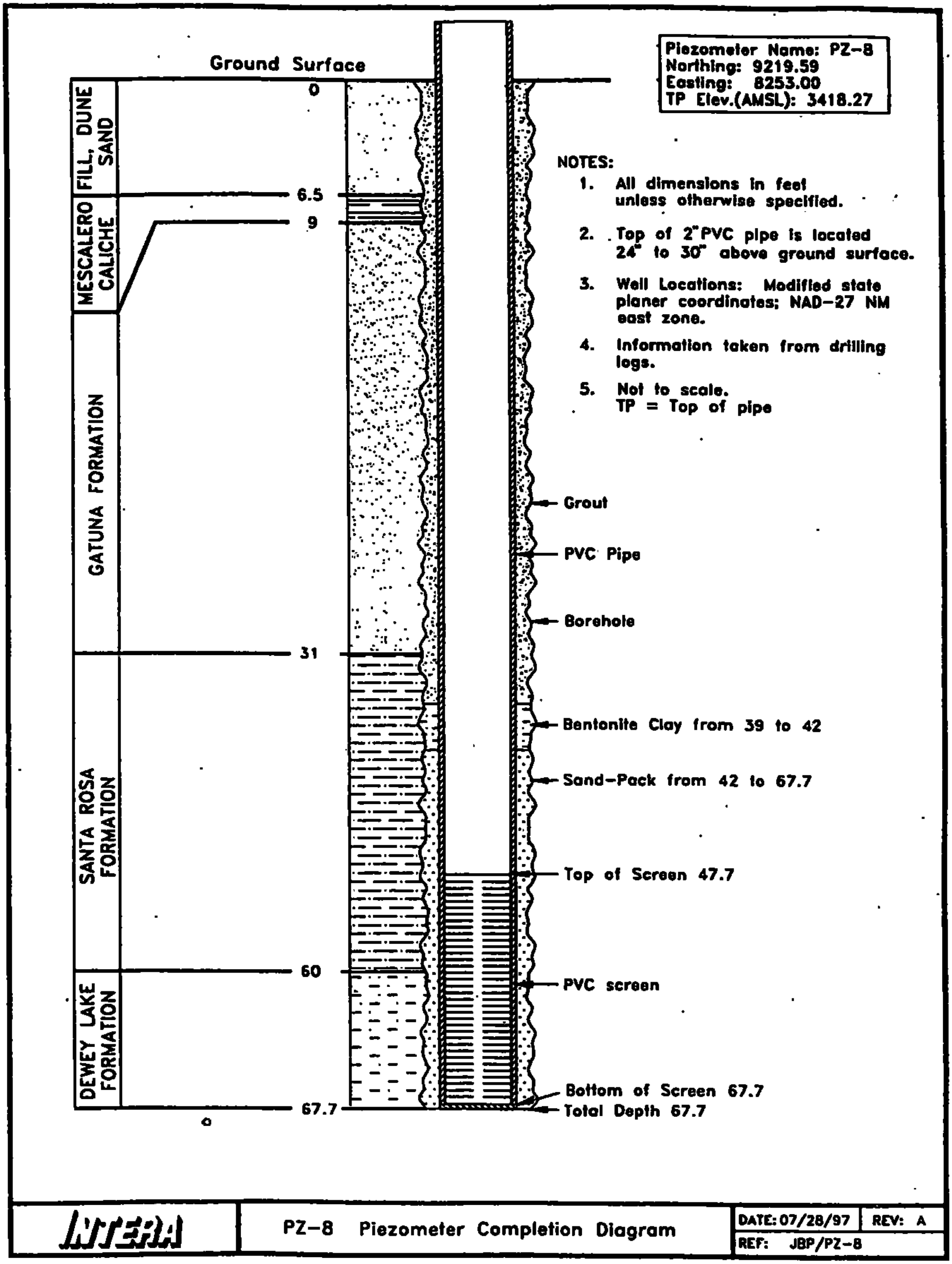
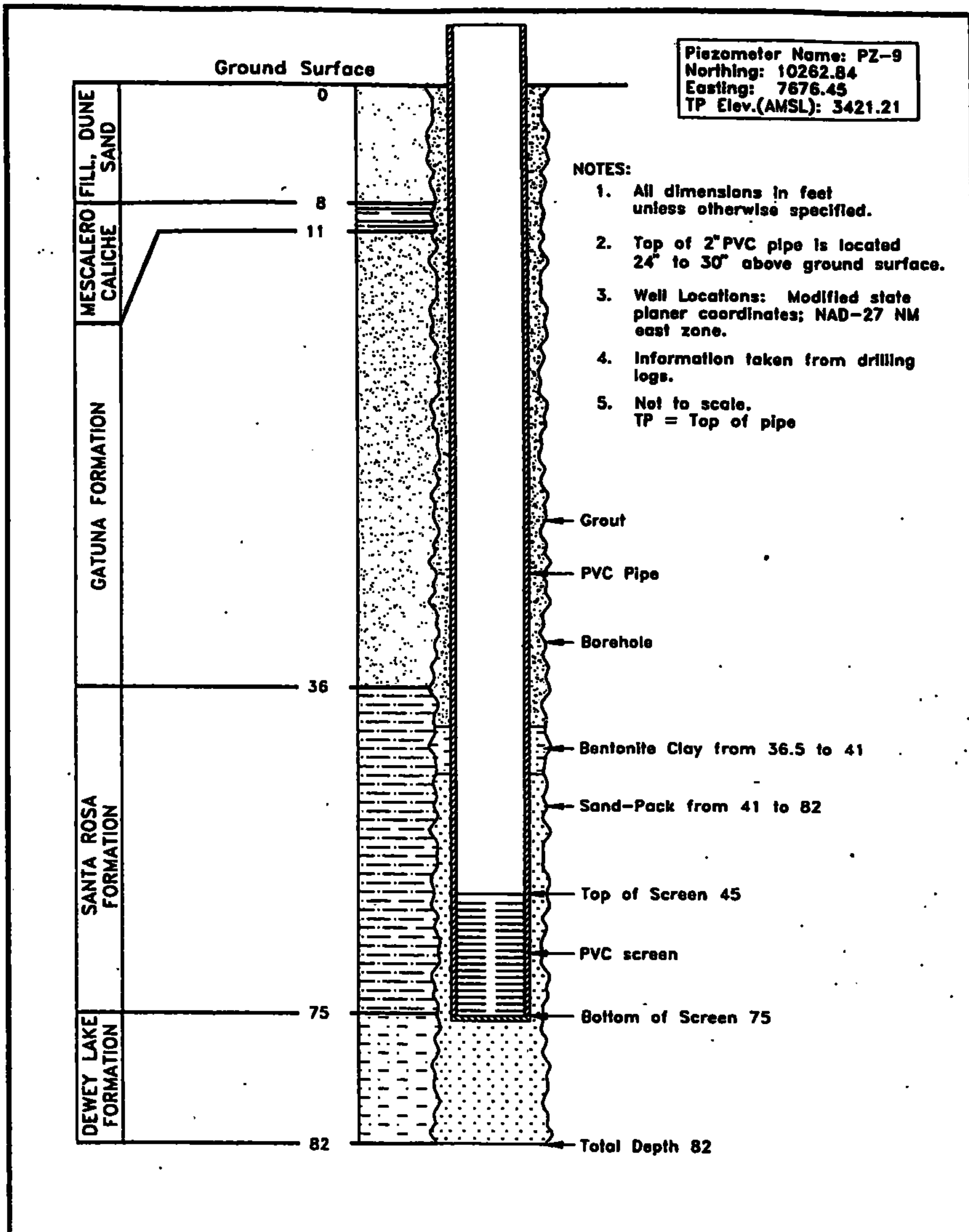


Figure 2.10 PZ-8 piezometer completion diagram



INTERA	PZ-9 Piezometer Completion Diagram	DATE: 07/28/97	REV: A
		REF: JBP/PZ-9	

Figure 2.11 PZ-9 piezometer completion diagram

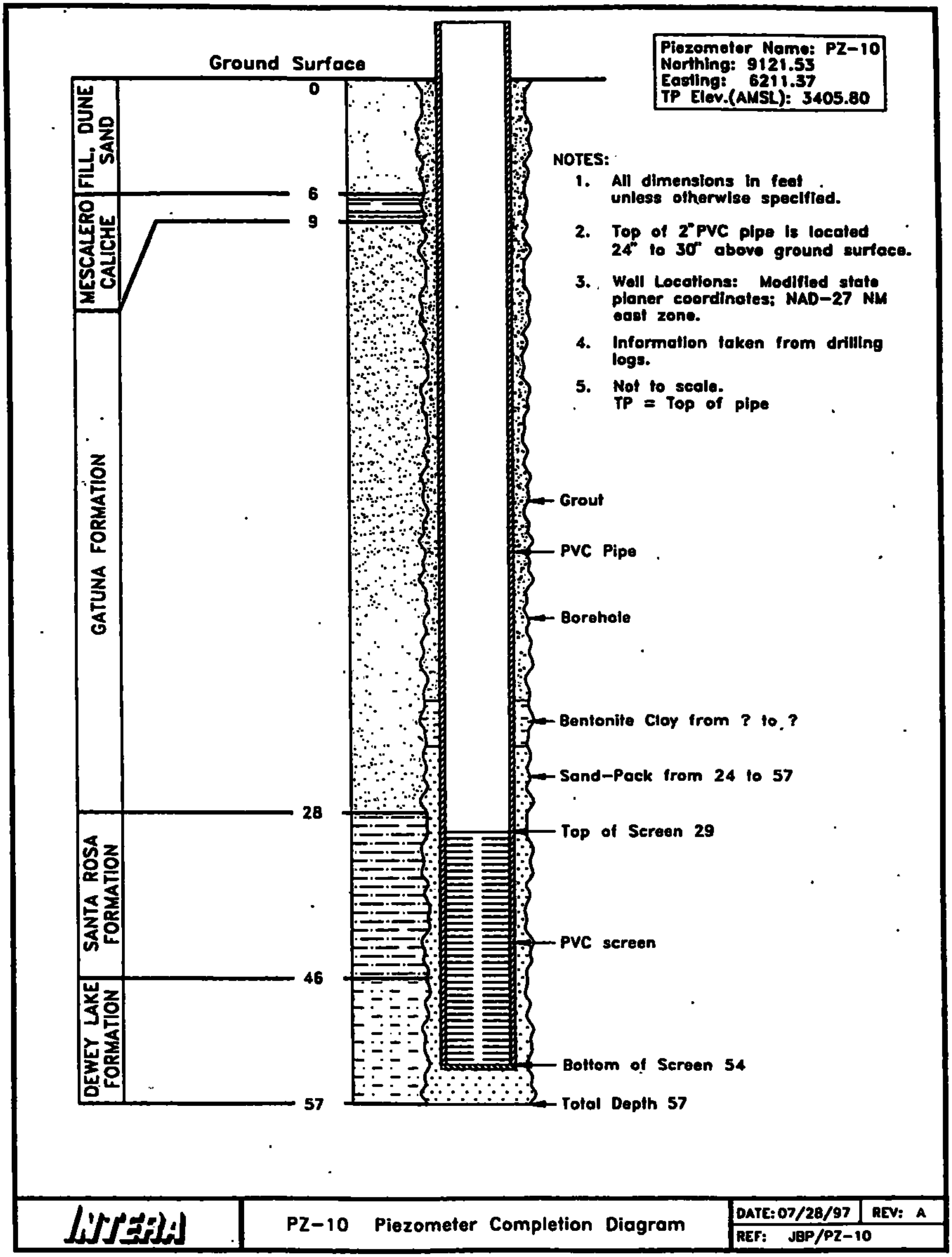


Figure 2.12 PZ-10 piezometer completion diagram

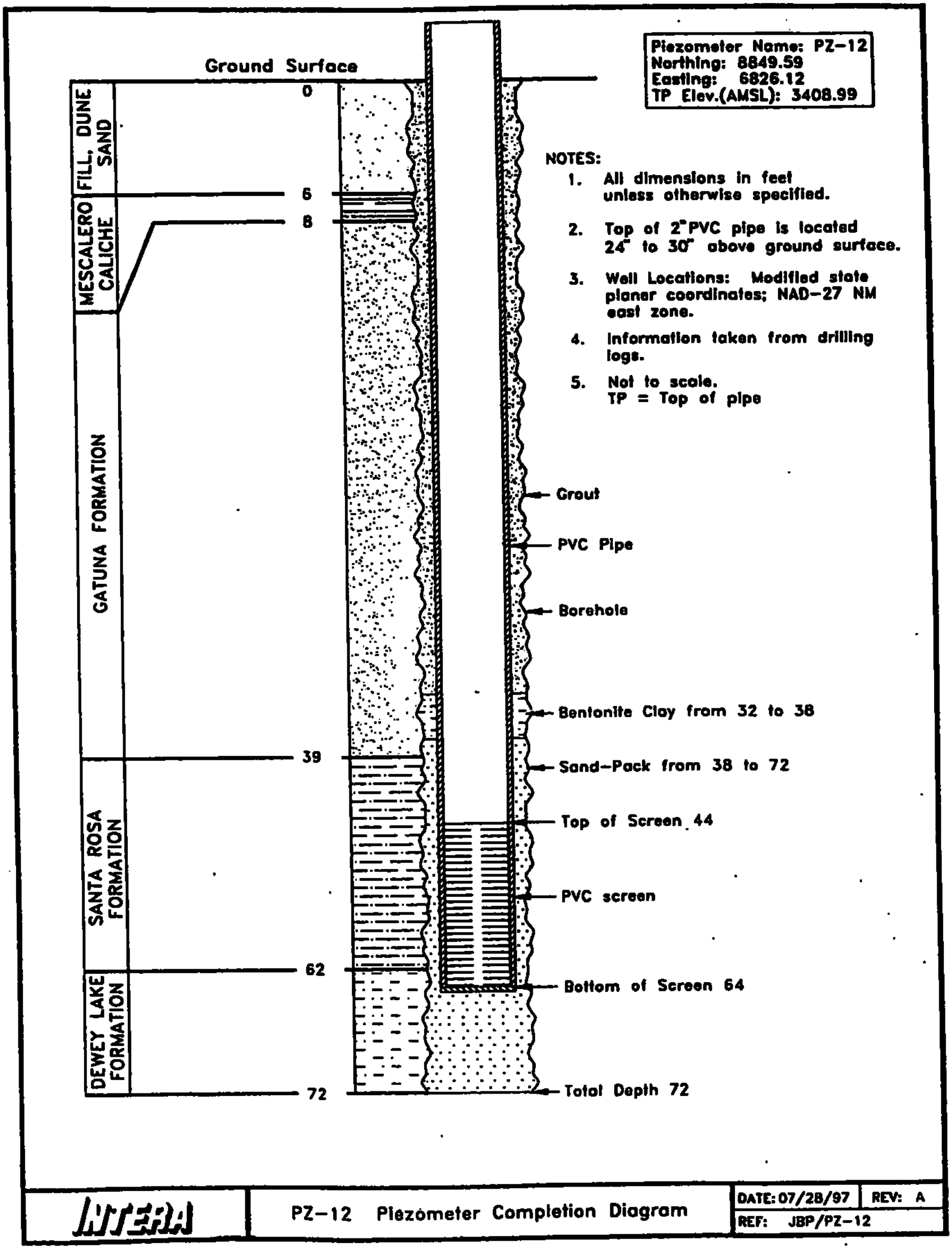


Figure 2.14 PZ-12 piezometer completion diagram

Table 2.2 Piezometer Completion Information: Piezometers 1-12

PIEZOMETERS	TOTAL DEPTH (feet bgs)	SCREENED INTERVAL (feet bgs)	SAND PACKED (feet bgs)	BENTONITE SEAL (feet bgs)
PZ-1	67.5	42-62	38-67.5	36-38
PZ-2	65.0	42-62	38-65	36-38
PZ-3	71.1	42-65	37-71.1	32-37
PZ-4	65	40-60	36-65	30-36
PZ-5	71.8	42-65	38.8-71.8	33.5-38
PZ-6	66	42-62	37-66	33.5-37
PZ-7	72	46-71	37-72	37-40
PZ-8	67.7	47.7-67.7	42-67.7	39-42
PZ-9	82	45-75	51-82	36.5-41
PZ-10	57	29-54	24-57	?
PZ-11	82	42-82	42-82	37-42
PZ-12	72	38-72	38-72	32-38

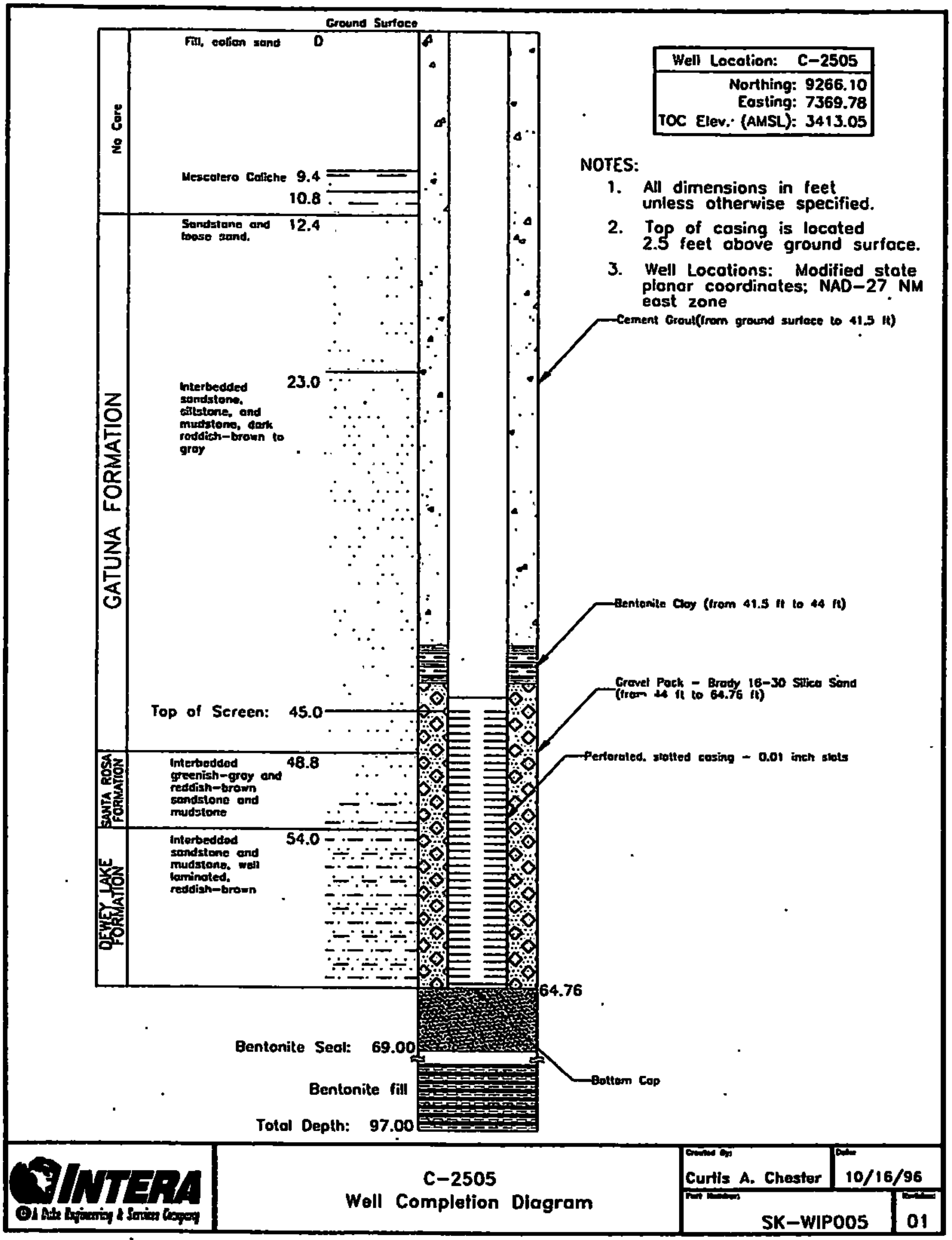


Figure 3.1 Well completion diagram - C-2505

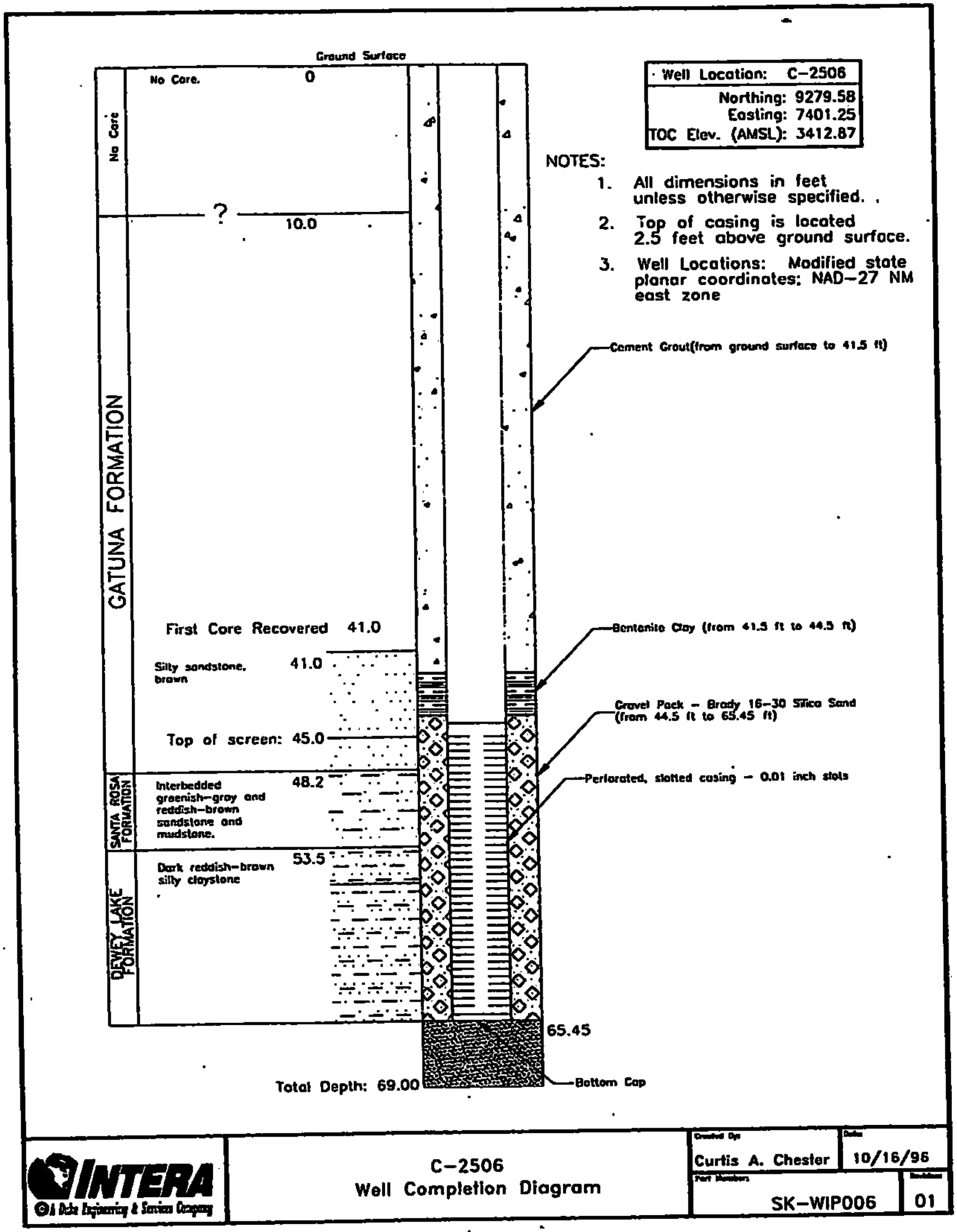


Figure 3.2 Well completion diagram – C-2506

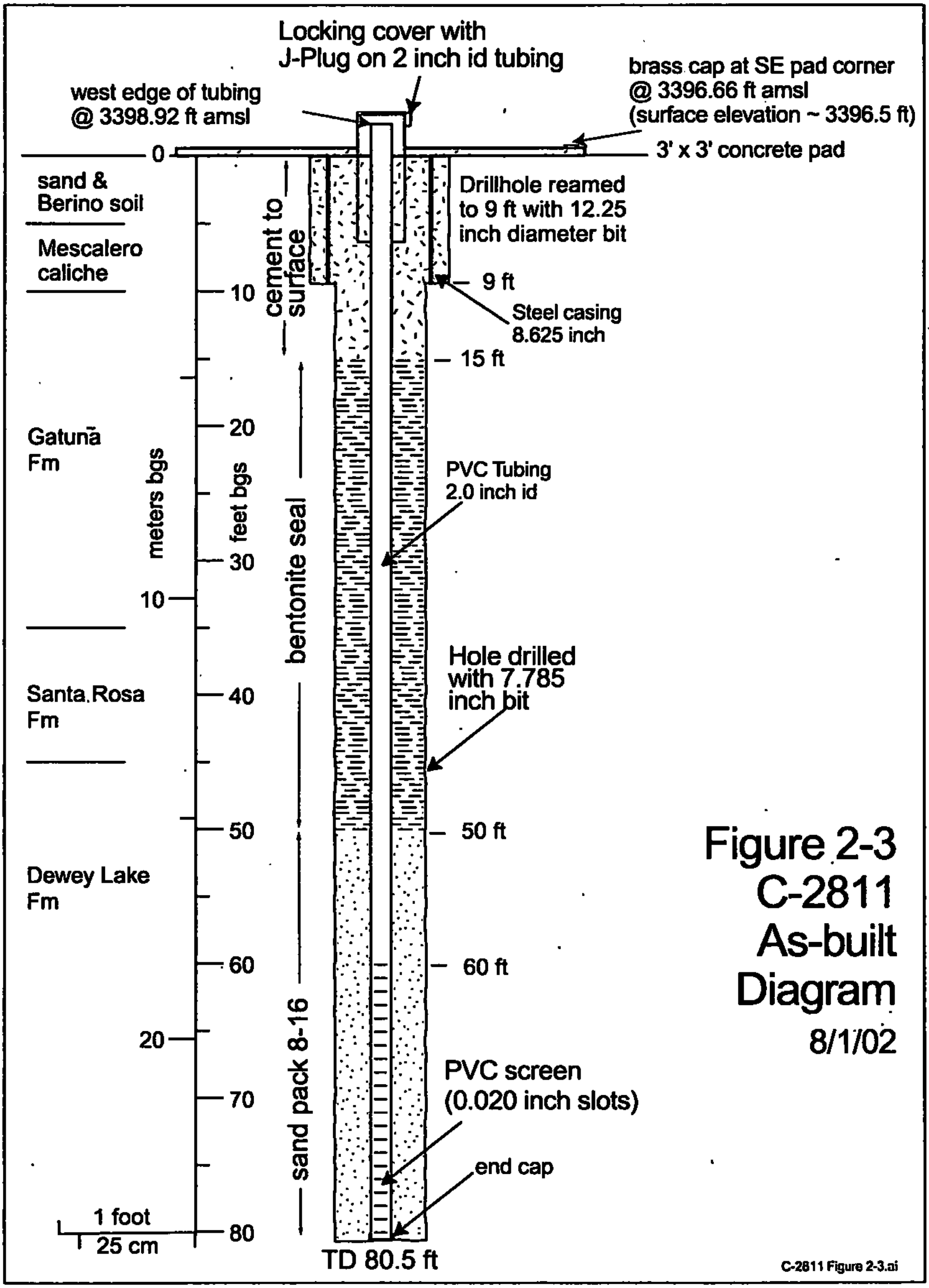


Figure 2-3
C-2811
As-built
Diagram
8/1/02

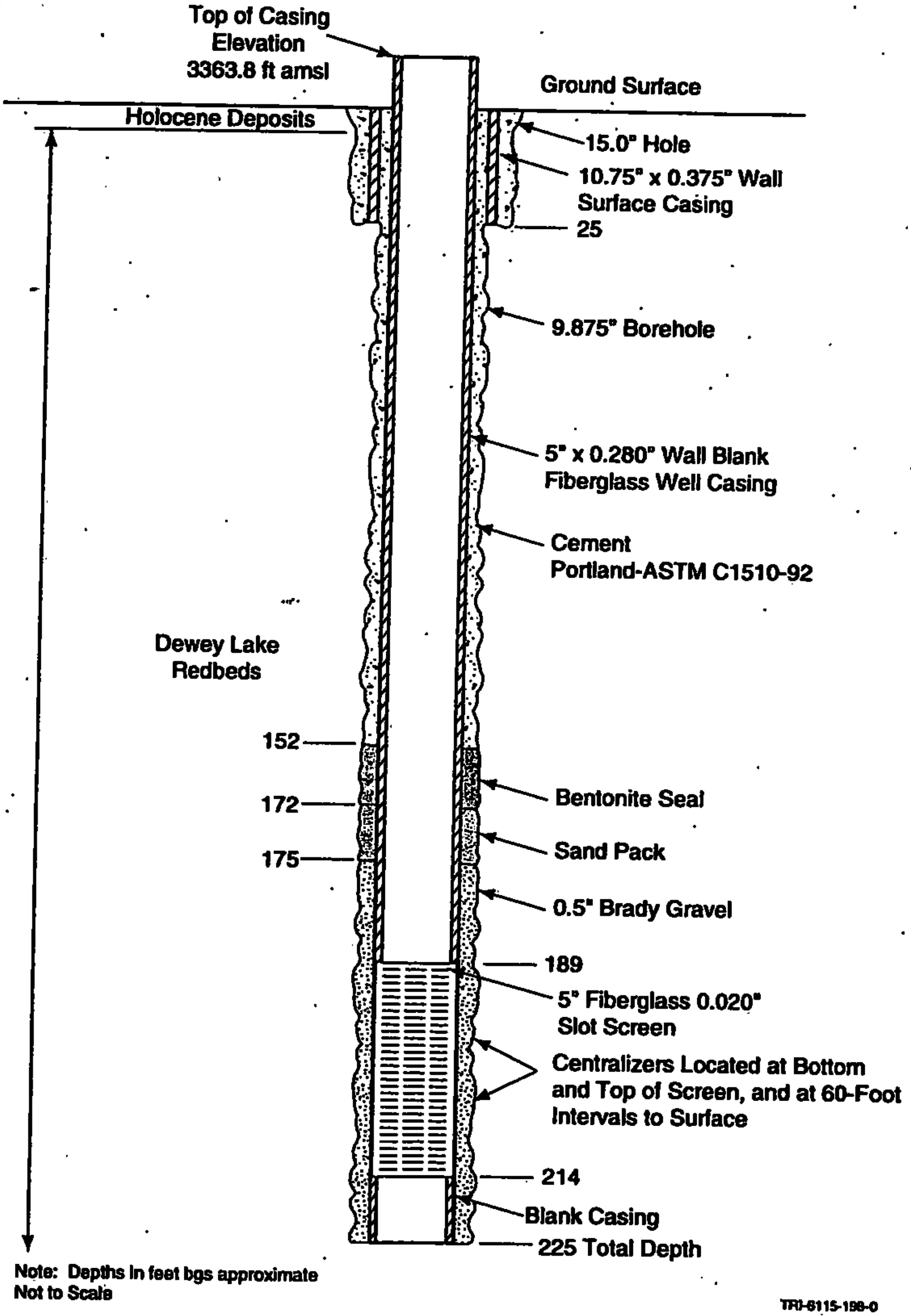


Figure 5-7. As-built configuration of well WQSP-6A.

Shallow Subsurface
Water at WIPP
Water Budget Analysis Source Controls

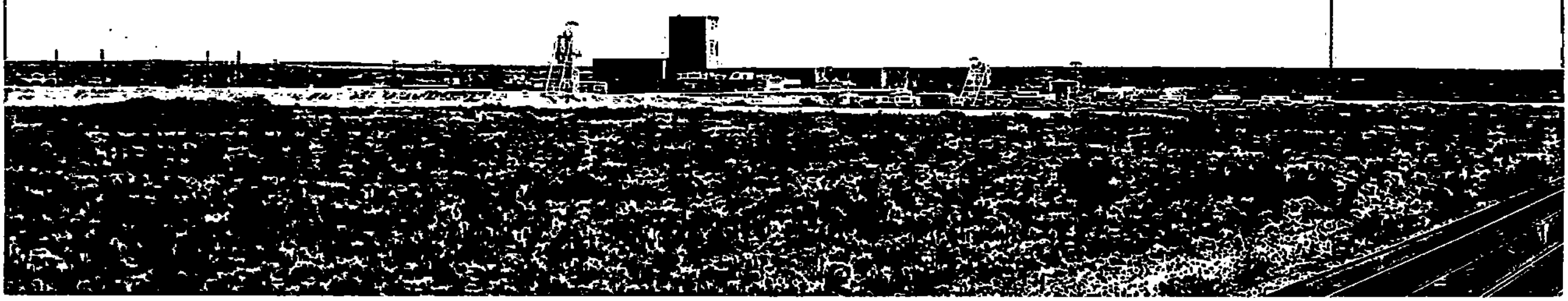
Presented to:

New Mexico Environment Department

Groundwater Quality Bureau

Presented by: DOE Carlsbad Field Office

September 16, 2003



Progress Since October 2002

Accomplishments

- Water Budget Analysis
- Source control strategy

TDS & Water Infiltration Controls

Source Control Actions

- Assessment
  - Total Dissolved Solids (TDS)
  - Water infiltration

Planned Activities

Planned Activities

- Salt Storage Area
- Salt Pile Evaporation Pond
- Evaporation Basin A (Detention Basin A)
- Evaporation Pond 1 / Pond 2
- Submission of Permit Application

Solutions

Expected Results

- Source control
- Migration Control

Implementation

Implementation Priorities

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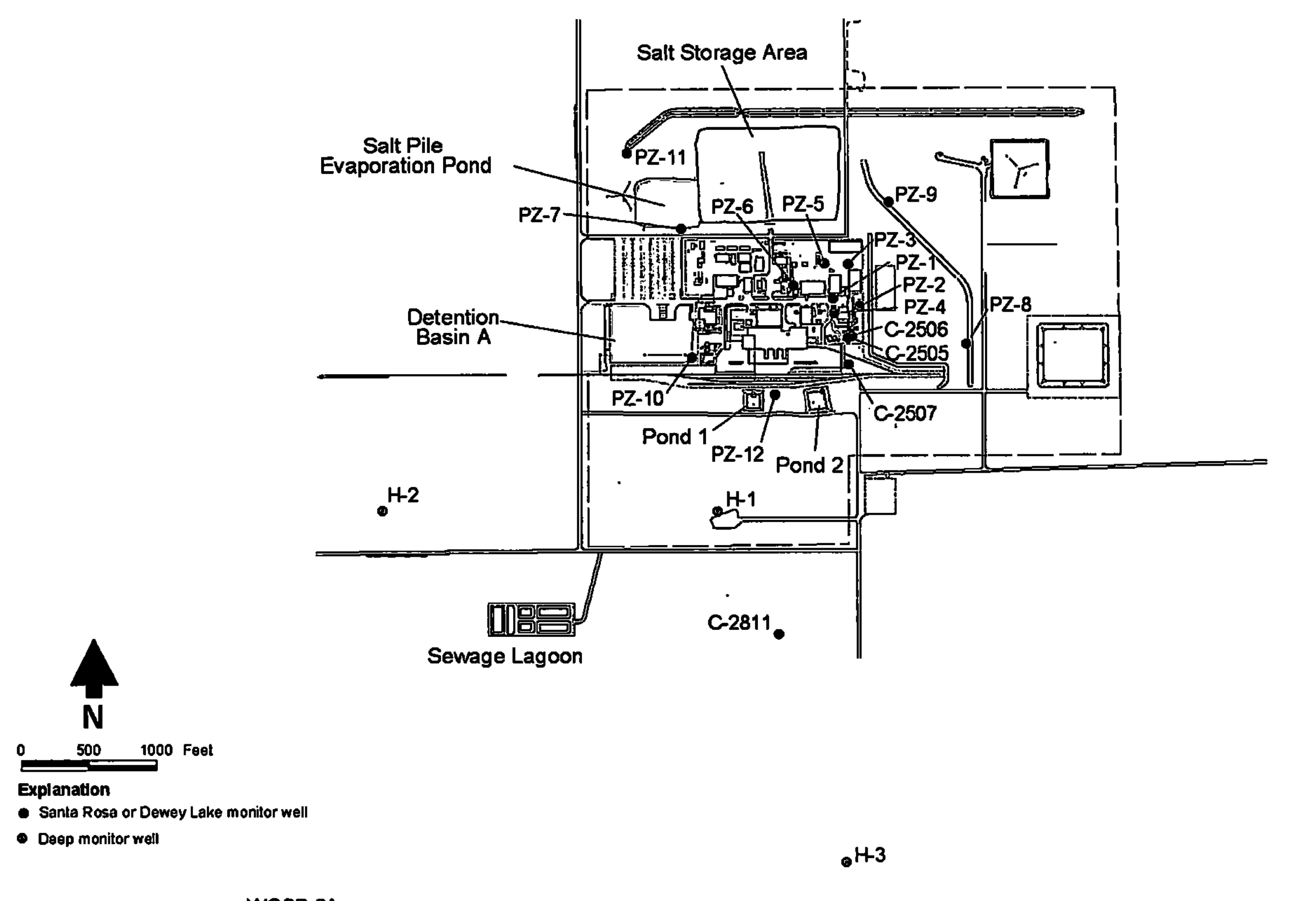


WATER BUDGET ANALYSIS
WIPP SHALLOW SUBSURFACE WATER
Santa Rosa and Dewey Lake Wells

Daniel B. Stephens & Associates, Inc.
8-10-03 4:40PM
JN 9525

Water Budget

Analysis

- Purpose
- Seepage Estimates – Historical and Present
- Recharge Estimation

Source (Engineered) Controls

Design and Implementation

- Concept – TDS and Water Infiltration
- Design Drawings
- Implementation

Water Budget

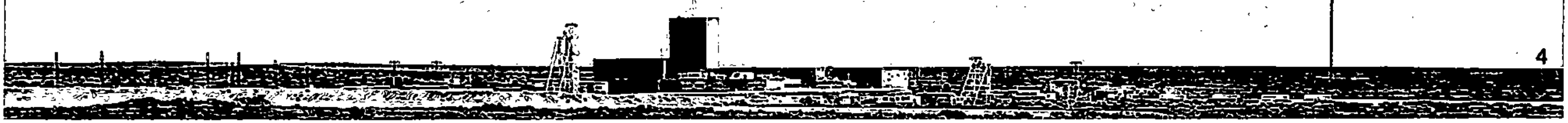
Prediction

- Long-Term Migration Potential
- Transient Simulation
- Source (Engineered) Controls

Summary

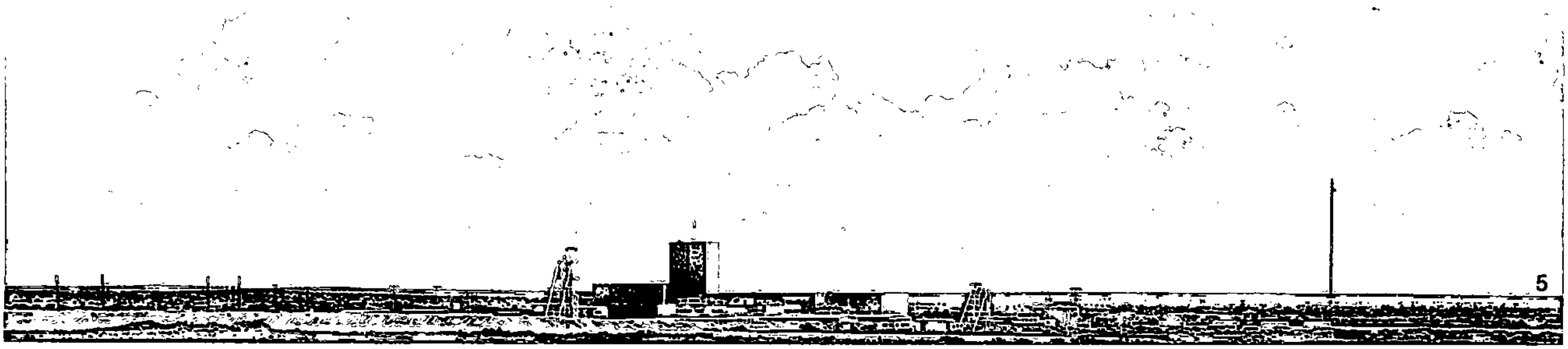
Summary

- Analysis
- Controls



Water Budget – Analysis
Purpose

- Basic Understanding: Infiltration Sources
- Future Decision Making Tool: Infiltration Management
- Effectiveness: Source Controls



Water Budget – Analysis

Seepage Estimates – Historical

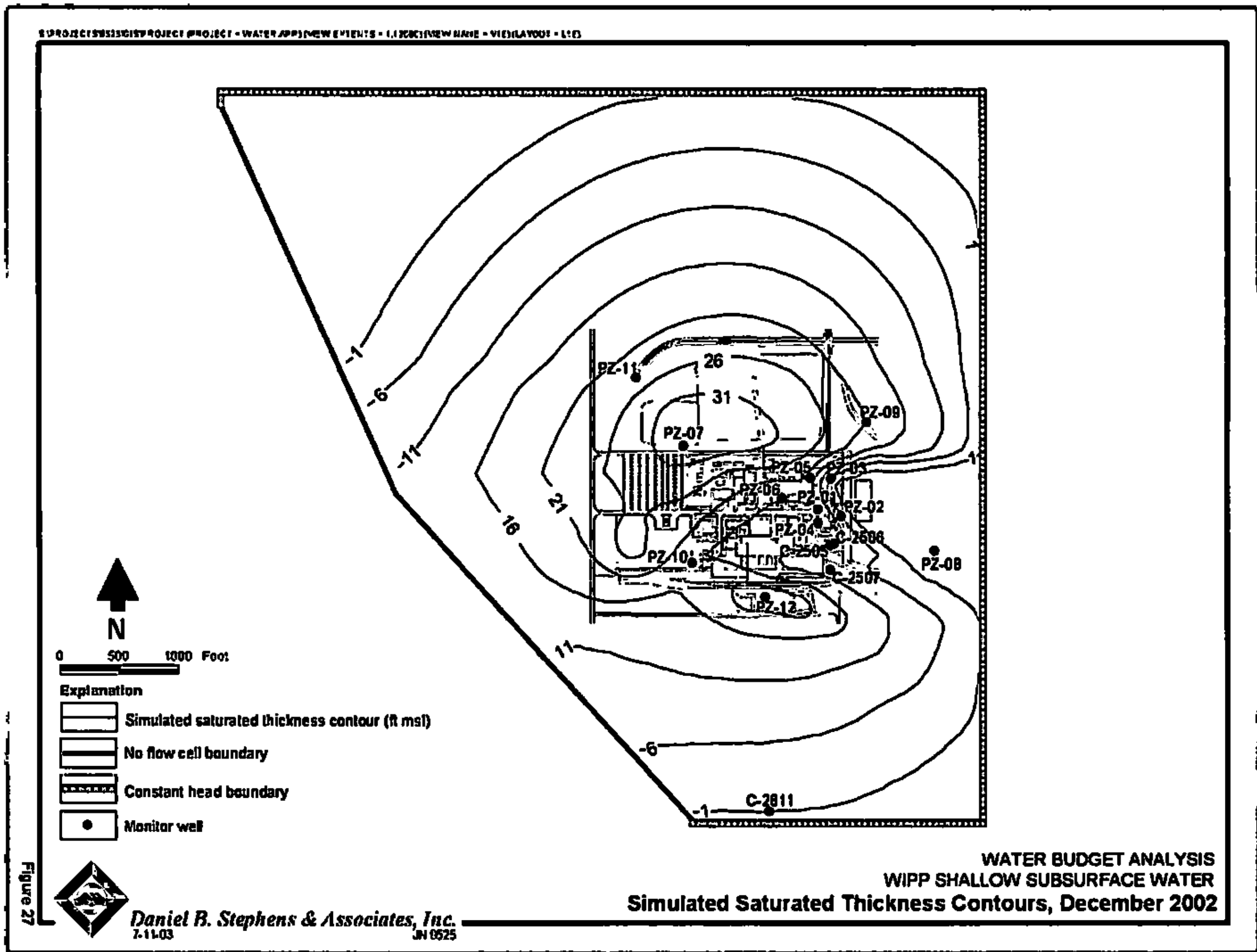
Historical Source	Volume (gal)	% (of total)
Drilling Fluid	3,000,000	49
Mine Dewatering	1,279,500	21
Air Intake Shaft	765,000	13
Pipeline Flushing	647,003	11
Shaft Construction	250,000	4
Temporary Showers	123,000	2
TOTAL	***6,064,503***	***100***

Water Budget – Analysis
Seepage Estimates – Present

Present Source	Volume (gal/yr)	% (of total)
Salt Storage Area	4,200,000	36
Detention Basin A	3,200,000	28
Salt Pile Evaporation Pond	3,000,000	26
Retention Pond 2	740,000	6
Retention Pond 1	280,000	2
Water Supply System	222,000	2
TOTAL	***11,642,000***	***100***

Water Budget – Analysis

Recharge Estimation



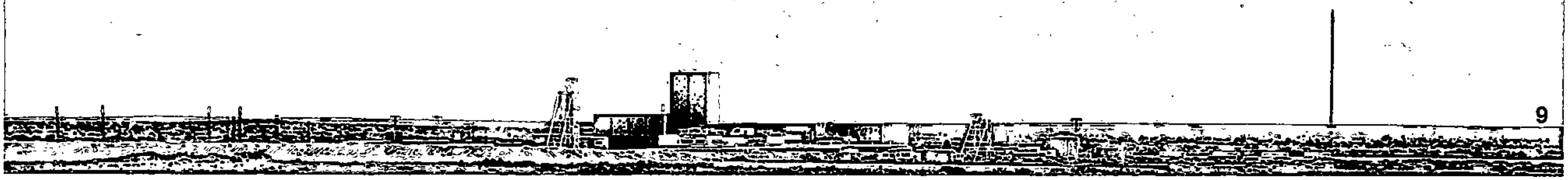
MODFLOW

- Progressive Saturation: 1981 - 2002
- Five Primary Sources Identified
- Calibrated to Observed Water Levels

Source Controls – Design/Implementation

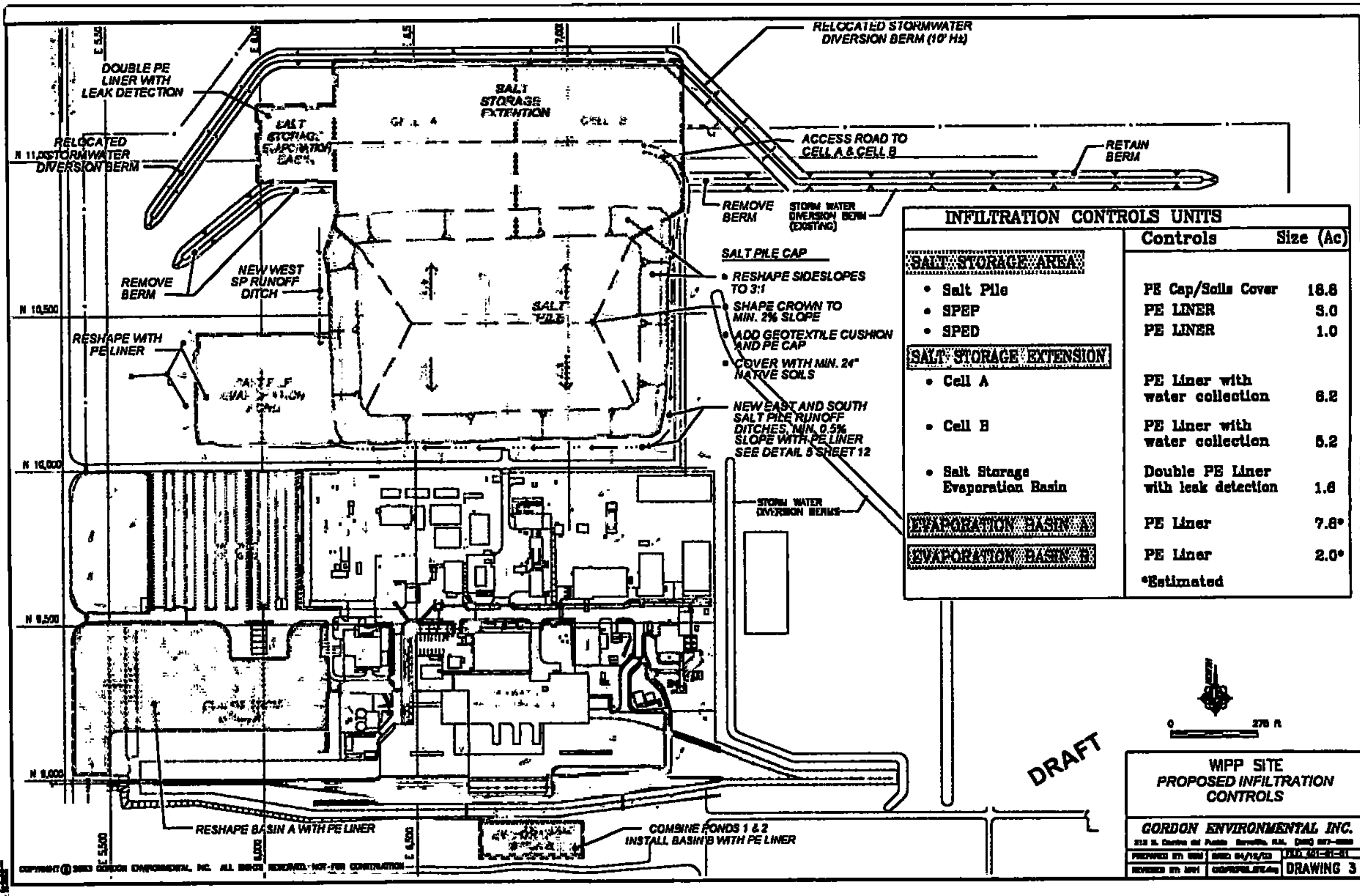
Concept – TDS and Water Infiltration

Location	Estimated Seepage Volume
Salt Storage Area	90% TDS - 37% water
Salt Pile Evaporation Pond	10% TDS - 26% water
Detention Basin A	0% TDS - 28% water
Pond 1/Pond 2	0% TDS - 9% water
Total	100% 100%



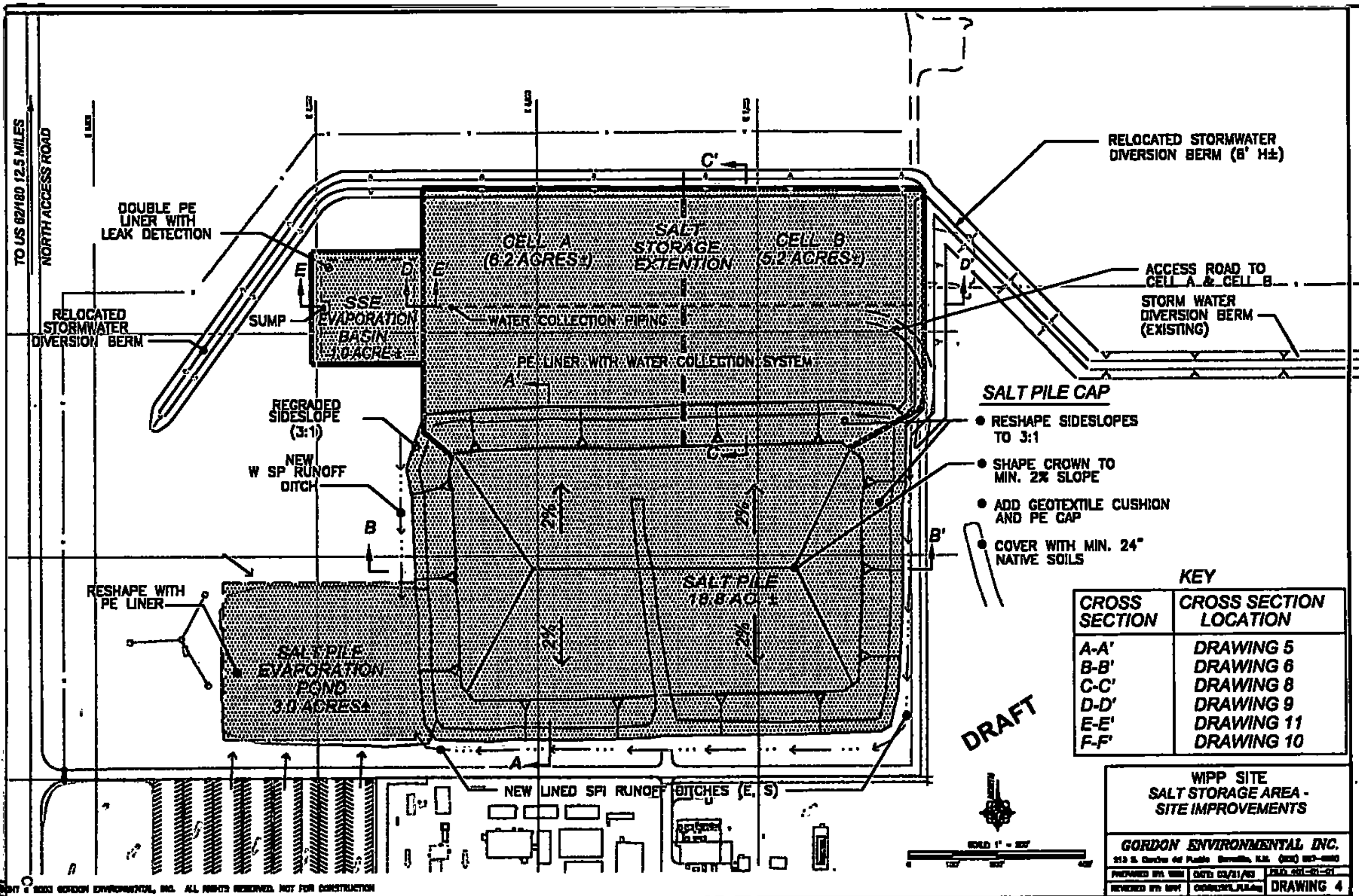
Source Controls – Design/Implementation

Proposed Infiltration Controls



Source Controls – Design/Implementation

Salt Storage Area

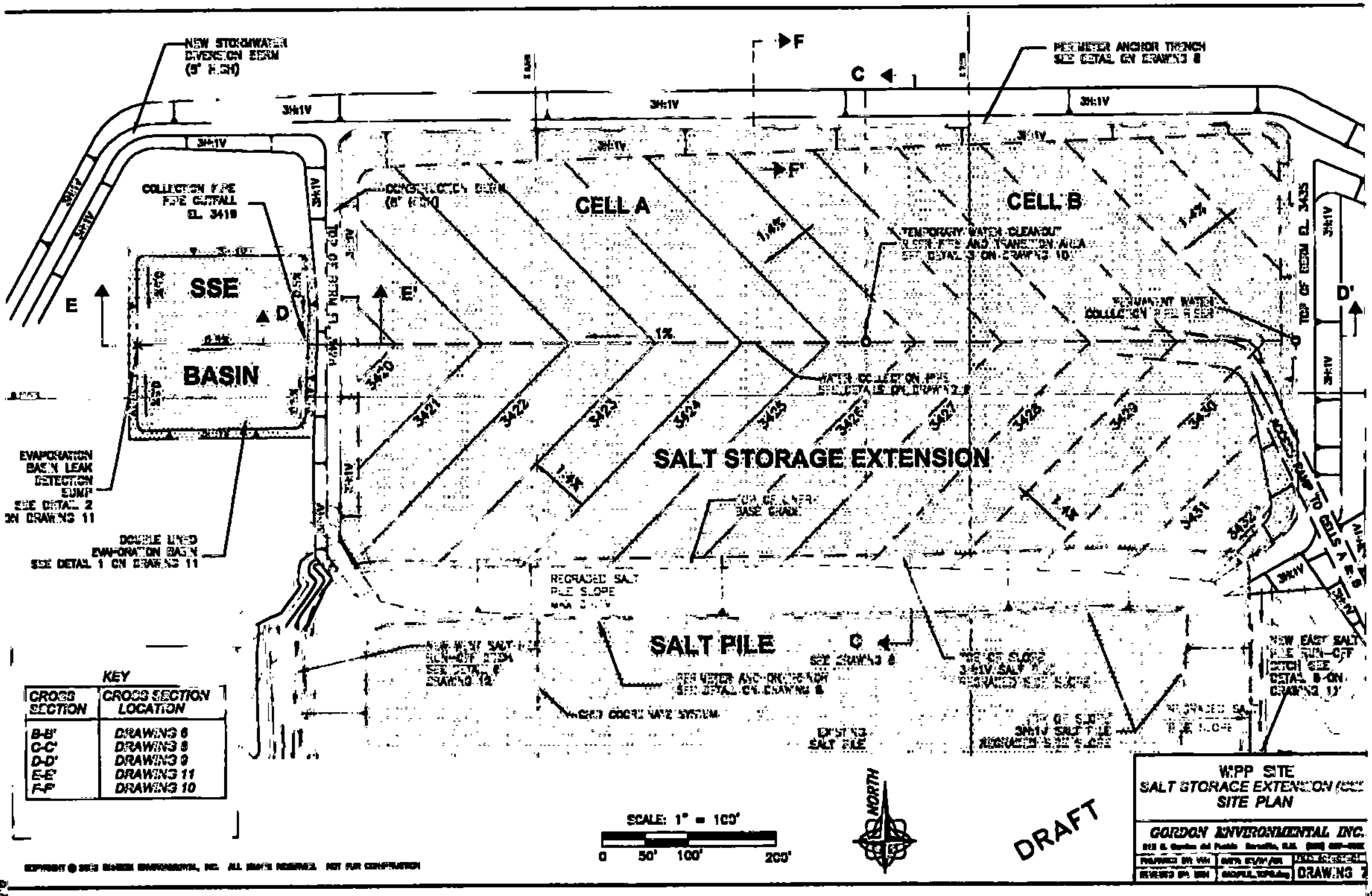


KEY

CROSS SECTION	CROSS SECTION LOCATION
A-A'	DRAWING 5
B-B'	DRAWING 6
C-C'	DRAWING 8
D-D'	DRAWING 9
E-E'	DRAWING 11
F-F'	DRAWING 10

Source Controls – Design/Implementation

Salt Storage Extension



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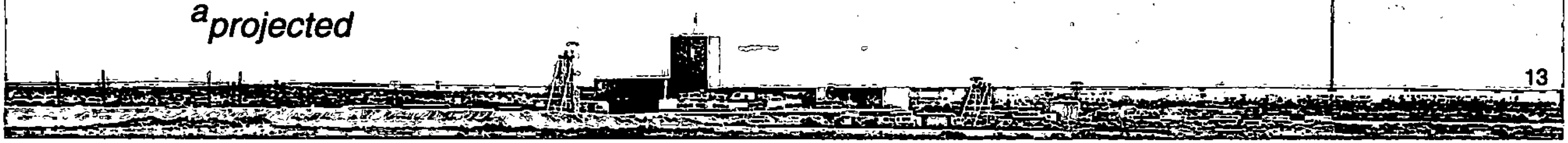
Source Controls – Design/Implementation

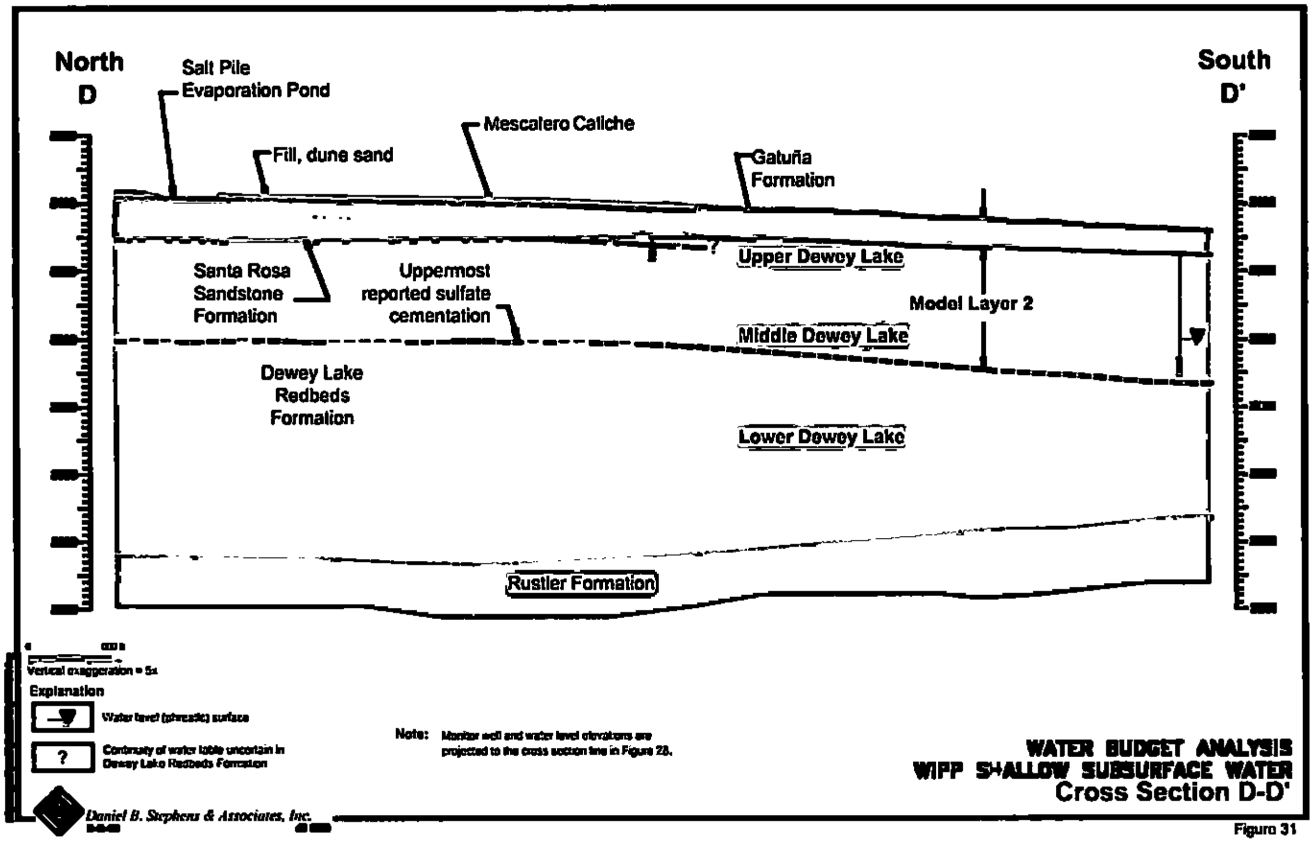
Milestone	*Date*
Preliminary Design Complete	March 28, 2003
NMED Concurrence	April 7, 2003
Final Design Complete	May 28, 2003
Request for Proposals Issued	June 02, 2003
Proposal Deadline	July 11, 2003
Notice of Award	August 08, 2003
QA/QC Plan Approved/Notice to Proceed	September 17, 2003
Start Construction	October 1, 2003[a]

[a] *projected*



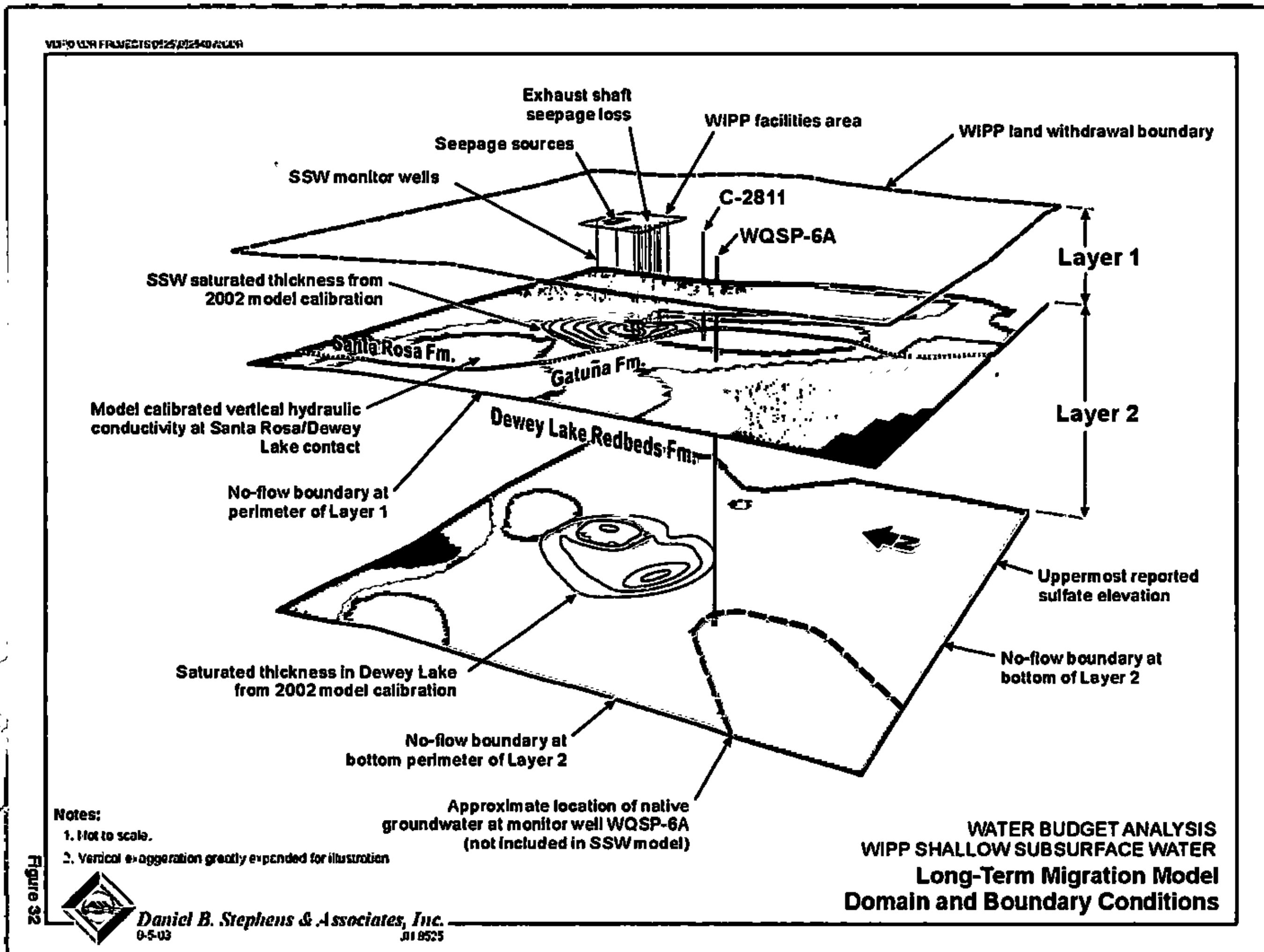
Water Budget – Prediction

Long-Term Migration Potential



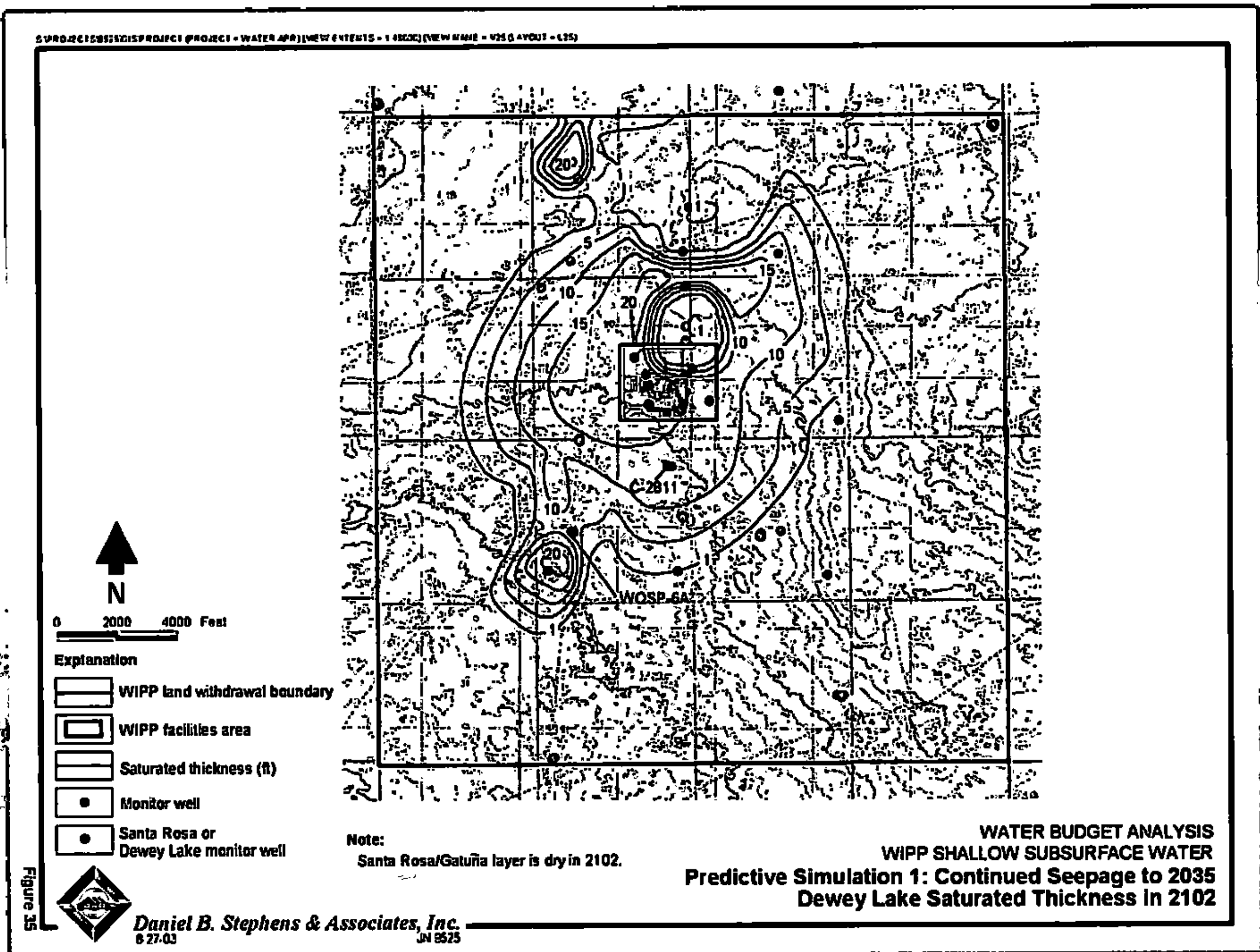
Water Budget – Prediction

Long-Term Migration Potential



Water Budget – Prediction

Long-Term Migration Potential - No Controls

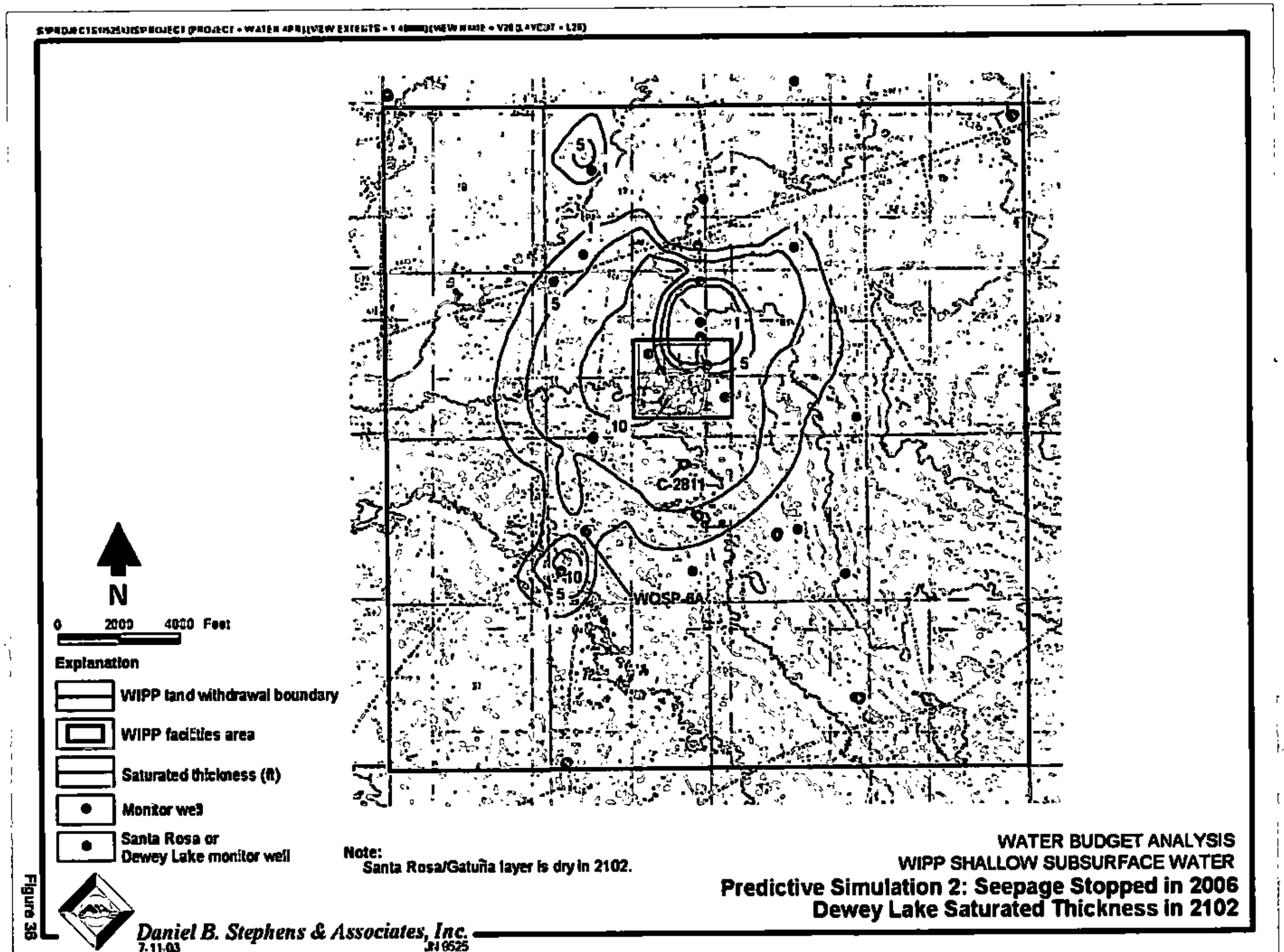


MODFLOW

- Dewey Lake Saturated Thickness (100 years)
- Seepage to 2035
- No Engineered Source Controls

Water Budget – Prediction

Long-Term Migration Potential - With Controls

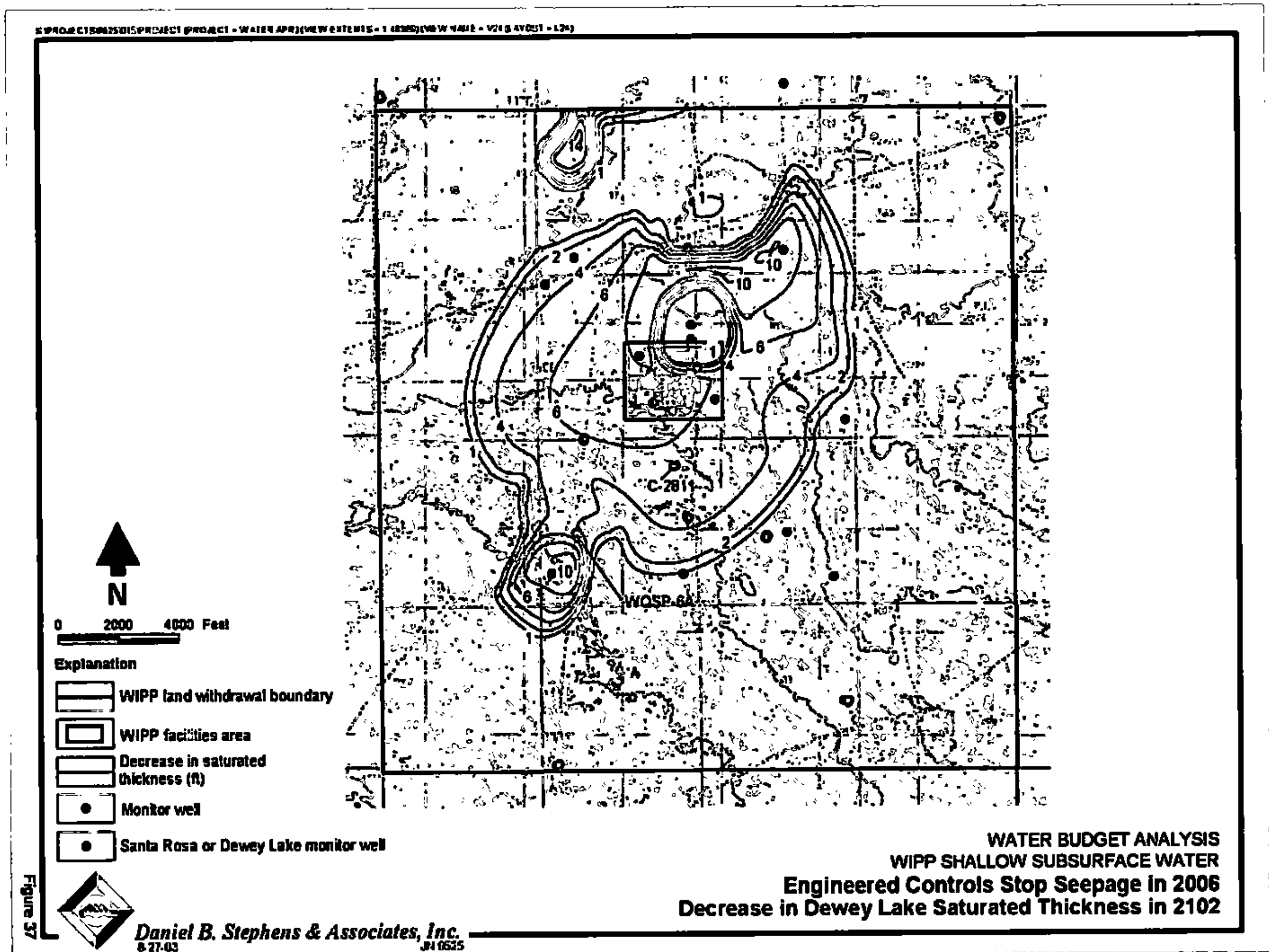


MODFLOW

- Dewey Lake Saturated Thickness (100 years)
- With Engineered Source Controls
- Seepage Stopped in 2006

Water Budget – Prediction

Long-Term Migration Potential - Improvements



MODFLOW

- Decrease in Dewey Lake Saturated Thickness (100 years)
- Engineered Controls
- Seepage Stopped in 2006

Summary

- Water Budget Analysis Demonstrated:
  - Salt Pile and Retention Ponds as primary water and TDS recharge sources
  - Engineered source controls significantly reduce migration potential of SSW
- DOE is Implementing Installation of Engineered Controls
- Engineered Controls will be Installed by December, 2004

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

AUG 2 9 2003

AUG 2 6 2003

Mr. Clint Marshall
Ground Water Pollution Prevention Section
Ground Water Quality Bureau
Environment Department
State of New Mexico
1190 Saint Francis Drive
Santa Fe, NM 87502

Dear Mr. Marshall:

This is to confirm the meeting scheduled for September 16, 2003 at 10:00am to brief you and your associates on:

(1) Status of the Infiltration Control Project and
(2) Water Budget Study Report

The planned attendance from the Waste Isolation Pilot Plant (WIPP) include: Keith Gordon, Dale Bignell, Lokesh Chaturvedi and David Emery.

We look forward to sharing our progress with you and your associates.

Sincerely,

David Emery
Site Environmental Compliance Manager

cc:
H. Johnson, CBFO
J. Gilbert, CBFO
S. Warren, WTS
R. Steger, CTAC
CBFO M&RC

CBFO:OEC:DEB:JW:03-3106:1 UFC:5480

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

AUG 0

AUG 0 5 2003

JUL 3 0 2003

Ms. Marcy Leavitt, Chief
Groundwater Quality Bureau
New Mexico Environmental Department
P.O. Box 26110
Santa Fe, NM 87505

Subject: Completed Public Notice Requirements

Dear Ms. Leavitt:

In response to your letter dated June 13, 2003, WIPP has completed your requested Public Notice requirements for the Discharge Plan 831 (DP–831) modification application as required under discharge permit public notice requirements of 20.6.2.3108.A.1 NMAC.

On June 24, 2003 the public notices (copies enclosed) were published in the Carlsbad Current Argus newspaper in Section A and Hobbs-News Sun in Local 2. A sign of a synopsis of the public notice, in English and Spanish, was placed at the entrance of the WIPP facility. A photograph of the poster and an affidavit of sign posting are enclosed with this letter. The sign was in place for a period of 30 days as of July 24, 2003.

If you have any questions regarding these actions, please contact Mr. David Emery at (505) 234-7475.

Sincerely,

Inés Triay

Dr. Inés R. Triay
Manager

Enclosure

cc: w/enclosure
H. Johnson, CBFO
D. Emery, CBFO
D. Bignell, WRES
R. Salness, WRES
CBFO M&RC

CBFO:OEC:DE:IW:03-2076:UFC:5486

AFFIDAVIT OF SIGN POSTING, DP- *831* AUG 0 5 2003

I certify, under penalty of law, that I fulfilled the ground water Discharge Permit public notice requirements of 20.6.2.3108.A.1 NMAC. I prominently posted a synopsis of the public notice (prepared by NMED), in English and in Spanish, at a conspicuous public location, approved by NMED, at or near the proposed facility for 30 days. I am aware that there are significant penalties for false certification including the possibility of fines. I have included a payment of $15.00 for the poster (If public notice option 1 or 2 was selected).

David D. Emerson

Signature of Applicant

July 24, 2003

Date

cm

AUG 0 5 2003


PUBLIC NOTICE/
NOTICIA PUBLICA
Proposed Discharge Permit Application/ Una Aplicación Por Un Permiso de Descargue Propuesto:
For 3,264,360 gallons per day of domestic, industrial and mining wastewater from a federal nuclear waste storage facility
Por 3,264,360 galones por día de aguas de desperdicio de tipo domestico, industrial, y minero de una facilidad federal por el deposito de desechos nucleares
Facility & Applicant/Propiedad Y Solicitante:
Waste Isolation Pilot Plant. Facility 26 miles E-SE of Carlsbad, Carlsbad
Bruce Lilly, Responsible Party, DOE/CBFO
For More Information/ Para Más Información:
Ground Water Quality Bureau/ Sección de Agua Subterranea
NM Environment Dept./ Departamento del Medio Ambiente
(505) 827-2900
www.nmenv.state.nm.us (public notices)

AUG 0 5 2003

Public Notice

DP-831
U. S. Department of Energy Waste Isolation Pilot Plant

DP-831, the U.S. Department of Energy's Waste Isolation Pilot Plant, proposes to modify its discharge permit to discharge up to 3,264,360 gallons per day of domestic and industrial wastewater and storm water runoff from mined rock salt tailings at its federal facility for disposing of defense generated transuranic radioactive waste.

Potential contaminants from this type of discharge include dissolved solids, chloride and nitrogen compounds. The groundwater most likely to be affected is at a depth of nearly 608 feet and has a total dissolved solids concentration of approximately 3920 milligrams per liter. The facility is located 26 miles southeast of Carlsbad, New Mexico, Section 20, T22S, R31E, in Eddy County.

Information in this public notice was provided by the applicant and will be verified by the New Mexico Environment Department (NMED) during the permit application review process. The NMED will accept comments and statements of interest regarding the application and create a facility-specific mailing list for persons who wish to receive future notices regarding this application. Comments and statements of interest should be sent to:

Clinton Marshall
DP-831
Ground Water Quality Bureau
P.O. Box 26110
Santa Fe, NM 87502

For additional information concerning this application, please call (505) 827-2900.

Applicant:
U.S. Department of Energy
Responsible Person: Mr. Bruce Lilly
U.S. Department of Energy Carlsbad Field Office
P. O. Box 3090
Carlsbad, NM 88221

AUG 0 5 2003

Public Notice

DP-831

U. S. Department of Energy Waste isolation Pilot Plant

DP-831, the U.S. Department of Energy's Waste Isolation Pilot Plant proposes to modify its discharge permit to discharge up to 3,264,360 gallons per day of domestic and industrial wastewater and storm water runoff from mined rock salt tailings at its federal facility for disposing of defense generated transuranic radioactive waste.

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Clinton Marshall
DP-831
Ground Water Quality Bureau
P.O. Box 26110 Santa Fe, NM 87502
For additional information concerning this application, please call (505) 827-2900.

Applicant:
U.S. Department of Energy
Responsible Person: Mr. Bruce Lilly
U.S. Department of Energy Carlsbad Field Office
P. O. Box 3090, Carlsbad, NM 88221

New Mexico Environmental Department
Ground Water Quality Bureau

Acknowledgement of Receipt

Acknowledgement of Receipt of Check/Cash

I hereby acknowledge receipt of Check No. # 001687 Dated. 7-29-03
or cash, received in the amount of $ 15.00 from Washington Tru Solutions
for Waste Isolation Pilot Plant (Facility Name) DP-831 (DP No.) 318 (AI ID)

Copy Made for Check Processing ____________ Date ____________

For Central File Activity ____________

Submitted to ASD by: ____________ Date: ____________

Received in ASD by: ____________ Date: ____________

Filing Fee [ ] New Facility [ ] Renewal [ ]

Modification [ ] Other [X] (Explain) Poster Fee

Organization Code ____________ Application FY ____________

To be Deposited in the Ground Water Section Discharge Plan Fees.

Full Payment [ ] or Annual Increment [ ]

WASHINGTON TRU SOLUTIONS LLC
P.O. Box 2078
Carlsbad, NM 88221

CARLSBAD NATIONAL BANK
PO Box 1359
Carlsbad, NM 88220

001687

VOID

Date 29 Jul 2003 Pay Amount 15.00***

Pay ****FIFTEEN AND XX / 100 DOLLAR****

To The Order Of
NEW MEXICO ENVIRONMENT DEPARTMENT
Harold Runnels Bld.
1190 St. Francis Dr.
PO Box 26110
Sante Fe, NM 87502

Authorized Signature

DP-831

MP

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

24 JUL 2003

Mr. Clint Marshall, Hydrologist
Mining Environmental Compliance Section
Groundwater Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87505

RECEIVED
JUL 25 2003

Subject: Additional Information for DP-831 Modification Application

Dear Mr. Marshall:

In response to your June 25, 2003 letter, WIPP is submitting the enclosed *WIPP Shallow Subsurface Water and Evaporation Basin Monitoring Plan* and schedule for completion of the infiltration controls.

The monitoring plan includes measurement of the surface elevation from all the shallow subsurface water (SSW) piezometers and monitoring wells on a quarterly basis. Also included is a sampling and analysis program for select SSW piezometers and wells and a sampling and analysis program for the Salt Pile Evaporation Pond (SPEP), Salt Storage Extension (SSE) Evaporation Basin, and Evaporation Basins A and B. There are currently no shallow monitoring wells north of the Salt Storage Area or future location of the SSE; therefore, an upgradient well is not included in the monitoring plan.

The enclosed schedule identifies major milestones for the installation of infiltration controls. Currently, we are in the process of contractor acquisition for this project. As the contracting process advances we will provide additional updates as necessary.

If you have any questions regarding the enclosed application, please contact Mr. Dave Emery at (505) 234-7475.

Sincerely,

Dr. Inés R. Triay for
Manager

Enclosures

CBFO:OEC:DE:VW:03-2074:UFC:5400

cc: w/enclosures
D. Emery, CBFO
E. B. Nuckols, CBFO
CBFO M&RC

CBFO:OEC:DE:VW:03-2074:UFC:5400

Salt Pile Infiltration Controls
Planned Construction Schedule

ACTIVITY	**ESTIMATED DATE**
• Award Contract	September, 2003
• Initiate Site Construction	October, 2003
• Complete Stormwater Diversion Berm	December, 2003
• Salt Storage Extension - Cell A & Evaporation Basin	April, 2004
• Begin Storage of Mined Salt in Cell A	May, 2004
• Complete Salt Pile Linercap, Pond and Ditches	November, 2004
• Complete Stormwater runoff Basin A	January, 2005
• Complete Stormwater runoff Basin B	April, 2005
• Salt Storage Extension Cell B - Begin Construction	May, 2006
Completion	October, 2006

RECEIVED
JUL 2 5 2003

WIPP SHALLOW SUBSURFACE WATER AND EVAPORATION BASIN MONITORING PLAN

JULY 25, 2003

Washington
Regulatory and Environmental Services

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2.2	Surface Elevation Monitoring Methodology	1
2.3	Water Surface Elevation Records and Document Control	2
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Figure 1 – WIPP Surface Facilities, Salt Pile (SP), Salt Pile Evaporation Pond (SPEP), Evaporation Basin A, Pond 1 and Pond 2 7

WIPP Shallow Subsurface Water and Evaporation Basin Monitoring Plan

1.0 INTRODUCTION

On April 29, 2003 a Discharge Plan modification application for Discharge Permit 831 (DP-831) was submitted to the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB). The application covers activities associated with salt storage operations at the Waste Isolation Pilot Plant (WIPP) site. As part of the application, infiltration control measures were proposed to the GWQB to limit discharges to the subsurface. This monitoring plan describes the sampling procedures and frequency for monitoring discharges to the subsurface and to the evaporation basins associated with infiltration control measures.

Figure 1 shows the WIPP layout, locations of wells, and existing surface water retention basins. This plan will become effective upon issuance of the DP-831 permit modification.

2.0 WATER SURFACE ELEVATION MONITORING

Shallow subsurface water (SSW) monitoring will be performed in selected shallow piezometers and wells to determine spatial and temporal elevation changes. Data will be used for groundwater flow direction and flow rate estimates. Data will be presented semiannually to GWQB within 120 days of monitoring and sample collection.

2.1. Monitoring Network and Data Collection Frequency

Seventeen SSW wells will be monitored. These SSW wells were selected based on the spatial distribution that will provide adequate coverage of flow conditions in the SSW beneath and adjacent to the WIPP facility. For collection of SSW elevations, all piezometers and wells will be measured on a quarterly basis. These include all wells presented in Figure 1 and WQSP-6A (a Hazardous Waste Facility Permit [WIPP Hazardous Waste Facility Permit (HWFP) State of New Mexico, 1999, Hazardous Waste Facility Proposed Final Permit, EPA No. 4890139088] well) to the southwest of the WIPP site.

2.2. Surface Elevation Monitoring Methodology

To obtain an accurate SSW surface elevation measurement, a calibrated water-level measuring device is lowered into a well or piezometer and the depth to water recorded from a known reference point. When using an electrical conductance probe, the depth to water is determined by reading the appropriate measurement markings on the embossed measuring tape when the audible signal is activated at the surface. WIPP procedures specify the methods to be used in obtaining water surface elevation measurements.

2.3. Water Surface Elevation Records and Document Control

The data management process for SSW surface elevation measurements begins with completion of the field data sheets. Date, time, tape measurement, equipment identification number, calibration due date, initials of the field personnel, and equipment/comments are recorded on the field data sheets. If, for some reason, a measurement is not possible (e.g., a test is under way that prevents entry to the well bore), a notation as to why the measurement was not taken will be recorded in the comment section of the field data sheet.

The data are used to calculate SSW surface elevation relative to the mean sea level. The SSW elevations are adjusted to equivalent freshwater heads when pressure density measurements are available.

An electronic database will be maintained for all SSW surface elevation data. Data will be appended into a yearly file. Upon verification of the data, it will be appended into the project database file. A copy of the current project database (through December of the preceding year) will be maintained at the facility.

3.0 WATER QUALITY SAMPLING

Semiannual water quality samples will be obtained from the specified SSW well network and analyzed as described in Section 3.1 below. Laboratory data will be used to identify spatial and temporal changes in SSW chemistry beneath and adjacent to the WIPP site. Results will be presented semiannually to GWQB within 120 days of sample collection.

3.1. Sampling Network

The SSW wells to be sampled were selected based on the spatial distribution that will provide adequate coverage of chemical characteristics in the SSW beneath and adjacent to the WIPP site. The network was selected based on the variable flow direction, the isopach of the contact between the Santa Rosa and Dewey Lake Redbeds Formations, and localized recharge areas at the facility (i.e., evaporation basins). Based on this analysis, the network of eleven piezometers/wells for sampling includes piezometers PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, and PZ-12; monitoring wells C-2507, C-2811 (Figure 1); and Water Quality Sampling Program (WQSP) WQSP-6A to the southwest of the WIPP site. Although well WQSP-6A is a part of this monitoring network, it is sampled and analyzed under a different monitoring program plan at WIPP (WQSP) as part of the Hazardous Waste Facility Permit; however, the sampling parameters include those needed to satisfy this monitoring plan.

3.2. Sampling Frequency and Schedule

Sampling of the SSW monitoring network has historically been performed annually. Due to DP-831 requirements, the wells/piezometers will be sampled and analyzed semi-annually. The sampling intervals will be performed during June and December, with the first round of sampling to be performed in June 2004.

3.3. Sampling Methodology

The method to be used on the SSW wells for sampling is the low-flow technique (http://www.nmev.state.nm.us/HWB/data/11-7low-flow%20final.pdf). Using this technique the amount of drawdown during well purging will be minimized through use of a submersible variable speed pump. Attached to the discharge line of the pump assembly will be an inline flow through cell where indicator parameters will be evaluated using an *in situ* multi-meter, which is capable of simultaneous analysis of pH, conductivity, and temperature. Indicator parameters will be taken at least every five minutes during purging until the results stabilize within ±10%. Specific emphasis will be placed on minimizing drawdown during the purging event by monitoring the water levels in 5-minute intervals. Samples will be collected directly from the discharge line into the specific containers. For wells not conducive to low-flow sampling (i.e., pumping rates too low), three well volumes will be purged to establish stabilized formation water for sampling.

4.0 EVAPORATION BASIN MONITORING

Evaporation basin water sampling and analysis will occur at the Salt Pile Evaporation Pond (SPEP), Salt Storage Extension (SSE), Evaporation Basin A, Pond 1, and Pond 2 to quantify chemical constituents, if any, in surface runoff water (Figure 1). Figure 1 presents Ponds 1 and 2 which were proposed to be combined in the DP-831 modification application. However, the hundred percent design indicates the capacity of the independent ponds is adequate and there is no need to combine them. Analytical data will be reported in the semiannual DP-831 reports to NMED GWQB.

4.1. Sampling Frequency and Locations

Water samples will be obtained from the SPEP, SSE, Evaporation Basin A, Pond 1, and Pond 2 once per year following a storm event where sufficient quantity of water has collected in the respective basins. Samples will be obtained from the edge of the basins at a low elevation point where the water has predominantly been contained. Sampling will commence upon issuance of the DP-831 modification permit. Sampling of the SSE will commence upon completion of the source control construction activities.

4.2. Sampling Methodology

A representative sample of the water collected in the evaporation basins will be obtained for laboratory analysis. Individual samples will be collected by submersing the sample container below the water surface and filling it to the appropriate volume. This may be performed by using a sampling boom with the container attached, or by hand grab sampling at the edge of the water body in the evaporation basin. Care will be taken to avoid obtaining a sample in areas of high algae growth. Additionally, care will be taken to minimize disturbance of bottom sediments. If sediments are inadvertently disturbed, samples will be obtained outside of the area of sediment plume. All applicable WIPP procedures will be adhered to when performing sample collection.

5.0 SAMPLE MANAGEMENT AND ANALYSIS

5.1. Sample Preservation, Tracking, Packaging, and Transportation

Some of the chemical constituents to be analyzed in the SSW monitoring program require preservation and special handling techniques. Samples requiring acidification will be as specified by the standard method of treatment required for the particular parameter suite. Samples will be preserved in accordance with standard methods for the examination of water and wastewater.

The laboratory receiving the samples will prescribe the type, the container material type, and the required sample volumes that will be collected. This information will be recorded on the sample checklist for use by field personnel when samples are being collected. Environmental Protection Agency (EPA) protocol will be followed for sample container type, volume, and preservative requirements.

The sample tracking system at WIPP uses uniquely numbered chain-of-custody (CofC) forms and request for analysis (RFA) forms. The primary consideration for storage or transportation is that samples shall be analyzed within the prescribed holding times for the parameters of interest. WIPP procedures provide protocol that ensures proper sample tracking.

Insulated shipping containers packaged with crushed ice or reusable ice packs will be used to keep the samples cool during transport to the contract laboratory.

5.2. Sample Documentation and Custody

To ensure the integrity of samples from the time of collection through the reporting date, sample collection, handling, and custody will be documented on a CofC form. Sample custody and documentation for SSW sampling and analysis activities are detailed in WIPP procedures. These procedures will be strictly followed throughout the course of sample collection and analysis.

Standardized forms used to document samples will include sample identification numbers, sample labels, custody tape, the sample tracking logbooks, and the RFA and CofC forms.

5.3. Laboratory Analysis and Analytical Parameters

Analyses of samples will be performed by a commercial laboratory using methods that are consistent with EPA recommended procedures. Table 1 presents the analytical parameters for the SSW well sampling program. Table 2 presents the analytical parameters for the evaporation basin sampling program.

Table 1 -Shallow Subsurface Water Analytical Parameters

PARAMETER	METHOD**	COMMENTS
Trace Metals		
Selenium	Standard Method 6010	Filtered only
Chromium	Standard Method 6010	Filtered only
General Chemistry		
Total Dissolved Solids	EPA 160.1	
Chloride	EPA 300.0	
Sulfate	EPA 300.0	
Nitrate (as Nitrogen)	EPA 300.0	
Field Indicator Parameters		
Temperature	Field Meter	
Conductivity	Field Meter	
pH	Field Meter	

** Equivalent or superceding methods approved by the EPA.

Table 2 -Evaporation Basins Water Analytical Parameters

PARAMETER	METHOD **	COMMENTS
Trace Metals		
Selenium	Standard Method 6010	Filtered only
Chromium	Standard Method 6010	Filtered only
General Chemistry		
Total Dissolved Solids	EPA 160.1	
Chloride	EPA 300.0	
Sulfate	EPA 300.0	
Nitrate (as Nitrogen)	EPA 300.0	

** Equivalent or superceding methods approved by the EPA.

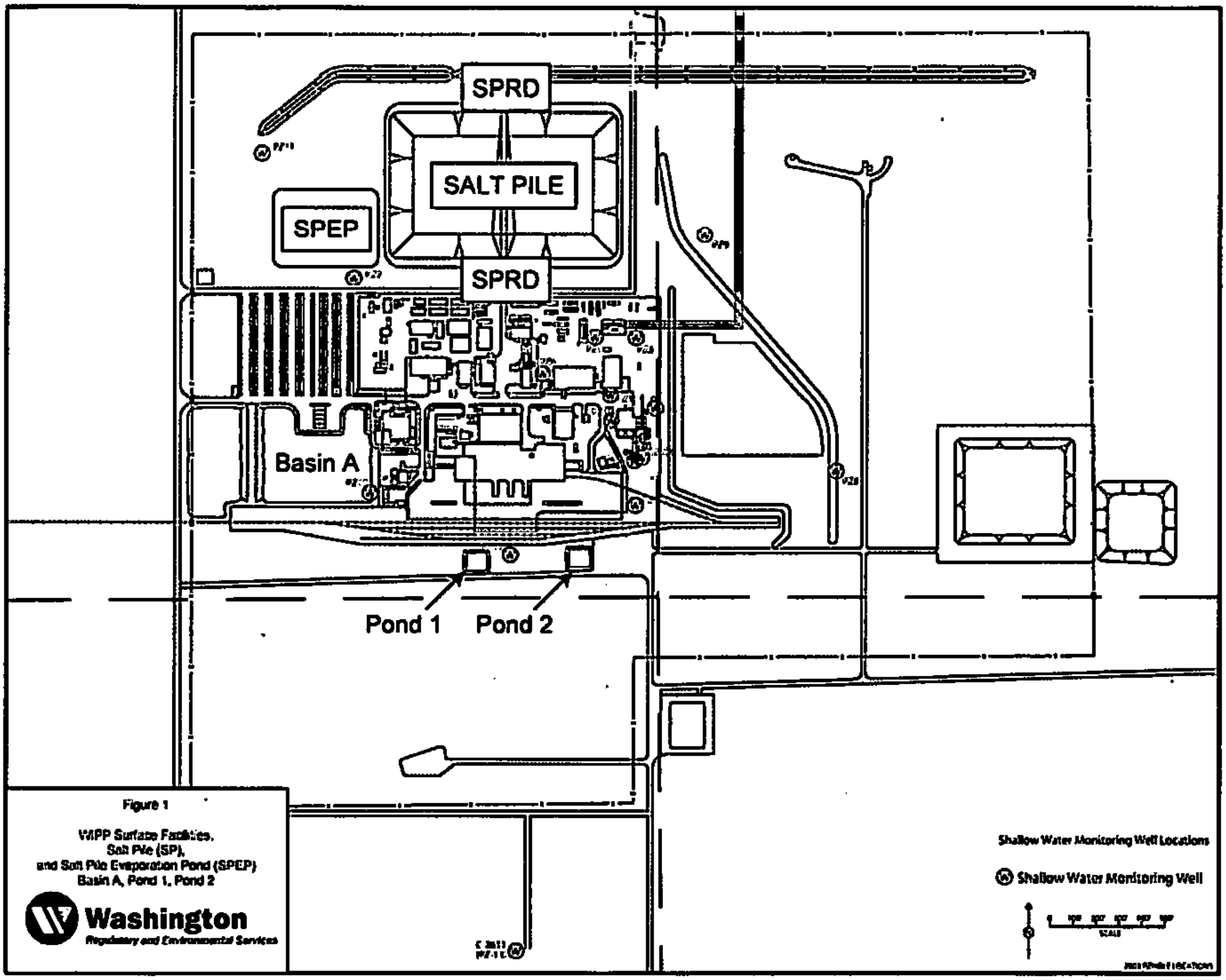

Figure 1 – WIPP Surface Facilities, Salt Pile (SP), Salt Pile Evaporation Pond (SPEP), Evaporation Basin A, Pond 1 and Pond 2

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2918
Fax (505) 827-2965

BILL RICHARDSON
GOVERNOR

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U.S. Postal Service
CERTIFIED MAIL
(Domestic Mail Only; No Ins

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7001 2510 0000 8014 4384

Postage	$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Inez Triay
Waste Isolation P
P.O. Box 3090
Carlsbad, New Mexi

PS Form 3800, January 2001

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

June 25, 2003

Inez Triay
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, NM 88221

RE: Request for Additional Information, DP-831, Waste Isolation Pilot Plant

Dear Ms. Triay:

The New Mexico Environment Department (NMED) is in receipt of the discharge permit modification application dated April 24, 2003 for the above referenced facility. The application proposes the discharge of up to 3,264,360 gallons per day of domestic and industrial wastewater, and storm water runoff from mine tailings.

NMED has reviewed the application in accordance with the New Mexico Water Quality Control Commission Regulations (20.6.2 NMAC). The following additional information is necessary, pursuant to Section 20.6.2.3106 NMAC, in order for NMED to complete its technical evaluation of the application:

1. Item 4B of your discharge plan modification application lists total dissolved solids (TDS) as the only contaminant associated facility's proposed salt pile storm water runoff collection and evaporation system. Please note that chloride and sulfate are also potential contaminants and will be included required analytes in your monitoring requirements as described below. Addtionally, past laboratory analyses of some wells have shown that chromium and selenium concentrations exceed Water Quality Control Commission (WQCC) ground water numerical standards. These analytes will also be included in the monitoring requirements.

2. Your application for discharge permit modification did not specify a ground water monitoring plan. Discharges to the subsurface are occurring at the facility, therefore a ground water monitoring plan will be required as part of your permit modification. Please

submit a monitoring plan that, at a minimum, includes semi-annual water quality sampling and quarterly water level measurements of select wells or piezometers that will provide adequate coverage of ground water conditions in the shallow subsurface water (SSW) beneath and adjacent to the facility. The plan must include selected wells and/or piezometers onsite, C-2811, WQSP-6A (Dewey Lake Formation), and, if possible, a monitoring well upgradient of the salt pile extension (SSE). Samples must be analyzed, at a minimum, for total dissolved solids, chloride, sulfate, selenium, chromium and nitrate-nitrogen. Ground water monitoring conducted as a requirement for other regulatory agencies may be used to meet this permit requirement provided the data is timely and appropriate.

3. Pursuant to 20.6.2.3107 NMAC, discharges to the Salt Pile Evaporation Pond (SPEP), the Salt Storage Extension (SSE) Evaporation Basin, and Evaporation Basins A and B must be sampled on a periodic basis and analyzed for the constituents listed in Item 2 above. Please submit a monitoring plan that outlines the sampling procedures and frequency for monitoring discharges to these basins. Sampling events should take place immediately after storm events and should be conducted, at a minimum, annually.

4. Please provide a schedule for completion of the storm water controls described in Attachment A, Design Basis Summary in your application. The schedule should include estimated start dates, if applicable, and completion dates of the major tasks outlined in the application.

Please submit the requested information within 30 days of the date of this letter. Your cooperation is appreciated. If you have any questions, you may reach me at 505-827-0027.

Sincerely,

Clint Marshall

Clint Marshall, Hydrologist
Mining Environmental Compliance Section
Ground Water Quality Bureau

xc: Carl Stubbs, Acting District Manager, NMED District 4, Roswell
Carlsbad Field Office

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2918
Fax (505) 827-2965

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

June 13, 2003

RE: Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant

Dear Discharge Permit Applicant:

The New Mexico Environment Department Ground Water Quality Bureau (NMED-GWQB) received a Ground Water Discharge Permit Application from you on 4/29/03. The NMED has determined that your application is administratively complete according to the New Mexico Water Quality Control Commission (WQCC) Regulations of 20.6.2.3106 NMAC.

Within 30 days of submitting your Discharge Permit Application, you must provide notice to neighboring properties using one of three public notice options listed in 20.6.2.3108 NMAC. You selected public notice option # 2. The instructions and materials needed to complete the selected public notice option are attached to this correspondence.

If you have any questions please call the GWQB at (505) 827-2900.

Sincerely,

Diana D. Sandoval

for: Marcy Leavitt, Chief
Ground Water Quality Bureau

Attachments: Instructions for Option #2
Public Notice 1 (mail to property owner)
Public Notice Synopsis (for newspaper display ad)
Affidavit (return to NMED)
Invoice ($15 fee for poster – please submit payment to NMED)
Poster (post at facility)

Public Notice 1
DP-831

DP-831, Waste Isolation Pilot Plant, Inez Triay, Manager, proposes to modify the discharge permit for the discharge of up to 3,264,360 gallons per day of domestic and industrial wastewater, and storm water runoff from mine tailings from a federal nuclear waste storage facility. Potential contaminants from this type of discharge include dissolved solids, chloride and nitrogen compounds. The facility is located at 26 miles SE of Carlsbad; Carlsbad, NM 88221, in Section 20, T22S, R31E, Eddy County. Ground water most likely to be affected is at a depth of approximately 608 feet and has a total dissolved solids concentration of approximately 3920 milligrams per liter.

Information in this public notice was provided by the applicant and will be verified by NMED during the permit application review process. The New Mexico Environment Department will accept comments and statements of interest regarding the application and will create a facility specific mailing list for persons who wish to receive future notices. Comments and statements of interest should be sent to Clinton Marshall, DP-831, Ground Water Quality Bureau, P.O. Box 26110, Santa Fe, NM 87502. For additional information, please call (505) 827-2900.

Applicant:
Inez Triay, Responsible Party, DOE
PO Box 3090
Carlsbad, NM 88221

PUBLIC NOTICE/
NOTICIA PUBLICA

Proposed Discharge Permit Application/ Una Aplicación Por Un Permiso de Descargue Propuesto:
For 3,264,360 gallons per day of domestic, industrial and mining wastewater from a federal nuclear waste storage facility
Por 3,264,360 galones por día de aguas de desperdicio de tipo doméstico, industrial, y minero de una facilidad federal por el depósito de desechos nucleares
Facility & Applicant/Propiedad Y Solicitante:
PO Box 3090, 26 miles E-SE of Carlsbad, Carlsbad
Bruce Lilly, Responsible Party, DOE/CBFO
For More Information/ Para Más Información:
Ground Water Quality Bureau/ Sección de Agua Subterranea
NM Environment Dept./ Departamento del Medio Ambiente
(505) 827-2900
www.nmenv.state.nm.us (public notices)

U.S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE
OFFICE OF ENVIRONMENTAL COMPLIANCE
P.O. BOX 3090
CARLSBAD, NM 88221-3090

RECEIVED
JUN 23 2003

NO. OF PAGES (EXCLUDING COVER): 3

DATE: 6/23/03

TO:	Clint Marshall
LOCATION:	Ground Water Quality Bureau
PHONE/FAX:	(505) 827-0027 (505) 827-2965

FROM:	DAVID EMERY
LOCATION:	4021 National Parks Hwy., 2nd Floor
PHONE/FAX:	(505) 234-7475

MESSAGE: Clint - Original and proposed change is Attached. Please call if our suggested change is acceptable. In addition, not able to locate signature page for permit. Another will be signed Today, copy faxed today as well as mailing the original to your office.

Dave

Public Notice 1
DP-831

DP-831, Waste Isolation Pilot Plant, Inez Triay, Manager, proposes to modify the discharge permit for the discharge of up to 3,264,360 gallons per day of domestic and industrial wastewater, and storm water runoff from mine tailings from a federal nuclear waste storage facility. Potential contaminants from this type of discharge include dissolved solids, chloride and nitrogen compounds. The facility is located at 26 miles SE of Carlsbad; Carlsbad, NM 88221, in Section 20, T22S, R31E, Eddy County. Ground water most likely to be affected is at a depth of approximately 608 feet and has a total dissolved solids concentration of approximately 3920 milligrams per liter.

Information in this public notice was provided by the applicant and will be verified by NMED during the permit application review process. The New Mexico Environment Department will accept comments and statements of interest regarding the application and will create a facility specific mailing list for persons who wish to receive future notices. Comments and statements of interest should be sent to Clinton Marshall, DP-831, Ground Water Quality Bureau, P.O. Box 26110, Santa Fe, NM 87502. For additional information, please call (505) 827-2900.

Applicant:
Inez Triay, Responsible Party, DOE
PO Box 3090
Carlsbad, NM 88221

Public Notice

DP-831
U. S. Department of Energy Waste Isolation Pilot Plant

DP-831, the U.S. Department of Energy's Waste Isolation Pilot Plant, proposes to modify its discharge permit to discharge up to 3,264,360 gallons per day of domestic and industrial wastewater and storm water runoff from mined rock salt tailings at its federal facility for disposing of defense generated transuranic radioactive waste.

Potential contaminants from this type of discharge include dissolved solids, chloride and nitrogen compounds. The groundwater most likely to be affected is at a depth of nearly 608 feet and has a total dissolved solids concentration of approximately 3920 milligrams per liter. The facility is located 26 miles southeast of Carlsbad, New Mexico, Section 20, T22S, R31E, in Eddy County.

Information in this public notice was provided by the applicant and will be verified by the New Mexico Environment Department (NMED) during the permit application review process. The NMED will accept comments and statements of interest regarding the application and create a facility-specific mailing list for persons who wish to receive future notices regarding this application. Comments and statements of interest should be sent to:

Clinton Marshall
DP-831
Ground Water Quality Bureau
P.O. Box 26110
Santa Fe, NM 87502

For additional information concerning this application, please call (505) 827-2900.

Applicant:
U.S. Department of Energy
Responsible Person: Mr. Bruce Lilly
U.S. Department of Energy Carlsbad Field Office
P. O. Box 3090
Carlsbad, NM 88221

New Mexico E[illegible]nment Department
Ground Water [illegible]ity Bureau

DP Processing Form

DP# 831 Reviewer Clint	]] Date	Initial
Notice of Intent		
NOI Received		
DP Required Letter Sent		

Discharge Plan Application		
❖ DP Application Received	4-29-03	CT
❖ Filing Fee Received	4-29-03	CT
❖ Copy Transmitted to District Manager		
Additional Information Requested		
❖ DP application Complete per Completeness Checklist		
❖ Application Information Entered in to TEMPO Database		

Public Notice		
❖ Public Notice Published		
Public Notice Corrected		

Plans and Specifications		
❖ Plans and Specifications Received	4-29-03	CT
❖ Copy Sent to District Engineer	5/30/03	ds
❖ Comments Received from District Engineer		

Other Technical Requirements		
❖ Field Inspections		
Hydrogeologic Assessment Reviewed		
❖ Operational Plan Reviewed		
❖ Monitoring Plan Reviewed		
❖ Contingency Plan Reviewed		
❖ Closure Plan Reviewed		
Additional Information Requested		
❖ Technical Review Complete		
❖ Computer Database Updated		
❖ Correspondence Transferred to Discharge Plan and Correspondence Public Drawers		

Public Hearing/Meeting		
Public Meeting Held		
Public Hearing Held		
Public Hearing/Meeting Denied		

Discharge Plan Decision		
❖ Approval/Disapproval Letter Drafted		
❖ Discharge Fee Received		
❖ Approval/Disapproval Letter Sent		
Appeal of Discharge Plan Decision		
WQCC Hearing Schedule		
Appeal Resolved		

❖ Must be Completed
]] Date is Date Received, Sent, Published, Approved or Completed.

State of New Mexico
VIRONMENT DEPARTME...
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2918
Fax (505) 827-2965

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

MEMORANDUM

TO: Carl Stubbs, District Manager, District 4

FROM: Maura Hanning, Program Manager -MH
Ground Water Pollution Prevention Section

RE: Discharge Plan Modification

DATE: May 28, 2003

Enclosed is a copy of the latest discharge plan modification which the NMED Ground Water Pollution Prevention Section has received for your district. It is for:

DP-831-Waste Isolation Pilot Plant

Plans and specifications are included for review by the District Engineer.

Please call Clint Marshall of the Ground Water Pollution Prevention Section at 827-0027, if you would like additional information on this facility.

Enclosure(s)

cc: Glen Saums, Program Manager, Surface Water Section
Discharge Plan File

"Link 0027" ⊕

New Mexico [Envir]onmental Department
Ground Water Quality Bureau

Acknowle[dge]ment of Receipt

Acknowledgement of Receipt of Check/Cash

I hereby acknowledge receipt of Check No. 000260 Dated. 4/23/03
or cash, received in the amount of $ 2625.00 from Washington Tru Solutions
for Waste Isolation Pilot Plant DP 831 318
(Facility Name) (DP No.) (AI ID)

Copy Made for Check Processing ✓ Date 5/19/03

For Central File Activity PRD 2003000 1 DP- Modification
PRD 20030002 DP- Temporary

Submitted to ASD by: ______ Date: ______

Received in ASD by: ______ Date: ______

Filing Fee [ ] New Facility [ ] Renewal [ ]

Modification [X] Other [X] (Explain) Temporary Permission

Organization Code ______ Application FY ______

To be Deposited in the Ground Water Section Discharge Plan Fees.

Full Payment [ ] or Annual Increment [ ]

WASHINGTON TRU SOLUTIONS LLC
P.O. Box 2078
Carlsbad, NM

CARLSBAD NATIONAL BANK
PO Box 1359
Carlsbad, NM 88220

000260

Date 23.Apr.2003 Pay Amount 2,625.00***

Pay ****TWO THOUSAND SIX HUNDRED TWENTY-FIVE AND XX / 100 DOLLAR****

To The Order Of
NMED
PO Box 26110
Santa Fe, NM 87502

Authorized Signature

DP-831

⑈000260⑈ ⑆112201797⑆ 51225⑈

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

APR 25 2003

APR 29 2003

Ms. Marcy Leavitt, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110

Subject: Request for Temporary Permission to Discharge for Additional 120 Days

Dear Ms. Leavitt:

This is in response to your December 30, 2002 instructions concerning discharge plan. The Waste Isolation Pilot Plant (WIPP), Mining Operations hereby requests permission to discharge for additional 120 days.

In addition, a check made out to the New Mexico Environment Department (NMED) is enclosed for:

(1) Temporary Discharge Fee	$150.00
(2) Filing Fee/Modification Provided Under Separate Cover	$100.00
(3) Permit Fee (Modification)	$2, 375.00
	$2, 625.00

Your consideration is appreciated.

Sincerely,

Inés Triay

Dr. Inés R. Triay
Manager

Enclosure

cc: w/enclosure
C. Zvonar, CBFO
D. Emery, CBFO
S. Warren, WTS
D. Bignell, WRES
CBFO M&RC

CBFO:OEC:DE:VW:03-0380:UFC:5487

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

APR 25 2003

APR 29 2003

Ms. Marcy Leavitt, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110

Subject: Request for Temporary Permission to Discharge for Additional 120 Days

Dear Ms. Leavitt:

This is in response to your December 30, 2002 instructions concerning discharge plan. The Waste Isolation Pilot Plant (WIPP), Mining Operations hereby requests permission to discharge for additional 120 days.

In addition, a check made out to the New Mexico Environment Department (NMED) is enclosed for:

(1) Temporary Discharge Fee	$150.00
(2) Filing Fee/Modification Provided Under Separate Cover	$100.00
(3) Permit Fee (Modification)	$2, 375.00
	$2, 625.00

Your consideration is appreciated.

Sincerely,

Inés Triay

Dr. Inés R. Triay
Manager

Enclosure

cc: w/enclosure
C. Zvonar, CBFO
D. Emery, CBFO
S. Warren, WTS
D. Bignell, WRES
CBFO M&RC

CBFO:OEC:DE:VW:03-0380:UFC:5487

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

APR 25 2003

Ms. M. A. Menetrey, Program Manager
Mining Environmental Compliance Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87505

Subject: Discharge Plan 831 Modification Application

Dear Ms. Menetrey:

In response to the December 30, 2002 letter from Ms. Marcy Leavitt, of the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB), to Dr. Inés Triay, of the Waste Isolation Pilot Plant (WIPP), Carlsbad Field Office (CBFO), WIPP is submitting a discharge plan (DP) application modification for the mining operations at WIPP. The CBFO, pursuant to Section 20.6.2.3106.B of the Water Quality Control Commission Regulations, will be requesting temporary permission to discharge an additional 120 days under a separate letter.

The purpose of the enclosed application is to modify the existing DP-831 to cover discharge associated with the salt storage operations at WIPP. The application includes plans and specifications of facility operations not addressed in previous DP-831 applications and renewals. Where applicable, the DP-831 modification application refers to previous submittals to the GWQB, in lieu of submitting this information again. Additionally, the modification application refers to specific sections in the Notice of Intent (NOI) submitted to the GWQB on October 30, 2002 (WIPP NOI 2002). Excerpts from the NOI have been included as attachments to the modification application where appropriate.

As explained at the April 1, 2003 briefing between representatives of the WIPP and the GWQB, WIPP's approach to the modification application involves aggressive source, infiltration, and migration reduction and control measures. The design of the source control measures has been amended to include extension of a synthetically lined salt storage area, a new double lined Salt Storage Extension basin, single synthetically lined salt pile basin, Evaporation Basin A, Evaporation Basin B, and capping the existing salt pile. This approach is expected to eliminate solute and water infiltration and reduce the hydraulic head of the shallow subsurface water.

The DP-831 modification application includes associated figures and attachments. Attachment A includes the design basis and specifications for the system conveyance, collection, treatment, and distribution systems. Attachments B and D contain specific excerpts from the NOI delivered to the GWQB in October 2002. Attachment C includes recent water level measurements for the WIPP site. Attachment E contains specific responses to questions posed in the December 31, 2002 letter from NMED GWQB to the WIPP. Attachment E also contains figures requested in the GWQB's December 31, 2002 letter.

APR 25 2003

If you have any questions regarding the enclosed application, please contact David Emery of my staff at (505) 234-7475.

Sincerely,

Inés Triay

Dr. Inés R. Triay
Manager

Enclosure

cc: w/o enclosure
D. Emery, CBFO
CBFO M&RC

APR 25 2003

Discharge Plan 831 Modification Application

Waste Isolation Pilot Plant
Carlsbad, New Mexico

April 24, 2003

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2900
Fax (505) 827-2965
www.nmenv.state.nm.us

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

GROUND WATER DISCHARGE PERMIT APPLICATION

Enclosed is a Ground Water Discharge Permit Application Form (Form) and checklist. Section 20.6.2.3104 NMAC of the NM Water Quality Control Commission Regulations (20.6.2 NMAC) requires that any person proposing to discharge effluent or leachate so that it may move directly or indirectly into ground water must have an approved discharge permit, unless a specific exemption is provided for in the Regulations. The enclosed Form is a general guideline for use by applicants to ensure that an application is complete and provides all of the information required by sections 20.6.2.3106, 20.6.2.3107, 20.6.2.3108, and 20.6.2.3109 NMAC.

Mail **three complete copies** of your application with a **$100 filing fee** check made payable to the New Mexico Environment Department (NMED) at the address below:

Maura Hanning, Program Manager
Ground Water Pollution Prevention Section
NM Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Pursuant to Regulation 20.6.2.3108 NMAC, NMED will, within thirty (30) days of deeming the application administratively complete, publish a public notice and allow 30 days for public comment before taking final action on a discharge permit. A public hearing will be held if NMED determines that there is significant public interest. It takes approximately180 days to process a complete application and issue a discharge permit if no public hearing is held.

All applications must be accompanied by a filing fee of $100. **An additional fee will be assessed prior to permit issuance** to cover the estimated cost to the NMED for investigation, and, issuance of the permit. **Permit fees are listed in the Regulation 20.6.2.3114 NMAC.**

If you have any questions about this discharge permit application, call the Ground Water Pollution Prevention Section at 505-827-2900

COMPLETION CHECKLIST

✓		All portions of the Ground Water Discharge Permit Application Form have been addressed. (The application will not be considered complete if there are omissions, which will delay publication of the public notice and issuance of the permit.)
✓		Submitter has included operational, monitoring, contingency, and closure plans that are appropriate for the proposed treatment and disposal system, and meet the site-specific conditions for the proposed facility.
✓		Plans and specifications for the entire effluent or leachate conveyance, collection, treatment, distribution, and disposal system have been included as required by Regulation 20.6.2.1202 NMAC. For septic tank/leachfield systems, designs should be consistent with NMED's guidelines for Plans and Specifications for Discharge Permit Applications Using Septic Tank/Leachfields.
✓		The application has been signed and dated by the responsible party, generally the owner or lessee.
✓		If your facility site includes an archeological site on the State Register of Cultural Properties or National Register of Historic Places, the State Historic Preservation Office has the authority to require an archeological or historical study prior to NMED taking final action on your discharge permit.
✓		Four maps have been included: **1)** area United States Geological Survey (USGS) topographic map that includes the location of the facility and all of the information required in the application item 7.b, **2)** local road map clearly defining the location of the facility and the route to get to the facility, **3)** detailed site map that includes all discharge locations (lagoons, leachfields, land application areas, outfalls...), all water supply and monitoring wells, all water courses on the property and all buildings and **4)** United States Department of Agriculture (USDA) soils map. **Note: Previously submitted with DP-831 applications and renewals.**
✓		Three copies of all required information have been enclosed.
		A filing fee check in the amount of $100, has been enclosed, made payable to the NM Environment Department at the address on page 1. **Note: Funding for this modification application has been submitted under separate cover with request for Temporary Permission to Discharge for Additional 120 Days.**
✓		The SUMMARY OF APPLICANT'S PUBLIC NOTICE REQUIREMENTS has been reviewed and the option for Public Notice Has been selected on the application page 3.

ADMINISTRATIVE COMPLETENESS

To be deemed administratively complete for publication of a public notice, the following information must be provided. [20.6.2.3106, 20.6.2.3108 NMAC]

Review the SUMMARY OF APPLICANT'S PUBLIC NOTICE REQUIREMENTS (attached) to select an option below.

☐ Public Notice Option 1 ☑ Public Notice Option 2 ☐ Public Notice Option 3

1. **Name of the proposed discharger and facility** [20.6.2.3106, 20.6.2.3108.C.1 NMAC]:

Type of facility or operation (dairy, municipal wwtp, mining, school, etc.):

The Waste Isolation Pilot Plant (WIPP) is currently permitted to discharge into synthetically lined systems at the facility as defined in Discharge Permit (DP) 831. These permitted WIPP facilities include the facultative lagoon system and the H-19 evaporation pond. The facultative lagoon system is made up of seven synthetically lined ponds (two settling, two finishing, and three evaporation ponds, A, B, C) for treatment of sewage effluent, neutralized acid, and non-hazardous brine water. The H-19 evaporation pond receives non-hazardous brine water for treatment.

The purpose of this application is to modify the existing DP-831 permit to cover the discharge associated with the salt storage operations at WIPP, as described in the October 30, 2002 Notice of Intent. The following is a description of the facility and current salt storage operations.

The Waste Isolation Pilot Plant (WIPP) is a hazardous and radioactive waste disposal facility operated by the U.S. Department of Energy (DOE). It is designed, permitted, and operated for the receipt of defense generated TRU and TRU mixed waste. The WIPP is constructed in a bedded salt deposit 2150 feet beneath the earth's surface. Hazardous Waste Disposal Units are excavated in the bedded salt as permitted by the New Mexico Environment Department (NMED) with the issuance of Hazardous Waste Facility Permit (HWFP) #NM4890139088-TSDF, October 27, 1999. The excavated salt is stored on the surface for authorized disposition at closing of the WIPP. This pile, or salt pile (SP), is approximately 17 acres in size and has an associated salt pile evaporation pond (SPEP) that is approximately 3.5 acres. The SP is surrounded with ditches that divert runoff from the SP to the SPEP (referred to as the Salt Pile Runoff Ditches (SPRD). The SP, SPRD, and SPEP are the subject of this application (Figure 1). All of these units (SP, SPRD, SPEP) are collectively defined as the Salt Storage Area (SSA). The current design and operation of the SSA are described in Section 3.0, page 2, of the October 30, 2002 Notice of Intent (WIPP NOI 2002).

	Name	Address*	City	State	Zip	Telephone & Fax
Facility*	Waste Isolation Pilot Plant	26 miles E-SE of Carlsbad, NM	Carlsbad	NM	88221	505-234-7200
Owner	U.S. Department of Energy Ines Triay DOE/CBFO Manager	P.O. Box 3090	Carlsbad	NM	88221	505-234-7300 505-234-7027
Responsible Party	Bruce Lilly, DOE/CBFO Dave Reber, WTS	P.O. Box 3090	Carlsbad	NM	88221	505-234-8136 505-234-7027 505-234-8799 505-234-6082
Facility Representative	Bruce Lilly, DOE/CBFO Dave Reber, WTS	P.O. Box 3090	Carlsbad	NM	88221	505-234-8136 505-234-7027 505-234-8799 505-234-6082
Consultant	N/A	N/A	N/A	N/A	N/A	N/A
Other (specify)	N/A	N/A	N/A	N/A	N/A	N/A

*For the facility address, enter physical address- not mailing address.

2. <u>Locations of the Discharges</u> [20.6.2.3106.C.2 and 20.6.3108.C.2 NMAC]:

List the locations of the discharges covered by this permit. Add rows as necessary to include all discharge locations. Sections should be described to the nearest ¼ of a ¼ of a ¼ section (please see attachment).

Discharge Location (lagoons, leachfields, land application areas, outfalls, etc.)	County	Township	Range	Section	Latitude	Longitude
Salt Storage Area	**Eddy**	**22S**	**31E**	**SE, NW, SW 20**	**32°22'27"N**	**103°47'45"W**

3. **Brief Description of Discharge** [20.6.2.3108.C.3 NMAC]:

Briefly describe the activities which produce the discharge(s) including the treatment and disposal methods. Attach additional pages as necessary.

The SP and SPEP were constructed in 1984. The current configuration and operation of the SP/SPEP is generally described in Section 3.0, page 2, of the October 30, 2002 Notice of Intent (WIPP NOI 2002). The SP area is approximately 17 acres and the SPEP area is approximately 3.5 acres as shown in Figure 1 attached to this application. The discharge from the SP to the SPEP is associated with precipitation events.

Storm water samples collected from the SPRD (these ditches have also been referred to as the SP "moat") and SPEP in 1997 showed total dissolved solids (TDS) concentrations of 9,320 mg/L and 2,630 mg/L, respectively (WIPP NOI 2002, Attachment 4).

Source control activities were described in Section 5.0 of the October 30, 2002 NOI and preliminary design specifications were included in Attachment 10. Source control activities continue to focus on prevention of water infiltration, and dissolution of solutes (salt) to the subsurface.

See Design Basis Summary with Drawings 1-12 (included as Attachment A), which describes the proposed source control design for the SSA.

4. Discharge Characteristics [20.6.2.3106.C.1 and 20.6.2.3108.C.4 NMAC]:

4.a. Quantity:

Peak design discharge rate* in gallons per day (gpd) (design capacity of the treatment and disposal system):	**SPEP: 432,000 cubic feet (cf)** **SSE: 251,000 cf**
Average discharge rate on annual basis in gpd (actual flow):	**SPEP: 178,886 cf** **SSE: 87,643 cf**
Methods used to meter or calculate discharge volume:	**See Attachment A, Appendix A.1**

*Peak design discharge rate is the maximum volume of wastewater the system was designed to treat on a daily basis. This is generally based on the capacity of the different components of the system (size of lagoons, volume of tanks, etc.)

4.b. Quality: Add rows as necessary to include all contaminants and toxic pollutants.

Contaminant(s) or Toxic Pollutant(s) generally associated with facility type (contaminants of concern are listed in 20.6.2.7. and 20.6.2.3103 NMAC)	**Influent Concentration (mg/L)**	**Effluent Concentration (mg/L)**
Total Dissolved Solids (TDS)	**2,630 mg/L and 9,320 mg/L [1]**	**NA**

1 **Concentrations represent analytical results of storm water samples obtained in 1997 from the SPEP and SPRDs (WIPP NOI, 2002, Page 3). Excerpts from the WIPP 2002 NOI and associated references are attached to this application (Attachment B)**

4.c. Flow Characteristics:

Number of days per week discharge occurs:	**7 days [1]**
Number of months per year discharge occurs (specify months):	**12 months [1]**
Is flow continuous or intermittent:	**Intermittent**

1 **Flow is associated with precipitation and is intermittent, but could occur on any day of the week or month of the year.**

5. <u>Ground Water Conditions</u> [20.6.2.3106.C.3 and 20.6.2.3108.C.5 NMAC]:

Sources for this information may be the New Mexico State Engineers Office, NMED, GWPPS web site (www.nmenv.state.nm.us), and USGS reports. If you do not have a TDS value, take a sample from the nearest well to the discharge location and submit the results from the analysis.

Depth to ground water below the discharge site:	**608 feet [1 & 2]**
Flow direction of ground water below the site:	**West**
Flow gradient of ground water below the site:	**0.0026 feet/feet**
Reference* or source for depth, direction and gradient:	**See footnote below [1]**

[1] The closest groundwater below the SSA occurs in the Magenta Member of the Rustler Formation at approximately 608 feet below ground surface (bgs). Due to pressure in the formation, water levels measured in wells completed in the Magenta rise to the potentiometric surface, approximately 315 feet bgs at the discharge site. The hydraulic gradient was generated from depth to water measurements from wells completed in the Magenta Member (H-10a, H-6c) near the discharge site (Figure 2). Underneath the SSA, the potentiometric surface is interpolated to be approximately 315 feet bgs. Depth to water measurements were obtained during January 2003 (See attachment C to this application).

[2] In accordance with NMAC 20.6.2.3106 (c) (3), which states "Depth to and TDS concentration of the ground water most likely to be affected by the discharge,", and as described in Section 4.4.2 of the October 30, 2002 NOI, natural Dewey Lake Redbeds groundwater exists in well WQSP-6A approximately 6,600 feet southwest of the SSA, and approximately 167 feet below ground surface at the WQSP-6A location. Natural Dewey Lake Groundwater does not exist beneath the SSA. TDS values measured in WQSP-6A have consistently remained stable at approximately 4,000 mg/L (WIPP 2002 NOI Section 4.4.2 and Table 2)

* If determined from well logs, please provide photocopies of well logs with application. If depth is derived from a report, include copies of appropriate pages and complete reference to report including author, title, and publication date.

Total Dissolved Solids (TDS) concentration (mg/L) of ground water below the site:	**Ranges from 4,600 to 24,600 mg/l [1]**
Reference or source for TDS:	**WIPP Compliance Certification Application, Appendix USDW.3.3.3 [1]**

[1] TDS concentrations for Magenta wells were reported in the Title 40 CFR 191 Compliance Certification Application (CCA) for the Waste Isolation Pilot Plant. The values for TDS ranged from 4,600 mg/l in well H-06c to 24,600 mg/l in well H-04c. Well H-06c is located in the northwest quadrant on the border of the Land Withdrawal Act (LWA) boundary while well H-04c is located on the southwest quadrant of the LWA boundary (Figure 2).

TDS concentrations in Natural Dewey Lake Redbeds groundwater have ranged from 3,800 mg/L to 4550 mg/L (WIPP 2002 NOI, Table 2). This natural groundwater in the Dewey Lake does not exist beneath the discharge site as discussed above.

TECHNICAL ADEQUACY

To be deemed technically adequate for purposes of issuing the discharge permit, the following information must be provided [20.6.2.3106, 20.6.2.3107, 20.6.2.3109 NMAC]. Operational, monitoring, contingency, and closure plans must be submitted and must be appropriate for the proposed treatment and disposal type and meet the site specific conditions for the proposed facility.

6. **Permit Plans** [20.6.2.3106.C.7, 20.6.2.3107.A, and 20.6.2.3109.C NMAC]:

6.a. **Operational Plan** [20.6.2.3106.C.7 and 20.6.2.3109.C NMAC]:

The operational plan must describe how the system(s) for conveyance, collection, treatment, distribution, and disposal of wastewaters or other discharges will be constructed, operated, inspected, and maintained. The operational plan must demonstrate that ground water standards will not be exceeded.

6.a.i. In the following table, identify all proposed conveyance, collection, treatment distribution, and disposal units included in the operational plan. Add rows as necessary to include all units.

Treatment/Storage/ or Disposal Unit **Treatment units** (lagoon, mechanical treatment plant, manure separator, clarifier, etc.) **Disposal Units** (land application area, leachfield, evaporative lagoon, leachstockpile, etc.)	**Construction Material**	**Volumetric Capacity*/Area*** (gallons or cubic yards/ acres)
See design plans and specifications in Attachment A to this application	**See design plans and specifications in Attachment A to this application**	**See Attachment A to this application**

*Volumetric Capacity must be provided for all tanks, chambers, and impoundments or other storage units.
*Area must be provided for all land application areas, leachfields or other area features.

6.a.ii. Describe in detail the operational plan, including all conveyance, collection, treatment, distribution and disposal systems. Attach additional pages as necessary:

The current configuration and operation of the SP/SPEP is generally described in Section 3.0, page 2, of the October 30, 2002 Notice of Intent (WIPP NOI 2002). The description of the proposed design conveyance, collection, and treatment systems for the SSA is included in the Design Basis Summary in Attachment A to this application.

6.a.iii. Describe the operations and maintenance plan that will be followed to ensure the system is maintained as described. At a minimum the plan must include monthly inspections of all wastewater treatment and disposal units. Attach additional pages as necessary.

The current configuration and operation of the SP/SPEP is generally described in Section 3.0, page 2, of the October 30, 2002 Notice of Intent (WIPP NOI 2002). The SSA will be inspected monthly, and following severe rainstorms, for damage and impediments to water flow. Inspections will include, but are not limited to, identification of liner wear, erosion, animal damage, vehicular damage, buildup of salt, soil, debris, and/or vegetation, that may impede designed water flow. Upon identification of unusual operation or defects in the system, corrective action will be initiated to correct any discrepancies or deteriorating conditions.

6.b. Monitoring Plan [20.6.2.3106.C.5 and 20.6.2.3107.A.1-9 NMAC]:

The monitoring plan must describe how the facility will be monitored to ensure that the discharge will not adversely impact ground water quality. The plan must include all monitoring locations (effluent sampling, monitoring wells, lagoons, soil sampling, plant tissue analysis, etc.). Monitoring locations must be included on the facility map.

6.b.i. Monitoring Locations. In the following tables, identify all monitoring locations. Add additional rows as necessary to include all monitoring locations.

Flow, Effluent and Ground Water Monitoring

Monitoring Location	Lat	Long	Elevation	Sampling Frequency per year	Reporting Frequency per year	Water or Soil Contaminant Type (please refer to 20.6.2.7.uu, and 20.6.3103 NMAC)
NA	NA	NA	NA	NA	NA	NA

*Identify the sampling locations as designated or named by the facility.

Soil, Plant Tissue and Other Sampling

Monitoring Location*	Lat	Long	Sampling Frequency per year	Reporting Frequency per year	Water or Soil Contaminant Type
Land application area soil sampling	N/A	N/A	N/A	N/A	N/A
Land application area plant tissue analysis	N/A	N/A	N/A	N/A	N/A
Other	N/A	N/A	N/A	N/A	N/A

N/A: Not Applicable

6.b.ii. Describe in detail the sampling protocols that will be used for sample collection at all monitoring locations. Attach additional pages as necessary.

As described in the WIPP October 2002 NOI (WIPP NOI 2002, Section 6.2), water level monitoring and water quality sampling for the SSW beneath the WIPP surface facilities will continue in the shallow monitoring wells and piezometers under the current schedule. Currently, the water quality sampling plan (WQSP) wells (including WQSP-6A) are sampled semi-annually and water levels measured monthly in accordance with the HWFP. The piezometer network is sampled annually and water levels are obtained monthly. This will continue until such time as the results from the Site Investigation Work Plan suggests that the monitoring be adjusted (WIPP NOI 2002, Attachment 11). Currently, the water levels in the shallow monitoring wells and piezometers are measured once per month. Water quality samples are obtained and analyzed once per year from these sample locations.

The protocol for the 16 SSW wells and piezometers will follow low-flow sampling techniques as described in the New Mexico Environment Department (NMED) guidance titled *Use of Low-Flow and Other Non-Traditional Sampling Techniques for RCRA Compliant Monitoring.* Purging for these wells will consist of low flow pumping of the well such that the decrease in hydraulic head is equivalent to the rate at which water is removed from the well. Purged water will be routed through Tygon™, or similar type, tubing into an approved flow-through cell, where serial samples will be obtained. Field indicator parameter sampling will be performed with a multi-meter instrument capable of measuring dynamic, in situ changes in pH, specific conductance, temperature, and dissolved oxygen. Final samples will be obtained after indicator parameters have stabilized over three consecutive readings spaced a minimum of five minutes apart. SSW samples will be analyzed for parameters listed in the Table 1 of the WIPP 2002 NOI and Attachment D of this application

6.b.iii. Standard Monitoring Requirements: The following paragraphs are standard permit conditions. Please read the condition and check the boxes that you will comply with as a condition of your permit.

☐ All monitoring wells will be installed according to NMED Monitoring Well Construction and Abandonment Guidelines (copy enclosed)

☑ All monitoring wells (if 3 or more monitoring wells are on site) will be surveyed to a common permanent benchmark and that the survey will be submitted to the NMED, GWQB within 60 days of installation of all monitoring wells. Survey data will include northing, easting, and elevation to the nearest hundredth of a foot. One of the wells may be used as the benchmark.

☑ This facility will measure the depth to ground water in each monitoring well to the nearest hundredth of a foot prior to purging and sampling, and that three well volumes will be purged from each monitoring well prior to sample collection.

☐ This facility will complete land application data sheets (LADS, copy enclosed) documenting the amount of nitrogen applied to each land application area if applicable. The LADS will incorporate the wastewater volume and analytical results of the wastewater testing to determine total nitrogen applied to each field. **Not Applicable**

6.c. Contingency Plan [20.6.2.3107.A.10 NMAC]:

The contingency plan must describe the actions to be taken if Regulation 20.6.2.3103 NMAC ground water standards are exceeded or if toxic pollutants are present (20.6.2.7.uu) as a result of discharges regulated under the proposed permit, and to cope with failure of the discharge permit or system.

6.c.i. Standard Contingency Requirements: The following paragraphs are standard permit conditions. Please read the condition and check the boxes that you will comply with as a condition of your permit.

☐ This Facility will comply with the following contingency language:

In the event that monitoring indicates ground water standards are violated or may be violated during the term of the discharge permit or upon post closure monitoring, this facility will collect a confirmation sample from the monitoring wells within 15 days to confirm the initial sampling results. Upon confirmation of contamination, all ground water monitoring will be conducted monthly and a corrective action plan will be submitted to the NMED. The corrective action plan will include a site investigation to define the source, nature and extent of ground water contamination, and a proposed abatement option; and a schedule for implementation. The site investigation and abatement option must be consistent with the requirements and provisions of Regulations 20.6.2.4101, 20.6.2.4103, 20.6.2.4106.E, 20.6.2.4107, and 20.6.2.4112 NMAC. The corrective action plan will be submitted to NMED for approval within 30 days of confirmation of ground water contamination, and will be initiated within 30 days of NMED approval. **See note below.**

Note: The October 30, 2002 NOI describes the planned site investigation activities to assess the lens of shallow subsurface water (WIPP NOI 2002, Section 6 and Attachment 11).

☑ This facility will comply with the following contingency language:

In the event of a spill or release that is not as prescribed in the approved discharge permit, this facility will take immediate corrective action to contain or mitigate the damage caused by the discharge and will initiate the notifications and corrective actions as required by Regulation 20.6.2.1203 NMAC. Within 24 hours discovery of the incident, this facility will verbally notify NMED and provide the information outlined in Regulation 20.6.2.1203.A.1. NMAC. Within 7 days of discovering the incident, this facility will submit a written verifying the oral notification and providing any additional pertinent information or changes. Within 15 days of the incident, this facility will submit a corrective action plan describing actions taken and/or to be taken to remedy the impact of the unauthorized discharge.

6.c.ii. Specific Contingency Plan:

Describe any additional specific corrective actions or contingencies that will be taken to cope with failure of the discharge system: Attach additional pages as necessary.

Specific contingency planning includes monthly inspection and repair of the SSA system liners as necessary, containment and investigation of all spills and releases. In the event of a tear in a liner that results in a release to the environment, an effluent spill or unauthorized discharge, the Ground Water Quality Bureau will be notified pursuant to the standard permit condition 6.c.i. The Permitee will assess damages and attempt to isolate any discharge, and corrective measures will be implemented immediately.

6.d. Closure Plan [20.6.2.3107.A.11 NMAC]:

The closure plan must describe the closure actions to be taken to prevent Regulation 20.6.2.3103 NMAC ground water standards from being exceeded, or the introduction of a toxic pollutant in ground water after cessation of operations. At a minimum, the closure plan must include a description of closure measures, post closure monitoring plans, and financial assurance (if required by NMED).

6.d.i. Specific Closure Plan: Describe the specific closure activities to ensure that ground water quality will be protected after cessation of operations. The plan shall include plugging, removal, and/or filling of all conveyance, collection, treatment, distribution and disposal features in order to prevent future discharges at the facility. The plan must also describe how all liquid and solid wastes will be removed and disposed of according to local, state, and federal laws. The plan must also describe how disturbed areas will be backfilled to blend with the original surface topography to prevent future ponding and to prevent a discharge at the facility from occurring after the cessation of operations. Attach additional pages as necessary.

The closure plan dated December 16, 1996 will be implemented when the facility is decommissioned. The plan includes the pumping or evaporation of all wastewater ponds, removal of all solids, and recontouring and revegetation of the site. In addition, all basin liners will be removed or perforated upon closure of the site. This will be performed to comply with Section 20.6.2.3107.A.11 NMAC.

6.d.ii. Standard Closure Requirements: The following paragraphs are standard permit conditions. Please read the condition and check the boxes that you will comply with as a condition of your permit.

This facility will comply with the following closure requirements:

☑ The discharger will notify NMED at least 30 days prior to cessation of operations and will provide a schedule for implementation of the closure plan.

☐ This facility will conduct post closure monitoring at the frequency and locations prescribed under the active permit for a period approved by NMED. If Regulation 20.6.2.3103 NMAC ground water standards are violated or toxic pollutants are present during post closure monitoring, this facility will implement the contingency plan required in the active permit.

☑ All monitoring wells will be plugged and abandoned in accordance with NMED Monitoring Well Construction and Abandonment Guidelines once NMED has agreed in writing that post closure ground water monitoring may cease.

☑ Once NMED has approved all closure activities, this facility will submit a letter requesting termination of the discharge permit.

TECHNICAL SUPPORT

The following information must be submitted as required by Regulation 20.6.2.3106, and 20.6.2.3109 NMAC.

7. **Other Discharge Locations** [20.6.2.3106.C.2 NMAC]:

7.a. List the locations of any other discharges at this facility not covered by this permit but permitted under the New Mexico Liquid Waste Disposal Regulations, Hazardous Waste Management Regulations, Federal Clean Water Act (NPDES), and any un-permitted discharges. Add rows as necessary to include all other discharge locations.

Discharge Type (septic tank/leachfields; surface water discharges, etc.)	**Permit Identification**	**Discharge Location Description**
Facultative Lagoon System and evaporation facility	**DP-831**	**23,000 gpd of sewage effluent and 2,000 gpd of non-hazardous brine**
H-19 Evaporation Pond	**DP-831**	**8,000 gpd non-hazardous brine water to north evaporation cell**

7.b. **Area Map:** On the appropriate United States Geological Survey (USGS) 7.5 minute topographic quadrangle map, identify the location of all water supply wells, injection wells, seeps, springs, bodies of water, and watercourses within one mile of the outside perimeter of the discharge site.

As described in Section 8 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996, previous applications, renewals, and modifications, there are no water supply wells, injections wells, seeps, springs, bodies of water, or watercourses within one mile of the outside perimeter of the discharge site.

8. **Flooding Potential** [20.6.2.3106.C.4 NMAC]:

8.a. Describe the flooding potential of the discharge site based on the latest Federal Emergency Management Agency flood plain map or site specific analysis:

As described in Section 12 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996, the flooding potential of the WIPP facility is considered minimal since the general ground elevation in the vicinity of the surface facilities is approximately 400 feet above the 100 year floodplain of the Pecos River, which is the closest river to the facility. The potential for flash flooding is considered minimal because of the high percolation rate of the surrounding sand dunes and the flood protection berms (see Section 8.b of this application).

Source for Information: **WIPP DP-831 Renewal Permit Application, December 16, 1996**

8.b. Describe the methods used to control flooding, run-on and run-off at the discharge site (berms, diversion channels, etc.):

As described in the October 30, 2002 Notice of Intent, a berm exists along the north side of the SP/SPEP facility and is contoured such that rainfall will be diverted around the berm to the west, and around the SPEP (WIPP NOI 2002, Attachment 2). This berm will be relocated as a result of the Salt Storage Extension (SSE), however the integrity will be retained. See the description of the berm in the Design Basis Summary and specifications in Attachment A to this Application.

9. **Geologic and Soil Information** [20.6.2.3106.5 NMAC]:

9.a. **Lithology:** Describe the lithology and thickness of each geologic unit below the discharge site and indicate which units bear water. This information may be obtained from a driller's log or geologic report. Include photocopies of all well logs with the application. Add rows as necessary to include all units.

The geologic units below the discharge site (SP/SPEP area) are described in the October 30, 2002 Notice of Intent (WIPP NOI 2002, Section 4.0, and NOI Attachments 3,4,5,6,7, and 11). These descriptions include lithology, thickness, and hydrogeologic properties of the unit below the discharge site.

Source for Information: **October 30, 2002 Notice of Intent (WIPP NOI 2002, Section 4.0, and Attachments 3, 4, 5, 6, 7, and 11)**

9.b. **Soil Map:** Attach a copy of the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey map and descriptive information for soil(s) associated with the discharge site.

Previously provided in Attachment 9 of the WIPP Discharge Plan DP 831 Renewal Application, dated December 16, 1996.

10. Signatures:

Owner: I certify that I am the legal owner of the property in which all discharges will occur. I certify that I am knowledgeable about the information contained in this application, and believe the information is true, complete and accurate.

Print Name: Ines Triay

Signature: Ines Triay   Date 6-23-03

Responsible Party* (if property is leased or operated by someone other than the owner):

I certify that I am knowledgeable about the information contained in this application, and believe the information is true, complete and accurate.

Print Name: Bruce Lilly

Signature: Bruce Lilly   Date 6-23-03

* Enclose a signed copy of the lease agreement between the responsible party and the owner of the property on which the proposed discharge will occur. Lease agreement should be valid for the duration of the discharge permit or until the discharge permit is modified to reflect a new lessee.

LIST OF FIGURES FOR THIS DP MODIFICATION APPLICATION

FIGURE 1 – WIPP Surface Facilities, Salt Pile (SP), and Salt Pile Evaporation Pond (SPEP)

FIGURE 2 – WIPP Vicinity and Well Locations

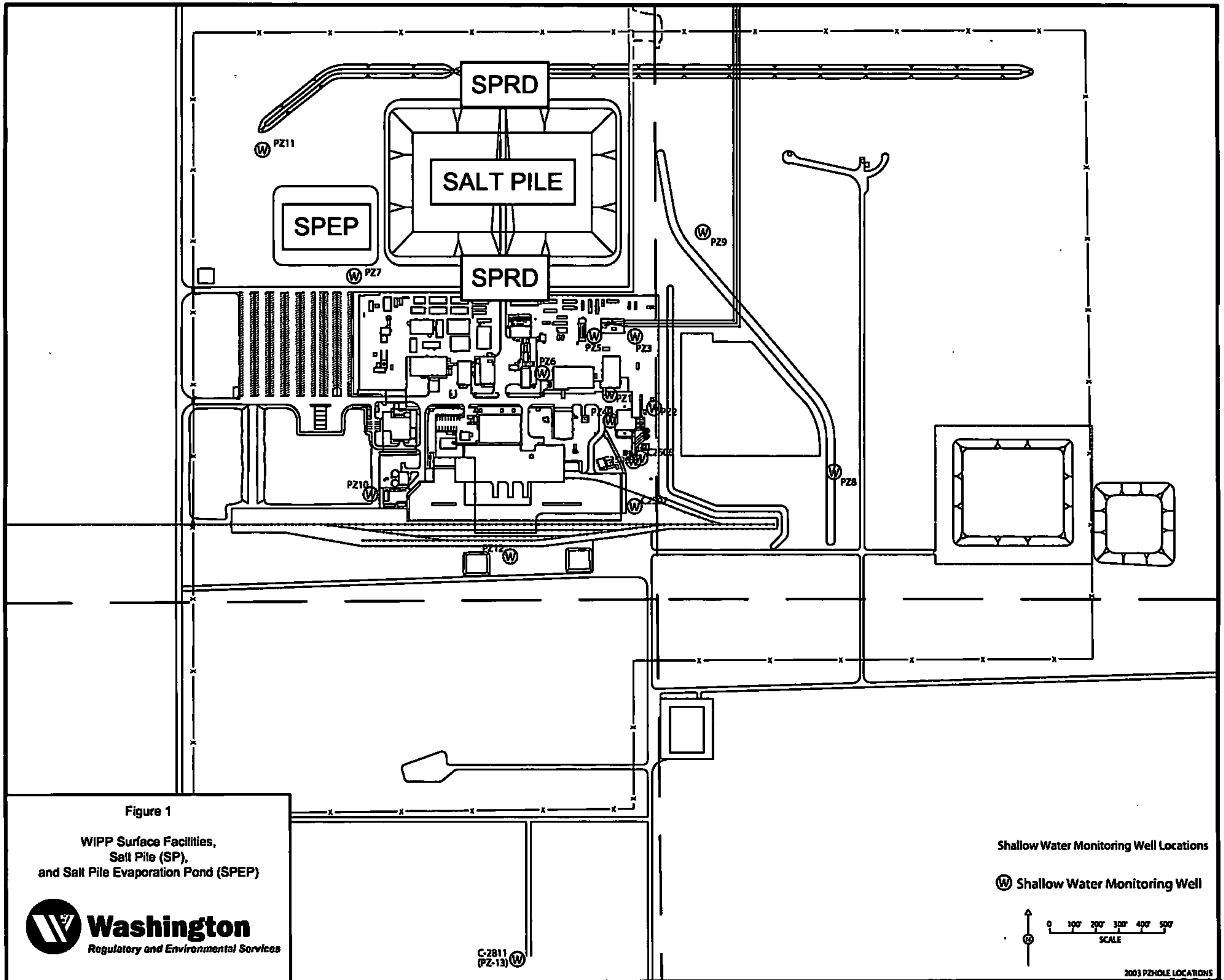

Figure 1

WIPP Surface Facilities,
Salt Pile (SP),
and Salt Pile Evaporation Pond (SPEP)

Washington
Regulatory and Environmental Services

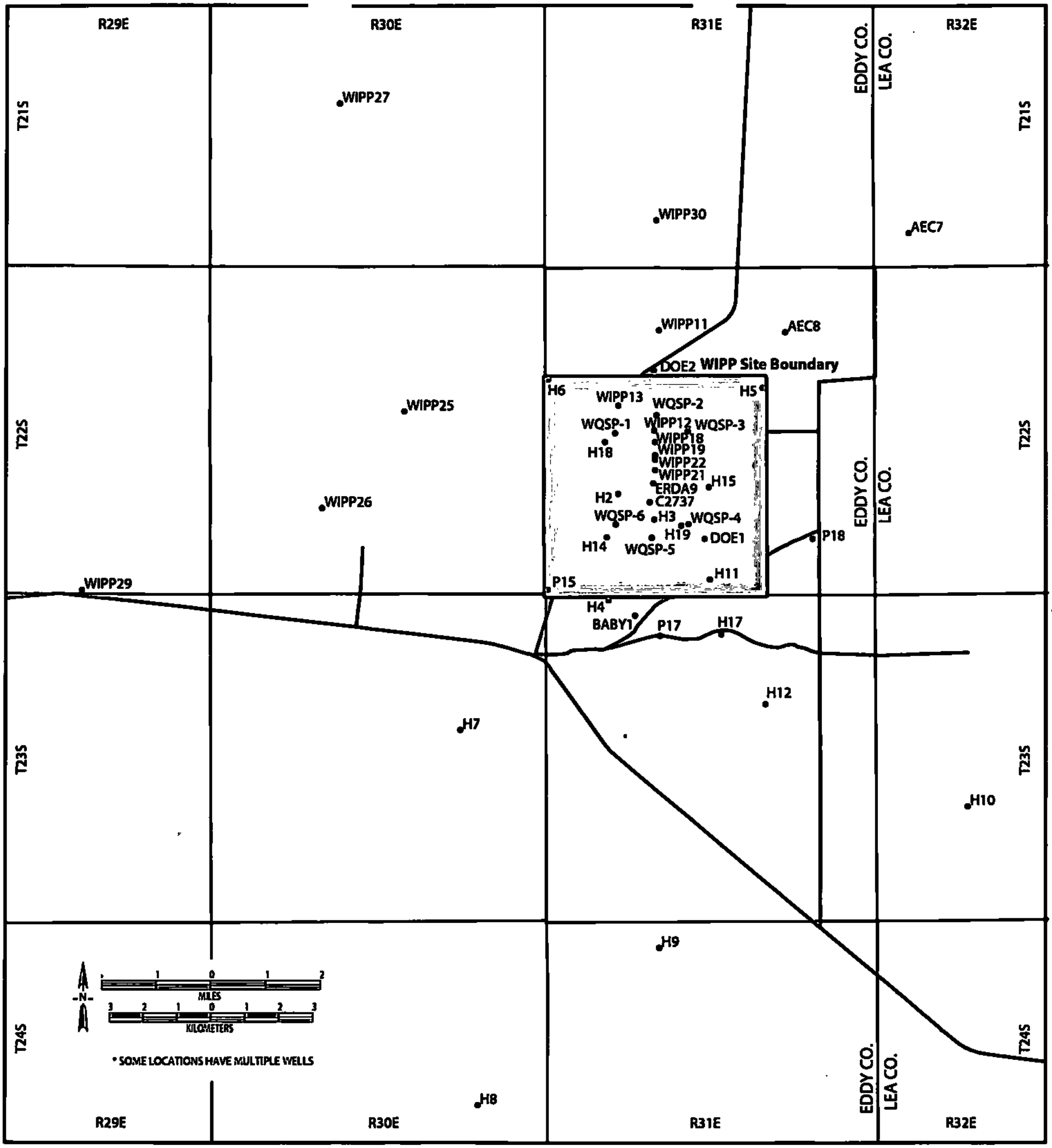

Figure 2

WIPP Vicinity and Well Locations

Washington
Regulatory and Environmental Services

ATTACHMENTS

A. Design Basis Summary: Conceptual Design for Infiltration Controls (including Drawings 1-12).

B. Excerpts from WIPP 2002 NOI Attachment 4, "Exhaust Shaft: Phase 2 Hydraulic Assessment Data Report Involving Drilling, Installation, Water-Quality Sampling, and Testing of Piezometers 1 – 12", 1997 surface water TDS measurements from Salt Pile Evaporation Pond and Salt Pile Run-off Ditches.

C. Water Level Measurements for January 2003.

D. Excerpt from WIPP 2002 NOI, Table 1, Analytical Results for Shallow Subsurface Water, December, 2001.

E. Response to hydrogeological questions posed in the December 31, 2002 letter from C. Marshall of New Mexico Environment Department (NMED) Ground Water Quality Board (GWQB) to I. Triay of WIPP CBFO.

ATTACHMENT A

Design Basis Summary: Conceptual Design For Infiltration Controls (including Drawings 1-12)

WASTE ISOLATION PILOT PLANT
CONCEPTUAL DESIGN FOR INFILTRATION CONTROLS

APRIL 2003

ATTACHMENT A:

DESIGN BASIS SUMMARY

PREPARED FOR:

CTAC

DOE/CBFO

PREPARED BY:

Gordon Environmental, Inc.
213 S. Camino del Pueblo
Bernalillo, NM 87004
(505) 867-6990
Fax (505) 867-6991

ATTACHMENT A

DESIGN BASIS SUMMARY:
WIPP Infiltration Controls
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Drawing 2: Existing Site Conditions
Drawing 3: Proposed Infiltration Controls
Drawing 4: Salt Storage Area – Site Improvements
Drawing 5: Salt Storage Pile – S-N Cross Section
Drawing 6: Salt Storage Pile – W-E Cross Sections
Drawing 7: Salt Storage Extension - Site Plan
Drawing 7: Salt Storage Extension - Site Plan
Drawing 8: Salt Storage Extension - S-N Cross Section
Drawing 9: Salt Storage Extension - W-E Cross Section
Drawing 10: Engineering Details
Drawing 11: Drainage Details
Drawing 12 Salt Storage Area Grading Plan

1.0 PROJECT OBJECTIVES

Historical stormwater management practices may have contributed to Shallow Subsurface Water (SSW) conditions beneath the WIPP site. Storage of mined salt in the Salt Pile (SP) is likely responsible for elevated total dissolved solids (TDS) in the SSW. Infiltration of salt contact water has occurred through the SP and its associated run-off control systems:

- The Salt Pile Run-Off Ditches (SPRD's)
- The Salt Pile Evaporation Pond (SPEP)

Stormwater run-off exclusive of the Salt Storage Area (which includes the SP, SPRD's, and SPEP) is currently collected and managed in three unlined detention basins. This run-off mostly from the roofs and paved areas, may represent a third of the stormwater that is available to recharge the SSW.

The purposes of the proposed infiltration control systems are to:

1. Eliminate the potential for future salt infiltration .
2. Control and Evaporate nearly 100% of the site's stormwater run-off .

The priorities are to address the greatest potential contributors of TDS first; and stormwater second. As shown on **Table A.1**, the controls associated with the Salt Storage Area (SSA) and SPEP will address 100% of the salt infiltration; and an estimated 60% of the recharge. The current Salt Pile will be reshaped and capped with a geomembrane liner, with an additional 2' thickness of vegetative soils to protect the liner and stabilize the cap (Section 2.1). The SPRD's and SPEP will also be lined with high-density polyethylene (HDPE) to minimize surface water infiltration. This will be the first priority in the implementation sequence.

TABLE A.1

INFILTRATION CONTROL PRIORITIES

	Estimated Contribution (% of total)[1]	
	TDS	**Water**
1. Salt Storage Area • Salt Pile • Salt Pile Run-Off Ditches	>90%	>35%
2. Salt Pile Evaporation Pond	<10%	>25%
3. Salt Storage Extension • Cells A & B • Salt Storage Extension Basin	100% (future)	<5%
4. Stormwater Controls		
• Evaporation Basin A	0	>25%
• Evaporation Basin B	0	<10%

[1]From DBSA, March 2003

Discontinued use of the current SP will require the development of new salt storage facilities. The new 15 acre± Salt Storage Extension (SSE) will include lined salt storage cells; and a double lined contact water evaporation basin (the SSE). The SSE will be constructed concurrent with the SP capping activities, and will control 100% of potential salt infiltration from future storage practices.

The remaining stormwater will be routed to lined evaporation basins that are designed to maintain zero discharge. Currently Basin A will be enlarged and lined with HDPE geomembrane. Currently Ponds 1 and 2 will be combined into a single lined unit Evaporation Basin B.

The infiltration controls consist of layered geosynthetic and soil systems designed to minimize infiltration. Because the SSE Basin will be the only unit that will continue to store and evaporate salt contact water, it is equipped with a double liner and leak detection system. The SSE cells have a floor drainage system designed to minimize fluid head (pressure) on the liner. The geosynthetic and soil liners and caps proposed in this design:

- Comply with applicable NMED regulations and guidelines.
- Consist of proven materials and conventional construction technologies.
- Have a demonstrated track record of performance in similar arid applications.
- Will, when completed, control nearly 100% of potential future salt infiltration; and over 95% of potential stormwater contributions.

Table A.2 provides a summary of the estimated sizes, capacities, and materials required for each infiltration control unit. The Conceptual Design Drawings (**Appendix A.2**) provides details on the dimensions and materials for the proposed installations.

TABLE A.2
Capacity/Materials Summary

Notes:
(1) Continued filling of SP to prepare minimum 2% slope (not included in total)
(2) Salt cut/fill necessary to prepare 3:1 sideslopes on SP

Area	Unit	Size (acres)	CAPACITY	Earth Moving (yd^3) [(s) = salt] [(a) = aggregate]			Geosynthetics (ft^2)		
				Cut	Fill	Cover	PE Liner	Geonet	Geotextile
1.0 Salt Storage Area	Salt Pile (SP)	18.8	120,000 tons(1)	36,000 (s)(2)	36,000 (s)(2)	55,000	840,000	--	840,000
	SP Pond (SPEP)	3.0	440,000 ft^3	Reshape	Reshape	--	150,000	--	--
	SP Ditches (SPRDs)	2.0	Design Storm	2,500	--	3,200(a)	88,000	--	--
SUBTOTAL		***23.8***	--	***2,500***	--	***55,000***	***1,078,000***	--	***840,000***
2.0 Salt Storage Extension	SW Berm	2.0	NA	18,000	54,000	--	--	--	--
	Cell A(3)	6.2	330,000 tons	18,000	20,000	20,000(4)	270,000	335,000	335,000
	SSE Basin	1.6	251,000 ft^3	18,000	--	--	150,000	75,000	1,000
	Cell B(3)	5.2	450,000 tons	--	30,000	17,000(4)	230,000	270,000	270,000
SUBTOTAL		***14.4***	--	***54,000***	***104,000***	***37,000***	***650,000***	***680,000***	***606,000***
3.0 Stormwater Controls	Evaporation Basin A(5)	7.3	1,000,000 ft^3	30,000	3,000	--	320,000	--	--
	Evaporation Basin B(5)	2.0	250,000 ft^3	5,000	5,000	--	88,000	--	--
SUBTOTAL		***9.3***	--	***35,000***	***8,000***	--	***408,000***	--	--
TOTALS		***47.5***	--	***91,500***	***112,000***	***55,000***	***2,086,000***	***655,000***	***1,446,000***

(3) Cells A & B include SP North Slope, geonet, and geotextile
(4) Protective Cover (2' thick) over new floor liner is salt or soil (not included in total)
(5) Estimated

2.0 SALT STORAGE AREA (SSA)

The Salt Storage Area (SSA) currently consists of approximately 35 acres that is a relatively independent drainage basin extending along the north perimeter of the WIPP site. The SSA consists of four primary drainage elements (see **Drawing 2**):

- The Salt Pile (SP) – 16.8 acres ±
- The Salt Pile Evaporation Pond (SPEP) – 3.5 acres ±
- The Salt Pile Run-off Ditches (SPRD's) – 1.5 acres ±
- Tributary areas (including some north parking lot run-off) – 13.2 acres ±

This design integrates discontinued use of the current SP in conjunction with development of a new lined salt storage unit (the Salt Storage Extension, **Section 3.0**). The other primary SSA systems (SPEP, SPRD's) will be lined with 60 mil HDPE geomembranes to prevent future infiltration of water.

Construction of the SSA infiltration control systems would involve the phased installations designed to address the most significant sources of salt and water first:

- Reshaping the SP with mined salt
- Capping the SP
- Installing Cell A of the new lined Salt Storage Extension
- Lining the new SSE Basin
- Lining the SPEP and associated ditches (east, south and northwest SPRD's)

2.1 Salt Pile (SP)

The first priority is to recontour the SP to prepare it for cap installation. A cut/fill approach is planned to reduce the sideslopes from about 1.5:1 to 3:1. This will extend the toe of the slope outward approximately 25'. The north sideslope of the SP will be regraded first to facilitate construction of the Salt Storage Extension.

Mined salt from ongoing operations will be used to shape the crown to a minimum 2% slope. This includes bringing the southwest lobe up to prevailing grade, and backfilling the ramp. In some limited circumstances, native soil may be used for reshaping the SP crown and sideslopes.

The SP cap system will be installed incrementally as the reshaping and base preparation is completed for individual segments. The cap configuration includes a 16 oz. geotextile cushion at the salt contact; with a 60 mil geomembrane above it. Textured HDPE will be used on the 3:1 sideslopes, and smooth 60 mil HDPE is planned for the crown. The geosynthetic layers will be anchored at the crest and toe of slope.

The north sideslope will be the first SP segment to be capped. The 60 mil textured HDPE geomembrane will also serve as the south sidewall liner for the Salt Storage Cells. This segment will include a geonet/geotextile layer that will serve both as a cushion for future salt placement; and as a drainage layer for water collection (see **Section 3.1**)

With the exception of the north sideslope, a min. 24" thick protective soil layer will be placed over the entire SP cap. It is planned that this process will proceed incrementally following cap installation over individual segments. Vegetative cover, consisting of hardy native grasses, will be added and maintained.

2.2 Salt Pile Run-off Ditches (SPRD's)

New SPRD's will be installed along the east, south, and north part of the west perimeters. All north drainage will be directed to the SSE Basin, and the south part of the west slope drains directly to the SPEP. The ditches are designed to manage the 25-year, 24-hour storm event (see **Appendix A.1**).

The toe of the regraded SP will extend out about 25' from its current position. A relatively horizontal bench about 20' wide will be installed between the toe of the SP slope and the inside edge of the adjacent SPRD.

The SPRD's will be lined with 60 mil (smooth) HDPE geomembrane after base preparation to a design slope 0.5%. The ditches are designed to accommodate the standard geomembrane roll width (22' –23') so that seams will only be necessary every 400'±. The sideslope liner will be extended across the bench to tie in with the inside SPRD anchor. Because of the extension of the toe and addition of the bench, the prior ditch areas will be regraded and covered with the new liner system.

2.3 Salt Pile Evaporation Pond (SPEP)

After the SP is capped and the SPRD's are lined, the SPEP will receive clean stormwater only. The current footprint will be reshaped to accommodate the new watershed dimensions (e.g., eliminate north SP run-off; and the extension of the west SP footprint) (**Section 2.1**). The SPEP floor and sidewalls will be compacted with a "level" floor and 3:1 sideslopes. A single 60 mil (smooth) HDPE liner will be placed and anchored at the perimeters. Ballast or anchors will be deployed to resist uplift.

The SPEP is sized to detain and evaporate the design storm event (see **Appendix A.1**).

3.0 SALT STORAGE EXTENSION (SSE)

The Salt Storage Extension consists of two primary units:

- The Salt Storage Cells (A & B)
- The Salt Storage Extension Evaporation Basin

The Salt Storage Extension includes approximately 11.4 acres of lined salt storage capacity designed to receive up to 600,000 tons of mined salt (i.e., Panels 4– 8). The Salt Storage Extension is contiguous with the north slope of the SP, and is subdivided into Cell A and Cell B. The storage cells include a geomembrane liner; geonet cushion/drainage system; protective layer; and fluid collection piping. The collection system conveys any stormwater infiltrating through the stored salt by gravity to the Salt Storage Evaporation Basin. The SSE Basin will have a double liner with a leak detection system, and is sized to detain and evaporate the design storm. This is the only drainage element that will be receiving salt water contact run-off after the project is completed.

Installation of salt storage capacity is currently designed in two increments which are hydraulically connected. Cell A, which is west and downgradient, would be constructed first. Cell B involves extending the liner and water collection system upgradient (east) to the east limit of the SP. The boundary between Cells A & B can be selected based on incremental construction costs vs. capacity developed.

Construction of the Salt Storage Extension Cells and Evaporation Basin includes four primary components:

- Lining the north sideslope of the SP (see **Section 2.2**).
- Relocating the stormwater diversion berm.
- Earthmoving – including Basin excavation and Cell A base preparation.
- Installing liners and related systems in the Basin and Cell A.

Lining the north sideslope of the SP is discussed in **Section 2.1** This approach minimizes the footprint of the SSE by taking advantage of the "wedge" of airspace available between the SP and the new cells.

Simultaneous with sideslope preparation, the existing stormwater diversion berm must be relocated approximately 400' north of its current position. An access zone approximately 50' wide is provided at the east end of Cell B, where the berm will extend north approximately 400' before it turns west. The new berm is approximately 8' high with 3:1 sideslopes, and serves the same stormwater diversion purpose as the existing berm. The new berm will be a structural element for the Salt Storage Cell liner system, where the north edge of liner will be anchored. A construction berm approximately 8' high is planned as the downgradient perimeter for Cell A. The berms will be constructed in horizontal lifts and subjected to conventional soil compaction and construction quality assurance standards (e.g., 90% Standard Proctor).

3.1 Cells A & B

Cell A includes a permanent berm along the west (downgradient) perimeter; and a temporary berm at the (upgradient) Cell B interface. Once at final design elevation, the soil in the floor and sidewalls of the Basin will be compacted. The fill soil placed as the foundation for Cell A will be placed in horizontal lifts and compacted.

The liner system for the new SSE Cells will be installed over the prepared subgrade in the floor area. On the north and east, it will be anchored at the top of the relocated stormwater diversion berm. On the south side, it will be anchored with the north SP sideslope cap to create a continuous impervious surface. On the west perimeter, the liner will be tied to the adjacent east sidewall liner of the SSE. The Cell A & Cell B liner configuration consists of the following layers, in ascending order:

- Compacted soil subbase (compacted sand on south slope)
- 60 mil (smooth) HDPE liner (textured on sideslopes)
- Collection system piping
- 200 mil geonet cushion/drainage layer
- 8 oz. geotextile filter fabric
- 2′ thick protective material layer (salt or soil)

Cells A & B are equipped with a continuous perforated pipe that slopes up at 1% from west to east to facilitate water collection off the liner to minimize head (i.e., water pressure). The pipe is enveloped in aggregrate, and daylights into the SSE Basin to allow gravity flow. A pipe boot is specified at the penetration of the west berm. Pipe cleanout capability is provided by a temporary riser at the upgradient terminus of Cell A; and a permanent cleanout riser at the east of Cell B.

3.2 SSE Basin

The new Salt Storage Extension Evaporation Basin has an estimated footprint of 1.6 acres with an average depth of 5′. The excavated soil (15,000 $yd^3 \pm$) will be used as fill and compacted to prepare Cell A to its design base grades.

Once the earthwork is complete, the prescribed liner systems will be installed in both the Basin and Cell A. Because the SSE Basin is the only unit that will manage salt water drainage in the future, it is equipped with a double liner system. The liner configuration, in ascending order, includes:

- Compacted soil subbase
- 60 mil (smooth) HDPE secondary liner
- 200 mil geonet leak detection layer
- 60 mil (smooth) HDPE primary liner

The leak detection layer will drain to a sump with an inclined riser to allow for future inspection and monitoring. Ballast or anchors will be deployed to resist uplift. No salt will be stored in the SSE until the Basin is complete.

4.0 STORMWATER CONTROLS

Future stormwater infiltration will be managed by lining the SPEP and Evaporation Basins A & B with 60 mil HDPE geomembranes. This will be the first priority in the implementation sequence. The watersheds for Basins A & B consist primarily of covered/paved surface and lined drainageways with culverts. Both basins will be sized to detain and evaporate the design storm event.

4.1 Evaporation Basin A

Basin A will be reshaped to accommodate the evaporation rate for the design storm; and to allow liner installation. Sidewalls will be prepared to maximum 3:1 sideslopes and compacted. The geomembrane liner system will be anchored at the perimeters, and uplift will be addressed with ballast or floor anchors.

4.2 Evaporation Basin B

Existing Ponds 1 & 2 may be combined into a single Evaporation Basin (Basin "B") designed to manage run-off from both watersheds. This unit will receive clean stormwater run-off only, and be lined consistent with the SPEP and Evaporation Basin A plans.

TABLE A.3

List of Acronyms

CTAC	Carlsbad Technical Assistance Contractor
DBSA	Daniel B. Stephens & Associates
DOE	Department of Energy
HDPE	High Density Polyethylene
NMED	New Mexico Environment Department
RCRA	Resource Conservation and Recovery Act
SP	Salt Pile
SPEP	Salt Pile Evaporation Pond
SPRD	Salt Pile Run-off Ditches
SSA	Salt Storage Area
SSE	Salt Storage Extension
SSW	Shallow Subsurface Water
TDS	Total Dissolved Solids
WIPP	Waste Isolation Pilot Plant

APPENDIX A.1 – DRAINAGE CALCULATIONS

A.1.1 – 25-yr, 24-hr Storm Event

A.1.2 – Average Annual Climate Data

Appendix A.1.1 – 25-yr, 24-hr Storm Event

DESIGN BASIS
WIPP INFILTRATION CONTROLS – CONCEPTUAL DESIGN
SPEP and SSE BASIN CAPACITY ANALYSIS
25-YEAR, 24-HOUR PEAK STORM EVENT

Objective:

The objective of this calculation is to determine if the Salt Pile Evaporation Pond (SPEP) and the Salt Storage Evaporation (SSE) Basin have the capacity to contain the runoff from their respective watersheds due to a 25-Year, 24-Hour storm event.

Data:

1. Design Storm: 25-Year, 24-Hour Storm Event

   Reference: New Mexico State Highway and Transportation Department, Drainage Manual, Volume 1, Hydrology, 1995

   25-Year, 24-Hour Storm Event Depth = 3.90 inches

2. SSA Drainage Area

   Reference: WIPP Infiltration Controls Conceptual Design, Gordon Environmental, Inc., March 31, 2003 [Drawing 12]

   Drainage Area ~ 27.5 acres

3. SSE Basin Drainage Area

   Reference: WIPP Infiltration Controls Conceptual Design, Gordon Environmental, Inc., March 31, 2003 [Drawing 12]

   Drainage Area ~ 10.4 acres

4. SPEP Capacity:

   Length of Pond: 425 feet (+/-)
   Width of Pond: 360 feet (+/-)
   Total Depth of Pond = 4 feet (+/-)
   Freeboard = 1 foot

   Pond Capacity = Calculated using Prismoid Equation Excel Worksheet (see **Attachment 1**).

   Pond Capacity = 438,000 ft^3

5. SSE Basin Capacity:

   Length of Basin: 265 feet (+/-)
   Width of Basin: 260 feet (+/-)
   Total Depth of Basin = 5 feet (+/-)
   Freeboard = 1 foot

Basin Capacity ~ Calculated using Prismoid Equation Excel Worksheet (see **Attachment 2**).

Basin Capacity ~251,000 ft^3

Calculation

1. SSA Drainage Basin Runoff Volume

   Assume 100% Runoff (i.e., 0 inches of infiltration) for the entire 27.5 acre basin.

   Volume of Runoff = [27.5 acres] x [43,560 sf/acre] x [3.90 in/12 in/ft] ~ **390,000 ft^3**

2. SSE Drainage Basin Runoff Volume

   Assume 100% Runoff (i.e., 0 inches of infiltration) for the entire 10.4 acre basin.

   Volume of Runoff = [10.4 acres] x [43,560 sf/acre] x [3.90 in/12 in/ft] ~ **147,500 ft^3**

Results

1. The SPEP has more than adequate capacity to store the 25-year, 24-hour storm event runoff without using the available freeboard.

2. The SSE Basin has more than adequate capacity to store the 25-year, 24-hour storm event runoff without using the available freeboard.

ATTACHMENT 1
WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
SPEP Area/Volume Calculation

Width at grade (ft)	360		**Footprint area (acres)**	**=**	**3.5**
Length at grade (ft)	425				
Sideslope:1 (below grade)	3		*Sideslope:1 (above grade)*	0	
Depth (ft)	3		*Height (ft)*	0	
Liner/Cap runout/anchor trench	0				
Width of base (ft)	**=**	**342.0**	**Width of top (ft)**	**=**	**0.0**
Length of base (ft)	**=**	**407.0**	**Length of top (ft)**	**=**	**0.0**
Volume of prismoid below grade (cf) =		**438,129**	**Volume of prismoid above grade (cf) =**		**-**
Volume of prismoid below grade (cy) =		**16,227**	**Volume of prismoid above grade (cy) =**		**-**
Area of "liner" below grade (sf)		**153,747**			
Area of "cap" above grade (sf)		**153,000**			

Total airspace volume (cf) = 438,129
Total airspace volume (cy) = 16,227

ATTACHMENT 2
WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
SSE Basin Area/Volume Calculation

Width at grade (ft)	260		**Footprint area (acres)**	**=**	**1.6**
Length at grade (ft)	265				
Sideslope:1 (below grade)	3		*Sideslope:1 (above grade)*	0	
Depth (ft)	4		*Height (ft)*	0	
Liner/Cap runout/anchor trench	0				
Width of base (ft)	**=**	**236.0**	**Width of top (ft)**	**=**	**0.0**
Length of base (ft)	**=**	**241.0**	**Length of top (ft)**	**=**	**0.0**
Volume of prismoid below grade (cf) =		**251,168**	**Volume of prismoid above grade (cf) =**		**-**
Volume of prismoid below grade (cy) =		**9,303**	**Volume of prismoid above grade (cy) =**		**-**
Area of "liner" below grade (sf)		**69,550**			
Area of "cap" above grade (sf)		**68,900**			
Total airspace volume (cf) =		**251,168**			
Total airspace volume (cy) =		**9,303**			

Appendix A.1.2 – Average Annual Climate Data

WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
EVAPORATION BASIN POTENTIAL
PERFORMANCE BASED ON AVERAGE ANNUAL CLIMATIC DATA

OBJECTIVE:

The purpose of this study was to determine the evaporation potential for the Salt Pile Evaporation Pond (SPEP) and Salt Storage Extension (SSE) Basin to determine if the capacity is adequate to manage the anticipated runoff from the SPEP watershed based on average monthly precipitation and evaporation data.

1.0 CLIMATIC DATA

WIPP is located in southeast New Mexico near Carlsbad, New Mexico. WIPP averages 15 inches of normal precipitation annually (Reference: Western Region Climatic Center, (www.wrcc.dri.edu) 1961-1990 Monthly Climate Summary, Waste Isolation Pilot Plant, New Mexico (299569)) and the dry climate provides a high pan evaporation rate, averaging in excess of 90-inches per year (Reference: Western Region Climatic Center, (www.wrcc.dri.edu) Evaporation Table for the Western United States, Monthly Average Pan Evaporation, Lake Avalon, New Mexico)). Given these two climatic conditions, evaporation is proven to be an effective means for reduction in runoff volumes after collection by the pond. The mean temperature, average rainfall and average evaporation rates by month are provided in **Table A.1.2-1**

TABLE A.1.2-1

AVERAGE MONTHLY TEMPERATURE, PRECIPITATION AND EVAPORATION DEPTHS FOR THE WASTE ISOLATION PILOT PLANT AND VICINITY

Month	Mean Temperature[1] (° F)	Average Precipitation (inches)	Average Evaporation (inches)
January	45.0	0.38	0.0
February	49.7	0.39	0.0
March	55.4	0.29	0.0
April	64.5	0.62	12.36
May	74.1	1.41	14.31
June	81.6	1.95	15.16
July	83.6	2.22	14.14
August	81.6	1.85	12.33
September	75.2	1.85	9.25
October	65.4	0.76	7.26
November	52.5	0.33	0.0
December	44.9	0.85	0.0
Average Annual		**12.90**	**84.81**

Note: 1. Evaporation potential (inches) is assumed to occur above a base temperature ~ 65°F.

2.0 SPEP EVAPORATION POTENTIAL

The dimensions of the SPEP were determined from the WIPP Infiltration Controls Conceptual Design Drawings and are:

- Top of Pond Length = 425 feet (+/-)
- Top of Pond Width = 360 feet (+/-)
- Depth = 4 feet (+/-)
- Sideslopes = 3H:1V

This configuration provides approximately 154,000 ft^2 (See **Attachment 1**) of area for evaporation assuming the pond is allowed a maximum 3-foot of water with a 1-foot freeboard. **Table A.1.2-2** presents the mass balance for the SPEP and assumes the installation and vegetation of the planned 2-foot soil cap over the entire salt pile (18.8 Acres).

The results in **Tale A.1.2-2** indicate that the evaporation pond system will reach a steady state mass balance at the end of the 2nd year of operation from which the same amount of collected stormwater (94,235 ft^3) remains in December of each operating year. This mass balance is based on average monthly values for precipitation and evaporation and will vary depending on wet as well as dryer years.

3.0 SSE BASIN EVAPORATION POTENTIAL

The dimensions of the SSE Basin were determined from the WIPP Infiltration Controls Conceptual Design Drawings and are:

- Top of Pond Length = 265 feet (+/-)
- Top of Pond Width = 260 feet (+/-)
- Depth = 5 feet (+/-)
- Sideslopes = 3H:1V

This configuration provides approximately 70,000 ft^2 (See **Attachment 2**) of area for evaporation assuming the pond is allowed a maximum 4-foot of water with a 1-foot freeboard. **Table A.1.2-3** presents the mass balance for the SSE Basin and assumes 100% runoff of precipitation over the SSE 10.4 (+/-) acreage.

The results in **Table A.1.2-3** indicate that the evaporation pond system will reach a steady state mass balance at the end of the 2nd year of operation from which the same amount of collected stormwater (47,626 ft^3) remains in December of each operating year. This mass balance is based on average monthly values for precipitation and evaporation and will vary depending on wet as well as dryer years.

ATTACHMENT 1
WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
SPEP Area/Volume Calculation

Width at grade (ft)	360		**Footprint area (acres)**	**=**	**3.5**
Length at grade (ft)	425				
Sideslope:1 (below grade)	3		*Sideslope:1 (above grade)*	0	
Depth (ft)	3		*Height (ft)*	0	
Liner/Cap runout/anchor trench	0				
Width of base (ft)	**=**	**342.0**	**Width of top (ft)**	**=**	**0.0**
Length of base (ft)	**=**	**407.0**	**Length of top (ft)**	**=**	**0.0**
Volume of prismoid below grade (cf) =		**438,129**	**Volume of prismoid above grade (cf) =**		**-**
Volume of prismoid below grade (cy) =		**16,227**	**Volume of prismoid above grade (cy) =**		**-**
Area of "liner" below grade (sf)		**153,747**			
Area of "cap" above grade (sf)		**153,000**			
Total airspace volume (cf) =		**438,129**			
Total airspace volume (cy) =		**16,227**			

ATTACHMENT 2
WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
SSE Basin Area/Volume Calculation

Width at grade (ft)	260		**Footprint area (acres)**	**=**	**1.6**
Length at grade (ft)	265				
Sideslope:1 (below grade)	3		*Sideslope:1 (above grade)*	0	
Depth (ft)	4		*Height (ft)*	0	
Liner/Cap runout/anchor trench	0				
Width of base (ft)	**=**	**236.0**	**Width of top (ft)**	**=**	**0.0**
Length of base (ft)	**=**	**241.0**	**Length of top (ft)**	**=**	**0.0**
Volume of prismoid below grade (cf) =		**251,168**	**Volume of prismoid above grade (cf) =**		**-**
Volume of prismoid below grade (cy) =		**9,303**	**Volume of prismoid above grade (cy) =**		**-**
Area of "liner" below grade (sf)		**69,550**			
Area of "cap" above grade (sf)		**68,900**			
Total airspace volume (cf) =		**251,168**			
Total airspace volume (cy) =		**9,303**			

TABLE A.1.2-3

WIPP INFILTRATION CONTROLS - CONCEPTUAL DESIGN
SSE BASIN MASS BALANCE

Month	Average Monthly Temperature (°F)[1]	Average Monthly Precipitation (in)[2]	Runoff Volume (ft^3)[3]	Average Monthly Evaporation (in)[4]	Average Evaporation Potential (ft^3)[5]	First Year Net Monthly Mass Balance (ft^3)[6]	Second Year Net Monthly Mass Balance (ft^3)[6]	Third Year Net Monthly Mass Balance (ft^3)[6]
January	45.0	0.38	14,346	0	0	14,346	61,972	61,972
February	49.7	0.39	14,723	0	0	29,069	76,695	76,695
March	55.4	0.29	10,948	0	0	40,017	87,643	87,643
April	64.5	0.62	23,406	12.36	71,637	0	39,413	39,413
May	74.1	1.41	53,230	14.31	82,938	0	9,705	9,705
June	81.6	1.95	73,616	15.16	87,865	0	0	0
July	83.6	2.22	83,809	14.14	81,953	1,856	1,856	1,856
August	81.6	1.85	69,841	12.33	71,463	235	235	235
September	75.2	1.85	69,841	9.25	53,611	16,465	16,465	16,465
October	65.4	0.76	28,692	7.26	42,078	3,078	3,078	3,078
November	52.5	0.33	12,458	0	0	15,537	15,537	15,537
December	44.9	0.85	32,089	0	0	47,626	47,626	47,626
Total		12.90	487,001	84.81	491,545			

Notes:
1. Evaporation Potential (inches) is assumed to occur above an average monthly temperature base of ~ 65°F.
2. 1986 - 2000 Monthly Climatic Data Summary, Waste Isolation Pilot Plant, New Mexico (299569), Western Region Climatic Center.
3. (10.5 acres) x (43,560 sf/acre) x (Avg. Monthly Precipitation / 12).
4. Western Region Climatic Center, Average Monthly Pan Evaporation Rates, Lake Avalon, New Mexico.
5. (69,550 sf) x (Avg. Monthly Evaporation) [See Attachment 2].
6. [Runoff Volume - Average Evaporation Potential + Previous Months Net Balance]; also assumes pond is empty at the beginning of the first year.

ATTACHMENT B

Excerpts from WIPP 2002 NOI Attachment 4, <u>"Exhaust Shaft: Phase 2 Hydraulic Assessment Data Report Involving Drilling, Installation, Water-Quality Sampling, and Testing of Piezometers 1 – 12"</u>, 1997 surface water TDS measurements from Salt Pile Evaporation Pond and Salt Pile Run-off Ditches.

Notice of Intent

Waste Isolation Pilot Plant
Carlsbad, New Mexico

October 30, 2002

having a slope of 10 percent extends into and divides the pile into two sections (east and west) that are approximately equal in area. Mine safety regulations require that a small berm (about 3 to 4 feet in height) be maintained at the top of the SP to prevent trucks from backing over the edge of the pile during unloading, and there are about 13 acres within the berm.

The SPEP receives run-off from a watershed that includes areas in addition to those in the original design calculations (349,920 cubic feet design requirement, see April 1983 NOI in Attachment 1). The run-off entering the SPEP consists of storm water from portions of the plant site and parking lot and run-off generated from the SP side slopes (approximately 4 acres of surface area) and access ramp. Also, a portion of the plant site run-off is diverted from the south through culverts that feed into the SPEP rather than being directed off-site. The 13 acres within the SP berm do not normally drain to the evaporation pond, and most precipitation either infiltrates or evaporates from the SP surface.

The SPEP capacity is approximately twice the design volume because the actual berm height is 7 feet compared to 3 feet in the original design. Ditches designed to divert storm water from a small area north of the SPEP are not operating at full capacity. There is also minor side slope erosion on the SP and within the run-off ditches, and some accumulation of sediment in the SPEP. However, the erosion, accumulation of sediment, and additional run-off into the SPEP are offset by the over-sized capacity of the SPEP.

Infiltration of water into the SP and SPEP will vary, depending on the intensity of rain and the condition of the ground surface. Actual infiltration on the SP surface depends on rainfall intensity and duration, the age of the salt, the condition of the surface as a result of prior rains, and atmospheric conditions. Field observations indicate that a portion of direct rainfall will penetrate the SP surface, and that subsequent evaporation will be minimal.

Storm water samples collected from the SPEP and SP run-off ditches (these ditches have also been referred to as the SP "moat") in 1997 showed total dissolved solids (TDS) concentrations of 2,630 mg/L and 9,320 mg/L, respectively (see report at Attachment 4).

4.0 Shallow Hydrogeology at the WIPP Site

4.1 Introduction

Shallow subsurface water occurs beneath the WIPP site at a depth of less than 100 feet below ground surface (bgs) at the contact between the lower Santa Rosa Formation and the upper Dewey Lake Formation. This SSW yields generally less than 1 gallon per minute in monitoring wells and piezometers and contains high concentrations of TDS and chlorides. The origin of this water is believed to be primarily from anthropogenic causes, with some contribution from natural sources. The SSW occurs not only under the WIPP site surface facilities but also to the south as indicated by the recent encounter in drillhole C-2737 about a half mile south of the Waste Shaft (Powers, 2002a, see Attachment 8). Figure 1 is a map of the WIPP site showing the location of this drillhole (which was completed as Well C-2737).

Well C-2737 monitors units of the deeper Rustler Formation, and was drilled to replace monitoring Well H-1, which has been plugged and abandoned. Well H-1 monitored water levels within the Culebra and Magenta Dolomite Members of the Rustler Formation. Well H-1, originally drilled and completed in 1978, was replaced because its steel casing was deteriorating and the water level data it was providing on the Magenta Member were suspect. During the

This document was included as Attachment 4 to 10/30/02 NOI

DOE-WIPP 97-2278

EXHAUST SHAFT: PHASE 2 HYDRAULIC ASSESSMENT DATA REPORT INVOLVING DRILLING, INSTALLATION, WATER-QUALITY SAMPLING, AND TESTING OF PIEZOMETERS 1-12

DECEMBER 1997

Waste Isolation Pilot Plant
Carlsbad, New Mexico

Processing and final preparation of this report was performed by the Waste Isolation Pilot Plant Management and Operating Contractor for the U.S. Department of Energy under contract No. DE-AC04-86AL31950

APPENDIX 2

Composition and Origin of Groundwater at the Santa Rosa/Dewey Lake Contact

2.0 Analytical Results for Groundwater and Surface-Water Samples

Appendix A contains analytical results for monitoring-well samples collected from September 1996 through October 1997 and piezometer-well samples collected from July 1997 through October 1997. However, analytical results on monitoring-well samples collected in September of 1996 are not used in the geochemical analysis presented in Section 3.0 because these samples were collected during well development and contained abundant sediment. Therefore, six rounds of data are available for the 3 monitoring wells and three rounds of data are available for 11 of the 12 piezometer wells. Piezometer well PZ-08 is dry and was not sampled. Abundant sediment in PZ-01 shut down the pump and a sample could not be collected during the first-round event. PZ-01 was developed further and a water sample was obtained during the second- and third-round event. The cation and anion charge balance of the samples is good (i.e., within ± 5 %) with the exception of five samples. An assessment of data quality is provided in Appendix A.

A single round of surface-water samples was collected on July 31 and August 1, 1997 after a large thunderstorm event. Surface-water samples were collected from seven locations: a drainage ditch west of the Support Building, Retention Basins A, B, and C, the moat around the salt pile, the salt pile evaporation pond, and the SE corner of the site within the fenced area (Figure 1). The highest TDS values were measured in samples from the salt pile evaporation pond and moat (2,630 to 9,320 mg/L; Appendix A), and the lowest TDS values were recorded for water collected from the retention basins (100 to 165 mg/L; Appendix A). Surface waters collected from the retention basin have excess positive charge balance (i.e., greater than 5 %). Additional details on data quality are provided in Appendix A.

Table A-1 in Appendix A provides a summary of simple statistics for all parameters analyzed. Simple statistics were calculated using reported detection limit values, unless the reported detection limit was greater than reported analyte concentrations. For example, February 1997 results for boron at monitoring well C2505 were reported as less than 1 milligram per liter (mg/L) but in May 1997 were reported as 0.27 mg/L (Table A-1,

TABLE A-1
Analytical Results from WASTREN Laboratory, Grand Junction, Colorado
And Calculation of Simple Statistics

Sample ID	Date	Location	SG	TDS	Cl	SO4	Br		NO3		NH4		TIC	TOC	Na	
			mg/L	mg/L	mg/L	mg/L	mg/L		mg/L		mg/L		mg/L	mg/L	mg/L	
Groundwater Samples																
WST97250/251/252	7/21/97	PZ-12	1.0	4060	1540	404	3.6	B	21.0		0.0070	U	58.9	1.9	386	
WST97253/254/255	7/21/97	PZ-12	1.0	3860	1550	404	3.7	B	21.0		0.0070	U	55.4	2.1	388	
WST97396/397/398	9/10/97	PZ-12	1.0	3290	1430	448	3.2		14.9		0.0335		61.4	5.7	436	
WST97487	10/16/97	PZ-12	1.0	3400	1420	483	4.4		13.9		0.0070	U	53.5	6.4	410	
WST97488/489/490	10/16/97	PZ-12	1.0	3440	1420	481	4.3		13.8		0.0070	U	58.4	8.4	408	
Number of Samples			5	5	5	5	5		5		5		5	5	5	
MEAN			1.0	3610	1472	444	3.8		16.9		0.012		57.1	4.9	406	
Standard Deviation			0.0	332	67	39	0.5		0.1		0.012		3.0	2.8	20	
minimum			1.0	3290	1420	404	3.2		13.8		0.0070		53.5	1.9	386	
maximum			1.0	4060	1550	483	4.4		21.0		0.0335		61.4	8.4	436	
Surface-Water Samples																
WST97274/275/276	7/31/97	DD	1.0	400	15.7	11.9	0.1	U	0.23	B	0.323		17.2	35.8	11.2	
WST97278/279/280	7/31/97	DD	1.0	360	15.6	11.9	0.1	U	0.22	B	0.316		16.9	35.1	11.0	
WST97282/283/284	8/1/97	SPEP	1.0	2760	1490	79.9	0.4	U	0.43	B	0.0276		15.7	6.9	952	
WST97286/287/288	8/1/97	SPEP	1.0	2630	1480	79.9	0.4	U	0.42	B	0.0253		16.4	7.7	950	
WST97290/291/292	8/1/97	SPM	1.0	9320	4990	524	1.0	U	1.9		0.123		5.9	3.1	3200	
WST97293/294/295	8/1/97	RB-A	1.0	100	4.1	4.0	0.1	U	0.16	B	0.0253		13.0	8.4	4.6	B
WST97296/297/298	8/1/97	RB-~~A~~	1.0	143	10.7	10.3	0.1	U	2.6		0.0741		15.4	4.9	8.3	
WST97300/301/302	8/1/97	RB-B	1.0	123	10.9	10.4	0.1	U	2.6		0.0718		16.0	4.6	8.2	
WST97304/305/306	8/1/97	RB-C	1.0	165	12.1	7.0	0.1	U	2.1		0.0950		19.5	4.8	18.9	
WST97308/309/310	8/1/97	SE corner	1.0	180	49.7	18.8	0.1	U	1.4		0.0253		9.6	2.5	30.9	

ATTACHMENT C

Water Level Measurements for January 2003

Waterlevel Measurements
For
January 2003

WELL NUMBER	ZONE	CASING ELEVATION ft amsl	DATE	TIME (MST)	DEPTH TO WATER ft	ADJUST TO TOC ft	ADJUSTED DEPTH TOC ft	ADJUSTED DEPTH METERS	WATER LEVEL ELEVATION ft amsl	ELEVATION IN METERS amsl	ADJUSTED FRESHWATER HEAD ft amsl
AEC-7	CUL	3657.25	01/21/03	07:20	620.19	0.98	619.21	188.74	3038.04	925.99	3060.97
C-2737 (PIP)	CUL	3399.30	01/22/03	11:12	383.03	0.75	382.28	116.52	3017.02	919.59	3017.02
CB-1	CUL	3328.38	01/21/03	13:05	347.61	0.93	346.68	105.67	2981.70	908.82	2985.56
DOE-1	CUL	3466.04	01/21/03	13:24	487.57	0.00	487.57	148.61	2978.47	907.84	3007.10
ERDA-9	CUL	3410.10	01/22/03	11:00	400.89	0.65	400.24	121.99	3009.86	917.41	3025.37
H-02b2	CUL	3378.31	01/23/03	08:46	339.50	0.00	339.50	103.48	3038.81	926.23	3041.17
H-03b2	CUL	3390.03	01/21/03	13:42	389.61	0.00	389.61	118.75	3000.42	914.53	3011.82
H-04b	CUL	3333.35	01/21/03	14:27	331.59	0.00	331.59	101.07	3001.76	914.94	3005.36
H-05b	CUL	3506.04	01/21/03	08:10	477.08	0.00	477.08	145.41	3028.98	923.23	3073.90
H-06b	CUL	3348.25	01/22/03	08:00	294.00	0.00	294.00	89.61	3054.25	930.94	3066.49
H-07b2	CUL	3165.07	01/20/03	09:40	167.66	0.00	167.66	51.10	2997.41	913.61	2997.32
H-10c	CUL	3688.64	01/20/03	11:45	663.04	0.00	663.04	202.09	3025.60	922.20	3025.60
H-11b4	CUL	3410.89	01/21/03	12:15	426.40	0.00	426.40	129.97	2984.49	909.67	3004.56
H-12	CUL	3427.19	01/20/03	12:25	456.40	0.00	456.40	139.11	2970.79	905.50	3008.16
H-17	CUL	3385.31	01/21/03	12:30	422.05	0.00	422.05	128.64	2963.26	903.20	3012.70
H-19b0	CUL	3418.38	01/23/03	09:09	427.44	0.00	427.44	130.28	2990.94	911.64	3012.79
P-17	CUL	3337.24	01/21/03	12:45	353.25	0.54	352.71	107.51	2984.53	909.68	2998,78
WIPP-12	CUL	3472.06	01/22/03	10:30	438.66	0.00	438.66	133.70	3033.40	924.58	3070.32
WIPP-13	CUL	3405.71	01/22/03	09:44	347.72	0.00	347.72	105.99	3057.99	932.08	3068.58
WIPP-19	CUL	3435.14	01/22/03	10:37	393.92	0.00	393.92	120.07	3041.22	926.96	3079.15
WIPP-21	CUL	3418.96	01/22/03	10:52	401.58	0.00	401.58	122.40	3017.38	919.70	3041.62
WIPP-22	CUL	3428.12	01/22/03	10:44	396.60	0.00	396.60	120.88	3031.52	924.01	3062.71
WIPP-25 (PIP)	CUL	3214.39	01/20/03	08:12	152.46	0.42	152.04	46.34	3062.35	933.40	3059.26
WIPP-26	CUL	3153.20	01/20/03	08:42	130.21	0.00	130.21	39.69	3022.99	921.41	3023.13
WIPP-27 (PIP)	CUL	3178.98	01/20/03	07:24	96.51	0.42	96.09	29.29	3082.89	939.66	3089.00
WIPP-29	CUL	2978.26	01/20/03	09:09	11.17	0.00	11.17	3.40	2967.09	904.37	2970.26
WIPP-30 (PIP)	CUL	3429.05	01/22/03	07:02	359.12	0.70	358.42	109.25	3070.63	935.93	3077.78
WQSP-1	CUL	3419.20	01/22/03	08:16	364.05	0.16	363.89	110.91	3055.31	931.26	3072.07
WQSP-2	CUL	3463.90	01/22/03	10:00	402.87	0.16	402.71	122.75	3061.19	933.05	3081.01
WQSP-3	CUL	3480.30	01/22/03	10:18	467.41	0.16	467.25	142.42	3013.05	918.38	3070.36
WQSP-4	CUL	3433.00	01/23/03	09:00	444.80	0.16	444.64	135.53	2988.36	910.85	3013.38
WQSP-5	CUL	3384.40	01/23/03	09:17	380.57	0.16	380.41	115.95	3003.99	915.62	3011.07
WQSP-6	CUL	3363.80	01/23/03	09:25	346.88	0.16	346.72	105.68	3017.08	919.61	3020.83
C-2737 (ANNULUS)	MAG	3399.30	01/22/03	11:18	258.00	0.00	258.00	78.64	3141.30	957.47	
H-02b1	MAG	3378.46	01/23/03	08:40	231.96	0.00	231.96	70.70	3146.50	959.05	
H-03b1	MAG	3390.64	01/21/03	13:37	260.48	0.00	260.48	79.39	3130.16	954.07	
H-04c	MAG	3334.04	01/21/03	14:14	191.19	0.00	191.19	58.27	3142.85	957.94	
H-05c	MAG	3506.04	01/21/03	08:18	349.12	0.00	349.12	106.41	3156.92	962.23	
H-06c	MAG	3348.52	01/22/03	07:49	282.99	0.00	282.99	86.26	3065.53	934.37	
H-08a	MAG	3432.99	01/20/03	10:38	406.02	0.00	406.02	123.75	3026.97	922.62	
H-10a	MAG	3688.67	01/20/03	11:53	468.53	0.00	468.53	142.81	3220.14	981.50	
WIPP-25 (ANNULUS)	MAG	3214.39	01/24/03	13:00	162.40	0.00	162.40	49.50	3051.99	930.25	
H-03d/DL (PVC)	DL	3390.01	01/21/03	13:52	317.12	2.22	314.90	95.98	3075.11	937.29	
WQSP-6a	DL	3364.70	01/23/03	09:32	167.11	0.25	166.86	50.86	3197.84	974.70	
H-08c	RUS/SAL	3432.90	01/20/03	10:45	453.00	0.00	453.00	138.07	2979.90	908.27	
AEC-8	B/C	3537.10	01/21/03	07:50	472.69	0.00	472.69	144.08	3064.41	934.03	
CB-1 (PIP)	B/C	3328.38	01/21/03	13:00	314.80	1.03	313.77	95.64	3014.61	918.85	
C-2505	SR/D	3413.05	01/23/03	11:03	45.61	0.00	45.61	13.90	3367.44	1026.40	
C-2506	SR/D	3412.87	01/23/03	11:07	45.02	0.00	45.02	13.72	3367.85	1026.52	
C-2507	SR/D	3410.01	01/23/03	11:00	45.66	0.00	45.66	13.92	3364.35	1025.45	
C-2811	SR/D	3398.92	01/22/03	11:25	60.59	0.00	60.59	18.47	3338.33	1017.52	
PZ-01	SR/D	3413.41	01/23/03	11:14	42.62	0.00	42.62	12.99	3370.79	1027.42	
PZ-02	SR/D	3413.42	01/23/03	11:11	44.00	0.00	44.00	13.41	3369.42	1027.00	
PZ-03	SR/D	3416.15	01/23/03	11:24	45.59	0.00	45.59	13.90	3370.56	1027.35	
PZ-04	SR/D	3412.10	01/23/03	11:18	47.70	0.00	47.70	14.54	3364.40	1025.47	
PZ-05	SR/D	3416.31	01/23/03	11:26	43.30	0.00	43.30	13.20	3372.01	1027.79	
PZ-06	SR/D	3413.49	01/23/03	11:35	43.71	0.00	43.71	13.32	3369.78	1027.11	
PZ-07	SR/D	3413.99	01/23/03	10:34	37.82	0.00	37.82	11.53	3376.17	1029.06	
PZ-09	SR/D	3421.21	01/23/03	10:26	57.56	0.00	57.56	17.54	3363.65	1025.24	
PZ-10	SR/D	3405.80	01/23/03	09:53	38.08	0.00	38.08	11.61	3367.72	1026.48	
PZ-11	SR/D	3418.95	01/23/03	10:40	45.74	0.00	45.74	13.94	3373.21	1028.15	
PZ-12	SR/D	3408.99	01/23/03	10:04	53.51	0.00	53.51	16.31	3355.48	1022.75	
H-09c	MAG	3407.30	01/20/03	11:07	273.21	0.00	273.21	83.27	3134.09	955.27	

* Density data not acquired, therefore adjusted freshwater head measurements cannot be calculated for these wells.

ATTACHMENT D

Excerpt from WIPP 2002 NOI, Table 1, Analytical Results for Shallow Subsurface Water, December 2001

Table 1. Analytical results for Shallow Subsurface Water, December 2001

Parameter	Units	C-2505	C-2506	C-2507	Dup.	C-2811	PZ-1
Ammonium	mg/L	0.097	0.0967	<0.0042	0.0075	<0.0042	0.0699
Arsenic	mg/L	<0.003	<0.003	0.0015	0.0017	0.0014	<0.003
Barium	mg/L	0.103	0.0914	0.0377	0.0386	0.0934	0.125
Boron	mg/L	0.17	0.12	0.27	0.25	0.17	0.079
Bromide	mg/L	9.9	9.5	5.3	5.6	2.8	19.2
Cadmium	mg/L	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.001
Calcium	mg/L	943	1250	418	431	283	4250
Chloride	mg/L	6230	9240	1300	1330	956	33100
Chromium	mg/L	0.0141	0.0099	0.0491	0.0535	0.0017	0.0108
Iron	mg/L	<0.008	<0.008	<0.0008	<0.0008	<0.0008	<0.008
Lead	mg/L	0.0048	<0.001	0.00012	<0.0001	<0.0001	<0.001
Magnesium	mg/L	646	820	337	331	207	2310
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0016
Nitrate	mg/L	23.2	23.2	26	25.7	27.9	4.9
Nitrite	mg/L	0.0165	<0.0082	0.0139	0.0156	0.0147	<0.0082
pH		7.28	7.2	7.61	7.42	7.56	6.94
Potassium	mg/L	11.3	14.5	6.5	6.5	4.6	32
Selenium	mg/L	0.112	0.0447	0.075	0.0698	0.0243	0.0753
Silicon	mg/L	22.7	22.3	25	25	22.3	19.4
Silver	mg/L	<0.001	<0.001	<0.0001	0.00012	<0.0001	<0.001
Sodium	mg/L	2030	3230	328	329	163	12700
Specific Gravity	mg/g	1.01	1.01	1	1	1	1.04
Sulfate	mg/L	1290	1300	940	970	379	1610
Total Dissolved Solids	mg/L	13000	18000	4170	4180	2630	62200
Total Inorganic Carbon	mg/L			75.1	75.8	49.5	
Total Organic Carbon	mg/L			3	2.9	1.4	
Total Suspended Solids	mg/L	<20	<20	<20	<20	<20	<20
Zinc	mg/L	<0.05	<0.05	0.0438	0.0386	0.0357	<0.05

ATTACHMENT E

The December 31, 2002 letter from C. Marshall of the GWQB to I. Triay of WIPP, requested the following items:

1. "*NMED recommends that a subsurface geologic map be constructed at the unconformity that extends from the top of the Santa Rosa Formation along the base of the Gatuna Formation. This map should aid in understanding the relationship between the SSW and the extent of the Santa Rosa Formation*".

   A map showing the elevation of the erosional base of the Gatuna Formation is attached to this DP Application (Figure E1).

2. *An isopach map of the Santa Rosa Formation may also be helpful*".

   An isopach map of the Santa Rosa Formation is attached to this DP Application (Figure E2).

3. "*Please provide an updated potentiometric map reflecting the most recent water level measurements for the SSW*".

   A potentiometric surface map depicting recent water level data is attached to this DP Application (Figure E3).

4. "*...a more detailed analysis and discussion, as well as an updated TDS isoconcentration map would be helpful in explaining the high TDS concentrations in and around PZ-9 and PZ-3*".

   An updated TDS isoconcentration map is attached to this application (Figure E4). The analytical results used to generate this map were from samples obtained during December 2002. The current hydrologic conceptual model for the anthropogenic subsurface water (SSWa) was developed based on the potentiometric surface map.

   Focused recharge to the SSWa has occurred through the salt pile (SP) and salt pile evaporation pond (SPEP). Recharge has occurred through precipitation and through historical discharges (WIPP NOI 2002) in the vicinity of the SPEP and SP, creating a mound of water where vertical movement is impeded by cementation changes at the Santa Rosa Formation and Dewey Lake Redbeds Formation contact. Flow from this area is believed to be multidirectional.

   TDS concentrations generally decrease in a radial direction from the SPEP and SP. Piezometer PZ-9 is close to the SP and the TDS concentration is high in this well and compared to the other locations. Additionally, it appears that wells located predominantly down gradient, but immediately adjacent to focused "clean" recharge sources, are being diluted more than others away from such focused recharge points. For example, PZ-10 is near the storm water detention basin and exhibits a low TDS concentration. TDS concentrations for PZ-3 during this latest round of sampling indicated a significant decrease when compared to previous sampling rounds, but remains among the greatest TDS, along with wells nearest the SP (PZ-7, PZ-5, PZ-6). This follows the trend of decreased TDS as a function of distance from the SP/SPEP.

5. "*It is noted that the TDS concentrations in the Barn Well are significantly lower than those in the Ranch Well. If possible, please provide an explanation for this difference*".

   Locally the TDS concentration in the Dewey Lake Redbeds Formation is highly variable due to isolated occurrence of saturation and limited recharge and mixing of freshwater.

   As noted in Section 2.5.2 of the October 30, 2002 WIPP NOI, TDS concentrations are higher in the Ranch Well than the Barn Well. The Ranch Well is located on the J.C. Mill Ranch adjacent to the ranch corral and used only to water livestock. The corral is actively used for containment of livestock. The Mills Ranch also maintains livestock drinkers and water holding tanks, supplied by the Ranch Well, near the corral. The well is reported to be over 50 years of age (personal communication with Dennis Powers). The Barn Well provides water for domestic uses (WIPP CCA, Appendix USDW).

ATTACHMENT E FIGURES

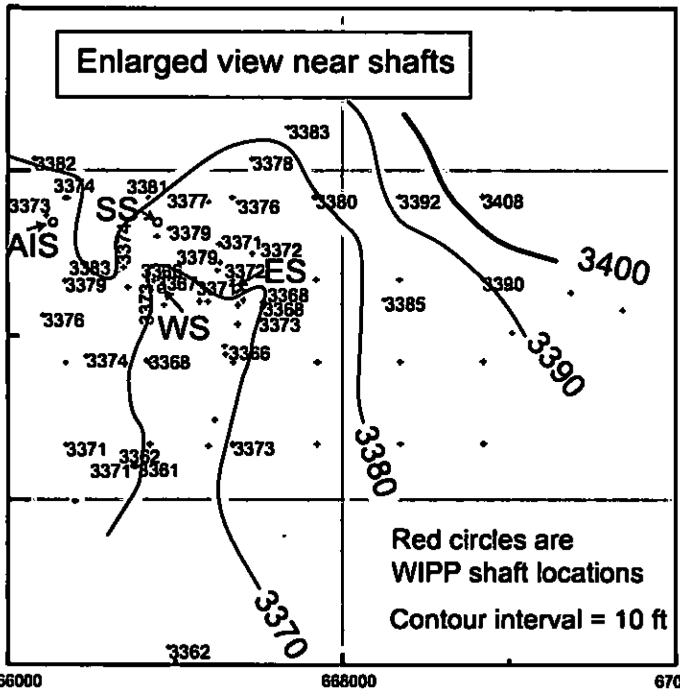
FIGURE E1 – Elevation of Base of Gatuna Formation in the vicinity of WIPP

FIGURE E2 – Thickness of Santa Rosa Formation in the vicinity of WIPP

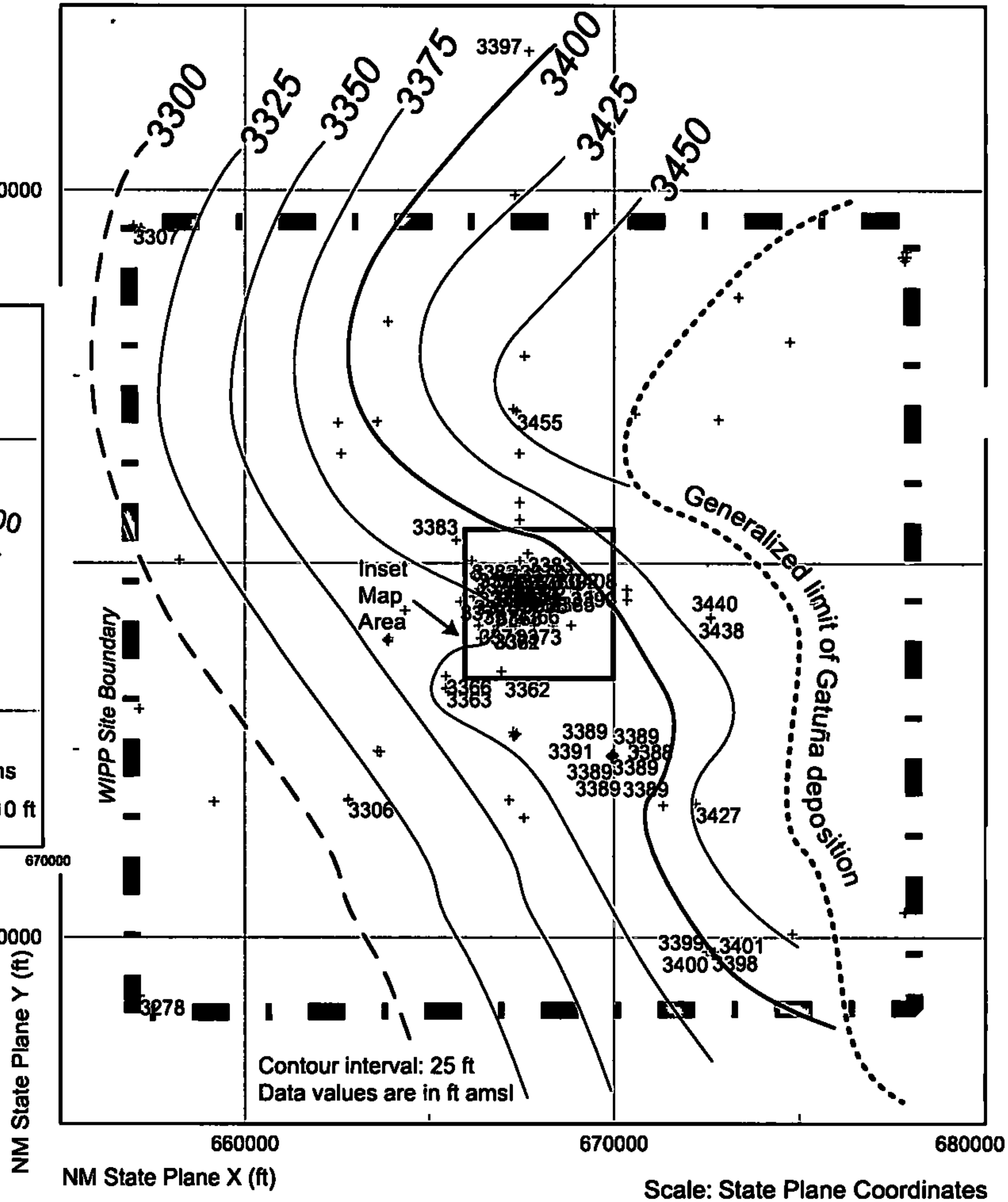
FIGURE E3 – Potentiometric Surface Map, Shallow Subsurface Water (SSW), January 2003

FIGURE E4 – Shallow Subsurface Water (SSW) Total Dissolved Solids (TDS) Isoconcentration Map, December 2002

Elevation (ft amsl) of (erosional) Base of Gatuña Formation in the Vicinity of WIPP



Scale: State Plane Coordinates
10,000 ft. Grids



Scale: State Plane Coordinates
2,000 ft. Grids

Figure E1
Elevation (ft amsl) of (erosional) Base of Gatuna Formation in the Vicinity of WIPP

Washington
Regulatory and Environmental Services

Thickness (ft) of Santa Rosa Formation in the Vicinity of WIPP

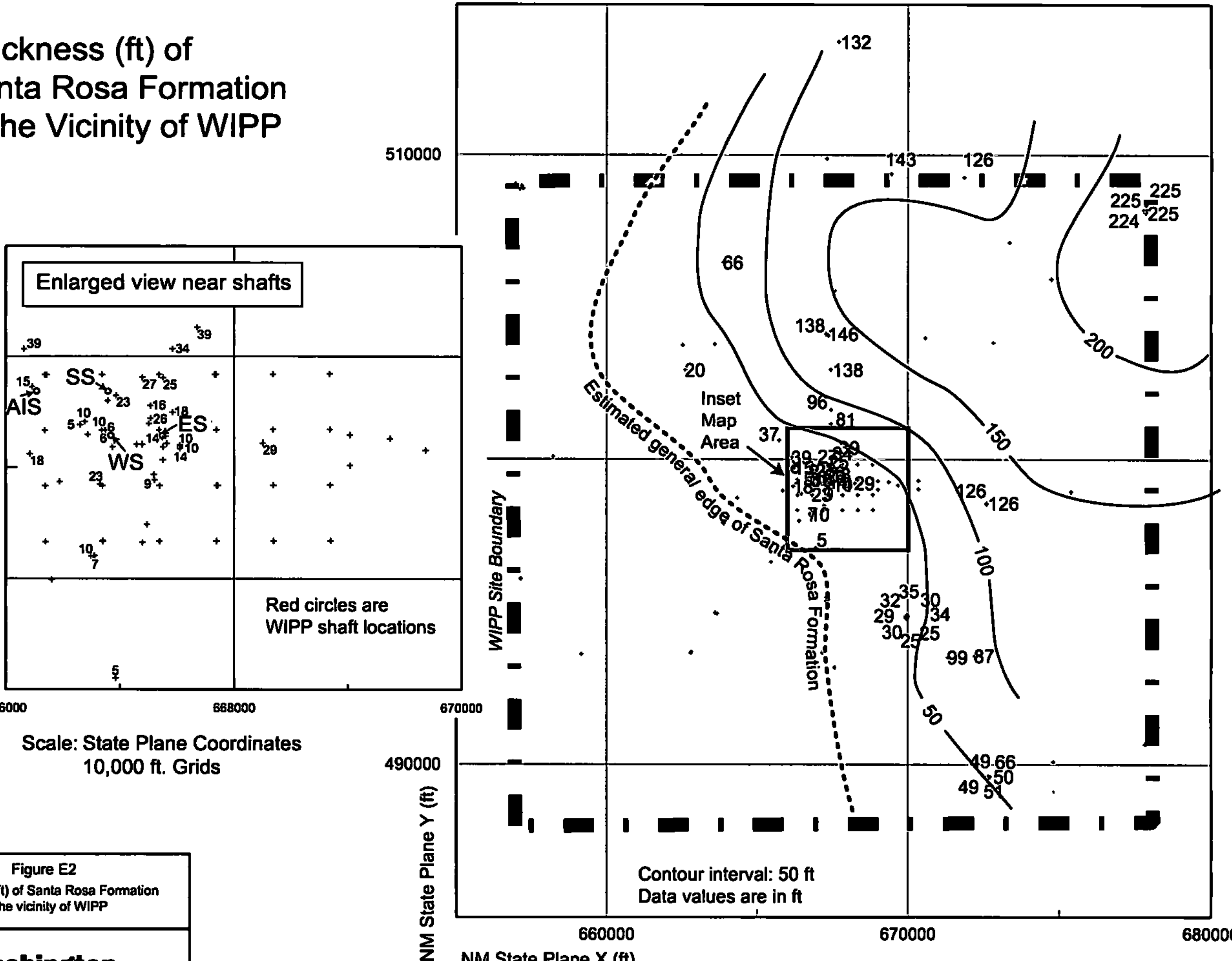


Figure E2
Thickness (ft) of Santa Rosa Formation in the vicinity of WIPP

Washington
Regulatory and Environmental Services

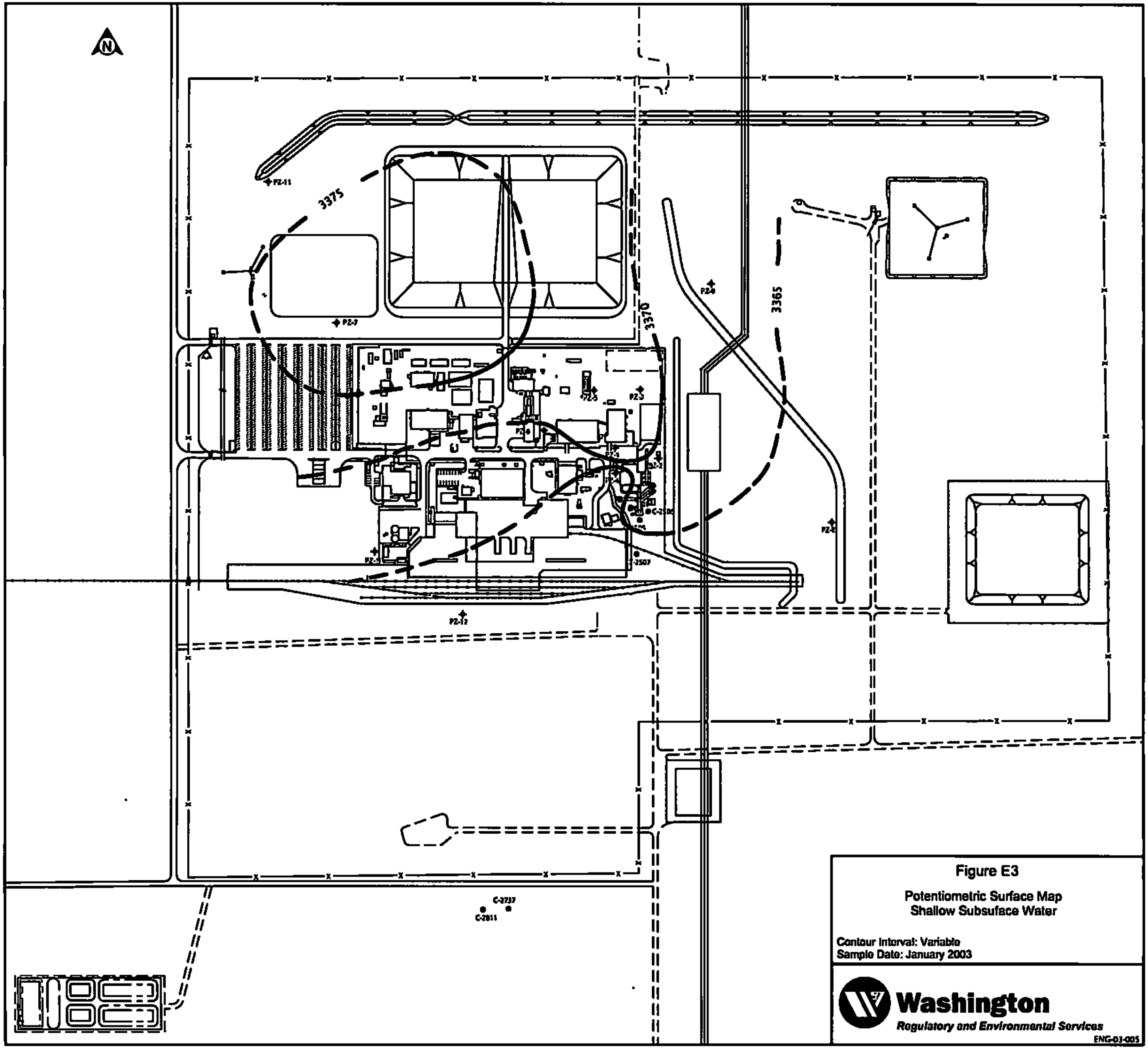


Figure E3

Potentiometric Surface Map
Shallow Subsuface Water

Contour Interval: Variable
Sample Date: January 2003

Washington
Regulatory and Environmental Services

ENG-03-005

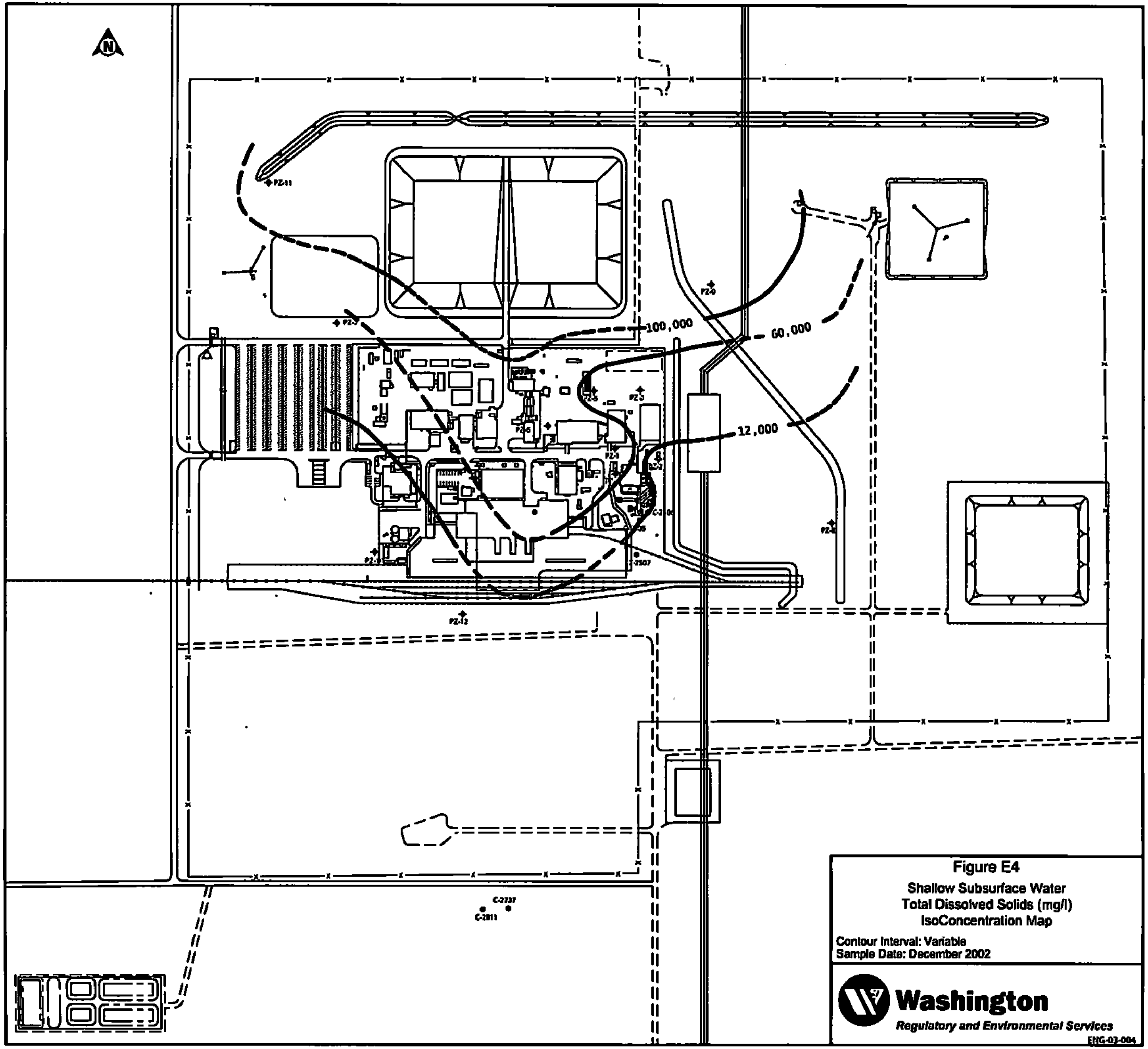


Figure E4
Shallow Subsurface Water
Total Dissolved Solids (mg/l)
IsoConcentration Map

Contour Interval: Variable
Sample Date: December 2002

Washington
Regulatory and Environmental Services

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
March 10, 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

RECEIVED
MAR 1 4 2005

Subject: Proposal for Inspection of WIPP Sewage Lagoon System

Dear Mr. Marshall:

The purpose of this letter is to provide you our proposal for inspection of the Waste Isolation Pilot Plant (WIPP) Sewage Lagoon Liner Systems using electronic methods. During your inspection of the WIPP Site on August 11, 2004, you requested that the Department of Energy (DOE) provide you with a plan for inspecting the geo-membrane liners of each of the seven lagoons that comprise the WIPP Sewage Lagoon System.

DOE proposes that the WIPP Management and Operating Contractor, Washington TRU Solutions (WTS) place a contract with a service provider capable of providing professional engineering services which uses electronic leak location detection methods to locate leaks in geo-membrane lined facilities. Literature is provided as Enclosure 1 that discusses this process. In addition to this work, WTS will collect sample coupons of membrane liner that is above the water line from each of the seven lagoons. These coupons will be subjected to laboratory testing to determine its condition and to evaluate the ability of the geo-membrane to continue to perform its intended function.

The WIPP sewage treatment facility is located on the southwest side of the WIPP Site and is surrounded by a chain-link fence topped by out riggers to discourage intrusion. The primary function of the WIPP sewage lagoon system is to provide for the collection and treatment of sewage effluent from WIPP facilities. Collection of the sanitary waste is through a buried gravity flow system. The influent to the sewage lagoon system is treated in one of two parallel trains, each consisting of one primary settling pond and one polishing pond. The polishing ponds discharge to a common evaporation pond (Evaporation Pond A). Two additional ponds (Evaporation Pond B and Evaporation Pond C) provide for additional capacity as needed to evaporate effluent from Pond A. See Figure 1 enclosed for an illustration of the layout of the seven ponds. The sewage lagoon system is designed to meet applicable American Society of Civil Engineers and the Water Pollution Control Federation design criteria and WIPP maintains operators certified in accordance with 20.7.4.20 NMAC.

The stabilization lagoons and evaporation ponds are approximately 6 feet and 7 feet deep, respectively, with a 3:1 slope. The two primary settling cells and the two polishing cells are lined with a single 30 millimeter Hypalon™ liner. The three effluent evaporation ponds are lined with a single medium density polyethylene liner. The liners

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for the original two settling ponds and two polishing ponds were constructed in 1985 with liners installed on 4-6 inches of sand over compacted caliche. Evaporation Pond A was originally lined only with compacted caliche. In 1992, a synthetic liner was installed in Evaporation Pond A and Evaporation Ponds B & C were constructed with liners installed on 4-6 inches of bentonite over compacted caliche.

WTS conducts a visual inspection of the sewage lagoon and evaporation pond liners weekly; however, only the exposed portion of the liner is visually inspected. During your inspection on August 11, 2004, you expressed concern that this may not be sufficient to determine if leaks from the lagoons have occurred. You requested that DOE provide you a plan to inspect the lagoons for leaks in approximately 6 months from the date of inspection.

DOE has reviewed several approaches, including the removal of all liquid and sludges from the lagoons to allow inspection of the geomembrane liners. It is our understanding that this is both an arduous task and frequently does not find all leaks present. There is the further concern that the process of sludge removal may cause damage to the geomembrane liner. DOE has determined that a process for geomembrane liner leak detection called the electrical leak location method has been used successfully in New Mexico in nearby municipal landfills. Information available indicates this is a dependable method for determining leaks beneath the surface in lagoons and landfills where the synthetic liners are covered and not readily inspectable. The process is nondestructive and does not present hazards to the geomembrane liners as may occur from more aggressive inspections requiring removal of water and sludges. The process utilizes electrical paths through leaks in a geomembrane liner and meets ASTM Standard. D-6747-04, *Standard Guide for Selection of Techniques for Electrical Detection of Potential Leak Paths in Geomembranes.*

In the leak detection process, a voltage is applied to an electrode placed in the soil or water covering the liner and to an electrode placed in the earth ground. The liner serves as an electrical insulator; therefore, if there are leaks in the liner, the imposed current produces localized anomalous areas of high current density near the leaks. Electrical measurements are then made on the soil or in the water to locate these points of current flow through the leaks (see Figure 2 enclosed). The precision of the process can be as close as 1" from the actual leak, dependent on conditions present. This method of leak detection has recently been used at other locations in southern New Mexico and several DOE facilities around the country.

The information obtained will be used to determine whether any leaks in the liners are present, if the liner materials are repairable, or that replacement is needed. Subject to vendor availability and the concurrence of your office, WIPP proposes to conduct the leak tests and laboratory analyses during calendar year 2005. DOE will notify the New Mexico Environment Department (NMED) of the dates work is to be performed. Should NMED have interest in observing this work, you presence is welcome.

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A report of the integrity of the liners, any immediate action that is planned to be taken, and future actions required to maintain the sewage lagoon system will be provided to the NMED within 90 days of the contractor's report.

Your approval of this proposal would be appreciated. We will proceed with the procurement of a contractor to perform the evaluation of the sewage lagoon liners on receipt of this approval.

If you have any questions pertaining to this subject, please contact Mr. Jody Plum at (505) 234-7462.

Sincerely,

Inés Triay

Inés Triay
Acting Manager

Enclosure

cc: w/enclosure
S. Zappe, NMED
J. Bearzi, NMED
M. Leavitt, NMED
D. Pepe, NMED-AIP
T. Klein, NMED-AIP
CBFO M&RC

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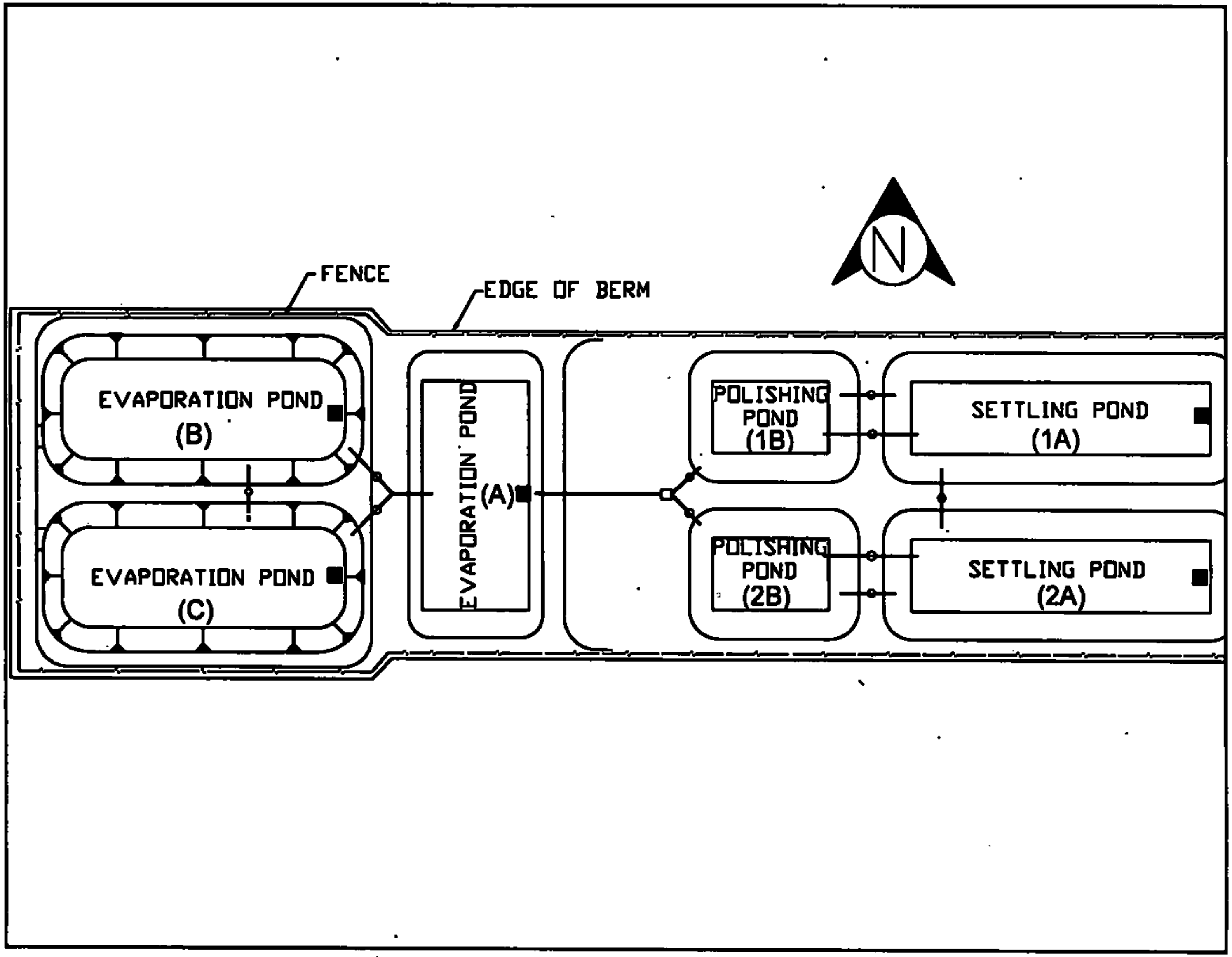
Figure 1



WASTE ISOLATION PILOT PLANT FACULTATIVE LAGOON SYSTEM

Leak Location Services, Inc.

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Geomembrane Liner Leak Detection for Landfills, and Surface Impoundments

QUALITY CONTROL / QUALITY ASSURANCE
ASTM STANDARD D-6747 TESTING

An International Company Specializing in Electrical Leak Location Surveys of Geomembrane Liners

Cutting Holes for Testing?

or

Testing for Holes and Cuts?

Do you have it backwards?

The industry is changing the erroneous rationale of focusing on testing seams that almost never fail in service while ignoring actual holes in the geomembranes.

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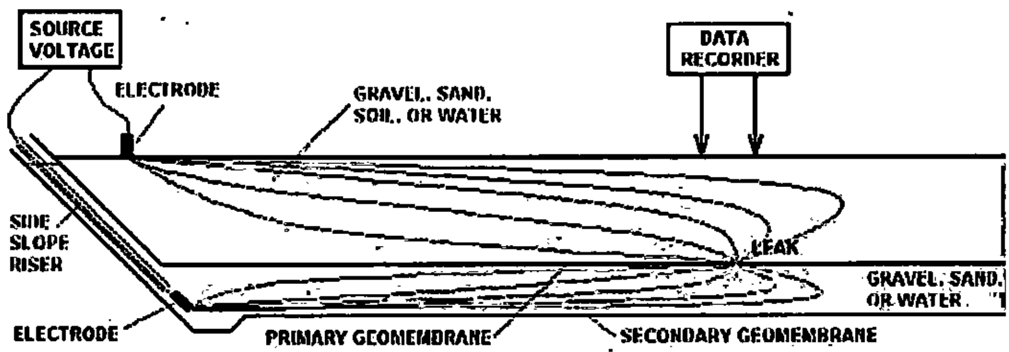
The electrical leak location method is a powerful tool used to detect electrical paths through leaks in a geomembrane liner. A voltage is applied to an electrode placed in the soil or water covering the liner and to an electrode placed in the leak detection zone for double-lined systems or connected to earth ground for single-lined systems. Because the geomembrane liner is an electrical insulator, current will flow only through leaks in the liner. This current produces localized anomalous areas of high current density near the leaks. Electrical measurements are then made on the soil or in the water to locate these points of current flow through the leaks.

The electrical leak location method is suitable for liquid impoundments and tanks, as well as pre-service inspection of solid waste landfills. Electrical leak location surveys are conducted on the primary or secondary geomembrane liners with water or soil covering the liner. Surveys with soil on the liner are important to detect leaks caused by machinery used to emplace the soil cover.

With the proper implementation of equipment and survey procedures the electrical leak location method can easily detect and locate 0.001 square inch (0.6 square mm) leaks in liners covered with water and 0.01 square inch (6 square mm) leaks in liners covered with 2 feet (600mm) of soil. The amplitude of the leak signal is proportional to the amount of electrical current flowing through the leak in the liner. LLSI maximizes this current by using a high voltage power supply that can provide up to 300 volts DC, depending on the current requirement.



Click image to see larger size

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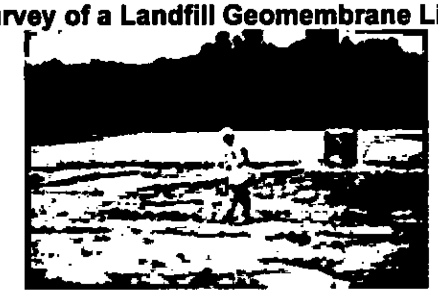
An electrical leak location survey of the soil-covered geomembrane of a newly constructed landfill is a very cost effective method for finding leaks that occur while placing a protective soil cover over the geomembrane liner. Damage caused by heavy machinery while installing earth materials on geomembranes is the most significant cause of damage to geomembranes. The method has a distinct advantage because the testing is done after the final construction and after the geomembrane liner has been subjected to construction and loading activity.

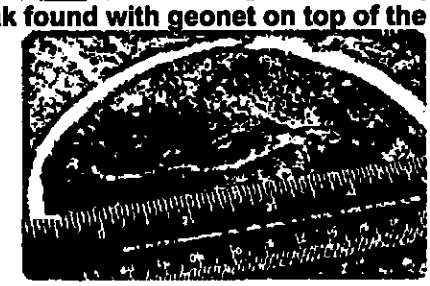
Surveys with soil on the liner are conducted by making point-by-point electrical measurements on the soil. The data is recorded in a portable data acquisition logger and then downloaded to a portable computer for processing and data analysis. When a suspect area is indicated in the processed data, manual measurements are taken to further localize the leak. *Click image to see larger size*

Survey of a Landfill Geomembrane Liner



Below are some of the leaks that have been found by LLSI at several sites.

1/8" leak found with geonet on top of the primary.



1 inch leak found on a panel

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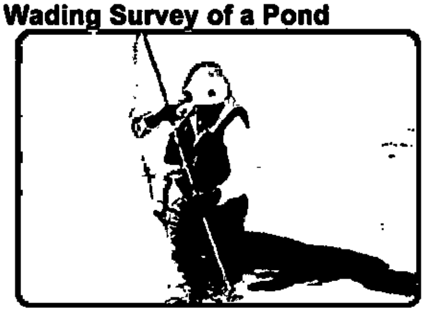
Geomembrane leak location surveys of surface impoundments and tanks can be conducted with water covering the geomembrane. Surveys are conducted using a probe while wading or standing on the side slopes, or using a sensor that is towed across the impoundment.

Wading Survey Mode

For the wading survey mode the survey personnel wade in the water and systematically scan the submerged liner to locate any leaks. For this method a water depth of between six and 30 inches (150 and 750 mm) is required. Temporary survey lanes are established across the bottom and are scanned with overlapping coverage. The liner field seams that can be located are double-checked. When detected, leaks are located to within one inch (25 mm) or less and immediately marked. The side slopes can be surveyed with deeper water using a long probe that is systematically scanned along the side slopes.

Wading Survey of a Pond



Towed Probe Survey Mode

If the water in the geomembrane lined pond, impoundment, or tank is too deep or the water in the pond is unsuitable for personnel to wade, then the towed probe survey mode is used. While standing on the top of the side slopes, survey personnel systematically pull the probe back and forth across the bottom of the pond along temporary survey lines. When detected, the distances to the leaks are immediately marked on the liner of the closer side slope.

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Bare Liner Surveys

To avoid the logistics of flooding the geomembrane with water, the exposed geomembrane can be tested for leaks using a water puddle test. This test is used on geomembranes that are in direct contact with the supporting sub-grade or a GCL.

The bare liner test is to detect electrical current flowing through a hole in the geomembrane liner using a small amount of water that is temporarily placed in contact with the liner using a squeegee. One output of an LLSI power supply is connected to earth ground or the GCL and the second output is connected to the scanning sensor through an LLSI electronic leak detection unit. When the water in the leak contacts earth ground or the gcl, a circuit is established and the electrical current will increase. The LLSI electronic leak detector unit converts the increase in the current to an audible tone indicating the presence of leak.

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GENERAL

- Tests are performed by an independent testing company for an objective evaluation
- Proven technology that has been successfully used for more than 18 years.
- Strongly encouraged or required by state regulatory agencies.
- Does not require specialty, sole source liner

FOR LANDFILLS

- Tests after protective sand or gravel is put on the liner to detect leaks caused by heavy equipment
- Tests double wedge welded seams

FOR SURFACE IMPOUNDMENTS AND TANKS

- Test under hydrostatic load to detect leaks caused by loading
- Does not require emptying or cleaning the facility
- Tests double wedge welded seams

FOR BARE GEOMEMBRANES

- Does not require flooding with water
- Can be performed during construction

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COMPARISON OF LEAK LOCATION SURVEY MODES

Survey Mode	Applications	Typical Sensitivity	Typical Accuracy	Advantages	Limitations
Wading Survey	Bottom of impoundments, sumps	0.001 square inch	1 inch	Most sensitive, tests under load, can be for in-service testing	Geomembrane must be flooded with water
Towed Sensor Survey	Impoundments with deep water or side slopes	0.001 square inch	24 inches	Deep or foul water surveys, can be for in-service testing	Accuracy of leak position, geomembrane must be flooded with water
Long Probe Survey	Side slopes of impoundments	0.001 square inch	2 inches	More accurate than towed survey	May require second mobilization
Surveys with Soil	Landfills, landfill caps, and heap leach pads	0.01 square inch	Half of thickness of soil cover, leaks are uncovered and exactly located	Detects leaks under soil, detects construction damage after high potential for damage is gone	Soil must have some moisture
Bare Liner Survey	Bare liners	0.001 square inch	Leaks are exactly located	Does not require flooding liner with water, can be done as construction progresses	Not as reliable for patches or tortuous leak paths, or for geomembranes with wrinkles, bridging, or desiccated subgrade
Electrical Leak Imaging and Monitoring System (ELIM)	Pre-installed monitoring system	0.1 to 1 percent of electrode spacing	10 percent of electrode spacing	Detects leaks under waste, continuous monitoring	Must be installed during liner installation, higher cost

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Leak Location Services, Inc. (LLSI) provides worldwide professional services for locating leaks in geomembrane-lined facilities. We use a time-proven electrical leak location method that is very accurate and highly sensitive. LLSI has affiliate companies in the United Kingdom and Canada allowing leak location field crews to quickly mobilize to anywhere in the world.

The development of the leak location method began in 1980 and the method has been in commercial use since 1985. Leak location surveys are used for construction quality assurance or to solve a leakage problem in lined landfills, impoundments, or tanks. LLSI founders Daren L. Laine and Glenn T. Darilek, P.E. are the pioneers in the development and commercial application of the electrical leak location method. Using specialized equipment designed and built by LLSI, the highly qualified and trained staff provide unrivaled know-how and technical expertise to verify their integrity or solve a liner leakage problem.

Leak Location Services, Inc. worldwide experience includes projects completed in thirteen countries on five continents.

- **Key members in the technical and commercial application of the electrical leak location method since 1981.**
- **Published more than 25 technical papers about the leak location method and applications.**
- **Holds five patents on the method.**
- **Performs about 100 leak location surveys of a total of more than 17 million square feet every year.**
- **Surveyed more than 75 million square feet of geomembrane liner at over 500 project sites.**
- **HAZWOPER trained.**
- **Trained for confined space entry.**
- **MSHA trained.**

Contact Us: results@llsi.com

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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
March 10, 2005

Mr. Steve Zappe, WIPP Project Leader
Hazardous Waste Permits Program
Hazardous Waste Bureau
New Mexico Environment Department
2905 E. Rodeo Park Dr., Bldg. 1
Santa Fe, New Mexico 87505-6303

Subject: Stained Soils Found in the Parking Area During Excavation for the TRUPACT Sun Shade Structure

Dear Mr. Zappe:

The purpose of this letter is to provide follow-up information concerning the stained soils noted during construction of the TRUPACT Sun Shade Structure (Enclosure 1). On February 14, 2005, the Department of Energy (DOE) and Washington TRU Solutions (WTS) notified you that stained soil had been found in two of the 15 footing excavations. These excavations are located within the Parking Area Unit (PAU) as described in the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP) that is paved over the area of Solid Waste Management Unit (SWMU) 005a (Enclosure 2). This SWMU was a concrete batch plant operated during the construction of several buildings at the WIPP facility. SWMU 005a is characterized in Revision 3 of the WIPP RCRA Permit Application as follows:

> "The only releases at these sites consist of spillage that occurred during filling of the trucks and stockpiling materials. The material released was water mixed with concrete, sand, and gravel and is considered non-hazardous. In addition, trace amounts of non-RCRA regulated motor oil, grease, and diesel may have leaked from trucks during handling."

During the notification call, it was stated that an investigation of the stained soil, including sampling, would be conducted to determine if there were constituents of concern present. The soil and a small amount of liquid were sampled on February 15, 2005. The excavations were deepened and a geologic soil description was made on February 18, 2005. The following enclosures provide details of the investigative activities:

Enclosure 1	Engineering Figure of the TRUPACT Sun Shade Shelter Noting the Location of the Structure and Footings
Enclosure 2	Aerial Photograph Noting the Location of Solid Waste Management Unit 005a
Enclosure 3	Analytical Results for the Investigation
Enclosure 4	Analytical Discussion
Enclosure 5	Summary Description of Additional Excavated Soil

CBFO:AMO:HLP:GS:05-0228:UFC 5486.00

The sample analyses have indicated the contaminant is diesel fuel (Enclosure 3). Excavations indicate only a small area was contaminated (see Enclosure 4). The levels of diesel fuel are slightly elevated (see Enclosure 4) above the clean soil levels described in the Solid Waste Regulations NMED 20.9.1.708. Data and observations indicate the stained soil is stable. The information developed during the investigation shows the stained soil is not migrating (Enclosure 5). The diesel found was bound to the soils and obvious signs of degradation indicate the microbes in the soil and oxidation of the fuels were taking place. The natural attenuation process is expected to continue to reduce the diesel levels in the soil. Inspection of the excavations on subsequent days after the excavations showed the stained soil to be dramatically lighter in color and no odor was present.

No impact is expected to human health or the environment, due to the depth of the contamination and the fact that it is covered with a minimum of 6 inches of concrete and 4 inches of asphalt under the concrete. The footings measuring approximately 4 feet wide by 4 feet long by 4 feet deep will be filled with compacted gravel and concrete. There is no apparent migration of the contaminants and no receptors under the concrete and asphalt.

The location has been identified using the Global Positioning Satellite System and SWMU 005a has been noted in the HWFP. Solid Waste Management Unit 005a will be thoroughly evaluated at the decommissioning of the WIPP facility and closed per the HWFP Attachment I. Since this is a previously identified SWMU with non hazardous constituents and no human health or environmental receptors, no further actions are planned until site closure.

Per DOE's phone conversation with you on March 4, 2005, construction of the TRUPACT sun shade structure will resume.

If you have any questions, please contact me at (505) 234-7300.

Sincerely,

Inés Triay

Inés R. Triay
Acting Manager

Enclosures

cc: w/enclosures
J. Bearzi, NMED
T. Klein, NMED-AIP
M. Leavitt, NMED
C. Marshall, NMED
D. Pepe, ???

CBFO:AMO:HLP:GS:05-0228:UFC 5486.00

New Mexico ‾ ˙onment Department
Ground Wat ıality Bureau

DP Processing Form

DP# 831 Reviewer Clint	]] Date	Initial
Notice of Intent		
NOI Received		
DP Required Letter Sent		

Discharge Plan Application		
❖ DP Application Received	3-8-05	CV
❖ Filing Fee Received	3-8-05	CV
❖ Copy Transmitted to District Manager		
Additional Information Requested		
❖ DP application Complete per Completeness Checklist		
❖ Application Information Entered in to TEMPO Database		

Public Notice		
❖ Public Notice Published		
Public Notice Corrected		

Plans and Specifications		
❖ Plans and Specifications Received	3-8-05	CV
❖ Copy Sent to District Engineer	3/28/05	ds
❖ Comments Received from District Engineer		

Other Technical Requirements		
❖ Field Inspections		
Hydrogeologic Assessment Reviewed		
❖ Operational Plan Reviewed		
❖ Monitoring Plan Reviewed		
❖ Contingency Plan Reviewed		
❖ Closure Plan Reviewed		
Additional Information Requested		
❖ Technical Review Complete		
❖ Computer Database Updated		
❖ Correspondence Transferred to Discharge Plan and Correspondence Public Drawers		

Public Hearing/Meeting		
Public Meeting Held		
Public Hearing Held		
Public Hearing/Meeting Denied		

Discharge Plan Decision		
❖ Approval/Disapproval Letter Drafted		
❖ Discharge Fee Received		
❖ Approval/Disapproval Letter Sent		
Appeal of Discharge Plan Decision		
WQCC Hearing Schedule		
Appeal Resolved		

❖ Must be Completed
]] Date is Date Received, Sent, Published, Approved or Completed.

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2900
Fax (505) 827-2965

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY
DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

TO: Manager, Carlsbad NMED Field Office

FROM: George Schuman, Program Manager GS
Ground Water Pollution Prevention Section

RE: Discharge Permit Application

DATE: March 25, 2005

Enclosed is a copy of the latest discharge permit application which the NMED Ground Water Pollution Prevention Section has received for your area . It is for:

DP-831-Waste Isolation Pilot Plant MODIFICATION

Please call Clint Marshall of the Ground Water Pollution Prevention Section at (505) 827-0027 if you would like additional information on this facility.

Enclosure(s)

cc: Glenn Saums, Program Manager, Surface Water Quality Bureau
Discharge Plan File

New M[illegible] Environmental Department
Ground Water Quality Bureau

Ackn[illegible]edgement of Receipt

Acknowledgement of Receipt of Check/Cash

I hereby acknowledge receipt of Check No. #008848 Dated 3/2/05
or cash, received in the amount of $ 100.00 from Washington Tru Solutions
for Waste Isolation Pilot Plant DP-831 318
(Facility Name) (DP No.) (AI ID)

Copy Made for Check Processing ________ Date ________
For Central File Activity PRD20050001 (DP-Mod)

Submitted to ASD by: ________ Date: ________

Received in ASD by: ________ Date: ________

Filing Fee [ ] New Facility [ ] Renewal [ ]

Modification [X] Other [ ] (Explain) ________

Organization Code ________ Application FY ________

To be Deposited in the Ground Water Section Discharge Plan Fees.

Full Payment [ ] or Annual Increment [ ]

WASHINGTON TRU SOLUTIONS LLC
P.O. Box 2078
Carlsbad, NM 88221

CARLSBAD NATIONAL BANK
PO Box 1359
Carlsbad, NM 88220

008848

VOID

Date Mar/02/2005 Pay Amount 100.00***

Pay ****ONE HUNDRED AND XX / 100 DOLLAR****

To The Order Of
NEW MEXICO ENVIRONMENT DEPARTMENT
Harold Runnels Bld.
1190 St. Francis Dr.
PO Box 26110
Sante Fe, NM 87502

Authorized Signature

DP-831

01013

⑈008848⑈ ⑆112201797⑆ 51225⑈

Check Date: Mar/02/2005 Vendor Number: 0000000109 Check No. 008848

Invoice Number	Invoice Date	Voucher ID	PO Number	Gross Amount	Discount Taken	Late Charge	Paid Amount
NMED Permit App DP-831	Mar/01/2005	00013177		100.00	0.00	0.00	100.00

For Inquiries: please call 1-888-234-3181 or (505) 234-3105

Check Number	Date	Total Gross Amount	Total Discounts	Total Late Charges	Total Paid Amount
008848	Mar/02/2005	100.00	0.00	0.00	100.00

TROY ® CHECK PAPERS

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 08 2005

MAR 04 2005

Ms. Maura Hanning, Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Modification of Discharge Permit DP-831, Waste Isolation Pilot Plant

Dear Ms. Hanning:

Enclosed please find three (3) copies of the completed Discharge Plan Application and a $100.00 check for the filing fee for this modification of Discharge Plan DP-831 for the Waste Isolation Pilot Plant (WIPP).

The modification request is being submitted pursuant to the September 8, 2004 letter from the Ground Water Quality Bureau (GWQB) to R.P. Detwiler, Acting Manager, U.S. Department of Energy (DOE). The GWQB requested that the DOE submit, within 120 days of the date of the letter, a permit modification application that addresses "additional potential contamination sources at the WIPP facility" and that incorporates "all potential sources into a comprehensive closure plan." The DOE requested and was granted an extension to March 6, 2005 to submit its response.

If you have any questions or comments, please contact Mr. Jody Plum at (505) 234-7462.

Sincerely,

for Inés Triay
Acting Manager

Enclosures

CBFO:OOM:WMR:VW:05-0015:UFC:5487

MAR 08 2005

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2900
Fax (505) 827-2965
www.nmenv.state.nm.us

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

[redacted]

Enclosed is a Ground Water Discharge Permit Application Form (Form) and checklist. Section 20.6.2.3104 NMAC of the NM Water Quality Control Commission Regulations (20.6.2 NMAC) requires that any person proposing to discharge effluent or leachate so that it may move directly or indirectly into ground water must have an approved discharge permit, unless a specific exemption is provided for in the Regulations. The enclosed Form is a general guideline for use by applicants to ensure that an application is complete and provides all of the information required by sections 20.6.2.3106, 20.6.2.3107, 20.6.2.3108, and 20.6.2.3109 NMAC.

Mail **three complete copies** of your application with a **$100 filing fee** check made payable to the New Mexico Environment Department (NMED) at the address below:

Maura Hanning, Program Manager
Ground Water Pollution Prevention Section
NM Environment Department
P. O. Box 26110
Santa Fe, NM 87502

Pursuant to Regulation 20.6.2.3108 NMAC, NMED will, within thirty (30) days of deeming the application administratively complete, publish a public notice and allow 30 days for public comment before taking final action on a discharge permit. A public hearing will be held if NMED determines that there is significant public interest. It takes approximately180 days to process a complete application and issue a discharge permit if no public hearing is held.

All applications must be accompanied by a filing fee of $100. **An additional fee will be assessed prior to permit issuance** to cover the estimated cost to the NMED for investigation, and, issuance of the permit. **Permit fees are listed in the Regulation 20.6.2.3114 NMAC.**

If you have any questions about this discharge permit application, call the Ground Water Pollution Prevention Section at 505-827-2900

COMPLETION CHECKLIST

☐		All portions of the Ground Water Discharge Permit Application Form have been addressed. (The application will not be considered complete if there are omissions, which will delay publication of the public notice and issuance of the permit.)
☐		Submitter has included operational, monitoring, contingency, and closure plans that are appropriate for the proposed treatment and disposal system, and meet the site-specific conditions for the proposed facility.
☐		Plans and specifications for the entire effluent or leachate conveyance, collection, treatment, distribution, and disposal system have been included as required by Regulation 20.6.2.1202 NMAC. For septic tank/leachfield systems, designs should be consistent with NMED's guidelines for Plans and Specifications for Discharge Permit Applications Using Septic Tank/Leachfields.
☐		The application has been signed and dated by the responsible party, generally the owner or lessee.
☐		If your facility site includes an archeological site on the State Register of Cultural Properties or National Register of Historic Places, the State Historic Preservation Office has the authority to require an archeological or historical study prior to NMED taking final action on your discharge permit.
☐		Four maps have been included: **1)** area United States Geological Survey (USGS) topographic map that includes the location of the facility and all of the information required in the application item 7.b, **2)** local road map clearly defining the location of the facility and the route to get to the facility, **3)** detailed site map that includes all discharge locations (lagoons, leachfields, land application areas, outfalls...), all water supply and monitoring wells, all water courses on the property and all buildings and **4)** United States Department of Agriculture (USDA) soils map.
☐		Three copies of all required information have been enclosed.
☐		A filing fee check in the amount of $100, has been enclosed, made payable to the NM Environment Department at the address on page 1.
☐		The SUMMARY OF APPLICANT'S PUBLIC NOTICE REQUIREMENTS has been reviewed and the option for Public Notice Has been selected on the application page 3.

MAR 08 2005

ADMINISTRATIVE COMPLETENESS

To be deemed administratively complete for publication of a public notice, the following information must be provided. [20.6.2.3106, 20.6.2.3108 NMAC]

Review the SUMMARY OF APPLICANT'S PUBLIC NOTICE REQUIREMENTS (attached) to select an option below.

☐ Public Notice Option 1 ☑ Public Notice Option 2 ☐ Public Notice Option 3

1. <u>**Name of the proposed discharger and facility**</u> [20.6.2.3106, 20.6.2.3108.C.1 NMAC]:

Type of facility or operation (dairy, municipal wwtp, mining, school, etc.): ____________________

The Waste Isolation Pilot Plant (WIPP) is a hazardous and radioactive waste disposal facility operated by the U.S. Department of Energy (DOE). It is designed, permitted, and operated for the receipt of defense generated TRU and TRU mixed waste. The WIPP is constructed in a bedded salt deposit 2150 feet beneath the earth's surface. Hazardous Waste Disposal Units are excavated in the bedded salt as permitted by the New Mexico Environment Department (NMED) with the issuance of Hazardous Waste Facility Permit (HWFP) #NM4890139088-TSDF, October 27, 1999. The WIPP is currently operating under Discharge Permit DP-831 as approved on April 29, 2003 and December 22, 2003.

The purpose of this application is to supplement the existing DP-831 permit with 1) the identification of additional potential contamination sources not identified in previous permit applications or modifications (see Additional Potential Contamination Sources (Tab 1), Table I, List of All Solid Waste Management Units (Tab 4) and Table II Solid Waste Management Units Not Previously Granted No Further Action (Tab 4), and 2) a closure plan (see Closure Plan for DP-831 Facility Components (Tab 2)).

	Name	Address*	City	State	Zip	Telephone & Fax
Facility*	Waste Isolation Pilot Plant	26 miles E-SE of Carlsbad, NM	Carlsbad	NM	88221	505-234-7200
Owner	U.S. Department of Energy Ines Triay Acting DOE/CBFO Manager	P.O. Box 3090	Carlsbad	NM	88221	505-234-7300
Responsible Party						

Facility Representative	George Basabilvazo, DOE/CBFO Scott Anderson, Washington TRU Solutions, LLC	P.O. Box 3090 P.O. Box 2078	Carlsbad Carlsbad	NM NM	88221 88221	505-234-8103 505-234-7488 505-234-8101
Consultant	N/A	N/A	N/A	N/A	N/A	N/A
Other (specify)	HL Plum DOE/CBFO	P.O. Box 3090	Carlsbad	NM	88221	505-234-7462

*For the facility address, enter physical address- not mailing address.

2. Locations of the Discharges [20.6.2.3106.C.2 and 20.6.3108.C.2 NMAC]:

List the locations of the discharges covered by this permit. Add rows as necessary to include all discharge locations. Sections should be described to the nearest ¼ of a ¼ of a ¼ section (please see attachment).

Discharge Location (lagoons, leachfields, land application areas, outfalls, etc.)	**County**	**Township**	**Range**	**Section**	**Latitude**	**Longitude**
Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 22, 2003.						

3. Brief Description of Discharge [20.6.2.3108.C.3 NMAC]:

Briefly describe the activities which produce the discharge(s) including the treatment and disposal methods. Attach additional pages as necessary.

Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 22, 2004.

4. Discharge Characteristics [20.6.2.3106.C.1 and 20.6.2.3108.C.4 NMAC]:

4.a. Quantity:

Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 22, 2003.

4.b. Quality: Add rows as necessary to include all contaminants and toxic pollutants.

Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 22, 2003.

4.c. Flow Characteristics:

Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 22, 2003.

5. <u>Ground Water Conditions</u> [20.6.2.3106.C.3 and 20.6.2.3108.C.5 NMAC]:

Sources for this information may be the New Mexico State Engineers Office, NMED, GWPPS web site (www.nmenv.state.nm.us), and USGS reports. If you do not have a TDS value, take a sample from the nearest well to the discharge location and submit the results from the analysis.

Depth to ground water below the discharge site:	**See DP-831 Permit Modification Application dated April 25, 2003.**
Flow direction of ground water below the site:	
Flow gradient of ground water below the site:	
Reference* or source for depth, direction and gradient:	

* If determined from well logs, please provide photocopies of well logs with application. If depth is derived from a report include copies of appropriate pages and complete reference to report including author, title, and publication date.

Total Dissolved Solids (TDS) concentration (mg/L) of ground water below the site:	**See DP-831 Permit Modification Application dated April 25, 2003.**
Reference or source for TDS:	

TECHNICAL ADEQUACY

To be deemed technically adequate, for purposes of issuing the discharge permit, the following information must be provided. [20.6.2.3106, 20.6.2.3107, 20.6.2.3109 NMAC]. Operational, monitoring, contingency, and closure plans must be submitted and must be appropriate for the proposed treatment and disposal type and meet the site specific conditions for the proposed facility.

6. <u>Permit Plans</u> [20.6.2.3106.C.7, 20.6.2.3107.A, and 20.6.2.3109.C NMAC]:

6.a. Operational Plan [20.6.2.3106.C.7 and 20.6.2.3109.C NMAC]:

The operational plan must describe how the system(s) for conveyance, collection, treatment, distribution, and disposal of wastewaters or other discharges will be constructed, operated, inspected, and maintained. The operational plan must demonstrate that ground water standards will not be exceeded.

6.a.i. In the following table, identify all proposed conveyance, collection, treatment distribution, and disposal units included in the operational plan. Add rows as necessary to include all units.

Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 22, 2003.

6.a.ii. Describe in detail the operational plan, including all conveyance, collection, treatment, distribution and disposal systems. Attach additional pages as necessary:

Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 22, 2003.

6.a.iii. Describe the operations and maintenance plan that will be followed to ensure the system is maintained as described. At a minimum the plan must include monthly inspections of all wastewater treatment and disposal units. Attach additional pages as necessary.

Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 22, 2003.

6.b. Monitoring Plan [20.6.2.3106.C.5 and 20.6.2.3107.A.1-9 NMAC]:

The monitoring plan must describe how the facility will be monitored to ensure the discharge will not adversely impact ground water quality. The plan must include all monitoring locations (effluent sampling, monitoring wells, lagoons, soil sampling, plant tissue analysis, etc.). Monitoring locations must be included on the facility map.

See DP-831 Additional Potential Contamination Sources, Tab 1

6.b.i. Monitoring Locations. In the following tables, identify all monitoring locations. Add additional rows as necessary to include all monitoring locations.

See DP-831 Additional Potential Contamination Sources, Tab 1

6.b.ii. Describe in detail the sampling protocols that will be used for sample collection at all monitoring locations. Attach additional pages as necessary.

See DP-831 Additional Potential Contamination Sources, Tab 1

6.b.iii. Standard Monitoring Requirements: The following paragraphs are standard permit conditions. Please read the condition and check the boxes that you will comply with as a condition of your permit.

See DP-831 Additional Potential Contamination Sources, Tab 1

6.c. Contingency Plan [20.6.2.3107.A.10 NMAC]:

Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 22, 2003.

6.c.i. Standard Contingency Requirements: The following paragraphs are standard permit conditions. Please read the condition and check the boxes that you will comply with as a condition of your permit.

Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 22, 2003.

6.c.ii. Specific Contingency Plan:

Describe any additional specific corrective actions or contingencies that will be taken to cope with failure of the discharge system: Attach additional pages as necessary.

Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 22, 2003.

6.d. Closure Plan [20.6.2.3107.A.11 NMAC]:

The closure plan must describe the closure actions to be taken to prevent Regulation 20.6.2.3103 NMAC ground water standards from being exceeded, or the introduction of a toxic pollutant in ground water after cessation of operations. At a minimum, the closure plan must include a description of closure measures, post closure monitoring plans, and financial assurance (if required by NMED).[1]

See Closure Plan for DP-831 Facility Components, Tab 2

[1] Based on a letter from Tracy Hughes to Pete Domenici, Jr.,, dated January 31, 2005, the DOE is not required to submit financial assurance information for DP-831.

6.d.i. Specific Closure Plan: Describe the specific closure activities to ensure that ground water quality will be protected after cessation of operations. The plan shall include plugging, removal, and/or filling of all conveyance, collection, treatment, distribution and disposal features in order to prevent future discharges at the facility. The plan must also describe how all liquid and solid wastes will be removed and disposed of according to local, state, and federal laws. The plan must also describe how disturbed areas will be backfilled to blend with the original surface topography to prevent future ponding and to prevent a discharge at the facility from occurring after the cessation of operations. Attach additional pages as necessary.

6.d.ii. Standard Closure Requirements: The following paragraphs are standard permit conditions. Please read the condition and check the boxes that you will comply with as a condition of your permit.

This facility will comply with the following closure requirements:

☑ The discharger will notify NMED at least 30 days prior to cessation of operations and will provide a schedule for implementation of the closure plan.

☐ This facility will conduct post closure monitoring at the frequency and locations prescribed under the active permit for a period approved by NMED. If Regulation 20.6.2.3103 NMAC ground water standards are violated or toxic pollutants are present during post closure monitoring, this facility will implement the contingency plan required in the active permit.

☐ All monitoring wells will be plugged and abandoned in accordance with NMED Monitoring Well Construction and Abandonment Guidelines once NMED has agreed in writing that post closure ground water monitoring may cease.

☐ Once NMED has approved all closure activities, this facility will submit a letter requesting termination of the discharge permit.

TECHNICAL SUPPORT

The following information must be submitted as required by Regulation 20.6.2.3106, and 20.6.2.3109 NMAC.

7. **<u>Other Discharge Locations</u>** [20.6.2.3106.C.2 NMAC]:

7.a. List the locations of any other discharges at this facility not covered by this permit but permitted under the New Mexico Liquid Waste Disposal Regulations, Hazardous Waste Management Regulations, Federal Clean Water Act (NPDES), and any un-permitted discharges. Add rows as necessary to include all other discharge locations.

Discharge Type (septic tank/leachfields, surface water discharges, etc.)	Permit Identification	Discharge Location Description
Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 22, 2003 and Closure Plan for DP-831 Facility Components, Tab 2.		

7.b. Area Map: On the appropriate United States Geological Survey (USGS) 7.5 minute topographic quadrangle map, identify the location of all water supply wells, injections wells, seeps, springs, bodies of water, and watercourses within one mile of the outside perimeter of the discharge site.

As described in Section 8 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996, previous applications, renewals, and modifications, there are no water supply wells, injections wells, seeps, springs, bodies of water, or watercourses within one mile of the outside perimeter of the discharge site.

8. **Flooding Potential** [20.6.2.3106.C.4 NMAC]:

8.a. Describe the flooding potential of the discharge site based on the latest Federal Emergency Management Agency flood plain map or site specific analysis:

Source for Information: **WIPP DP-831 Renewal Permit Application, December 16, 1996**

As described in Section 12 of the WIPP Discharge Plan DP-831 Renewal Permit Application, dated December 16, 1996, the flooding potential of the WIPP facility is considered minimal since the general ground elevation in the vicinity of the surface facilities is approximately 400 feet above the 100 year floodplain of the Pecos River, which is the closest river to the facility. The potential for flash flooding is considered minimal because of the high percolation rate of the surrounding sand dunes and the flood protection berms (see Section 8.b of this application).

8.b. Describe the methods used to control flooding, run-on and run-off at the discharge site (berms, diversion channels, etc.):

As described in the April 25, 2003, DP-831 Permit Modification Application and subsequent design drawings, a berm exists along the north side of the Salt Storage Extension (SSE) and is contoured such that rainfall is diverted around the WIPP surface facilities.

9. **Geologic and Soil Information** [20.6.2.3106.5 NMAC]:

9.a. Lithology: Describe the lithology and thickness of each geologic unit below the discharge site and indicate which units bear water. This information may be obtained from a driller's log or geologic report. Include photocopies of all well logs with the application. Add rows as necessary to include all units.

The geologic units below the discharge site (SP/SPEP area) are described in the October 30, 2002 Notice of Intent (WIPP NOI 2002, Section 4.0, and NOI Attachments 3,4,5,6,7, and 11). These descriptions include lithology, thickness, and hydrogeologic properties of the unit below the discharge site.

Source for Information: **October 30, 2002, Notice of Intent (WIPP NOI 2002, Section 4.0, and Attachments 3, 4, 5, 6, 7, and 11)**

9.b. Soil Map: Attach a copy of the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey map and descriptive information for soil(s) associated with the discharge site.

Previously provided in Attachment 9 of the WIPP Discharge Plan DP 831 Renewal Application, dated December 16, 1996.

10. Signatures:

Owner: I certify that I am the legal owner of the property in which all discharges will occur. I certify that I am knowledgeable about the information contained in this application, and believe the information is true, complete and accurate.

Print Name: Kerry W. Watson
Authorized Agent of Owner, U.S. Department of Energy

Signature: Kerry W. Watson Date 3/4/2005

Responsible Party* (if property is leased or operated by someone other than the owner):

I certify that I am knowledgeable about the information contained in this application, and believe the information is true, complete and accurate.

Print Name: ______________________

Signature:______________________ Date______________________

Tab 1

DP-831 ADDITIONAL POTENTIAL CONTAMINATION SOURCES

The following information is being submitted as part of the Permit Modification Application, March 4, 2005 ("Permit Modification Application") and in response to the September 8, 2004, letter from the New Mexico Environment Department's (NMED) Ground Water Quality Bureau (GWQB) to R.P. Detwiler, Acting Manager, U.S. Department of Energy (DOE), Waste Isolation Pilot Plant (WIPP). The GWQB requested that the DOE submit, within 120 days of the date of the letter, a permit modification application that addresses "additional potential contamination sources at the WIPP facility." WIPP requested and was granted an extension to March 6, 2005, to submit the permit modification application. The additional "potential contamination sources" addressed include "all active and inactive salt storage areas and waste disposal areas located within the WIPP property boundary defined by the Land Withdrawal Act."

Other than the Salt Storage Area and the Site and Preliminary Design Validation (SPDV) pile, both discussed below, there are no additional salt storage areas. Additional piezometers are proposed for groundwater monitoring around the SPDV pile. Tables I and II (Tab 4) provide a summary of the Solid Waste Management Units (SWMUs) that are regulated by the NMED Hazardous Waste Bureau (HWB) pursuant to the WIPP Hazardous Waste Permit (HWFP). As discussed in the Closure Plan for DP-831 Facility Components (Tab 2), some of the SWMUs identified in Table I (Tab 4) have received "No Further Action" (NFA) determinations from the HWB. Additionally, with the exception of SWMU 004a (Portacamp), DOE has requested NFA decisions for all of the SWMUs listed in Table II (Tab 4). No additional groundwater monitoring is proposed for the additional SWMUs identified in Tables I and II (Tab 4) because no groundwater impacts are expected.

1. SALT STORAGE AREA

The salt storage operations at the WIPP facility were described in the October 30, 2002, Notice of Intent and in the April 24, 2003, DP-831 Modification Application. As explained, the WIPP is a hazardous and radioactive waste disposal facility operated by the DOE. It is designed, permitted and operated for the receipt of transuranic (TRU) and TRU mixed waste. The WIPP TRU waste disposal rooms are constructed in a bedded salt formation. At WIPP's closure, all permitted Hazardous Waste Disposal Units (HWDU) will have been excavated from the bedded salt layer 2150 feet beneath the earth's surface. The excavated salt is stored on the surface for authorized disposition at closing of WIPP. The disposition of the salt is discussed in the Closure Plan for DP-831 Facility Components (Tab 2). The salt pile is approximately 18.8 acres in size and has an associated salt pile evaporation pond that is approximately 3.0 acres. The salt pile is surrounded by ditches that divert runoff from the salt pile to the evaporation pond. The salt pile and associated evaporation pond and ditches were the subject of the April 24, 2003, DP-831 Modification Application. All of the components are collectively defined as the Salt Storage Area. The design and operation of the Salt Storage Area were described in Section 3.0, page 2, of the October 30, 2002, Notice of Intent.

Pursuant to the current conditions of DP-831, the following groundwater and storm water controls have been or are being implemented:

- Synthetic liner covering the Salt Pile;
- Placement of salt on a synthetically lined system with stormwater/leachate collection system (Salt Storage Extension System);
- One synthetically lined evaporation pond (Salt Storage Evaporation Basin) for the collection of salt contact water from Cell A of the Salt Storage Extension;
- Synthetically lined conveyance ditches around the Salt Pile, which discharge to the Salt Pile Evaporation Pond;
- Four synthetically lined storm water evaporation ponds (the Salt Pile Evaporation Pond, Evaporation Basin A, and Evaporation Basins 1 and 2), H-19 evaporation pond and seven sewage lagoon ponds;
- Storm water overland flow diversion berms;
- Salt placement procedures and active monitoring programs.

Monitoring of the shallow subsurface water is currently being performed at WIPP. The Shallow Subsurface Water (SSW) DP-831 monitoring and sampling network, set forth in the current DP-831, consists of water level monitoring on a quarterly basis and SSW sampling and analysis on a semi-annual basis.

2. SITE AND PRELIMINARY DESIGN VALIDATION (SPDV) PILE

The Site and Preliminary Design Validation Pile (SPDV pile) has been closed and fully remediated. The SPDV pile was created during the design validation phase of the WIPP for placement of construction materials resulting from the drilling of two 2,150 foot shafts and the underground excavation of connecting tunnels, exploratory tunnels, and four rooms. The materials in the SPDV pile include mined tailings interspersed with soil, rock, and debris from the construction of the shafts. The SPDV pile encompasses approximately 10 acres and ranges in height from 7 to 20 feet above ground. The volume is approximately 168,000 cubic yards, which includes an area beneath the pile where soil was excavated prior to tailings placement.

In 1995, the SPDV pile was characterized to determine the chemical nature of wastes within the pile and to support selection of reclamation alternatives. ("Characterization of the Site Preliminary Design Validation Salt Pile," Daniel B. Stephens & Associates, Inc., Jan. 5, 1996). The investigation determined that no remedial measures were required according to NMED guidelines. As a result of the study, stabilization and reclamation were recommended in order to prevent offsite transport of salt and brine solutions into the surrounding environment, and to blend the salt pile into the surrounding environment.

Reclamation activities completed in 1999 and 2000 at the SPDV pile included:

1) Re-contouring the SPDV pile to an estimated average of 15 feet above near ground surface elevation while maintaining the initial basal footprint situated on top of the undisturbed caliche.
2) Establishing a 4:1 horizontal to vertical slope ratio along the sides to deter veneer failure. The majority of the slopes are constructed at a three percent grade outward from the center crown to prevent ponding.
3) After contouring, the SPDV pile was capped with a Claymax geosynthetic clay liner encompassing nearly 319,000 square feet. The liner is on top of six inches of native material screened to a maximum of 3/4" in diameter.
4) After the liner was placed, a minimum of three feet of soil rooting medium consisting of 15% (by weight) 1/2" crushed rock was added to minimize wind erosion.
5) The entire reclaimed SPDV pile was seeded with shallow rooted plants, which have been successfully established.
6) The reclaimed SPDV is regularly inspected, monitored and maintained.

The reclaimed SPDV pile is unlikely to discharge to the groundwater due to the capping installed during reclamation and the fact that no brine liquid was added to the pile. The orientation of the reclaimed SPDV pile is primarily from north to south along the long axis.

Based on the general trend of the cementation change between the Santa Rosa and Dewey Lake formations, and the local topography surrounding the reclaimed SPDV pile, the assumed hydraulic gradient of a potential perched shallow water lens is to the south-southwest.

Because the existence of a perched zone at the location of the SPDV remains unclear, three additional piezometers are proposed for installation. The additional piezometers would be on the east side, the west side, and the south side of the reclaimed SPDV pile, as close to the reclaimed pile as possible without damaging the liner. The piezometers would be drilled to a point immediately beyond the cementation change at the Dewey Lake-Santa Rosa contact, where moisture, if present, would perch. The completion depths are estimated to be approximately 60 to 70 feet below ground surface. To the extent possible, drilling techniques will not involve fluids so that the moisture of drill cuttings and soil/rock samples can be monitored for evidence of infiltration into the subsurface from the reclaimed SPDV pile. The piezometers will be integrated into the current DP-831 monitoring and sampling program. Plans for the three additional piezometers will be submitted to the GWQB for review and approval prior to field work.

Tab 2

CLOSURE PLAN
FOR DP-831 FACILITY COMPONENTS

I. INTRODUCTION

The following Closure Plan is being submitted in response to the September 8, 2004, letter from the New Mexico Environment Department's Ground Water Quality Bureau (GWQB) to R.P. Detwiler, Acting Manager, U.S. Department of Energy (DOE), Waste Isolation Pilot Plant (WIPP). The GWQB requested that the DOE submit, within 120 days of the date of the letter, a permit modification application that addresses "additional potential contamination sources at the WIPP facility" and that incorporates "all potential sources into a comprehensive closure plan." The DOE requested and was granted an extension to March 6, 2005, to submit the permit modification application. The GWQB stated that the application "may reference current activities and existing documents, plans and specifications that apply towards final closure of facility components covered under DP-831." *Id.* at 3. As discussed below, the decommissioning and decontamination and final closure of the WIPP facility will be completed pursuant to the WIPP Hazardous Waste Facility Permit (HWFP) and applicable federal regulations and requirements. This Closure Plan references and incorporates existing plans and specifications for closure of the facility components that are or may be covered by DP-831.

II. BACKGROUND

The WIPP facility is a mined geologic repository in a deep salt formation. The WIPP Land Withdrawal Act (WIPP LWA), passed by Congress in 1992 and amended in 1996, authorizes the disposal of transuranic (TRU) waste at WIPP. (Pub. L. No. 102-579, 106 Stat. 4777 (1992) and Pub. L. No. 104-201, 110 Stat. 2851-2854 (1996)). The TRU waste disposed of at WIPP includes both "mixed waste" and "non-mixed waste." TRU mixed waste contains both radioactive materials and hazardous wastes. Hazardous wastes are defined and regulated pursuant to the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6901 *et seq.* and the New Mexico Hazardous Waste Act (HWA), NMSA 1978 §74-4-1 *et seq.* TRU non-mixed waste does not contain hazardous waste.

The WIPP LWA grants the DOE authority over the WIPP facility and defines the regulatory authority of the United States Environmental Protection Agency (EPA). EPA has sole authority, through the certification and re-certification process, to determine if the WIPP facility complies with EPA's radioactive waste disposal standards set forth in 40 CFR Part 191, Subparts B and C, and Part 194. (WIPP LWA at §8). DOE submitted its initial Compliance Certification Application (CCA) in October, 1996. On May 18, 1998, EPA certified that WIPP will comply with 40 CFR Part 191, Parts B and C, as implemented by 40 CFR Part 194. (63 FR 27405). The CCA, approved by EPA, includes requirements for the decontamination, decommissioning and final closure of the WIPP facility. Compliance recertification applications are submitted to EPA every five years. (WIPP LWA at §8(f)).

NMED, pursuant to its authority to implement the Solid Waste Disposal Act, as amended by RCRA, 42 U.S.C. §6901 *et seq.*, has regulatory authority over the hazardous waste component of the TRU mixed-waste. (WIPP LWA at §9, stating that WIPP is required to comply with the Solid Waste Disposal Act).

The State of New Mexico has been authorized by EPA to implement a hazardous waste program in lieu of, but equivalent to, the federal program. NMSA §74-4-1 *et seq.*; 42 U.S.C. §6926; 50 FR 1515 (Jan. 11, 1985). NMED has the authority to regulate hazardous wastes and facilities for the treatment, storage and disposal of hazardous waste. Such facilities must receive a permit from NMED in order to operate in New Mexico. EPA has also authorized New Mexico to regulate the hazardous components of radioactive mixed waste managed in the state in a manner consistent with the federal RCRA program. (55 FR 28397, July 11, 1990). The HWA implemented RCRA in the State of New Mexico and required the Environmental Improvement Board to issue regulations consistent with RCRA. With a few exceptions, the New Mexico Hazardous Waste Management Regulations, 20.4.1.1. NMAC *et seq.*, adopt the RCRA regulations found at 40 CFR Parts 260 to 266, 268, 270 and 273. The Hazardous Waste Bureau (HWB) is responsible for implementing the State RCRA program.

In October, 1999, pursuant to the HWA and RCRA, the HWB issued WIPP a treatment, storage and disposal facility permit that authorized WIPP to accept TRU-mixed waste for storage and disposal. The WIPP HWFP provides all the conditions necessary for compliance with RCRA and for the safe management, storage, and disposal of TRU waste, including general waste information, waste analysis requirements, and closure requirements.

III. CLOSURE PLAN

The plan presented in this document is based on existing decontamination and decommissioning plans and closure plans developed pursuant to the HWFP, applicable federal regulations and requirements, and the current DP-831. A detailed closure plan will be prepared for the Environmental Protection Agency (EPA) final Compliance Recertification Application (CRA), which will be prepared during the final three years of the project, as WIPP operations approach completion.

The following sections of the HWFP contain closure plan requirements:

- Module II- General Facility Conditions; Section II.L – Closure
- Module III- Container Storage; Section III.H- Closure
- Module IV- Geologic Repository Disposal; Section IV.I- Closure
- Module VI- Post Closure Care Plan
- Permit Attachment I – Closure Plan
- Permit Attachment J – Post Closure Plan

HWFP Attachment I includes the facility closure plan and is attached at Tab 3.

The detailed closure plan to be developed as part of the final CRA will include design engineering, construction and decommissioning details, borrow source locations, cut and fill plans, final drainage plans, sampling and remediation plans, confirmation and verification plans, and closure monitoring plans.

As required by the HWFP, once operations at the WIPP facility are completed, the entire facility will undergo decontamination and decommissioning prior to final closure. The objective of decontamination and decommissioning activities at the WIPP facility "is to return the surface to as close to the pre-construction condition as reasonably possible, while protecting the health and safety of the public and the environment." Tab 3 at I-11.

The HWFP states as follows:

> In the preparation of its Final Environmental Impact Statement, the DOE committed to restore the site to as near to its original condition as is practicable. This involves removal of access roads, unneeded utilities, fences, and any other structures built by DOE to support WIPP operations. Provisions would be left for active post-closure controls of the site and for the installation of long-term makers and monuments for the purpose of permanently marking the location of the repository and waste. Permit Attachment J-1a(1) discusses the active and long-term controls proposed for the WIPP. Installation of borehole seals are anticipated to take twelve (12) months, shaft seals fifty-two (52) months, and final surface contouring eight (8) months.

Id. at I-18.

Decontamination includes "those activities which are performed to remove contamination from surfaces and equipment that are not intended to be disposed of at the WIPP facility." *Id.* at I-11. Decommissioning is "the process of removing equipment, facilities or surface areas from further use and closing the facility. Decommissioning is part of final facility closure only and will involve the removal of equipment, buildings, closure of the shafts, and establishing active and passive institutional controls for the facility." *Id.* HWFP Attachment I identifies and discusses the major activities required to be accomplished as part of decontamination and decommissioning. *Id.* at I-11 to I-19.

The foregoing requirements apply to all facility components that are or may be covered under DP-831. Specific components of the facility are addressed below. Section F discusses groundwater impacts and monitoring for the facility for both the operational phase and during closure.

A. <u>Facultative Lagoon System, H-19 Evaporation Pond, Salt Evaporation Ponds, and Storm Water Collection Ponds</u>

The closure plan for the facultative lagoon system and H-19 evaporation pond was included in the December 16, 1996, DP-831 Permit Renewal Application and in the June 5, 2002, DP-831 Renewal Application. The closure plan for the salt pile evaporation ponds and storm water collection ponds was included in the April 24, 2003, DP-831 Modification Application. The closure plan includes the synthetically lined conveyance ditches.

The December 16, 1996, DP-831 Permit Renewal Application, at Section 19, states as follows:

At the time the WIPP facility is decommissioned, the sewage facility and the evaporation ponds will be closed using closure plans discussed in the *Waste Isolation Pilot Plant Final Supplemental Environmental Impact Statement (SEIS)* (DOE/EIS 0026-FS, January, 1990). Although a detailed closure plan has not been completed, the SEIS states that all surface facilities will be decommissioned, all hazardous materials removed from the site, surface soils will be re-contoured to approximate original features, and native vegetation will be planted.

Closure plans for the sewage facility and evaporation ponds will specifically require that all lagoons and ponds will be pumped or evaporated and that all sludges be sampled to determine if hazardous constituents exist as defined by the Resource Conservation and Recovery Act (RCRA- 40 CFR 261). If hazardous constituents are detected, the sludges will be managed accordingly.

The June 5, 2002 DP-831 Permit Renewal Application, at 6.d, states as follows:

The standard permit conditions in 6.d.ii will be incorporated into the closure plan for the facultative lagoon system and evaporation facilities currently permitted under DP-831 and described in section 19 of the WIPP Discharge Plan Renewal Permit Application, dated December 16, 1996.

At the time the WIPP facility is decommissioned, the closure plan will specify the closure activities required to ensure that groundwater quality will be protected. These activities include the pumping or evaporation of all wastewater ponds, removal and disposal of all solids in accordance with applicable regulations, and contouring and revegetation of the site.

The April 24, 2003, DP-831 Modification Application states:

The closure plan dated December 16, 1996, will be implemented when the facility is decommissioned. The plan includes the pumping or evaporation of all wastewater ponds, removal of all solids, and recontouring and revegetation of the site. In addition, all basin liners will be removed or perforated upon closure of the site. This will be performed to comply with Section 20.6.2.3107.A.11 NMAC.

The closure plan set forth in the December 16, 1996, and the June 5, 2002, DP-831 Permit Renewal Applications and the April 24, 2003, DP-831 Modification Application are incorporated herein.

B. Active Salt Pile

The active salt pile and the salt pile storage area are described in Section 1 of the April 24, 2003, DP-831 Modification Application and in Section 3.0, page 2, of the October 30, 2002, Notice of Intent to Discharge. The salt pile will be disposed of in accordance with the requirements of the LWA, §4(b)(4) which states that "[t]he Secretary shall dispose of salt tailings extracted from the Withdrawal that the Secretary determines are not needed for backfill at WIPP. Disposition of such tailings shall be made under sections 2 and 3 of the Act of July 31, 1947 (30 U.S.C. 602, 602; commonly referred to as the 'Materials Act of 1947')." The final plan for the post-closure management and use of the area withdrawn under the LWA will be developed by the Secretary of the DOE in consultation with the Secretary of the Interior and the State of New Mexico. The plan will be submitted to Congress. (WIPP LWA §13). As required by Section 4(b)(1) of the LWA, Land Management Plan (DOE/WIPP 93-004) was developed in consultation with the Department of Interior and the State of New Mexico in 1994. The Land Management Plan was submitted to Congress and is reviewed and updated biennially. As part of the closure of the facility, a berm will be constructed around the perimeter of the closure area, which would include 70 hectares (175 acres). Exhibit B, 1990 FEIS at 3-15. As part of decommissioning, DOE will restore the areas occupied by the salt pile and "[a]ny salt remaining after the WIPP closure and construction of the berm would be sold or disposed of in accordance with the Materials Act of 1947." *Id.*

C. <u>Site and Preliminary Design Validation Pile</u>

The SPDV pile has been closed and fully remediated. The SPDV pile was created during the design validation phase of the WIPP for placement of construction materials resulting from the drilling of two 2,150 foot shafts and the underground excavation of connecting tunnels, exploratory tunnels, and four rooms. The materials in the SPDV pile include mined tailings interspersed with soil, rock, and debris from the construction of the shafts. The SPDV pile encompasses approximately 10 acres and ranges in height from 7 to 20 feet above ground. The volume is approximately 168,000 cubic yards, which includes an area beneath the pile where soil was excavated prior to tailings placement.

In 1995, the SPDV pile was characterized to determine the chemical nature of wastes within the pile and to support selection of reclamation alternatives. ("Characterization of the Site Preliminary Design Validation Salt Pile," Daniel B. Stephens & Associates, Inc., Jan. 5, 1996). The investigation determined that no remedial measures were required according to NMED guidelines. As a result of the study, stabilization and reclamation were recommended in order to prevent offsite transport of salt and brine solutions into the surrounding environment, and to blend the salt pile into the surrounding environment.

Reclamation activities completed in 1999 and 2000 at the SPDV pile included:

1) Re-contouring the SPDV pile to an estimated average of 15 feet above ground surface elevation while maintaining the initial basal footprint situated on top of the undisturbed caliche.
2) Establishing a 4:1 horizontal to vertical slope ratio along the sides to deter veneer failure. The majority of the slopes are constructed at a three percent grade outward from the center crown to prevent ponding.
3) After contouring, the SPDV pile was capped with a Claymax geosynthetic clay liner encompassing nearly 319,000 square feet. The liner is on top of six inches of native material screened to a maximum of 3/4" in diameter.
4) After the liner was placed, a minimum of three feet of soil rooting medium consisting of 15% (by weight) 1/2" crushed rock was added to minimize wind erosion.
5) The entire reclaimed SPDV pile was seeded with shallow rooted plants, which have been successfully established.
6) The reclaimed SPDV is regularly inspected, monitored and maintained.

The reclaimed SPDV pile is unlikely to discharge to the groundwater due to the capping installed during reclamation and the fact that no brine liquid was added to the pile. However, as set forth in DP-831 Additional Potential Contamination Sources (Tab 1), additional groundwater monitoring piezometers will be installed down gradient from the SPDV pile.

D. <u>Underground Hazardous Waste Disposal Units, the Underground Respository, the Waste Handling Building Unit, Parking Area Unit, and Boreholes.</u>

The Underground Hazardous Waste Disposal Units (HWDUs), the Repository, the Waste Handling Building (WHB) unit, and the Parking area unit will be closed pursuant to the requirements of HWFP Attachment I (Tab 3), HWFP Module II, Section II.L, HWFP Module III, Section III.H, and HWFP Module VI, Section VI.I. Post-closure groundwater monitoring will be conducted pursuant to HWFP Modules V and VI and HWFP Attachment L, the WIPP Groundwater Monitoring Plan. All boreholes will be closed pursuant to Table I-3 of HWFP Attachment I (Tab 3).

E. Other DP-831 Facility Components

DP-831 Additional Potential Contamination Sources (Tab 1) identifies "additional potential contamination sources at the WIPP facility." Tables I and II (Tab 4) provide a summary of the WIPP Solid Waste Management Units (SWMUs) included in the WIPP HWFP. Any facility components that have not been previously discussed in this Closure Plan will be closed pursuant to HWFP Attachment I (Tab 3), the FEIS and the final CRA that will be prepared during the final three years of the project.

As indicated in Table I (Tab 4), a number of the SWMUs have received a "no further action" (NFA) determination by the NMED Hazardous Waste Bureau (HWB), as set forth in the "Technical Support Document Exclusion/Inclusion of Solid Waste Management Units and Areas of Concern, Proposed Final Permit Module VII, Corrective Action for Solid Waste Management Units," NMED, June 25, 1999 ("June 25, 1999 Technical Support Document"). For the SWMUs identified in Table II (Tab 4), NMED requested further sampling and analysis, which was completed in August, 2002. In October, 2002, the "No Further Action Report (NFA) and Petition" was submitted to the HWB. Upon approval of the report by NMED, a permit modification request will be submitted to the HWB requesting that the SWMUs be removed from Module VII of the WIPP HWFP.

The DOE requests that the GWQB recognize and/or accept the NFA determinations made by the HWB in the June 25, 1999, Technical Support Document and any NFA determinations that will be made by the HWB, based on the DOE's October 2002, submittal to the HWB, or any subsequent submittals reviewed and addressed pursuant to applicable HWB regulations. The DOE further requests that the GWQB determine that the no further closure activity is required under DP-831 for the SWMUs that have received NFA determinations from the HWB.

F. Groundwater Impacts and Monitoring

a. Operational Phase: The following groundwater and storm water controls, as described in the current DP-831 and supporting documents, have been or are being implemented at the WIPP facility:

- Synthetic liner covering the Salt Pile;
- Placement of salt on a synthetically lined system with stormwater/leachate collection system (Salt Storage Extension System);
- One synthetically lined evaporation pond (Salt Storage Evaporation Basin) for the collection of salt contact water from Cell A of the Salt Storage Extension;
- Synthetically lined conveyance ditches around the Salt Pile, which discharge to the Salt Pile Evaporation Pond;
- Four synthetically lined storm water evaporation ponds (the Salt Pile Evaporation Pond, Evaporation Basin A, and Evaporation Basins 1 and 2), H-19 evaporation pond and seven sewage lagoon ponds;
- Storm water overland flow diversion berms;
- Salt placement procedures and active monitoring programs.

Monitoring of the shallow subsurface water is currently being performed at WIPP. The Shallow Subsurface Water (SSW) DP-831 monitoring and sampling network, set forth in the current DP-831, consists of water level monitoring on a quarterly basis and SSW sampling and analysis on a semi-annual basis.

Additional groundwater monitoring associated with the SPDV pile is proposed in DP-831 Additional Potential Contamination Sources (Tab 1) and will be incorporated in the existing SSW-DP-831. No groundwater impacts are expected from the Solid Waste Management Units (SWMUs) identified in Tables I and II (Tab 4) and no additional groundwater monitoring is proposed.

b. Closure: As required by the Standard Closure Requirement 6.d.ii, post closure groundwater monitoring for the WIPP facility will be conducted at the frequency and locations under the active permit for a period approved by NMED. If Regulation 20.6.2.3103 NMAC groundwater standards are violated or toxic pollutants are present during post closure monitoring, the WIPP will implement the contingency plan required in the active permit.

In addition to the SSW DP-831 monitoring and sampling, the WIPP facility conducts groundwater monitoring pursuant to the HWFP Attachment L, "WIPP Ground-Water Detection Monitoring Program Plan." As required by the HWFP,

> "Post-closure groundwater monitoring will involve a continuation of the monitoring plan in Permit Attachment L as described in Module V. The sampling frequency may be changed to biannually after final facility closure is complete by modification of the Permit as approved by the Secretary of the NMED in accordance with 20.4.1.901.B NMAC (incorporating 40 CFR §270.42). In addition, the final target analyte list specified in Permit Attachment L may be changed by permit modification based on final volume of waste."

HWFP Attachment J, Post-Closure Plan, at J-5.

Tab 3

WIPP Hazardous Waste Facility Permit (HWFP)

HWFP ATTACHMENT I

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ATTACHMENT I

CLOSURE PLAN

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ATTACHMENT I

CLOSURE PLAN

Introduction

This Permit Attachment contains the Closure Plan that describes the activities necessary to close the Waste Isolation Pilot Plant (**WIPP**) individual units and facility. Since the current plans for operations extend over several decades, the Permittees will periodically reapply for an operating permit in accordance with Title 20 of the New Mexico Administrative Code, Chapter 4, Part 1 (**20.4.1 NMAC**), Subpart 900 (incorporating 40 CFR §270.10(h)). Consequently, this Closure Plan describes several types of closures. The first type is panel closure, which occurs as underground hazardous waste disposal units (**HWDUs**) are filled. Final closure at the end of the Disposal Phase will entail "clean" closure of the two storage units on the surface and construction of the four shaft seal systems. Finally, in the event a new permit is not issued prior to expiration of an existing permit, a modification to this Closure Plan will be sought to perform contingency closure. Contingency closure defers the final closure of waste management facilities such as the Waste Handling Building Container Storage Unit (**WHB Unit**), the conveyances, the shafts, and the haulage ways because these will be needed to continue operations with non-mixed Transuranic (**TRU**) waste.

The hazardous waste management units (**HWMUs**) addressed in this Closure Plan include the aboveground HWMU in the WHB, the parking area HWMU, and Panels 1 through 8, each consisting of seven rooms. In addition, the disposal area access drifts shown as E-300, E-140, W-30, and W-170 between S-1600 and S-3650 on Figure I-1 may, at some time in the future, be needed for waste disposal. These access drifts, if used for disposal, are also subject to this Closure Plan.

This plan was submitted to the New Mexico Environment Department (**NMED**) and the U.S. Environmental Protection Agency (**EPA**) in accordance with 20.4.1.900 NMAC (incorporating 40 CFR §270.14(b)(13)). Closure at the panel level will include the construction of barriers to limit the emission of hazardous waste constituents from the panel into the mine ventilation air stream below levels that meet environmental performance standards[1] and to mitigate the impacts of methane buildup and deflagration that may be postulated for some closed panels. The Post-Closure Plan (Permit Attachment J) includes the implementation of institutional controls to limit

[1] The mechanism for air emissions prior to closure is different than the mechanism after closure. Prior to closure, volatile organic compounds (VOC) will diffuse through drum filters based on the concentration gradient between the disposal room and the drum headspace. These VOCs are swept away by the ventilation system, thereby maintaining a concentration gradient that is assumed to be constant. Hence, the VOCs in the ventilation stream are a function of the number of containers only. After closure, the panel air will reach an equilibrium concentration with the drum headspace and no more diffusion will occur. The only mechanism for release into the mine ventilation system is due to pressure that builds up in the closed panel. This pressure arises from the creep closure mechanism that is reducing the volume of the rooms and from the postulated generation of gas as the result of microbial degradation of organic matter in the waste. Consequently, the emissions after panel closure are a direct function of pressurization processes and rates within the panel.

access and groundwater monitoring to assess disposal system performance. Until final closure is complete and has been certified in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.115), a copy of the approved Closure Plan and all approved revisions will be on file at the WIPP facility and will be available to the Secretary of the NMED or the EPA Region VI Administrator upon request.

I-1 Closure Plan

This Closure Plan is prepared in accordance with the requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264 Subparts G, I, and X), Closure and Post-Closure, Use and Management of Containers, and Miscellaneous Units. The WIPP underground HWDUs, including Panels 1 through 8 and the disposal area access drifts, designated as Panels 9 and 10 on Figure I-1, will be closed to meet the performance standards in 20.4.1.500 NMAC (incorporating 40 CFR §264.601). The WIPP surface facilities, including Waste Handling Building Container Storage Unit and the Parking Area Container Storage Unit, will be closed in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.178). For final facility closure, this plan also includes closure and sealing of the facility shafts in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.601).

Following completion of waste emplacement in each underground HWDU, the HWDU will be closed. The Permittees will notify the NMED of the closure of each underground HWDU as specified in the schedule in Figure I-2. For the purpose of this Closure Plan, panel closure is defined as the process of rendering underground HWDUs in the repository inactive and closed according to the facility Closure Plan. The Post-Closure Plan (Permit Attachment J) addresses requirements for future monitoring that are deemed necessary for the post-closure period, including monitoring closed panels prior to final facility closure.

For the purposes of this Closure Plan, final facility closure is defined as closure that will occur when all waste disposal areas are filled or when the WIPP achieves its capacity of 6.2 million cubic feet (ft^3) (175,600 cubic meters (m^3)) of TRU waste. At final facility closure, the surface container storage areas will be closed, and equipment that can be decontaminated and used at other facilities will be cleaned and sent off site. Equipment that cannot be decontaminated plus any derived waste resulting from decontamination will be placed in the last open underground HWDU. Stockpiled salt may be placed in the underground; it may be used as the core material for the berm component of the permanent marker system; or it must be otherwise disposed of in accordance with Sections 2 and 3 of the Minerals Act of 1947 (30 U.S.C. §§602 and 603). In addition, shafts and boreholes which lie within the WIPP Site Boundary and penetrate the Salado will be plugged and sealed, and surface and subsurface facilities and equipment will be decontaminated and removed. Final facility closure will be completed to demonstrate compliance with the Closure Performance Standards contained in 20.4.1.500 NMAC (incorporating 40 CFR §264.111, 178, and 601).

In the event the Permittees fail to obtain an extension of the hazardous waste permit in accordance with 20.4.1.900 NMAC (incorporating 40 CFR §270.51) or fail to obtain a new permit in accordance with 20.4.1.900 NMAC (incorporating 40 CFR §270.10(h)), the Permittees will seek a modification to this Closure Plan in accordance with 20.4.1.900 NMAC (incorporating 40 CFR 270.42) to accommodate a contingency closure. Under contingency closure, storage units will undergo clean closure in accordance with 20.4.1.500 NMAC (incorporating 40 CFR

§264.178) waste handling equipment, shafts, and haulage ways will be inspected for hazardous waste residues (using, among other techniques, radiological surveys to indicate potential hazardous waste releases as described in Permit Attachment I3) and decontaminated as necessary, and underground HWDUs that contain radioactive mixed waste will be closed in accordance with the panel closure design described in this Closure Plan. Final facility closure, however, will be redefined and a request for a time extension for final closure will be requested. A copy of this Closure Plan will be maintained by the Permittees at the WIPP facility and at the Department of Energy (DOE) Carlsbad Field Office. The primary contact person at the WIPP facility is:

Manager, Carlsbad Field Office
U.S. Department of Energy
Waste Isolation Pilot Plant
P. O. Box 3090
Carlsbad, New Mexico 88221-3090
(505) 234-7300

I-1a Closure Performance Standard

The closure performance standard specified in 20.4.1.500 NMAC (incorporating 40 CFR §264.111), states that the closure shall be performed in a manner that minimizes the need for further maintenance; that minimizes, controls, or eliminates the escape of hazardous waste; and that conforms to the closure requirements of §264.178 and §264.601. These standards are discussed in the following paragraphs.

I-1a(1) Container Storage Units

Closure of the permitted container storage units (the Waste Handling Building Unit and Parking Area Unit) will be accomplished by removing all waste and waste residues. Indication of waste contamination will be based, among other techniques, on the use of radiological surveys as described in Permit Attachment I3. Radiological surveys use very sensitive radiation detection equipment to indicate if there has been a potential release of TRU mixed waste, including hazardous waste components, from a container. This allows the Permittees to indicate potential releases that are not detectable from visible evidence such as stains or discoloration. Visual inspection and operating records will also be used to identify areas where decontamination is necessary. Contaminated surfaces will be decontaminated until radioactivity is below free release limits[2]. Once surfaces are determined to be free of radioactive waste constituents, they will be tested for hazardous waste contamination. These surface decontamination activities will ensure the removal of waste residues to levels protective of human health and the environment. The facility is expected to require no decontamination at closure because any waste spilled or released during operations will be contained and removed immediately. Solid waste management units associated described in Permit Module VII will be subject to closure. In the event portions of these units which require decontamination cannot be decontaminated, these portions will be removed and the resultant wastes will be managed as appropriately.

[2] The free release criteria for items, equipment, and areas is < 20 dpm/100 cm^2 for alpha radioactivity and < 200 dpm/100 cm^2 for beta-gamma radioactivity.

Once the container storage units are decontaminated and certified by the Permittees to be clean, no further maintenance is required. The facilities and equipment in these units will be reused for other purposes as needed.

I-1a(2) Miscellaneous Unit

Post-closure migration of hazardous waste or hazardous waste constituents to ground or surface waters or to the atmosphere, above levels that will harm human health or the environment, will not occur due to facility engineering and the geological isolation of the unit. The engineering aspects of closure are centered on the use of panel closures on each of the underground HWDUs and final facility seals placed in the shafts. The design of the panel closure system is based on the criteria that the closure system for closed underground HWDUs will prevent migration of hazardous waste constituents in the air pathway in concentrations above health-based levels beyond the WIPP land withdrawal boundary during the thirty-five (35) year operational and facility closure period and to withstand any flammable gas deflagration that may occur prior to final facility closure.

Consistent with the definitions in 20.4.1.101 NMAC (incorporating 40 CFR §260.10), the process of panel closure is considered partial closure because it is a process of rendering a part of the repository inactive and closed according to the approved underground HWDU partial closure plan. Panel closure will be complete when the panel closure system is emplaced and operational, when that underground HWDU and related equipment and structures have been decontaminated (if necessary), and when the NMED has been notified of the closure.

Shaft seals are designed to provide effective barriers to the inward migration of ground water and the outward migration of gas and contaminated brine over two discrete time periods. Several components become effective immediately and are expected to function for one hundred (100) years. Other components become effective more slowly, but provide permanent isolation of the waste. The final shaft seal design is specified in Permit Attachment I2.

The facility will be finally closed (i.e., decontaminated and decommissioned) to minimize the need for continued maintenance. Protection of human health and the environment includes, but is not limited to:

- Prevention of any releases that may have adverse effects on human health or the environment due to the migration of waste constituents in the groundwater or in the subsurface environment [20.4.1.500 NMAC, incorporating 40 CFR §264.601(a)].

- Prevention of any releases that may have adverse effects on human health or the environment due to migration of waste constituents in surface water, in wetlands, or on the soil surface [20.4.1.500 NMAC, incorporating 40 CFR §264.601(b)].

- Prevention of any release that may have adverse effects on human health or the environment due to migration of waste constituents in the air [20.4.1.500 NMAC, incorporating 40 CFR §264.601(c)].

As part of final facility closure, surface recontouring and reclamation will establish a stable vegetative cover, and further surface maintenance will not be necessary to protect human health and the environment. Prior to cessation of active controls, monuments will be emplaced to serve as long-term site markers to discourage activities that would penetrate the facility or impair the ability of the salt formation to isolate the waste from the surface environment for at least 10,000 years. The Federal government will maintain administrative responsibility for the repository site in perpetuity and will limit future use of the area.

If, during panel or final facility closure activities, unexpected events require modification of this Closure Plan to demonstrate compliance with closure performance standards, a Closure Plan amendment will be submitted in accordance with 20.4.1.900 NMAC (incorporating 40 CFR §270.42).

I-1a(3) Post-Closure Care

The post-closure care period will begin after completion of the first panel closure and will continue for thirty (30) years after final facility closure. The post-closure care period may be shortened or lengthened at the discretion of the regulatory agency based on evidence that human health and the environment are being protected or that they are at risk. During the post-closure period, the WIPP shall be maintained in a manner that complies with the environmental performance standards in 20.4.1.500 NMAC (incorporating 40 CFR §264.601). Post-closure activities are described in Permit Attachment J.

I-1b Requirements

The Permit specifies a sequential process for the closure of individual HWMUs at the WIPP. Each underground HWDU will undergo panel closure when waste emplacement in that panel is complete. Following waste emplacement in each underground HWDU, construction-side ventilation will be terminated and waste-disposal-side ventilation will be established in the next underground HWDU to be used, and the underground HWDU containing the waste will be closed. The Permittees will notify the NMED of the closure of each of the underground HWDUs as they are sequentially filled on a HWDU-by-HWDU basis. The HWMUs in the WHB and in the parking area will be closed as part of final facility closure of the WIPP facility.

The Permittees will notify the Secretary of the NMED in writing at least sixty (60) days prior to the date on which closure activities are scheduled to begin.

I-1c Maximum Waste Inventory

The WIPP will receive no more than 6.2 million ft^3 (175,600 m^3) of TRU mixed waste. Excavations are mined as permitted when needed during operations to maintain a reserve of disposal areas. The amount of waste placed in each room is limited by structural and physical considerations of equipment and design. Waste volumes include waste received from off-site generator locations as well as derived waste from disposal and decontamination operations. Maximum waste volumes in the disposal panels are calculated as follows: for 100 percent 55-gallon drums--11,502 7-packs consisting of 80,514 drums and 591,800 ft^3 (16,760 m^3) of waste; for 100 percent standard waste boxes (**SWB**)--11,580 SWBs and 767,750 ft^3 (21,740 m^3) of waste. Since the waste can arrive in any combination of 7-packs and SWBs, a fixed volume is not set for each panel. Furthermore, the placement of backfill materials to modify chemical nature of brines over the long-term will likely result in fewer containers per panel as described in Permit Attachment M2. For planning purposes, a maximum achievable volume is used. This equates to 662,400 ft^3 (18,750 m^3) of contact handled (**CH**) TRU per panel. 81,000 containers were assumed in design calculations since, for air dispersion modeling, it is important to maximize the number of container vents through which volatile organic compounds (**VOC**) may be released. In reality, using the 40 percent-60 percent mix, there would be only 51,000 containers in a panel, containing 56,000 vents (2 vents per SWB).

The maximum extent of operations during the term of this permit is expected to be Panels 1 through 4 and Panels 9 and 10 as shown on Figure I-1, the WHB Container Storage Unit, and the Parking Area Container Storage Unit. Note that panels 4, 9, and 10 are scheduled for excavation only under this permit. If other waste management units are permitted during the Disposal Phase, this Closure Plan will be revised to include the additional waste management units. At any given time during disposal operations, it is possible that two rooms may be receiving waste for disposal at the same time. Underground HWDUs in which disposal has been completed (i.e., in which CH TRU mixed waste emplacement activities have ceased) will undergo panel closure.

I-1d Schedule for Closure

For the purpose of establishing a schedule for closure, an operating and closure period of no more than thirty-five (35) years (twenty-five (25) years for disposal operations and ten (10) years for closure) is assumed. This operating period may be extended or shortened depending on a number of factors, including the rate of waste approved for shipment to the WIPP facility and the schedules of TRU mixed waste generator sites, and future decommissioning activities.

I-1d(1) Schedule for Panel Closure

The anticipated schedule for the closure of the underground HWDUs known as Panels 2 through 8 is shown in Figure I-2. This schedule assumes there will be little contamination within the exhaust drift of the panel. The following assumptions are made in estimating the time that closure will be initiated at each underground HWDU: waste operations are assumed to begin in July 1998 for planning purposes; throughput for CH waste is 784 drums per week (7 pallets per day, 4 days per week, 28 drums per pallet); and the capacity of a panel is 81,000 drums. Under these assumptions, a minimum of 104 weeks is needed to emplace the waste. Allowing a 25 percent contingency for maintenance delays and time to transition from one room to another, it is estimated that a panel will be filled 2.5 years after emplacement is initiated. This means that underground HWDUs will be ready for closure according to the schedule in Table I-1. These dates are estimates for planning and permitting purposes. Actual dates may vary depending on the availability of waste from the generator sites. Waste availability at maximum throughput is not anticipated immediately as assumed here.

In the schedule in Figure I-2, notification of intent to close occurs thirty (30) days before placing the final waste in a panel. Once a panel is full, the Permittees will initially block ventilation through the panel as described in Permit Attachment M2 and then will assess the closure area for ground conditions and contamination so that a definitive schedule and closure design can be determined. If as the result of this assessment the Permittees determine that a panel closure cannot be emplaced in accordance with the schedule in this Closure Plan, a modification will be submitted requesting an extension to the time for closure.

The Permittees will initially block ventilation through Panel 1 as described in Permit Attachment M2 once Panel 1 is full to ensure continued protection of human health and the environment. The Permittees will then install the explosion isolation wall portion of the panel closure system that is described in Permit Attachment I1, Section 3.3.2, Explosion-and Construction-Isolation Walls. Construction of the explosion isolation wall will not exceed 180 days after the last receipt of waste in Panel 1. Final closure of Panel 1 will be completed as specified in this Permit no later than five years after completion of the explosion isolation wall.

I-1d(2) Schedule for Final Facility Closure

The Disposal Phase for the WIPP facility is expected to require a period of twenty-five (25) years beginning with the first receipt of TRU waste at the WIPP facility and followed by a period ranging from seven to ten (7-10) years for decontamination, decommissioning, and final closure. Assuming the first waste receipt occurs in July 1998, the Disposal Phase may extend until 2023, and so the latest expected year of final closure of the WIPP facility (i.e., date of final closure certification) would be 2033. If, as is currently projected, the WIPP facility is dismantled at closure, all surface and subsurface facilities (except the hot cell portion of the WHB, which will remain as an artifact of the Permanent Marker System [**PMS**]) will be disassembled and either salvaged or disposed in accordance with applicable standards. In addition, asphalt and crushed caliche that was used for paving will be removed, and the area will be recontoured and revegetated in accordance with a land management plan. A detailed closure schedule will be submitted in writing to the Secretary of the NMED, along with the notification of closure. Throughout the closure period, all necessary steps will be taken to prevent threats to human health and the environment in compliance with all applicable Resource Conservation and Recovery Act (**RCRA**) permit requirements. Figure I-3 presents the best estimate of a final facility closure schedule.

The schedule for final facility closure is considered to be a best estimate because closure of the facility is driven by policies and practices established for the decontamination, if necessary, and decommissioning of radioactively contaminated facilities. These required activities include extensive radiological contamination surveys and hazardous constituent surveys using, among other techniques, radiological surveys to indicate potential hazardous waste releases. Both types of surveys will be performed at all areas of the WIPP site where hazardous waste were managed. These surveys, along with historical radiological survey records, will provide the basis for release of structures, equipment, and components for disposal or decontamination for release off site. Specifications will be developed for each structure to be removed. A cost benefit analysis will be needed to evaluate decontamination options if extensive decontamination is necessary. Individual equipment surveys, structure surveys, and debris surveys will be required prior to disposition. Size-reduction techniques may be required to dispose of mixed or radioactive waste at the WIPP site. Current DOE policy, as reflected in the WIPP facility Safety Analysis Report (**SAR**) (DOE 1997), requires the preparation of a final decommissioning and decontamination (**D&D**) plan immediately prior to final facility closure. In this way, the specific conditions of the facility at the time D&D is initiated will be addressed. Section I-1e(2) provides a more detailed discussion of final facility closure activities.

Figure I-3 shows the schedule for the final facility closure consisting of decontamination, as needed, of the TRU waste-handling equipment, and of the aboveground equipment and facilities, including closure of surface HWMUs; decontamination of the shaft and haulage ways; disposal of decontamination derived wastes in the last open underground HWDU; and subsequent closure of this underground HWDU. Subsequent activities will include installation of repository shaft seals.

An overall schedule for final facility closure, showing currently scheduled dates for the start and end of final facility closure activities is shown in Table I-2. The dates assume a start up date of March 1999 and hazardous waste permit effective dates of September 1999, September 2009, and September 2019. Details for panel closures are shown on Table I-1.

I-1d(3) Extension for Closure Time

As indicated by the closure schedule presented in Figure I-3, the activities necessary to perform facility closure of the WIPP facility will require more than one hundred eighty (180) days to complete because of additional stringent requirements for managing radioactive materials. Therefore, the Permit provides an extension of the 180-day final closure requirement in accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.113). During the extended closure period, the Permittees will continue to demonstrate compliance with applicable permit requirements and will take all steps necessary to prevent threats to human health and the environment as a result of TRU mixed waste management at the WIPP facility including all of the applicable measures in Permit Attachment E (Preparedness and Prevention).

In addition, according to the schedules in Figure I-3, the final derived wastes that are generated as the result of decontamination activities will not be disposed of for sixteen (16) months after the initiation of final facility closure. In accordance with 20.4.1.500 NMAC (incorporating 40 CFR §264.113(a)), the Permit provides an extension of the 90-day limit to dispose of final derived waste resulting from the closure process. This provision is necessitated by the fact that the radioactive nature of the derived waste makes placement in the WIPP the best disposition, and the removal of these wastes will, by necessity, take longer than ninety (90) days in accordance with the closure schedules. During this extended period of time, the Permittees will take all steps necessary to prevent threats to human health and the environment, including compliance with all applicable permit requirements. These steps include all of the applicable preparedness and prevention measures in Permit Attachment E.

Finally, in the event the hazardous waste permit is not renewed as assumed in the schedule, the Permittees will submit a modification to the Closure Plan to implement a contingency closure that will allow the Permittees to continue to operate for the disposal of non-mixed TRU waste. This modification will include a request for an extension of the time for final facility closure. This modified Closure Plan will be submitted to the NMED for approval.

I-1d(4) Amendment of the Closure Plan

If it becomes necessary to amend the Closure Plan for the WIPP facility, the Permittees will submit, in accordance with 20.4.1.900 NMAC (incorporating 40 CFR §270.42), a written notification of or request for a permit modification describing any change in operation or facility design that affects the Closure Plan. The written notification or request will include a copy of the amended Closure Plan for approval by the NMED. The Permittees will submit a written notification of or request for a permit modification to authorize a change in the approved plan, if:

- There are changes in operating plans or in the waste management unit facility design that affect the Closure Plan
- There is a change in the expected year of closure
- Unexpected events occur during panel or final facility closure that require modification of the approved Closure Plan
- Changes in State or Federal laws affect the Closure Plan
- Permittees fail to obtain permits for continued operations as discussed above

The Permittees will submit a written request for a permit modification with a copy of the amended Closure Plan at least sixty (60) days prior to the proposed change in facility design or operation or within sixty (60) days of the occurrence of an unexpected event that affects the Closure Plan. If the unexpected event occurs during final closure, the permit modification will be requested within thirty (30) days of the occurrence. If the Secretary of the NMED requests a modification of the Closure Plan, a plan modified in accordance with the request will be submitted within sixty (60) days of notification or within thirty (30) days, if the change in facility condition occurs during final closure.

I-1e Closure Activities

Closure activities include those instituted for panel closure (i.e., closure of filled underground HWDUs), contingency closure (i.e., closure of surface HWMUs and decontamination of other waste handling areas), and final facility closure (i.e., closure of surface HWMUs, D&D of surface facilities and the areas surrounding the WHB, and placement of repository shaft seals). Panel closure systems will be emplaced to separate areas of the facility and to isolate panels. Permit Attachments I1 and I2 provide panel closure system and shaft seal designs. All closure activities will meet the applicable quality assurance (QA)/quality control (QC) program standards in place at the WIPP facility. Facility monitoring procedures in place during operations will remain in place through final closure, as applicable.

I-1e(1) Panel Closure

Following completion of waste emplacement in each underground HWDU, disposal-side ventilation will be established in the next panel to be used, and the panel containing the waste will be closed. A panel closure system will be emplaced in the panel access drifts, in accordance with the design in Permit Attachment I1 and the schedule in Figure I-2 and Table I-1. The panel closure system is designed to meet the following requirements that were established by the DOE for the design to comply with 20.4.1.500 NMAC (incorporating 40 CFR §264.601(a)):

- the panel closure system shall limit the migration of VOCs to the compliance point so that compliance is achieved by at least one order of magnitude

- the panel closure system shall consider potential flow of VOCs through the disturbed rock zone (DRZ) in addition to flow through closure components
- the panel closure system shall perform its intended functions under loads generated by creep closure of the tunnels
- the panel closure system shall perform its intended function under the conditions of a postulated methane explosion
- the nominal operational life of the closure system is thirty-five (35) years
- the panel closure system for each individual panel shall not require routine maintenance during its operational life
- the panel closure system shall address the most severe ground conditions expected in the waste disposal area
- the design class of the panel closure system shall be IIIb (which means that it is to be built to generally accepted national design and construction standards)
- the design and construction shall follow conventional mining practices
- structural analysis shall use data acquired from the WIPP underground
- materials shall be compatible with their emplacement environment and function
- treatment of surfaces in the closure areas shall be considered in the design
- thermal cracking of concrete shall be addressed
- during construction, a QA/QC program shall be established to verify material properties and construction practices
- construction of the panel closure system shall consider shaft and underground access and services for materials handling

The performance standard for air emissions from the WIPP facility is established in Module IV and Permit Attachment M2. Releases shall be below these limits for the facility to remain in compliance with standards to protect human health and the environment. The following panel closure design has been shown, through analysis, to meet these standards, if emplaced in accordance with the specifications in Permit Attachment I1.

The approved design for the panel closure system calls for a composite panel barrier system consisting of a rigid concrete plug with removal of the DRZ, and an explosion-isolation wall. The design basis for this closure is such that the migration of hazardous waste constituents from closed panels during the operational and closure period would result in concentrations well below health-based standards. The source term used as the design basis included the average concentrations of VOCs from CH waste containers as measured in headspace gases through

January 1995. The VOCs are assumed to have been released by diffusion through the container vents and are assumed to be in equilibrium with the air in the panel. Emissions from the closed panel occur at a rate determined by gas generation within the waste and creep closure of the panel.

Figures I-4 and I-5 show a diagram of the panel closure design and installation envelopes. Permit Attachment I1 provides the detailed design and the design analysis for the panel closure system. Although the permit application proposed several panel closure design options, depending on the gas generated by wastes and the age of the mined openings, the NMED and EPA determined that only the most robust design option (D) would be approved. This decision does not prevent the Permittees from continuing to collect data on the behavior of the wastes and mined openings, or proposing a modification to the Closure Plan in the future, using the available data to support a request for reconsideration of one or more of the original design options. If a design different from Option D as defined in Permit Attachment I1 is proposed, the appropriate permit modification will be sought.

I-1e(2) Decontamination and Decommissioning

Decontamination is defined as those activities which are performed to remove contamination from surfaces and equipment that are not intended to be disposed of at the WIPP facility. The policy at the WIPP will be to decontaminate as many areas as possible, consistent with radiation protection policy. Decontamination is part of all closure activities and is a necessary activity in the clean closure of the surface container management units. Decontamination determinations are based upon radiological and hazardous constituent surveys.

Decommissioning is the process of removing equipment, facilities, or surface areas from further use and closing the facility. Decommissioning is part of final facility closure only and will involve the removal of equipment, buildings, closure of the shafts, and establishing active and passive institutional controls for the facility. Passive institutional controls are not included in the Permit.

The objective of D&D activities at the WIPP facility is to return the surface to as close to the preconstruction condition as reasonably possible, while protecting the health and safety of the public and the environment. Major activities required to accomplish this objective include, but are not limited to the following:

1. Review of operational records for historical information on releases

2. Visual examination of surface structures for evidence of spills or releases

3. Performance of site contamination surveys

4. Decontamination, if necessary, of usable equipment, materials, and structures including surface facilities and areas surrounding the WHB.

5. Disposal of equipment/materials that cannot be decontaminated but that meet the treatment, storage, and disposal facility waste acceptance criteria (TSDF-WAC) in an underground HWDU

6. Emplacement of final panel closure system

7. Emplacement of shaft seals[3]

8. Regrading the surface to approximately original contours

9. Initiation of active controls

This Closure Plan will be amended prior to the initiation of closure activities to specify the methods to be used.

Health and Safety

Before final closure activities begin, health physics personnel will conduct a hazards survey of the unit(s) being closed. A release of radionuclides could also indicate a release of hazardous constituents. If radionuclides are not detected, sampling for hazardous constituents will still be performed if there is documentation or visible evidence that a spill or release has occurred. The purpose of the hazards survey will be to identify potential contamination concerns that may present hazards to workers during the closure activities and to specify any control measures necessary to reduce worker risk. This survey will provide the information necessary for the health physics personnel to identify worker qualifications, personal protective equipment (PPE), safety awareness, work permits, exposure control programs, and emergency coordination that will be required to perform closure related activities.

I-1e(2)(a) Determine the Extent of Contamination

The first activities performed as part of decontamination include those needed to determine the extent of any contamination that needs to be removed prior to decommissioning a facility. This includes activities 1 to 3 above and, as can be seen by the schedules in Figures I-3 and I-4 (Items B and C), these surveys are anticipated to take ten (10) months to perform, including obtaining the results of any sample analyses. The process of identifying areas that require decontamination include three sources of information. First, operating records will be reviewed to determine where contamination has previously been found as the result of historical releases and spills. Even though releases and spills will have been cleaned up at the time of occurrence, newer equipment and technology may allow further cleaning. Second, surfaces of facilities and structures will be examined visually for evidence of spills or releases. Finally, extensive detailed contamination surveys will be performed to document the level of cleanliness for all surface structures and equipment. If equipment or areas are identified as contaminated, the Permittees will notify NMED as specified in Permit Module I, and a plan and procedure(s) will be developed and implemented to address decontamination-related questions, including:

- Should the component be decontaminated or disposed of as waste?
- What is the most cost-effective method of decontaminating the component?

[3] For the purposes of planning, the conclusion of shaft sealing is used by the DOE as the end of closure activities and the beginning of the Post-Closure Care Period.

- Will the decontamination procedures adequately contain the contamination?

Radiological and hazardous constituent surveys will be used in determining the presence of hazardous waste and hazardous waste residues in areas where spills or releases have occurred. Radiological surveys are described in Permit Attachment I3. Once cleanup of the radioactivity has been completed, the surface will be sampled for hazardous constituents specified in Permit Attachment O to determine that they, too, have been cleaned up. Sampling and analysis protocols will be consistent with EPA's document SW-846 (EPA, 1996).

I-1e(2)(b) Decontamination Activities

Once the extent of contamination is known, decontamination activities will be planned and performed. Radiological control and the control of hazardous waste residues are the primary criteria used in the design of decontamination activities. Radiation control procedures require that careful planning and execution be used in decontamination activities to prevent the exposure of workers beyond applicable standards and to prevent the further spread of contamination. Careful control of entry, cleanup, and ventilation are vital components of radiation decontamination. The level of care mandated by DOE orders and occupational protection requirements results in closure activities that will exceed the one hundred eighty (180) days allowed in 20.4.1.500 NMAC (incorporating 40 CFR §264.113(b)). Decontamination activities are included as item 4 above and are shown on the schedules for contingency closure and final facility closure (Figures I-3 and I-4) as activities D, E, and F. These activities are anticipated to have a duration of twenty (20) months for both contingency closure and for final facility closure. The result of these activities is the clean closure of the surface container management units. Under contingency closure, the other areas that have been decontaminated will not be closed. Instead they will remain in use for continued waste management activities involving non-mixed waste. Under final facility closure, other areas that are decontaminated are eligible for closure.

The "Start Clean—Stay Clean" operating philosophy of the WIPP Project will provide for minimum need for decontamination. However, the need for decontamination techniques may arise.

Decontamination activities will be coordinated with closure activities so that areas that have been decontaminated will not be recontaminated. All waste resulting from decontamination activities will be surveyed and analyzed for the presence of radioactive contamination and hazardous constituents specified in Permit Attachment O. The waste will be characterized as hazardous, mixed, or radioactive and will be packaged and handled appropriately. Mixed and radioactive waste will be classified as TRU mixed waste managed in accordance with the applicable Permit requirements. Derived mixed waste collected during decontamination activities that are generated before repository shafts have been sealed will be emplaced in the facility, if appropriate, or will be managed together with decontamination derived waste collected after the underground is closed. This waste will be classified and shipped off site to an appropriate, permitted facility for treatment, if necessary, and for disposal.

Removal of Hazardous Waste Residues

Because of the type of waste management activities that will occur at the WIPP facility, waste residues that may be encountered during the operation of the facility and at closure may include derived waste. Derived wastes result from the management of the waste containers or may be collected as part of the closure activities (such as those during which wipes were used to sample the containers and equipment for potential radioactive contamination or those involving solidified decontamination solutions, the handling of equipment designated for disposal, and the handling of residues collected as a result of spill cleanup). Derived wastes collected during the operation and closure of the WIPP facility will be identified and managed as TRU mixed wastes. These wastes will be disposed in the active underground HWDU. D&D derived wastes and equipment designated for disposal will be placed in the last underground HWDU panel before closure of that unit.

Surface Container Storage Units

The procedures employed for waste receipt at the WIPP facility minimize the likelihood for any waste spillage to occur outside the WHB. TRU mixed waste is shipped to the WIPP facility in approved shipping containers (i.e., Contact Handled Packages) that are not opened until they are inside the WHB. Therefore, it is unlikely that soil in the Parking Area Unit or elsewhere in the vicinity of the WHB will become contaminated with TRU mixed waste constituents as a result of TRU mixed waste management activities. An evaluation of the soils in the vicinity of the WHB will only be necessary if a documented event resulting in a release has occurred outside the WHB.

The "Start Clean—Stay Clean" operating philosophy of the WIPP Project will minimize the need for decontamination of the WHB during decommissioning and closure. Procedures for opening shipping containers in the WHB limit the opportunity for waste spillage.

Should the need for decontamination of the WHB arise, the following methods may be employed, as appropriate, for the hazardous constituent/contaminant type and extent:

- Chemical cleaning (e.g., water, mild detergent cleanser, and polyvinyl alcohol)
- Nonchemical cleaning (e.g., sandblasting, grinding, high-pressure water spray, scabbler pistons and needle scalers, ice-blast technology, dry-ice blasting)
- Removal of contaminated components such as pipe and ductwork

Waste generated as a result of WHB decontamination activities will be managed as derived waste in accordance with applicable permit requirements and will be emplaced in the last open underground HWDU for disposal.

Waste Handling Equipment and

The waste hoist conveyance and associated waste handling equipment will be decontaminated to background or be disposed as derived waste as part of both contingency and final facility closure. Procedures for detection and sampling will be as described above. Equipment cleanup will be as above using chemical or nonchemical techniques.

Personnel Decontamination

PPE worn by personnel performing closure activities in areas determined to be contaminated will be disposed of appropriately. Disposable PPE used in such areas will be placed into containers and managed as TRU mixed waste. Non-disposable PPE will be decontaminated, if possible. Non-disposable PPE that cannot be decontaminated will be managed as TRU mixed waste.

In accordance with DOE policy, TRU mixed waste PPE will be considered to be contaminated with all of the hazardous waste constituents contained in the containers that have been managed within the unit being closed. Wastes collected as a result of closure activities and that may be contaminated with radioactive and hazardous constituents will be considered TRU mixed wastes. These wastes will be managed as derived wastes, as described in Permit Attachment M2. Such waste, collected as the result of closure of the WIPP facility, will be disposed of in the final open underground HWDU.

Cleanup Criteria

Radiation decontamination will be less than or equal to the following levels, or to whatever lesser levels that may be established by DOE Order at the time of cleanup:

Contamination Type	Loose[4]	Fixed plus removable
alpha contamination (α)	20 dpm/100 cm^2	500 dpm/100 cm^2
beta-gamma contamination (β-γ)	200 dpm/100 cm^2	1000 dpm/100 cm^2

Hazardous waste decontamination will be conducted in accordance with standards in 20.4.1.500 NMAC (incorporating 40 CFR §264) or as incorporated into the Permit.

Final Contamination Sampling and Quality Assurance

Verification samples will be analyzed by an approved laboratory that has been qualified by the DOE according to a written program with strict criteria. The QA requirements of EPA/SW-846, "Test Methods for Evaluating Solid Waste" (EPA, 1986), will be met for hazardous constituent sampling and analyses.

[4] The unit "dpm" stands for "disintegration per minute" and is the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

Quality Assurance/Quality Control

Because decisions about closure activities may be based, in part, on analyses of samples of potentially contaminated surfaces and media, a program to ensure reliability of analytical data is essential. Data reliability will be ensured by following a QA/QC program that mandates adequate precision and accuracy of laboratory analyses. Field documentation will be used to document the conditions under which each sample is collected. The documented QA/QC program in place at the WIPP facility will meet applicable RCRA QA requirements.

Field blanks and duplicate samples will be collected in the field to determine potential errors introduced in the data from sample collection and handling activities. To determine the potential for cross-contamination, rinsate blanks (consisting of rinsate from decontaminated sampling equipment) will be collected and analyzed. At least one rinsate blank will be collected for every 20 field samples. Duplicate samples will be collected at a frequency of one duplicate sample for every ten field samples. In no case will less than one rinsate blank or duplicate sample be collected for a field-sampling effort. These blank and duplicate samples will be identified and treated as separate samples. Acceptance criteria for QA/QC hazardous constituent sample analyses will adhere to the most recent version of EPA SW-846 or other applicable EPA guidance.

I-1e(2)(c) Dismantling

Final facility closure will include dismantling of structures on the surface and in the underground. These are items 6 and 7 above and are represented as Activity G in the final facility closure schedule in Figure I-4. During dismantling, priority will be given to contaminated structures and equipment that cannot be decontaminated to assure these are properly disposed of in the remaining open underground HWDU in a timely manner. All such facilities and equipment are expected to be removed and disposed of sixteen (16) months after the initiation of closure. Dismantling of the balance of the facility, including those structures and equipment that are not included in the application and are not used for TRU mixed waste management, is anticipated to take an additional sixty-six (66) months. It should be noted that the placement of D&D waste into the final underground HWDU may, by necessity, involve the placement of uncontainerized bulk materials such as concrete components, building framing, structural members, disassembled or partially disassembled equipment, or containerized materials in non-standard waste boxes. Such placement will only occur if it can be shown that it is protective of human health and the environment and all items are described in an amendment to the Closure Plan. Identification of bulk items is not possible at this time since their size and quantity will depend on the extent of non-removable contamination.

I-1e(2)(d) Closure of Open Underground HWDU

The closure of the final underground HWDU is shown by Activity H in Figure I-3. This closure will be consistent with the description in Section I-1e(1) and the design in Permit Attachment I1. Detailed closure schedules for underground HWDUs are given in Figure I-2 and Table I-1.

I-1e(2)(e) Final Facility Closure

Final facility closure includes several activities designed to assure both the short-term isolation of the waste and the long-term integrity of the disposal system. These include the placement of plugs in boreholes that penetrate the salt and the placement of the repository sealing system. In addition, the surface will be returned to as near its original condition as practicable, and will be readied for the construction of markers and monuments that will provide permanent marking of the repository location and contents.

Figure I-6 identifies where ten existing boreholes overlie the proximate area of the repository footprint. Of these identified boreholes in Figure I-6, all but ERDA-9 are terminated hundreds of feet above the repository horizon. Only ERDA-9, which is accounted for in long-term performance modeling, is drilled through the repository horizon, near the WIPP excavations.

To mitigate the potential for migration beyond the repository horizon, the DOE has specified that borehole seals be designed to limit the volume of water that could be introduced to the repository from the overlying water-bearing zones and to limit the volume of contaminated brine released from the repository to the surface or water-bearing zones.

Borehole plugging activities have been underway since the 1970s, from the early days of the development of the WIPP facility. Early in the exploratory phase of the project, a number of boreholes were sunk in Lea and Eddy counties. After the WIPP site was situated in its current location, an evaluation of all vertical penetrations was made by Christensen and Peterson (1981).

As an initial criterion, any borehole that connects a fluid-producing zone with the repository horizon becomes a plugging candidate.

Grout plugging procedures are routinely performed in standard oil-field operations; however, quantitative measurements of plug performance are rarely obtained. The Bell Canyon Test reported by Christensen and Peterson (1981) was a field test demonstration of the use of cementitious plugging materials and modification of existing industrial emplacement techniques to suit repository plugging requirements. Cement emplacement technology was found to be "generally adequate to satisfy repository plugging requirements." Christensen and Peterson (1981) also report "that grouts can be effective in sealing boreholes, if proper care is exercised in matching physical properties of the local rock with grout mixtures. Further, the reduction in fluid flow provided by even limited length plugs is far in excess of that required by bounding safety assessments for the WIPP." The governing regulations for plugging and/or abandonment of boreholes are summarized in Table I-3.

The proposed repository sealing system design will prevent water from entering the repository and will prevent gases or brines from migrating out of the repository. The proposed design includes the following subsystems and associated principal functions:

- Near-surface: to prevent subsidence at and around the shafts

- Rustler Formation: to prevent subsidence at and around the shafts and to ensure compliance with Federal and State of New Mexico groundwater protection requirements

- Salado Formation: to prevent transporting hazardous waste constituents beyond the point of compliance specified in Permit Module V

The repository sealing system will consist of natural and engineered barriers within the WIPP repository that will withstand forces expected to be present because of rock creep, hydraulic pressure, and probable collapses in the repository and will meet the closure requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.601 and §264.111). Permit Attachment I2 presents the final repository sealing system design.

Once shaft sealing is completed, the Permittees will consider closure complete and will provide the NMED with a certification of such within sixty (60) days.

I-1e(2)(f) Final Contouring and Revegetation

In the preparation of its Final Environmental Impact Statement (DOE, 1980), the DOE committed to restore the site to as near to its original condition as is practicable. This involves removal of access roads, unneeded utilities, fences, and any other structures built by the DOE to support WIPP operations. Provisions would be left for active post-closure controls of the site and for the installation of long-term markers and monuments for the purpose of permanently marking the location of the repository and waste. Permit Attachment J-1a(1) discusses the active and long-term controls proposed for the WIPP. Installation of borehole seals are anticipated to take twelve (12) months, shaft seals fifty-two (52) months, and final surface contouring eight (8) months.

I-1e(2)(g) Closure, Monuments, and Records

A record of the WIPP Project shall be listed in the public domain in accordance with the requirements of 20.4.1.500 NMAC (incorporating 40 CFR §264.116). Active access controls will be employed for at least the first one hundred (100) years after final facility closure. In addition, a passive control system consisting of monuments or markers will be erected at the site to inform future generations of the location of the WIPP repository (see "Permanent Marker Conceptual Design Report" [DOE, 1995b]).

This Permit requires only a thirty (30) year post-closure period. This is the maximum post-closure time frame allowed in an initial Permit for any facility, as specified in 20.4.1.500 NMAC (incorporating 40 CFR §264.117(a)). The Secretary of the NMED may shorten or extend the post-closure care period at any time in the future prior to completion of the original post-closure period (30 years after the completion of construction of the shaft seals). The Permanent Marker Conceptual Design Report and other provisions during the first 100 years after closure are addressed under another Federal regulatory program.

Closure of the WIPP facility will contribute to the following:

- Prevention of the intrusion of fluids into the repository by sealing the shafts

- Prevention of human intrusion after closure
- Minimization of future physical and environmental surveillance

Detailed records shall be filed with local, State, and Federal government agencies to ensure that the location of the WIPP facility is easily determined and that appropriate notifications and restrictions are given to anyone who applies to drill in the area. This information, together with land survey data, will be on record with the U.S. Geological Survey and other agencies. The Federal government will maintain permanent administrative authority over those aspects of land management assigned by law. Details of post-closure activities are in Permit Attachment J.

I-1e(3) Performance of the Closed Facility

20.4.1.500 NMAC (incorporating 40 CFR §264.601) requires that a miscellaneous unit be closed in a manner that protects human health and the environment. The RCRA Part B permit application addressed the expected performance of the closed facility during the thirty (30) year post closure period. Groundwater monitoring will provide information on the performance of the closed facility during the post-closure care period, as specified in Section J-1a(2) (Monitoring) of Permit Attachment J.

The principal barriers to the movement of hazardous constituents from the facility or the movement of waters into the facility are the halite of the Salado Formation (natural barrier) and the repository seals (engineered barrier). Data and calculations that support this discussion were presented in the permit application. The majority of the calculations performed for the repository are focused on long-term performance and making predictions of performance over 10,000 years. In the short term, the repository is reaching a steady state configuration where the hypothetical brine inflow rate is affected by the increasing pressure in the repository due to gas generation and creep closure. These three phenomena are related in the numerical modeling performed to support the permit application. The modeling parameters, assumptions and methodology were described in detail in the permit application.

I-2 Notices Required for Disposal Facilities

I-2a Certification of Closure

Within sixty (60) days after completion of closure activities for a HWMU (i.e., for each storage unit and each disposal unit), the Permittees will submit to the Secretary of the NMED a certification that the unit (and, after completion of final closure, the facility) has been closed in accordance with the specifications of this Closure Plan. The certification will be signed by the Permittees and by an independent New Mexico registered professional engineer. Documentation supporting the independent registered engineer's certification will be furnished to the Secretary of the NMED with the certification.

I-2b Survey Plat

Within sixty (60) days of completion of closure activities for each underground HWDU, and no later than the submission of the certification of closure of each underground HWDU, the Permittees will submit to the Secretary of the NMED a survey plat indicating the location and dimensions of hazardous waste disposal units with respect to permanently surveyed benchmarks. The plat will be prepared and certified by a professional land surveyor and will contain a prominently displayed note that states the Permittees' obligation to restrict disturbance of the hazardous waste disposal unit. In addition, the land records in the Eddy County Courthouse, Carlsbad, New Mexico, will be updated through filing of the final survey plats.

References

Christensen, C. L., and Peterson, E. W. 1981. "Field-Test Programs of Borehole Plugs in Southeastern New Mexico." In The *Technology of High-Level Nuclear Waste Disposal Advances in the Science and Engineering of the Management of High-Level Nuclear Wastes*, P. L. Hofman and J. J. Breslin, eds., SAND79-1634C, DOE/TIC-4621, Vol. 1, pp. 354–369. Technical Information Center of the U.S. Department of Energy, Oak Ridge, TN.

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U.S. Department of Energy, 1980, "Final Environmental Impact Statement, Waste Isolation Pilot Plant," DOE/EIS 0026, U.S. Department of Energy, Washington, D.C.

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U.S. Department of Energy, 1997, "WIPP Safety Analysis Report," DOE/WIPP-95-2065, Revision 1, U.S. Department of Energy, Carlsbad, NM.

U.S. Environmental Protection Agency, 1996, "Test Methods for Evaluating Solid Waste," SW-846, U.S. Environmental Protection Agency, Washington, D.C.

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TABLES

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TABLE I-1
ANTICIPATED EARLIEST CLOSURE DATES FOR THE UNDERGROUND HWDUs

HWDU	OPERATIONS START	OPERATIONS END	CLOSURE START	CLOSURE END
PANEL 1	3/99	2/03	3/03	9/03 SEE NOTE 5
PANEL 2	1/02	7/04	8/04	12/05
PANEL 3	7/04	1/07	2/07	6/07
PANEL 4	1/07	7/09	8/09	12/10
PANEL 5	7/09	1/12	2/12	6/12
PANEL 6	1/12	7/14	8/14	12/15
PANEL 7	7/14	1/17	2/17	6/17
PANEL 8	1/17	7/19	8/19	12/20
PANEL 9	7/19	1/22	2/22	SEE NOTE 4
PANEL 10	1/22	7/24	8/24	SEE NOTE 4

NOTE 1: Only Panels 1 to 3 will be closed under the permit covered by this application. Closure schedules for Panels 4 through 10 are projected assuming new permits will be issued in 2009 and 2019.

NOTE 2: The point of closure start is defined as sixty (60) days following notification to the NMED of closure.

NOTE 3: The point of closure end is defined as one hundred eighty (180) days following placement of final waste in the panel.

NOTE 4: The time to close these areas may be extended depending on the nature and extent of the disturbed rock zone. The excavations that constitute these panels will have been opened for as many as forty (40) years so that the preparation for closure may take longer than the time allotted in Figure I-2. If this extension is needed, it will be requested as an amendment to the Closure Plan.

NOTE 5: The anticipated closure end date for Panel 1 is for installation of the 12-foot explosion isolation wall. Final closure of Panel 1 will be completed as specified in this Permit no later than five years after completion of the explosion isolation wall.

TABLE I-2
ANTICIPATED OVERALL SCHEDULE FOR CLOSURE ACTIVITIES

ACTIVITY	FINAL FACILITY CLOSURE	
	START	STOP
Notify NMED of Intent to Close WIPP (or to Implement Contingency Closure)	August 2024	N/A
Perform Contamination Surveys in both Surface Storage Areas	August 2024	February 2025
Sample Analysis	October 2024	May 2025
Decontamination as Necessary of both Surface Storage Areas	April 2025	November 2025
Final Contamination Surveys of both Surface Storage Areas	December 2025	July 2026
Sample Analysis	April 2026	November 2026
Prepare and Submit Container Management Unit Closure Certification	December 2026	March 2027
Dispose of Closure-Derived Waste	September 2024	November 2025
Closure of Open Underground HWDU panel	December 2025*	July 2026
Install Borehole Seals	August 2026	July 2027
Install Repository Seals	April 2027	July 2031
Recontour and Revegetate	August 2031	March 2032
Prepare and Submit Final (Contingency) Closure Certification	August 2031	March 2032
Post-closure Monitoring	May 2032	N/A

N/A--Not Applicable
Refer to Figures I-3 and I-4 for precise activity titles.

*This assumes the final waste is placed in this unit in November 2025 and notification of closure for this HWDU is submitted to the NMED in October 2025.

TABLE I-3
GOVERNING REGULATIONS FOR BOREHOLE ABANDONMENT

Federal or State Land	Type of Well or Borehole	Governing Regulation	Summary of Requirements
Both	Groundwater Surveillance	State and Federal regulation in effect at time of abandonment	Monitor wells no longer in use shall be plugged in such a manner as to preclude migration of surface runoff or groundwater along the length of the well. Where possible, this shall be accomplished by removing the well casing and pumping expanding cement from the bottom to the top of the well. If the casing cannot be removed, the casing shall be ripped or perforated along its entire length if possible, and grouted. Filling with bentonite pellets from the bottom to the top is an acceptable alternative to pressure grouting.
Federal	Oil and Gas Wells	43 CFR Part 3160, §§ 3162.3-4	The operator shall promptly plug and abandon, in accordance with a plan first approved in writing or prescribed by the authorized officer.
Federal	Potash	43 CFR Part 3590, § 3593.1	(b) Surface boreholes for development or holes for prospecting shall be abandoned to the satisfaction of the authorizing officer by cementing and/or casing or by other methods approved in advance by the authorized officer. The holes shall also be abandoned in a manner to protect the surface and not endanger any present or future underground operation, any deposit of oil, gas, or other mineral substances, or any aquifer.
State	Oil and Gas Well Outside the Oil-Potash Area	State of New Mexico, Oil Conservation Division, Rule 202 (eff. 3-1-91)	B. Plugging (1) Prior to abandonment, the well shall be plugged in a manner to permanently confine all oil, gas, and water in the separate strata where they were originally found. This can be accomplished by using mud-laden fluid, cement, and plugs singly or in combination as approved by the Division on the notice of intention to plug. (2) The exact location of plugged and abandoned wells shall be marked by the operator with a steel marker not less than four inches (4") in diameter, set in cement, and extending at least four feet (4') above mean ground level. The metal of the marker shall be permanently engraved, welded, or stamped with the operator name, lease name, and well number and location, including unit letter, section, township, and range.
State	Oil and Gas Wells Inside the Oil-Potash Area	State of New Mexico, Oil Conservation Division, Order No. R-111-P (eff. 4-21-88)	F. Plugging and Abandonment of Wells (1) All existing and future wells that are drilled within the potash area, shall be plugged in accordance with the general rules established by the Division. A solid cement plug shall be provided through the salt section and any water-bearing horizon to prevent liquids or gases from entering the hole above or below the salt selection. It shall have suitable proportions—but no greater than three (3) percent of calcium chloride by weight—of cement considered to be the desired mixture when possible.

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FIGURES

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Figure I-1
Location of Underground HWDUs and Anticipated Closure Locations

Figure I-2
WIPP Panel Closure Schedule

Figure I-3
WIPP Facility Final Closure Schedule

Figure I-4
Design of a Panel Closure System

Figure I-5
Typical Disposal Panel

Figure I-6
Approximate Location of Boreholes in Relation to the WIPP Underground

Tab 4

Table I

List of All Solid Waste Management Units

	Unit Type	Unit Description	Chemicals Deposited in the Unit	Status	Impacts to Groundwater
001 a - ab	MUD Pits	These mud pits were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons.	Sodium and potassium chloride saturated brine; starch; bentonite gel; diesel fuel; drill cuttings; metal cuttings; grease; hydraulic fluid; motor oil.	The mud pits are no longer in use. NFA granted in 1999.* NFA Petition was submitted in Oct. 2002 for the removal of the remaining mud pits listed in Table II.	None. No GW present and engineering controls limit migration potential.
002 a - d	Mine Tailings and Top Soil Storage Areas	A total of four areas ranging in size from 3 to 15 acres used for mine tailings and topsoil storage.	Mined rock (principally salt); topsoil; traces of hydraulic oil; motor oil; diesel fuel; and scrap steel.	The two salt storage piles (002a,b) are inactive. The two top soil piles (002c,d) are active.	Engineering controls are in place per DP-831 for the salt storage piles. No impacts to groundwater are expected from the top soil storage areas.
003 a - b	Landfills	Two landfills used for disposal of construction debris.	Foundation excavation soils; concrete; scrap wood; and metal.	003b is active. 003a is inactive.	None. No GW present and no hazardous materials or liquids have been placed in CD landfill.

Table I

	Unit Type	Unit Description	Chemicals Deposited in the Unit	Status	Impacts to Groundwater
004 a - c	Storage Yards	Three storage yard areas used for storage of construction and maintenance materials, wastewater, and used oils or materials that can be reclaimed or recycled.	Water contaminated with motor oil, hydraulic oil, and diesel fuel; used hydraulic oil, motor oil, antifreeze, glycol-based oils, chemical grout; used lead acid batteries; scrap metal. Used hydrocarbons are collected in containers for future recycling.	004a is active. 004b is inactive & closed. 004c is inactive & closed.	None. Only portacamp (004a) is active; i.e., not granted NFA Status. No hazardous wastes are stored in 004a & any products stored in that area are stored in sealed containers and on secondary containment. There are no records of hazardous materials releases in 004a.
005 a - c	Concrete Batch Plants	Three areas were used as temporary locations for concrete batch plants.	Concrete; trace amounts of motor oil and grease.	Inactive and closed. NFA granted in 1999*.	None. Concrete plants are closed. No hazardous constituents were present in these locations.
006 a - b	Holding Ponds	Two ponds used to hold brine drilling fluid from the drilling of the salt handling and waste handling shafts.	Saturated brine; bentonite; drill cuttings; hydraulic oil and grease.	Inactive and closed. NFA granted in 1999*.	None. No hazardous constituents were present.
007 a - c	Evaporation Ponds	Three ponds used for the evaporation of water.	Water; soap; non hazardous cleaning solutions; oil; unsaturated salt brine.	Two Inactive and closed. NFA granted in 1999*. 007b NFA requested in the October 2002 Petition.	None. Two inactive ponds are closed. Engineering controls will be put in place for the other evaporation pond.

Table I

	Unit Type	Unit Description	Chemicals Deposited in the Unit	Status	Impacts to Groundwater
008 a - r	Surface Satellite Accumulation Areas	Ten hazardous waste or used petroleum product satellite accumulation areas; two hazardous waste staging areas. All hazardous wastes were kept in steel containers and managed as hazardous waste.	Non-radioactive, site-generated wastes, collected in containers including spent solvents, aerosol cans, oily rages, expired chemicals, and paint products.	Inactive and closed . NFA Granted in 1999*.	None. No hazardous constituents were released. No contaminant migration to GW due to engineered controls. Waste was managed appropriately.
009 a - l	Underground Satellite Accumulation Areas	Ten hazardous waste or used petroleum product satellite accumulation areas.	Non-radioactive, site-generated wastes, including spent solvents, aerosol cans, oily rages, used oils, spent lead acid batteries, grout, and cement. Hazardous waste and used petroleum products are collected in containers.	Nine of ten closed. All granted NFA in 1999*.	None. No usable groundwater occurs within the repository horizon (Salado Formation).
010 a - e	Shaft Sumps	An area at the bottom of each of the four WIPP shafts that collected construction debris or accumulated brine.	Welding residue; scrap wood and metal; salt; Class C cement; chem-seal; bentonite; grease and oil; cement and chem grout; Rustler formation brine; washwater.	Two active (010b,c) and NFA was request in October 2002. Three inactive (010a,d,e) granted NFA in 1999*.	None. No usable groundwater occurs within the repository horizon (Salado Formation).
011 a - e	Sewage Treatment Facility	Only five of the seven sewage treatment lagoons were listed in the RFA.	Sanitary waste; neutralized film developer (tested non-hazardous), and oil.	Active	None. No known usable GW under the sewage lagoons. Analysis indicates no hazardous constituents. Engineering controls in place including liners and inspections.

Table I

	Unit Type	Unit Description	Chemicals Deposited in the Unit	Status	Impacts to Groundwater
012	Non-hazardous Solid Waste Collections Bins	Twenty portable bins used for solid waste collection.	Non-hazardous solid waste including non liquid sanitary waste and industrial waste.	Active	None. Administrative controls insure no hazardous constituents in bins. Engineering controls prevent release of any constituents.
013	TRU Mixed Waste Management Units	Areas where transuranic (TRU) mixed waste was managed during the Disposal Phase. Includes contact and remote handled TRU waste, including areas in the Waste Handling Building and Disposal Panels 1 through 8 in the underground. Waste will be in approved containers**.	Radioactive mixed waste consisting of TRU waste that is co-contaminated by various listed hazardous or characteristic waste consisting mostly of metals.	Active	None. No hazardous releases. No liquids accepted, and there have been no air releases. In addition, engineering controls, impermeable concrete, inspections, and spill prevention control procedures are in place.

* Technical Support Document Exclusion/Inclusion of Solid Waste Management Units and Areas of Concern
Proposed Final Permit Module VII Corrective Action for Solid Waste Management Units - Waste Isolation Pilot Plant EPA No. NM4890139088
New Mexico Environment Department June 25, 1999

Note: Table I contains all known SWMUs. Table II contains SWMUs and AOCs not granted NFA in 1999 and covered in the October 2002 NFA Petition.

Table II

Solid Waste Management Units not Previously Granted No Further Action

SWMU No.	Unit Type	Unit Description	Chemicals Deposited in the Unit	Status	Impacts to Groundwater
001g (H-14/P-1)	MUD Pits	Mud Pits were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons. No NFA determination at this time.	Sodium and potassium chloride saturated brine; starch; bentonite gel; diesel fuel; drill cuttings; metal cuttings; grease; hydraulic fluid; motor oil.	Inactive. Awaiting NFA*.	None. No known protected GW in the area. Mud pit liner in place. Contaminates have very low migration potential.
001h (H-15/P-2)	MUD Pits	Mud Pits were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons. No NFA determination at this time.	Sodium and potassium chloride saturated brine; starch; bentonite gel; diesel fuel; drill cuttings; metal cuttings; grease; hydraulic fluid; motor oil.	Inactive. Awaiting NFA*.	None. No known protected GW in the area. Mud pit liner in place. Contaminates have very low migration potential.
001j (P-3)	MUD Pit	Mud Pits were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons. No NFA determination at this time.	Sodium and potassium chloride saturated brine; starch; bentonite gel; diesel fuel; drill cuttings; metal cuttings; grease; hydraulic fluid; motor oil.	Inactive. Awaiting NFA*.	None. No known protected GW in the area. Mud pit liner in place. Contaminates have very low migration potential.
001k (P-4)	MUD Pit	Mud Pits were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons. No NFA determination at this time.	Sodium and potassium chloride saturated brine; starch; bentonite gel; diesel fuel; drill cuttings; metal cuttings; grease; hydraulic fluid; motor oil.	Inactive. Awaiting NFA*.	None. No known protected GW in the area. Mud pit liner in place. Contaminates have very low migration potential.

Table II

SWMU No.	Unit Type	Unit Description	Chemicals Deposited in the Unit	Status	Impacts to Groundwater
001L (WIPP-12/P-5)	MUD Pits	Mud Pits were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons. No NFA determination at this time.	Sodium and potassium chloride saturated brine; starch; bentonite gel; diesel fuel; drill cuttings; metal cuttings; grease; hydraulic fluid; motor oil.	Inactive. Awaiting NFA*.	None. No known protected GW in the area. Mud pit liner in place. Contaminates have very low migration potential.
001m (P-6)	MUD Pit	Mud Pits were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons. No NFA determination at this time.	Sodium and potassium chloride saturated brine; starch; bentonite gel; diesel fuel; drill cuttings; metal cuttings; grease; hydraulic fluid; motor oil.	Inactive. Awaiting NFA*.	None. No known protected GW in the area. Mud pit liner in place. Contaminates have very low migration potential.
001n (P-15)	MUD Pit	Mud Pits were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons. No NFA determination at this time.	Sodium and potassium chloride saturated brine; starch; bentonite gel; diesel fuel; drill cuttings; metal cuttings; grease; hydraulic fluid; motor oil.	Inactive. Awaiting NFA*.	None. No known protected GW in the area. Mud pit liner in place. Contaminates have very low migration potential.
001o (Badger Unit)	MUD Pits	Mud Pits were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons. No NFA determination at this time.	Sodium and potassium chloride saturated brine; starch; bentonite gel; diesel fuel; drill cuttings; metal cuttings; grease; hydraulic fluid; motor oil.	Inactive. Awaiting NFA*.	None. No known protected GW in the area. Mud pit liner in place. Contaminates have very low migration potential.

Table II

SWMU No.	Unit Type	Unit Description	Chemicals Deposited in the Unit	Status	Impacts to Groundwater
001x (WIPP-13)	MUD Pit	Mud Pits were used for settling drill cuttings out of the drilling fluids being used in drilling holes to support hydrologic testing and monitoring, potash evaluation, and drilling for hydrocarbons. No NFA determination at this time.	Sodium and potassium chloride saturated brine; starch; bentonite gel; diesel fuel; drill cuttings; metal cuttings; grease; hydraulic fluid; motor oil.	Inactive. Awaiting NFA*.	None. No known protected GW in the area. Mud pit liner in place. Contaminates have very low migration potential.
004a (Portacamp)	Storage Yard	One yard used for storage of construction and maintenance materials, wastewater, and used oils or materials that can be reclaimed or recycled.	Water contaminated with motor oil, hydraulic oil, and diesel fuel; used hydraulic oil, motor oil, antifreeze, glycol-based oils, chemical grout; used lead acid batteries; scrap metal. Used hydrocarbons are collected in containers.	Active. Awaiting NFA*.	None. Anything stored in Portacamp is non-hazardous. Materials are stored in sealed containers that have secondary containment. Therefore, engineering controls preclude contaminate transport pathways.
007b (SW)	Evaporation Pond	One pond used for the evaporation of water. No NFA determination at this time.	Water; soap; non-hazardous cleaning solutions; oil; unsaturated salt brine.	Inactive. Awaiting NFA*.	None. SWMU closed and excavated. New pond constructed over previous SWMU. No hazardous contaminates present, therefore no migration potential.

* NFA Petition to NMED October 2002

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
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Sent To Dr. Ines R. Triay,
Street, Apt. No.; Waste Isolation Pil
or PO Box No. US Dept. of Energy
City, State, ZIP+4 P.O. Box 3090
Carlsbad, New Mexic

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

March 7, 2005

Dr. Ines R. Triay, Acting Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Response to Notice of Intent to Discharge Storm Water from SWIC Ponds 1, 2 and A to the Ground, DP-831, Waste Isolation Pilot Plant

Dear Dr. Triay:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received a Notice of Intent (NOI), submitted by the U.S. Department of Energy Waste Isolation Pilot Plant (WIPP) dated March 4, 2005. Excessive precipitation in the area has caused further delay in lining Storm Water Infiltration Control (SWIC) Pond A and discharge of storm water to the environment is requested to manage storm water at the WIPP site. In accordance with 20.6.2.1201 NMAC, the NOI requests the following discharges to occur.

1. Approximately 200,000 gallons of storm water will be discharged from the SWIC Pond A to SWIC Ponds 1 and 2, or to the ground. Storm water discharge from SWIC Pond A to SWIC Ponds 1 and 2 is necessary to allow completion of construction activities for synthetically lining this facility as required under DP-831.

2. Approximately 600,000 gallons of storm water will be discharged from SWIC Ponds 1 and 2 to the ground adjacent to these facilities. Discharge of storm water from these ponds is necessary to create storage capacity for future rain events and prevent damage to these facilities.

Samples of the storm water to be discharged were obtained and analyzed for pH, Specific Gravity, Specific Conductance, Bicarbonate, Chloride, Divalent Cations, Iron, Calcium, Sulfide and Potassium.

Based on the presently available information in your letter, dated March 7, 2005, a discharge permit is not being required for the discharges described above`. A discharge permit is not being required because the discharges conform to the numerical ground water standards in 20.6.2.3103 NMAC and do not contain any toxic pollutants as defined in 20.6.2.1101.TT NMAC, and therefore are exempt from the discharge permit requirement under 20.6.2.3105.A NMAC.

If at some time in the future WIPP intends to change the amount, the character, or location of the discharges so that they will not be as described, or if observation or monitoring shows that the discharges are threatening ground water quality, you must file a new request for exemption with the NMED.

If you have any questions, please call Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027.

Sincerely,

William C. Olson, Chief
Ground Water Quality Bureau

WCO/CLM

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
March 4, 2005

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Harold Runnels Building, Room N2250
1190 St. Francis Drive
Santa Fe, NM 87501

RECEI'
MAR 1 1 2

Subject: Notice of Intent to Discharge

Dear Mr. Marshall:

This letter is to confirm the information provided to you on March 1, 2005 during a teleconference with Mr. H. L. Plum, U.S. Department of Energy (DOE) and Mr. Stewart Jones, Washington TRU Solutions (WTS). There were discussions explaining the need for an extension of scheduled construction activities to emplace a liner in Storm Water Infiltration Control (SWIC) Pond A, and the discharge of storm water from Waste Isolation Pilot Plant (WIPP) SWIC Ponds 1, 2 and A.

Mr. Plum reported that excessive precipitation has continued to be recorded at the WIPP since the notifications submitted January 31 and February 2, 2005. Due to the additional storm water being collected, SWIC Pond 1 is at capacity and SWIC Pond 2 will be at or near capacity if predicted precipitation events occur March 4-7, 2005. Storm water that has collected in SWIC Pond A due to additional precipitation has caused further delay in construction activities even with the relief previously provided by the New Mexico Environment Department (NMED) after the Notification of Intent submitted February 2, 2005. He informed you that the number of precipitation events and the amount of rainfall resulting from these events is above the average expected for the WIPP site upon which the construction schedules were determined and SWIC capacities determined.

The excess volume of storm water collected requires DOE to provide a Notification of Intent to Discharge to NMED of the need to discharge storm water from the SWIC Ponds 1, 2 and A. This request is to allow the pumping and dispersal of excess storm water that has collected in SWIC Ponds 1, 2 and A to alternative locations for beneficial use of the water in the environment adjacent to these facilities. This is needed to prevent damage to SWIC Ponds 1 and 2 by exceeding their design capacity and to expedite the completion of construction activities for emplacement of liner material in SWIC Pond A.

CBFO:AMO:HLP:VW:05-0227:UFC:5487

Since the discussion of March 1, 2005, a review of options to prevent the collection of storm water in SWIC Pond A in the event of additional precipitation events have occurred. Engineers have determined that continued diversion of storm water from entering the storm water culverts on the east side of SWIC Pond A is appropriate and that this water will be diverted to SWIC Pond 2. Storm water collected from the parking lot north of SWIC Pond A that would normally pass through culverts on the north side of this facility will be diverted to the same location as storm water that has been and will be pumped from SWIC Pond A. With these actions, only rainfall falling on the surface of SWIC Pond A will affect the construction activities underway. SWIC Pond A has a surface area of 6.39 acres and the effect of additional precipitation events are expected to be limited. It is anticipated that this action will allow the soils in this facility to dry and allow work to resume in a minimum of 2 weeks of the date of approval of this request, unless the volume of precipitation is so large as to overwhelm measures described to control storm water collection.

It was concurred that discharge of these waters to the environment for beneficial reuse could be possible. You also stated that water samples must be collected and analyzed and this information forwarded with a formal written request as required by 20.6.2.1200 NMAC, Notice of Intent to Discharge to NMED. It was stressed that the collection of water samples must occur and this action completed prior to any such discharge occurring from a regulated site. NMED would review the information received in the notification and provide written determination of its decision by return mail. Both parties agreed that this re-use of collected storm water, when water quality had not been degraded, was appropriate in arid environments. DOE did discuss the sampling protocol to be used for this storm water. You agreed that, due to the fact that previous sampling and analysis events had determined this water to be of good quality, that DOE could limit analysis to the parameters that could be completed by site laboratory facilities. These parameters and field analytical results for the ponds are found in response to question 4 below. The storm water samples did not indicate presence of contaminants above levels of concern.

It was further discussed that WIPP's Discharge Permit (DP)- 831 contained a condition that construction activities to reshape and emplace an impermeable liner in SWIC Pond A would be completed by January 2005. Due to the unusually large number of precipitation events that occurred in September and October 2004 and the large volume of storm water collected in SWIC Pond A, the DOE did request an extension to complete construction to April 2005 by letter to NMED of November 12, 2004. NMED approved this extension November 18, 2004. As discussed above, continued delay of construction activities has occurred. Rather than requesting another date for construction activities to be completed in the future, you suggested that DOE provide a monthly status update of construction progress. DOE concurred that this would be an acceptable. DOE would like to suggest that this information be included in our current monthly report to NMED on freeboard remaining in the WIPP Sewage Lagoons permitted in DP-831.

CBFO:AMO:HLP:VW:05-0227:UFC:5487

DOE's oral and written notices are provided to NMED under 20.6.2.1201 NMAC.

(1) Name of the person making the discharge;
Dr. Inés Triay, Acing Manager

(2) The address of the person making the discharge;
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
4021 National Parks Highway
Carlsbad, NM 88221
(505) 234-7303

(3) The location of the discharge;

Name	County	Township	Range	Section	Latitude	Longitude
Pond A	Eddy	22S	31E	SE ¼ of the SW ¼ of the SE ¼ of Section 20	N32, 22 Minutes, 19.9 Seconds	W103, 47 Minutes, 51.9 Seconds
Pond 1	Eddy	22S	31E	SW1/4 of the SE1/4 of the SE1/4 of Section 20	N 32 degrees, 22 minutes, 13.6' seconds	W 103, 47 minutes, 39.4 seconds
Pond 2	Eddy	22S	31E	SE1/4 of the SE1/4 of the SE1/4 of Section 20	N 32 degrees, 22 minutes, 13.7 seconds	W103 degrees, 47 minutes, 34.3 seconds

(4) An estimate of the concentration of water contaminates in the discharge; and add type of results;

Parameter	**Pond A Results**	**Pond 1 Results**	**Pond 2 Results**
Ph	8.20	8.19	7.58
Specific Gravity @ 21° C	1.002	1.002	1.002
Specific Conductance @ 25° C	556	602	168
Bicarbonate of Alkalinity HCO_3	115.2	83.3	47.7
Chloride mg/l	103	132	22
Divalent Cations meq/l	0.5	0.7	1.1
Fe (total)	0.07	0.03	0.00
Calcium mg/l	9.0	14.0	21
Sulfide mg/l	0.0	12.0	7.0
Potassium mg/l	1.0	2.0	2.0

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(5) The quantity of the discharge.
Approximately 200,000 gallons of storm water may be discharged from SWIC Pond A to SWIC Ponds 1 and 2 and/or directly to the environment. Approximately 600,000 gallons of storm water will be pumped from SWIC Ponds 1 and 2, and dispersed to the environment adjacent to these facilities for beneficial use of the water by the environment. Approximately 800,000 gallons of storm water will be managed by these activities.

If you have any questions regarding this notification, please contact Mr. Jody Plum at (505) 234-7462.

Sincerely,

for

Inés Triay
Acting Manager

cc:

M. Leavitt, NMED	
J. Bearzi, NMED	*ED
S. Zappe, NMED	ED
T. Klein, NMED-AIP	ED
D. Pepe, NMED-AIP	
CBFO M&RC	

*ED denotes Electronic Distribution

CBFO:AMO:HLP:VW:05-0227:UFC:5487

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

March 2, 2005

RECEIV
MAR 2 8 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Notification of the February 2005 Freebaord Levels For the Sewage Lagoons and the H-19 Evaporation Pond

Dear Mr. Marshall:

Your letter dated December 28, 2004, approving the corrective actions proposed by the Waste Isolation Pilot Plant (WIPP) for the loss of freeboard in the sewage lagoons and the H-19 evaporation pond requires us to notify you of the freeboard levels in each pond by the last day of each month. As requested, here are the freeboard levels for February 2005.

Area	February 15, 2005
Settling Pond 1A	21 inches
Polishing Pond 1B	21 inches
Settling Pond 2A	20 inches
Settling Pond 2B	18 inches
Evaporation Pond A	18 inches
Evaporation Pond B	20 inches
Evaporation Pond C	20 inches
H-19 Evaporation Pond	22 inches

If you have any questions or require additional information, please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

Ines R. Triay
Acting Manager

cc:
J. Kieling, NMED *ED
J. Bearzi, NMED ED

*ED denotes electronic distribution
CBFO:AMO:HLP:GS:05-0224:UFC 5486.00

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

BILL RICHARDSON
Governor

RON CURRY
Secretary

U.S. Postal Service
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Postage	$
Certified Fee	
Return Reciept Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

7002 2410 0004 2505 7485

Sent To: Dr. Ines R. Triay,
Waste Isolation Pil
Street, Apt. No.; US Dept. of Energy
or PO Box No. P.O. Box 3090
City, State, ZIP+4 Carlsbad, New Mexic
PS Form 3800, June 2002

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

February 23, 2005

Dr. Ines R. Triay, Acting Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Corrective Action Approval, DP-831, Discharge of Storm Water from SWIC Ponds 1, 2 and A, Waste Isolation Pilot Plant

Dear Dr. Triay:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received a Written Notification and Corrective Action Report, submitted by the U.S. Department of Energy Waste Isolation Pilot Plant (WIPP) dated January 31, 2005. The report addresses the discharge of storm water from Storm Water Infiltration Control (SWIC) Ponds 1, 2 and A located at the WIPP. Pursuant to Section 20.6.2.1203.A(7) NMAC, the corrective action is hereby approved.

Heavy rains occurred at the WIPP site from August through December 2004. Construction activities were also in progress during this time to prepare SWIC Ponds 1, 2 and A for liner installation. Large volumes of storm water collected in the ponds as a result of the rainfall. WIPP construction personnel made a decision to pump the storm water to the ground to allow construction activities to continue. An estimated 7,000,000 to 14,000,000 gallons of storm water was discharged from SWIC Ponds 1, 2 and A from September through December 2004.

When WIPP regulatory oversight personnel learned of the discharge, the activity was stopped immediately. Samples of the storm water were collected and analyzed for volatiles, semivolatiles, total dissolved solids, total petroleum hydrocarbons (TPH), nitrate, sulfate, chloride, total dissolved solids (TDS), total suspended solids, metals and pH. The samples did not exceed Water Quality Contol Commission (WQCC) ground water standards for any of the analytes tested, therefore no additional corrective actions are proposed.

If additional information becomes available indicating these corrective actions are inadequate, then additional actions may be required. Approval of this corrective action report does not relieve you of your responsibility to comply with any other applicable federal, state and/or local laws and regulations.

If you have any questions, please call Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027.

Sincerely,

William C. Olson, Chief
Ground Water Quality Bureau

WCO/CLM

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office

STATE OF NEW MEXICO
WATER QUALITY CONTROL COMMISSION

COPY

IN RE: DISCHARGE PERMIT
MODIFICATION REQUIRED,
DP-831, WASTE ISOLATION
PILOT PLANT

NO: WQCC 04-07(A)

RECEIVED
FEB 09 2005

NOTICE OF DISMISSAL OF APPEAL

COMES NOW, the United States Department of Energy (Petitioner) and provides notice dismissing the above appeal.

Respectfully submitted,

DOLAN & DOMENICI, P.C.

Pete V. Domenici, Jr., Esq.
6100 Seagull St, N.E., Suite 205
Albuquerque, New Mexico 87109
505-883-6250

W. Michael Rose, Esq.
Chief Counsel
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico, 88221

Elizabeth Rose, Esq.
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico, 88221

I hereby certify that a copy of the foregoing was mailed to the following on the
8 day of February 2005.

George Schuman, Acting Chief
Ground Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, New Mexico 87502

Tracy Hughes
General Counsel
Office of General Counsel
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-6891

Pete V. Domenici, Jr., Esq.

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

FEB 0 2 2005

RECEIVED
FEB 0 7 2005

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Harold Runnels Building, Room N2250
1190 St. Francis Drive
Santa Fe, NM 87501

Subject: Notice of Intent to Discharge

Dear Mr. Marshall:

The purpose of this letter is to confirm the information provided by Mr. H. L. Plum, U.S. Department of Energy (DOE) to Mr. Clint Marshall, New Mexico Environment Department (NMED), January 31, 2005. Mr. Plum reported the need to discharge storm water from the Waste Isolation Pilot Plant (WIPP) Storm Water Infiltration Control (SWIC) Pond A to SWIC Ponds 1 and/or 2. This action is being requested to allow the pumping of excess storm water that has collected in SWIC Pond A to alternative locations to allow the completion of construction activities for emplacement of liner materials in SWIC Pond A. DOE's oral and written notices are provided to NMED under 20.6.2.1201 NMAC.

During this conversation, Mr. Plum also indicated a need to dispose of water in the near future from the WIPP Fire Water Tank to SWIC Ponds 1 and/or 2, or Pond A if construction activities to line this facility have been completed, to allow needed preventive maintenance activities to occur. Further site maintenance activities that occur throughout the year require the testing of fire hydrants. This water will be allowed to collect in site drainage and disposed in SWIC Ponds A, 1, 2 and/or the Salt Pile Evaporation Pond.

(1) Name of the person making the discharge;
Dr. Ines Triay, Manager

(2) The address of the person making the discharge;
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
4021 National Parks Highway
Carlsbad, NM 88221
(505) 234-7303

(3) The location of the discharge;

Name	County	Township	Range	Section	Latitude	Longitude
Pond A	Eddy	22S	31E	SE ¼ of the SW ¼ of the SE ¼ of Section 20	N32, 22 Minutes, 19.9 Seconds	W103, 47 Minutes, 51.9 Seconds

(4) An estimate of the concentration of water contaminants in the discharge; and None believed to be present.

(5) The quantity of the discharge.
A combined total of approximately 270,000 gallons of water will be discharge to SWIC Ponds A, 1, 2, and/or Salt Pile Evaporation Pond. It is estimated that approximately 200,000 gallons of storm water and approximately 70,000 gallons of potable water will be disposed in these ponds by these activities.

On February 1, 2005, Mr. Plum and Mr. Marshall discussed the potential future need to discharge water from the SWIC Ponds 1, 2 and A, and/or the Salt Pile Evaporation Pond to the environment. These ponds are designed and operated to capture storm water runoff and site generated potable water discharges from maintenance activities such as maintenance of fire hydrants and water storage tanks.

Mr. Marshall concurred that discharge of these waters to the environment could be possible. He stated that water samples must be collected and analyzed and this information forwarded with a formal written request as required by 20.6.2.1200 NMAC, Notice of Intent to Discharge to NMED. Mr. Marshall stressed that the collection of water samples must occur and this action completed prior to any such discharge occurring from a regulated site. NMED would review the information received in the notification and provide written determination of its decision by return mail. Both agreed that this re-use of collected storm water and potable water, when water quality had not been degraded, was appropriate in arid environments.

If you have any questions regarding this notification, please contact Mr. Plum at (505) 234-7462.

Sincerely,

Ines Triay

Dr. Ines R. Triay
Acting Manager

CBFO:AMO:HJP:GS:05-0214:UFC 5487.00

cc:

T. Klein, NMED-AIP	* ED
J. Bearzi, NMED	ED
S. Zappe, NMED	ED
CBFO M&RC	

*ED denotes electronic distribution
CBFO:AMO:HJP:GS:05-0214:UFC 5487.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
January 31, 2005

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Harold Runnels Building, Room N2250
1190 St. Francis Drive
Santa Fe, NM 87501

RECEIVED
FEB 03 2005

Subject: Notice of Discharge-Removal

Dear Mr. Marshall:

The purpose of this letter is to confirm the information provided by Mr. H. L. Plum, U. S. Department of Energy (DOE) to Mr. Clint Marshall, New Mexico Environment Department (NMED), January 25, 2005. Mr. Plum reported the discharge of water from the Waste Isolation Pilot Plant (WIPP) Storm Water Infiltration Control Ponds 1, 2, and A as described in Discharge Plan-831 (DP-831), as amended, issued by the New Mexico Environment Department, December 22, 2003. DOE's oral and written notices are being provided to NMED under 20.6.2.1203 NMAC. A. (1).

(a) Name, address, and telephone number of the person or persons in charge of the facility:
Dr. Inės Triay, Acting Manager
U. S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
4021 National Parks Highway
Carlsbad, NM 88221
(505) 234-7303

(b) Name and address of the facility (Discharge Locations):
Waste Isolation Pilot Plant
26 miles East-Southeast of Carlsbad, New Mexico, Eddy County

Name	County	Township	Range	Section	Latitude	Longitude
Pond 1	Eddy	22S	31E	SW1/4 of the SE1/4 of the SE1/4 of Section 20	N32°, 22 Minutes, 13.6 Seconds	W103°, 47 Minutes, 39.4 Seconds
Pond 2	Eddy	22S	31E	SE1/4 of the SE1/4 of the SE1/4 of section 20	N32°, 22 Minutes, 13.7 Seconds	W103°, 47 Minutes, 34.3 Seconds
Pond A	Eddy	22S	31E	SE1/4 of the SW1/4 of the SE1/4 of section 20	N32°, 22 Minutes, 19.9 Seconds	W103°, 47 Minutes, 51.9 Seconds

CBFO:AMO:HLP:VW:05-0203:UFC:5487

(c) The date, location, and duration of the discharge:
September 1, 2004 through December 31, 2004
(periodic discharges over an estimated 25 days)

(d) The source and cause of the discharge:
The DOE has been constructing lined ponds to retain storm water runoff as required by DP-831 (as amended December 22, 2003). Unusual and heavy rainfall occurred at the WIPP site August 2004 though December 2004. Total rainfall at the WIPP facility during this period was 13.57 inches. The surface drainage area to the three ponds, including the surface area of each pond is 49.4 acres (enclosure 1). The Storm Water Infiltration Control Ponds 1, 2, and A were not lined at the time these rainfall events occurred, but construction activities, including the reshaping of earthwork required prior to emplacement of pond liners, had begun. Due to the large volume of water collected in Storm Water Infiltration Control Ponds 1, 2, and A, as a result of the unusually heavy rainfall events, construction activities were halted. This halt in construction activities was caused by the large volume of water that had been collected in the ponds that did not allow the use of heavy earth moving equipment to prepare the pond for installation of liner material. Construction activities could not resume until the ponds dried and equipment could again enter the ponds to complete grading and compacting activities.

Excessive rain, beginning in August 2004, continued to hamper construction activities through December 2004. To facilitate resumption of construction activities, a decision to pump this storm water from each of these three ponds to the ground was made as part of construction activities necessary to complete the project (Enclosure 1).

Lining of Storm Water Infiltration Control Ponds 1 and 2 was completed on January 23, 2005, and these lined ponds are now in service at WIPP. Pond A continues to retain water and a separate Notification of Intent to Discharge from Pond A to Pond(s) 1 and 2 is being prepared and will be submitted to NMED in the near future.

(e) A description of the discharge, including its chemical composition:
The water discharged consisted of storm water rainfall that had been collected on the surface of 49.4 acres. Approximately 42.42 acres are covered with asphalt or packed soil and some 6.98 acres are storm water pond surface. Grab samples were collected from the storm water ponds on October 7, 2004 (enclosure 1). The protocols used for the collection of grab samples and the analytical results are enclosures 2, 3, and 4 of this notification. The analytical data (enclosure 5) shows there were no contaminants of concern above regulatory limits.

(f) The estimated volume of the discharge:
7,000,000 to 14,000,000 gallons of storm water were discharged from Storm Water Infiltration Control Ponds 1, 2, and A between September 1, 2004 and December 31, 2004.

CBFO:AMO:HLP:VW:05-0203:UFC:5487

(g) Any actions taken to mitigate immediate damage from the discharge.

All pumping activities were stopped on December 31, 2004. There was no damage to the soil surface where discharge occurred. The analytical data, enclosure 5, shows there were no contaminants of concern above regulatory limits. No damage from these discharges of storm water has been determined and no further action is planned to be initiated as a result of these discharges. There is no known harm to human health or the environment from these discharges.

Action has been taken to assure all contractors working on projects regulated by DP-831 know to report any changes in construction or operations to DOE prior to initiation of any changes occurring.

If you have any questions regarding the above information, please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

Inés Triay

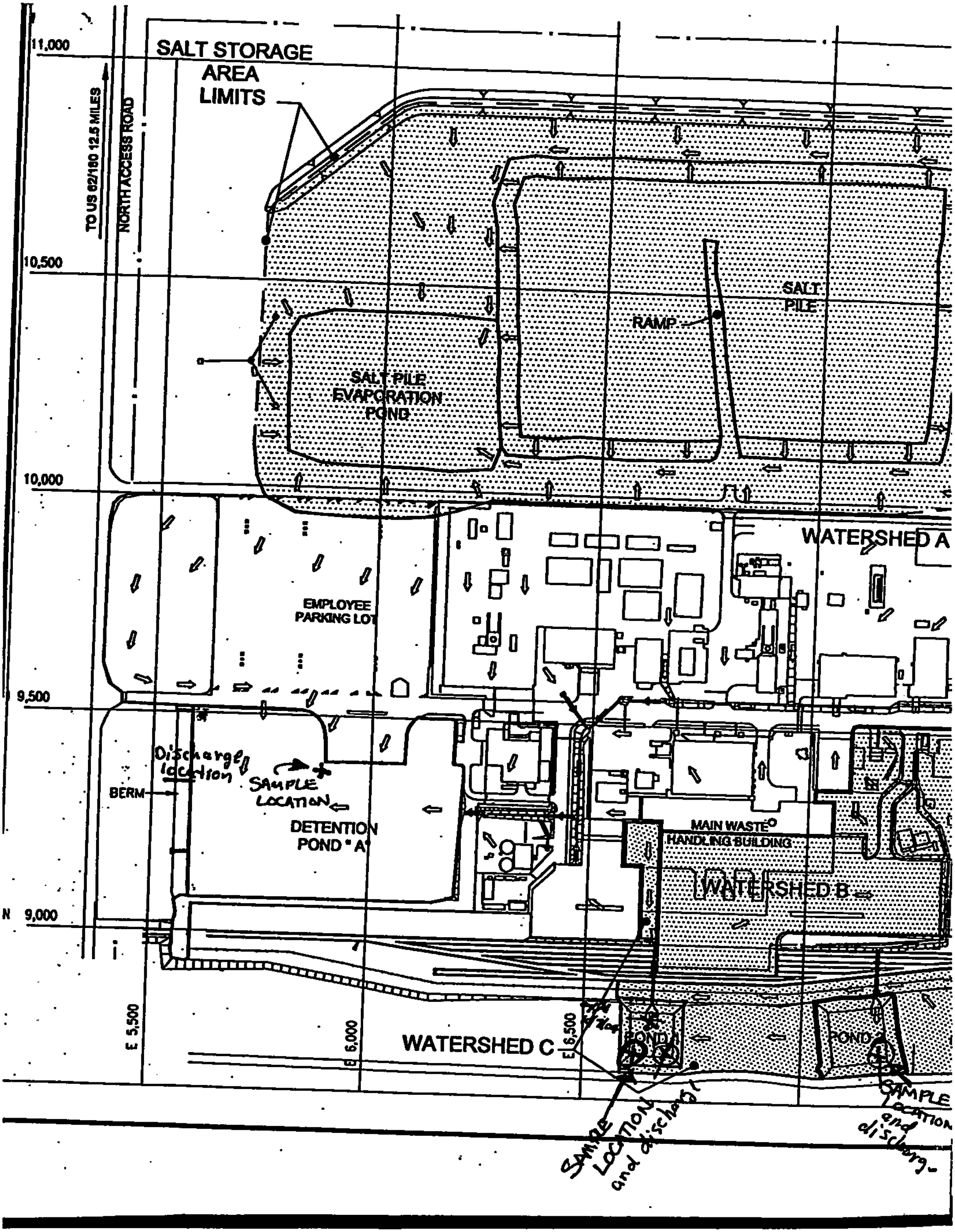
Inés Triay
Acting Manager

Enclosure

cc: w/enclosure
C. Lundstrom, NMED
J. Bearzi, NMED
S. Zappe, NMED
CBFO M&RC

CBFO:AMO:HLP:VW:05-0203:UFC:5487

ENCLOSURE 1



11,000
SALT STORAGE
AREA
LIMITS
TO US 62/180 12.5 MILES
NORTH ACCESS ROAD
10,500
SALT
PILE
RAMP
SALT PILE
EVAPORATION
POND
10,000
WATERSHED A
EMPLOYEE
PARKING LOT
9,500
Discharge location
SAMPLE LOCATION
BERM
DETENTION
POND "A"
MAIN WASTE
HANDLING BUILDING
WATERSHED B
N 9,000
E 5,500
E 6,000
WATERSHED C
E 6,500
POND 1
POND 2
Sample Location and discharge
SAMPLE Location and discharge

ENCLOSURE 2

PRE-JOB SAMPLING PLAN

Date: October 7, 2004
Purpose: Environmental Sampling
PPE: Level D, Nitrile Gloves, Lab Coats, Steel Toe Shoes Safety Glasses
Safety Concerns: No eating or drinking while sampling. Be conscious of cross contamination of samples. Observe general safety measures. Pond liners and other surfaces may be slippery or unstable due to recent storms. Exercise extreme caution on these surfaces.
Lab Destination: Trace Analysis Laboratory
PO #: 402560 Budget Number: W125010601
Lab Contact: Mike Able Phone Number: 800-378-1296
Lab Address: 6701 Aberdeen Avenue, Suite 9, Lubbock, TX 79424

GENERAL INFORMATION:

Sample Location:	**Storm Water Evaporation Pond (South of Parking Lot)**
Sample Parameters:	**Total Volatiles**
Preservative:	**pH<2 with Hydrochloric Acid, chill 4 C**
Sample Equipment/Bottles:	(2) 40-mL amber glass VOA vials, plastic dipper, pH strips, Sampling Bag, paper towels.
SAMPLE COLLECTION:	**Total Volatiles** Collect sample from pond using plastic dipper. Collect sample into (2) 40-mL amber glass VOA vials. No air bubbles. Collect extra sample in an additional glass bottle to ensure that no air bubbles are present after preservation. Preserve after collection to pH<2 with Hydrochloric Acid. Chill 4° C.
Sample Location:	**Storm Water Evaporation Pond (South of Parking Lot)**
Sample Parameters:	**Total Organic Carbon**
Preservative:	**pH<2 with Sulfuric Acid, chill 4 C**
Sample Equipment/Bottles:	(2) 40-mL amber glass VOA vials, plastic dipper, pH strips, Sampling Bag, paper towels.
SAMPLE COLLECTION:	**Total Organic Carbon** Collect sample from pond using plastic dipper. Collect sample into (2) 40-mL amber glass VOA vials. No air bubbles. Collect extra sample in an additional glass bottle to ensure that no air bubbles are present after preservation. Preserve after collection to pH<2 with Sulfuric Acid. Chill 4° C.
Sample Location:	**Storm Water Evaporation Pond (South of Parking Lot)**
Sample Parameters:	**Total Semi-Volatiles**
Preservative:	**Chill 4 C**
Sample Equipment/Bottles:	(1) 1-L amber glass bottle, plastic dipper, Sampling Bag, paper towels.
SAMPLE COLLECTION:	**Total Semi-Volatiles** Collect sample from pond using plastic dipper. Collect sample into (1) 1-L amber glass bottle. No air bubbles. Chill 4° C.

Notebook No.
Continue on Page N/A

...10/5/04 10/7/04

SAMPLING TEAM: ~~R. ...~~ S. TRAVIS, K. GUILLERMO 10/7/04
...POSE: STORMWATER ANALYSIS
...: LEVEL D, NITRILE GLOVES, LAB COAT, SAFETY GLASSES, STEEL TOE SHOES
...THER: PARTLY CLOUDY, COOL (~70°F), BREEZY (5-10 mph)
...ATION: SITE DRAINAGE UNITS

...04-061 ... 59 — Collected sample from ~~WATERSHED "G" POND 1.~~ Retention Pond A (South Parking Lot) using a plastic dipper. Collected sample into (2) 40-mL VOA amber glass vials. Preserved with HCl to pH<2. Analyzing for Total Volatiles. Sample is stormwater from recent heavy rains.

...4-062 ...CE ...20 — Collected sample using protocol for WST-04-061. Preserved with H_2SO_4 to pH<2. Analyzing for Total Organic Carbon. Sample collected from retention pond A stormwater from recent heavy rains. (3) 40-mL amber glass VOA vials Pond A

...-063 ...CE ...27 — Collected sample from Retention Pond A using plastic dipper. Collected into (1) 1-L amber glass bottle. No air bubbles. No preservative. Analyzing for Total Semi-Volatiles.

...-064 ...CE ...'09 — Collected sample from Retention Pond A using a plastic dipper. Collected into (1) 2-L wide-mouth plastic bottle. No preservative. Analyzing for pH, TSS, TDS, Nitrates, Chlorides, Sulfates. Field pH ≅ 5

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Read and Understood By

N/A	N/A	N/A	N/A
Signed	Date	Signed	Date

04-065
CE
1

Collected sample from Retention Pond A using a plastic dipper. Collected into (1) 250-mL wide-mouth plastic bottle. Preserved with HNO_3 to pH<2. Analyzing for Total RCRA Metals plus Zinc.

4-066
ACE
1

Duplicate of WST-04-065.

NOTE: Samples for Retention Pond A collected at approximately the mid-point on North Side. See attached map. Pond is approximately half-full of water (~2.5 feet) F29)

04-067
ACE
34

Collected sample from Watershed C, Pond 1 using plastic dipper. Collected sample into (2) 40-mL amber glass VOA vials. Preserved with HCl to pH<2. Analyzing for Total Volatiles. Sample is stormwater from recent heavy rains.

4-068
CE
36

Collected sample using protocol from WST-04-067. Preserved with H_2SO_4 to pH<2. Analyzing for Total Organic Carbon. Sample collected in (2) 40-mL amber glass VOA vials Pond 1

04-069
ACE
938

Collected sample from Watershed C, Pond 1 using plastic dipper. Collected into (1) 1-L amber glass bottle. No preservative. Analyzing for Total Semi-Volatiles. No air bubbles.

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N/A N/A N/A N/A
Signed Date Signed Date

-04-070 Collected sample from Watershed C Pond 1
0940 using plastic dipper. Collected into (1) 2-L
plastic, wide-mouth bottle. No preservative.
ace Analyzing for pH, TSS, TDS, Chlorides,
Sulfates, and Nitrates. Field pH ≅ 5

04-071 Collected sample from Watershed C, Pond 1
71 using plastic dipper. Collected into (1) 250-mL
wide-mouth, plastic bottle. Preserved with
e HNO_3 to pH<2. Analyzing for Total RCRA
metals plus Zinc.

-04-072 Duplicate of WST-04-071.
941
e

NOTE Samples collected from Watershed C, Pond 1
were collected from the pump intake on the
southwest corner of the pond. Pond is about
1 ft deep in water at deepest point. See attached map
for sampling location.

-04-073 Collected sample from Watershed C, Pond 2
0957 using plastic dipper. Collected into (2) 40-mL amber
glass VOA vials. Preserved with HCl to pH<2.
ice Analyzing for Total Volatiles. Sample is stormwater
from recent heavy rains.

-04-074 Collected sample using protocol from WST-04-073.
0959 (2) 40-mL amber glass VOA vials. Preserved
with H_2SO_4 to pH<2. Analyzing for Total
race Organic Carbon.

-04-075 Collected sample from Watershed C, Pond 2 using
1003 plastic dipper. Collected into (1) 1-L amber glass bottle.
Trace No air bubbles. No preservative. Analyzing for Total
Semi-Volatiles.

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N/A	N/A	N/A	N/A
Signed	Date	Signed	Date

10/7/04

Notebook No N/A

Continued From Page N/A

WST-04-076 1004 Trace	Collected Sample from Watershed C, Pond 2 into (1) 2-L wide-mouth plastic bottle. No preservative. Analyzing for pH, TSS, TDS, Chlorides, Sulfates, and Nitrates. Field pH ≅ 5. Plastic dipper used to collect sample.
WST-04-077 1005 Trace	Collected Sample from Watershed C, Pond 2 using plastic dipper. Collected into (1) 250-mL wide-mouth plastic bottle. Preserved with HNO_3 to pH<2. Analyzing for Total RCRA metals plus Zinc.
WST-04-078 1005 Trace	Duplicate of WST-04-077

NOTE: Samples collected from Watershed C, Pond 2 were collected at southeast corner of pond at pump uptake. Pond is about ~~...~~ deep in water at ~~dep~~ deepest point. ~~See~~ See attached map for sampling location.

No further entries for this date

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Read and Understood By

Guillermo, SMC 10/7/04 Signed Date

[signature] 10/7/04 Signed Date

ENCLOSURE 3

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Effective Date: 10/03/03

WP 02-EC.05
Revision 3

Quality Assurance Project Plan for WIPP Site Effluent and Hazardous Materials Sampling

Cognizant Section: Site Environmental Compliance

Approved By: Stewart B. Jones

WASTE ISOLATION PILOT PLANT
WIPP

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ACRONYMS AND ABBREVIATIONS

ASME	American Society of Mechanical Engineers
CFR	Code of Federal Regulations
DQO	Data Quality Objective
EPA	U.S. Environmental Protection Agency
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NQA	Nuclear Quality Assurance
ppb	parts per billion
QA	Quality Assurance
QAPD	Quality Assurance Program Description
QAPjP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
QSL	Qualified Suppliers List
RCRA	Resource Conservation and Recovery Act
RIDS	Records Inventory and Disposition Schedule
SEC	Site Environmental Compliance
µg/L	micrograms per liter
WIPP	Waste Isolation Pilot Plant
WTS	Washington TRU Solutions

1.0 INTRODUCTION [1]

1.1 Project Description

This Quality Assurance Project Plan (QAPjP) states the quality assurance (QA) requirements for the Waste Isolation Pilot Plant (WIPP) Site Effluent and Hazardous Materials Sampling Program, which is established in WP 02-EC.06, WIPP Site Effluent and Hazardous Materials Sampling Plan. Throughout the rest of this document, the WIPP Site Effluent and Hazardous Materials Sampling Plan will be referred to as the "sampling plan."

The sampling plan outlines the processes for sampling and analyzing various media at the WIPP site. For the purpose of this plan, the WIPP site is defined as the area within the fenced boundary, the underground, the 16 sections as defined by the Land Withdrawal Act, the Skeen-Whitlock Building offices, and any additional Department of Energy leased property used for the operation of WIPP.

This plan applies to nonroutine sampling that is not specified by an established monitoring procedure. The scope of this plan includes the following environmental data operations, as defined in WP 13-1, Washington TRU Solutions LLC (WTS) Quality Assurance Program Description (QAPD):

- Underground Storage Tank Leaks
- Hazardous and Mixed Waste Characterization
- Site Effluent
- Spill Response
- Contaminated Soil
- Contaminated Debris
- Used Oil
- Site Investigation
- Site Remediation
- Solid Waste Management Units
- Waste Handling Building Sumps
- WIPP Site Drinking Water

This plan satisfies the requirement for planning and managing these activities in accordance with an approved QAPjP.

1.2 Sampling Team

The WIPP Sampling Team is responsible for performing sampling activities in accordance with the sampling plan and this QAPjP. The team consists of a team coordinator and sampling technicians. The team coordinator is responsible for evaluating sampling situations and media that may be encountered, and to determine the sampling technique, container, preservative, and analyses of the sample to be taken, in accordance with the sampling plan or after consultation with appropriate groups on site. The team coordinator does not always have to be present for the actual sampling activity. Once the sampling activity has been coordinated and a sampling plan generated, the sampling technicians may complete the sampling and shipping process.

The sampling team will perform field parameter tests, such as pH, temperature and conductivity if appropriate, during sample collection to help determine the required analyses and preservatives. The members of the sampling team will have the required training to perform these tests.

The members of the sampling team will be trained in accordance with the Resource Conservation and Recovery Act (RCRA), and either ST-01, Sampling Team Qualification Card, or STA-01, Sampling Team Assistant Qualification Card, and will be part of the RCRA training matrix. It is recommended that the sampling team members be certified by the State of New Mexico Environment Department in Water Supply Regulations in order to perform lead and copper sampling for drinking water. Additionally, it is recommended that sampling team members attend a U.S. Environmental Protection Agency (EPA) approved, or equivalent, sampling course that includes proper sampling techniques and sampling quality control management.

The development and management of the contract with the analytical laboratory will be the responsibility of the sampling team. The team will initiate the review cycle of the results and prepare a final report of the sampling activity.

In the event of a spill, only qualified sampling team members may be called out to support the Emergency Response Team. The Facility Shift Manager will make the determination to activate the sampling team, per the applicable WIPP procedure. In the event of a TRU waste spill, the sampling team shall be available to take samples of the spill area. These samples shall be taken after the area has been decontaminated, and may be analyzed for total metals, total semi-volatiles, total volatiles, or beryllium to verify that cleanup has been effectively completed.

1.2.1 Site Environmental Compliance

The Site Environmental Compliance (SEC) Section will be responsible for providing regulatory oversight of sampling programs and for providing interpretation of regulatory changes that could impact sampling programs.

1.2.2 Industrial Safety and Hygiene

The Industrial Safety and Hygiene Section will be responsible for determining the type of personal protective equipment to be used for sampling or in the event of spill cleanup.

1.2.3 Shipping Coordination

Shipping Coordination shall assist in the shipment of any hazardous samples to ensure that the proper Department of Transportation regulations for packaging and shipping are met.

1.2.4 Quality Assurance

The QA Department is responsible for conducting independent assessments of the sampling and analysis program, in accordance with the WTS QAPD. QA uses a graded approach to determine the frequency of assessments based on program risk. QA will also ensure that the proposed contract laboratory meets the requirements for the Qualified Suppliers List (QSL).

1.2.5 Business Management

The Procurement section is responsible for placement of the analytical laboratory subcontract and the administration of subcontract activities.

The Warehouse is responsible for processing the shipping authorization.

1.2.6 Contract Laboratory

The contract laboratory will.be responsible for performing the analyses of the samples, reporting the results, and having an analytical Quality Assurance/Quality Control (QA/QC) program in place, as specified in the subcontract statement of work.

2.0 TECHNICAL SPECIFICATIONS

2.1 Project Data Quality Objectives

As required by the WTS QAPD, the following criteria for data quality are established.

2.1.1 Data Quality Objectives for Precision, Accuracy, and Lower Limits of Detection

The specifications for precision, accuracy, and lower limits of detection for each analyte are in accordance with SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. The Data Quality Objectives (DQOs) established by the EPA Contract Laboratory Program Statement of Work will be incorporated as part of the statement of work for the contract with the analytical laboratory.

Table 1.0 provides the test methods, accuracy and precision recovery ranges, required reporting limits, and the completeness percent required for groundwater and soil/ sediment media. Sample media does not always include groundwater or soil/sediment. Due to the diverse media sample under the sampling plan, a graded approach to QA/QC of the data quality objectives is taken based on the users determination of tolerable error in the results. The estimated method reporting limits or quantitation limits listed in Table 1.0 provide guidance and may not always be achievable in all sample media due to matrix interference. A graded approach to QA/QC bases the level of managerial controls applied to an item or work according to the intended use of the results and the degree of confidence needed in the quality of the results.

2.1.2 DQO for Representativeness

The sampling plan identifies the guidelines for ensuring that representative samples are collected. A random grid method or other techniques, as specified by SW-846, will be used whenever necessary.

2.1.3 DQO for Completeness

The sampling team will, in all cases, ensure that all documentation associated with sampling is complete. SEC and QA will review the program periodically to ensure that sampling activities fulfill the QA requirements established in this plan.

2.1.4 DQO for Comparability

To ensure comparability with other WIPP activities, units for reporting analyte concentrations are to be expressed in mg/L, µg/L, mg/kg, or ppb, or as appropriate.

2.2 Sampling Procedures

2.2.1 Effluent, Discharge, or Spill Sampling Procedures

If nonemergency sampling is required, the sampling team will collect samples as required by the sampling plan.

The sampling methods and tools for sampling different media and situations are suggested in Table 1, Sampling Equipment for Particular Materials, of the sampling plan. This sampling will be performed on an "as needed" basis. The sampling plan is designed to provide general guidelines for sampling situations not identified in specific procedures. The sampling plan presents suggested methods and tools for sampling different media, ~~but the sampling team coordinator will~~ make the determination of which method will be utilized according to the situation.

The type of preservative method and the containers used are defined in the sampling plan. It is necessary to ensure that the correct preservative methods are used for the analyses to be performed. Table 2, Containers, Preservatives, and Holding Times, of the sampling plan outlines the preservative methods. The analytical laboratory will aid in the selection of preservatives if a situation arises where the preservative method is not included in Table 2 of the sampling plan. Preservatives are to be kept in appropriate storage facilities, in accordance with applicable WIPP procedures, when not in use.

The maximum hold times and storage specifications for each sample type are defined in Table 2 of the sampling plan.

The sampling plan lists recommended analyses for different sample types in Table 4. In the event that the minimum analyses are not sufficient, it is the responsibility of the sampling team coordinator, in consultation with other applicable groups, to determine which analyses are needed. If additional analyses are to be performed, it will be the responsibility of the sampling team to state these analyses on the Request for Analysis Form.

The data packages produced from sample analyses will be reviewed, as appropriate, by the following groups:

- SEC
- Environmental Monitoring and Hydrology
- QA

The review process is outlined in the sampling plan.

2.2.2 Solid Waste Characterization Sampling Procedures

Sampling for the characterization of solid waste will be performed according to the sampling plan, unless the material can be characterized using generator knowledge. The sampling team coordinator or cognizant individual will determine the sampling method, container, preservative, and analyses to be performed, in accordance with the sampling plan and in consultation with other applicable groups.

Verification of the effectiveness of the removal of hazardous materials from a spill shall be obtained by collecting samples and sending them to the contract laboratory for analysis. Analytical results shall provide the necessary documentation that any residual contamination from a spill of TRU-mixed waste has been effectively removed.

Samples taken from the sumps in the Waste Handling Building shall be analyzed for hazardous constituents, gross alpha, and gross beta/gamma based on process knowledge. For unidentifiable materials, the sampling containers, amounts, and preservatives are specified in Table 2 of the sampling plan.

2.3 Sample Documentation, Handling, and Shipping

Shipping of samples will be performed through the Warehouse per WIPP shipping procedures. Shipping Coordination will determine if the sample meets the definition of a hazardous material upon review of the shipping authorization request. If the sample is a determined to be a hazardous material, Shipping Coordination shall provide packaging, labeling, and required documentation in accordance with the applicable WIPP procedure. Samples determined to be nonhazardous by Shipping Coordination shall be packaged for shipping by the Sampling Team.

Transportation of all samples shall be arranged by the Warehouse.

2.4 Sample Custody

Chain-of-Custody and Request for Analysis forms specified by the sampling plan will be used to document sample custody. The forms have provisions for maintaining positive identification of the sample from collection through analysis. The carrier is not required to sign for custody of the sample. The shipping documents tendered with the shipment will document their custody.

2.5 Equipment Calibration and Maintenance

The instrumentation used for field parameter testing by the sampling team will be under the control of the WIPP Metrology Office as part of the Monitoring and Data Collection Recall System. Calibration/comparison checks of field equipment are part of the specific procedures for the field equipment. The calibration of all instruments used for field measurements will be verified before each use. All field measurement equipment will be calibrated by a QSL certified calibration laboratory according to manufacturer's specifications. The Sampling Team will verify that the standards have not expired prior to use.

Calibration and maintenance of analytical equipment used by the contracted laboratory is addressed by the laboratory contract.

2.6 Analytical Methods

A list of analytical methods acceptable for each constituent is included in Table 3 of the sampling plan. The subcontracted laboratory will be responsible for specifying analytical methods and for justifying deviations from suggested methods in the contract quotation.

2.7 Data Reduction, Validation, and Reporting

Laboratory results are to be reviewed against previously specified DQOs. The primary responsibility of drawing conclusions from the analyses and compiling the report belongs to SEC and the sampling team coordinator, although the data may go through a review cycle designated in the sampling plan.

If any discrepancies are found in the analytical results, the laboratory shall be contacted by the designated representative to obtain any additional information that could resolve these discrepancies. No discrepancies shall remain unresolved; use the guidance of EPA 540/R-99/008 and/or EPA 540R-94/013 540-R-01-008 to determine data acceptability. Use the appropriate data qualifiers for data that is not fully compliant. A description of the reasons for data qualification and the qualification that is applied to the data shall be documented on Attachment 1 of the sampling plan.

2.8 Internal Quality Control Checks

Field duplicates will be collected and analyzed for every matrix in a batch, or a frequency of one duplicate per every ten samples whenever appropriate. Compliance type sampling will require blanks and duplicates, whereas characterization sampling may not require blanks and duplicates. The collection and analysis of blanks and duplicates for characterization samples will be determined by the sampling team coordinator.

In the event that samples must be stored overnight before shipment, the following procedure will be followed:

- Samples will be maintained in a locked, temperature-controlled area.
- Access will be restricted to authorized personnel only.

2.9 Performance and System Audit Requirements

The successful bidders of the analytical laboratory contracts for the sample analyses are required to be included on the QSL for analytical services. The laboratory's QA program must be reviewed and approved in accordance with applicable WIPP procedures in order to be included on the WTS QSL. After the bid is awarded, an additional surveillance or source inspection may be performed by SEC and QA personnel while analytical work is in progress.

2.10 Preventive Maintenance

Routine preventive maintenance records of field analytical equipment will be subject to review as part of the Environmental Assessment Program. Since most analyses are performed by a contracted analytical laboratory, the preventive maintenance records for the contracted laboratory will be addressed in the subcontract statement of work.

2.11 Corrective Action

In cases where deviations from accepted practices are determined, the contract laboratory shall follow all requirements of WIPP procedures addressing Corrective Action Programs.

2.12 QA Reports to Management

An assessment of the Site Effluent and Hazardous Materials Sampling Program will be conducted and reported to SEC management by the QA Department. Scheduling of these assessments will be determined by the QA Department.

2.13 Specific Routine Procedures Used to Assess Data Quality

The quality of the contract analyses will be determined by comparing the duplicate analysis in each batch of ten samples to the previously established limit for precision in the DQOs. Accuracy will be determined by the submission of a calibration check for each analyte against a known standard concentration of the analyte (laboratory control standard, matrix spike, or matrix spike duplicate on a submitted sample that is designated as the matrix spike sample) within the range of analysis by the contract laboratory.

2.14 Disposition of Nonconforming Samples

Samples collected by the WIPP Sampling Team are normally intended for waste characterization prior to disposal rather than for compliance-related monitoring. In the unusual event that a sample is identified by the contract laboratory as a nonconforming sample (e.g., a sample has exceeded the holding time for a specific test), another sample shall be collected and submitted to the contract laboratory for analysis. If another sample cannot be collected, discussions between the lab manager and the sampling team coordinator may be held indicating that the test be run on the sample as received. Any impact on the test results shall be noted and the discussion shall be documented and included as part of the analytical file.

3.0 DEFINITIONS

Accuracy - The degree of agreement of a measurement (or, an average of measurements of the same thing), X, with an accepted reference or true value, T, usually expressed as the difference between the two values, X-T, or the difference as a percentage of the reference or true value, 100(X-T)/T, and sometimes expressed as a ratio, X/T. Accuracy is a measure of the bias in a system.

Assessment/Verification - The act of reviewing, inspecting, testing, checking, conducting surveillances, auditing, or otherwise determining and documenting whether items, processes, or services meet specified requirements. The terms "assessment" and "verification," as used in the WTS QAPD, are synonymous; their use is determined by who is performing the work. Assessments are performed by or for senior management. Verifications are performed by the line organization.

Audit - A planned and documented activity performed to determine by investigation, examination, or evaluation of the objective evidence, the adequacy of, and compliance with, established procedures, instructions, drawings, manuals, specifications, codes, and standards or other applicable requirements, and the effectiveness of implementation.

Comparability - Expresses the confidence with which one data set can be compared to another.

Completeness - For determination of data quality, a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions.

Complete Record - A document is considered a complete record when the record is stamped, initialed, signed, and dated, or otherwise validated.

Data Validation - A systematic process for reviewing a body of data against a set of criteria to provide assurance that the data are adequate for their intended use.

Data Quality Objective - The totality of features and characteristics of data that bears on the data's ability to satisfy a given purpose. The characteristics of major importance are accuracy, precision, completeness, representativeness, and comparability.

Document - Recorded information that describes, defines, specifies, reports, certifies, requires, or provides data or results.

Environmental Data Operations - Compliance activities associated with collection and analysis of environmental samples, including data reduction, handling, reporting, and records management.

Inspection - An examination or measurement to verify whether an item or process meets specified requirements.

Major Measurement Parameter - Datum point or set of data collected or reported for environmental compliance, and specified in a DQO.

Monitoring and Data Collection Equipment - Devices, systems, or equipment used for collection of data or control of processes.

Nonconformance - A deficiency in characteristic or record that renders the quality of an item or sample unacceptable or indeterminate.

Precision - A measure of agreement between comparable data gathered or developed under similar conditions expressed in terms of a standard deviation.

Procurement Document - Purchase requisitions, purchase orders, drawings, contracts, specifications, or instructions used to define requirements for purchase.

QA Record - A completed and validated document that furnishes objective evidence of the quality of items or activities affecting quality.

Quality - The degree to which an item or process meets or exceeds the user's requirements and expectations.

Quality Assurance - Actions that provide confidence that quality is achieved. Comprises all planned or systematic actions necessary to provide adequate confidence that a component, system, structure, or facility will perform satisfactorily in service; or the total integrated program for ensuring the reliability of monitoring and measurement data.

Quality Assurance Plan - Subtier QA implementation documents that are limited in scope and that usually contain more detail than the QAPD. QAPjPs are examples of QA plans.

Quality Assurance Program Description - A description of the overall program established by WTS to implement QA requirements and guidance, such as American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance (NQA)-1-1989, EPA QA/G-5, and 10 *Code of Federal Regulations* (CFR) 71, Subpart H. The QAPD assigns responsibilities and authorities, defines policies and requirements, and provides for the performance and assessment of work.

Quality Control - Comprises all those QA actions related to the physical characteristics of components, systems, or structures that provide a means to control and measure the quality of a component, system, or structure to predetermined requirements.

Records Management - The systematic control over the creation, maintenance, retention, protection, and preservation of records.

Representativeness - The degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or environmental condition.

Supplier - Any individual or organization that furnishes items or services in accordance with a procurement document. An all-inclusive term used in place of any of the following: vendor, seller, contractor, fabricator, consultant, and their subtier levels.

Surveillance - The act of monitoring, observing, or witnessing to verify whether an item or activity conforms to specified requirements.

Temporary Storage - For records, temporary storage is accomplished in accordance with ASME NQA-1-1989, Supplemental Requirement 17S-1, Section 4.4.3. Temporary storage is required for managing active records prior to the submittal to the records holding facilities.

Validation - An activity that demonstrates that an item, process, or set of data satisfies specified requirements of the user. For records, to certify the content of a document as authentic and complete (certification of document validity is indicated by the date and signature or initials of authorized individuals).

4.0 REFERENCES

EPA 540/R-99/008, USEPA Contract Laboratory Program National Functional Guidelines For Organic Data Review

EPA 540-R-01-008, USEPA Contract Laboratory Program National Functional Guidelines For Inorganic Data Review

SW 846, Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, Third Ed.

WP 02-EC.06, WIPP Site Effluent and Hazardous Materials Sampling Plan

WP 13-1, Washington TRU Solutions Quality Assurance Program Description

TABLE 1.0 - EPA TEST METHODS AND RECOMMENDED DQO LIMITS

TEST METHOD	ACCURACY PERCENT RECOVERY	PRECISION (RPD)	ESTIMATED METHOD REPORTING LIMIT (MDL) ppb	ANNUAL COMPLETENESS PERCENT
6010B	75% - 125%	+-20%	**Table 1, 6000 Series** RECOMMENDED WAVELENGTHS AND ESTIMATED INSTRUMENTAL DETECTION LIMITS SW-846 VOLUME 1A.	85%
6020	75% - 125%	+-20%	< = 0.02ug/L	85%
7060A	75% - 125%	+-20%	0.001mg/L	85%
7421	75% - 125%	+-20%	0.001mg/L	85%
7470A	75% - 125%	+-20%	0.0002mg/L	85%
7471	75% - 125%	+-20%	0.0002mg/L	85%
7740A	75% - 125%	+-20%	0.0002mg/L	85%
7742	75% - 125%	+-20%	3.0ug/L	85%
8081A	75% - 125%	+-20%	**Table 3, 8000 Series** DETERMINATION OF ESTIMATED QUANTITATION LIMITS FOR VARIOUS MATRICES. SW-846 VOLUME 1B.	85%
8260B	75% - 125%	+-20%	**Table 3, 8000 Series** ESTIMATED QUANTITATION LIMITS FOR VOLATILE ANALYTES. SW-846 VOLUME 1B. 8000 Series	85%
8270	75% - 125%	+-20%	**Table 2, 8000 Series** ESTIMATED QUANTITATION LIMITS FOR SEMI-VOLATILE ORGANICS. SW-846 VOLUME 1B.	85%

TABLE 1.0 - EPA TEST METHODS AND RECOMMENDED DQO LIMITS

TEST METHOD	ACCURACY PERCENT RECOVERY	PRECISION (RPD)	ESTIMATED METHOD REPORTING LIMIT (MDL) ppb	ANNUAL COMPLETENESS PERCENT
8315	75% - 125%	+-20%	**Table 1, 8000 Series** METHOD DETECTION LIMITS USING LIQUID-SOLID EXTRACTION/TABLE 2. METHOD DETECTION LIMITS USING LIQUID-LIQUID EXTRACTION/ SW-846 VOLUME 1B.	85%
9020	75% - 100%	-0.2	**Table 1, 9000 Series** METHOD DETECTION LIMITS USING LIQUID-SOLID EXTRACTION/TABLE 2. METHOD DETECTION LIMITS USING LIQUID-LIQUID EXTRACTION/ SW-846 VOLUME 1B.	85%
9056	75% - 125%	+-20%	0.05mg/L	85%
9060	75% - 125%	+-20%	>1mg/L	85%

Note: Estimated Method Reporting Limits are provided as guidance and may not always be achievable in all matrices.

ENCLOSURE 4

Working Copy

Effective Date: 9/29/03

WP 02-EC.06
Revision 5

WIPP Site Effluent and Hazardous Materials Sampling Plan

Cognizant Section: Site Environmental Compliance

Approved By: Stewart B. Jones

WASTE ISOLATION PILOT PLANT
WIPP

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ACRONYMS AND ABBREVIATIONS

AOC	Areas of Concern
CFR	*Code of Federal Regulations*
COC	Chain-of-Custody
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
mm	millimeter
MSDS	Material Safety Data Sheet
M&DC	Monitoring and Data Collection
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
RFA	Request for Analysis
SAP	Sampling and Analysis Plan
SCBA	self-contained breathing apparatus
SEC	Site Environmental Compliance
SWMU	solid waste management unit
WIPP	Waste Isolation Pilot Plant

1.0 INTRODUCTION

This document describes the environmental sampling activities for effluent, hazardous, transuranic (TRU)-mixed, and PCB (polychlorinated biphenyl)-containing TRU-mixed waste at the Waste Isolation Pilot Plant (WIPP) site that do not fall under an existing monitoring program. Rather than maintaining a separate plan for each specific area, or specific procedures, this plan contains guidelines incorporating all of the environmental sampling into one sampling plan, and provides one document identifying sampling protocol, suggested analytical parameters, and quality assurance requirements. This plan does not apply to radioactive areas, personnel monitoring, or industrial hygiene sampling. Specific sampling protocols are contained in WP 02-EC1001, Characterization Sampling, Shipping, and Documentation.

Throughout this document, the WIPP Site Effluent and Hazardous Materials Sampling Plan will be referred to as the "plan" and "TRU-mixed and PCB-containing TRU-mixed waste" will be referred to as "TRU-mixed waste."

The purpose of this plan is to provide a guide for all types of effluent, hazardous, and TRU-mixed waste sampling at the WIPP site. Any site effluent or hazardous material sampling activity not addressed by an established monitoring program will fall under this plan. The areas of interest are as follows:

- Underground storage tanks
- Hazardous and TRU-mixed waste characterization
- Site effluent
- Spill response
- Contaminated soils
- Contaminated debris
- Used oils
- Site environmental investigations
- Site remediations
- Solid waste management units (SWMUs)
- Waste Handling Building sumps
- WIPP site drinking water

This plan outlines methods for sampling, containers to use, preservation techniques, sample labeling and documentation, sample custody, suggested analyses, data review, and validation.

Each sampling area is addressed differently. There are separate requirements and different regulations for different types of samples and different sample media. The intent of this plan is to allow the flexibility to sample each situation using the best possible method for the given situation.

The Quality Assurance Project Plan for WIPP Site Effluent and Hazardous Material Sampling, WP 02-EC.05, addresses the quality assurance/quality control measures to be taken when using this plan.

2.0 PERSONNEL [1]

The sampling team will be the primary group responsible for the implementation of this plan. This sampling team will consist of at least two sampling personnel, one of which may be the team coordinator.

The team coordinator will serve as the Quality Assurance Officer, whose responsibilities will include determining the validity of the sample collected. This is done by verifying that the sampling technique, preservation, containment, and shipping are adequate to ensure a representative sample that will produce valid data.

The team coordinator will be the member of the team to determine the type of sampling technique to be used. If additional consultation with other groups on-site is needed, it is up to the team coordinator to make those contacts. The team coordinator will review all documentation and data after the process is complete.

The team coordinator will be responsible for scheduling the sampling activities, coordinating safety reviews, and preliminary surveys when necessary.

In order to prevent spills or cross-contamination, two people are essential for sampling activities. It is a good practice to have at least two additional people available to serve as backups in a hazardous situation. The sampling personnel are responsible for maintaining two sampling logbooks in accordance with Section 4.2 of this plan.

Each member of the team will be trained according to the requirements of the Resource Conservation and Recovery Act (RCRA), and will be part of the RCRA training matrix on-site. It is recommended that a New Mexico Environment Department or U.S. Environmental Protection Agency (EPA) approved, or equivalent, sampling course that includes proper sampling techniques and sampling quality control management be attended by each member of the team. All members of the team will complete ST-01, WIPP Sampling Team Qualification Card, and the prerequisite training identified on the card, prior to performing sampling tasks without the direct supervision of a qualified person. All sampling team personnel responding to hazardous materials incidents will be trained in accordance with Title 29 *Code of Federal Regulations* (CFR) §1910.120, "Hazardous Waste Operations and Emergency Response."

All sampling team assistants will complete STA-01, WIPP Sampling Team Assistant Qualification Card, and the prerequisite training identified on the card.

3.0 SAMPLING ACTIVITIES

3.1 Communication

Prior to leaving for off-site sampling activities, Site Environmental Compliance (SEC) sampling personnel will sign out from their designated work locations to indicate their off-site sampling location. The SEC sampling team coordinator will make arrangements to have an effective, two-way communication device at the sampling location. The communication device must be fully operational for the entire sampling event. The device must be able to send and receive messages from all locations where sampling activities will be conducted (e.g., if a cell phone is used, the battery must be fully charged and the phone must be able to access a service area during the entire sampling event). Notification of emergencies shall be made directly to the Central Monitoring Room by the sampling team. The equipment will be maintained in the presence of the sampling team while performing off-site activities.

3.2 Sampling Protocol

Sampling protocols may vary according to each waste stream. Each waste stream shall be evaluated independently.

3.2.1 Underground Storage Tanks [2]

The WIPP site has two underground storage tanks for diesel and unleaded fuel. These tanks are equipped with leak detection devices that will alarm if a leak occurs. If a leak occurs, sufficient core soil samples to determine the spread or location of the leaking fuel are required. More information about the underground storage tanks is included in WP 04-GC1605, Operation of Surface Fuel Station Storage Tanks.

3.2.2 Hazardous and TRU-Mixed Waste Characterization [3]

Most hazardous waste determinations at the site can be made by Material Safety Data Sheets (MSDSs) or information from the WIPP Waste Information System. In some instances, sampling is required.

In the event a hazardous or TRU-mixed waste sample must be collected from a radiological area, a plan will be developed jointly by Operational Health Physics and the sampling team. The plan shall be covered by a Radiological Work Permit and must address beryllium exposure in accordance with WP 12-IH.02-9, WIPP Industrial Hygiene Program - Beryllium Exposure Prevention Program. In accordance with this plan and WP 02-EC1001, all appropriate sampling protocols shall be followed.

Verification of the effectiveness of the removal of hazardous materials from a TRU-mixed waste spill shall be obtained by collecting samples of the swipes and sending them to the contract laboratory for analysis. Analytical results shall provide the necessary documentation that any residual contamination from a spill of TRU-mixed waste has been effectively removed.

The sampling team coordinator will select analytical parameters for samples taken from the fire suppression sumps in the Waste Handling Building. The selection of analytical parameters for these samples shall be based on process knowledge and may include hazardous constituents, beryllium, gross alpha, and gross beta/gamma.

3.2.3 Spill Response [1]

The sampling team will be on-call to the Facility Shift Manager (FSM) in the event of a spill. Sampling team members trained to the EPA's Emergency Response to Hazardous Materials, or equivalent, may be called upon to support the Emergency Response Team for sampling spill incidents. If the FSM determines that a sample must be collected, the sampling team will be contacted to sample the spill. Only qualified personnel will respond to emergency incidents. Hazardous material responses and analyses will be conducted in accordance with 29 CFR §1910.120.

In the event of a spill of hazardous or TRU-mixed waste in a radiological area, the sampling team may be called to collect a sample after radiological cleanup has been completed. Operational Health Physics will survey the known or suspected TRU mixed waste spill and SEC, in conjunction with Industrial Hygiene, shall determine whether sampling for hazardous materials is needed. If sampling is indicated, then all activities shall be covered under a Radiological Work Permit. Sampling protocols and procedures shall be in accordance with WP 02-EC1001 and this sampling plan.

3.2.4 Used Oils [4,5]

The WIPP site recycles used oils. Prior to being sent to an off-site recycling facility, the oils must be characterized to demonstrate that they are nonhazardous and meet the recycling requirements of 40 CFR Part 279. The oils are evaluated to determine if they meet the recycling requirements of 40 CFR Part 279. Process knowledge or sampling data may be used to meet these characterization requirements.

3.2.5 Solid Waste Management Units [6]

Sampling of SWMUs and Areas of Concern (AOCs) will be completed as needed in accordance with the WIPP Sampling and Analysis Plan (SAP) for Solid Waste Management Units and Areas of Concern. The SWMUs and AOCs are identified in both the SAP and the WIPP Hazardous Waste Facility Permit.

3.2.6 Contaminated Soils

Due to the remoteness of many areas at the site, there is the possibility of site soils being contaminated by an unknown substance. In this event, soil samples will be collected by the sampling team to identify possible contaminants, the extent of contamination, and the course of remediation. Additionally, samples of site soils may be collected by the sampling team to verify the completion of remediation from spills of petroleum products, hazardous materials, or hazardous waste.

3.2.7 Contaminated Debris [7]

Debris is defined in 40 CFR §268.2 as "solid material exceeding a 60mm particle size that is intended for disposal and that is a manufactured object; or plant or animal matter; or natural geologic material." Since this covers a large range of materials, sampling will be performed as needed on a case-by-case basis.

3.2.8 Site Remediations [8]

Samples to determine the levels of contaminants in an area to be remediated, or samples to determine if remediation technologies used were sufficient, will be the responsibility of the sampling team. If possible, a follow-up sample of a remediated area will be taken within 72 hours of the initial cleanup to determine if sufficient remediation was performed.

3.2.9 Site Investigations

In the event that site investigations are required to verify compliance with various permits or to locate contaminated areas, samples will be collected in accordance with this plan.

3.2.10 WIPP Site Drinking Water

The sampling team shall perform triennial lead and copper sampling of the WIPP site drinking water. Sampling support may also occur on an as-needed basis to confirm that the site drinking water meets the water supply regulations established by the state of New Mexico.

The sampling team will collect all samples in accordance with established procedures for sampling site drinking water for lead, copper, chlorine, and total coliform. Only sampling team members currently certified by the state of New Mexico to collect compliance samples may participate in the collection of water samples for lead and copper analysis. In accordance with 20.7.10 NMAC, sampling certification is not required for persons performing only microbiological or turbidity samples.

3.3 Sampling Devices

This plan addresses a variety of media that may be sampled by sampling team members. Due to various media and constituents being analyzed, there are many methods for sample collection.

Care should be exercised to ensure that representative samples are taken from all areas of concern. Representative samples should be taken at different locations or depths encompassing the entire population of the concerned media. When appropriate, the EPA suggests that either grab or composite samples be collected. A grab sample is an individual sample collected from a single location at a specific time. Composite samples consist of discrete grab samples mixed together to characterize the average composition for any one day.

The different types of sampling devices are presented in Table 1, along with the appropriate media for each sampling device. In some situations, combinations or variations of these sampling tools may be needed. The final decision on which sampling devices to be used will be made by the team coordinator.

3.3.1 Coliwasa

A coliwasa is a glass, plastic, or metal tube with a tapered stopper at the bottom. The stopper is released; the instrument is inserted into the material; and the stopper is retracted, holding the sample inside the tube. The coliwasa is used when sampling drummed or containerized substances.

3.3.2 Weighted Bottle

A weighted bottle is used to sample from the bottom of a vessel. This sampler consists of a glass or plastic bottle, a stopper, a sinker, and a line to raise, lower, and pull out the stopper. The bottle is lowered into the vessel and the stopper pulled when the bottle reaches the bottom of the vessel.

3.3.3 Dipper

A dipper is a beaker or similar container attached to a telescoping pole, so that samples from different locations can be collected by a person standing in one location. This apparatus is used primarily for surface sampling.

3.3.4 Liquid Thief

A liquid thief is a glass tube used for sampling from containers with small openings. When inserted into the liquid, the sampler places his or her thumb over the top opening, holding the liquid in the tube until it can be transferred to the sample container.

3.3.5 Solid Thief

A solid thief is a tool that consists of two metal cylinders (usually stainless steel or brass), one inside the other, with slot openings in both tubes. The outer tube is pointed so that it can be driven into the material to be sampled. The instrument is closed (slots in tubes not lined up and the opening is blocked) when it enters the material, then the tubes are turned so that the slots are aligned and material can enter. The tool is closed before it is withdrawn from the material.

3.3.6 Trier

A trier is a metal tube, cut in half lengthwise and pointed at one end. It is used in a similar fashion to the thief but it cannot encapsulate the sample drawn.

3.3.7 Auger

An auger is used for hard or packed samples. It has spiral blades and a central shaft. It is used in a rotating motion, much like a drill, to loosen the material so that it can be scooped or shoveled.

3.3.8 Scoops and Trowels

Scoops and trowels are either metal or plastic hand tools used to dig or move material. The amount of sample needed will determine which one of these similar devices will be used.

3.3.9 Soil Sampler

A soil sampler is a stainless steel device used to collect small soil samples. This is primarily used when analyzing soils for volatile constituents.

3.3.10 Peristaltic Pump

The peristaltic pump is the only mechanical tool listed and will mechanically pull a sample. This pump could decrease the sampling time when large samples are needed.

3.3.11 Tool Decontamination

When possible, the sampling team will use disposable tools. New tools will be used for each sampling event. Disposable equipment must be kept clean and free of contamination prior to sampling.

In order to prevent sample contamination, nondisposable tools may require cleaning before they are used to collect a sample. After sampling activities are complete, the tools must again be cleaned to remove any residual material. Deionized water or an appropriate detergent may be used to perform the cleanings. Wash water should be collected in a container and evaluated to determine if it must be disposed of as hazardous waste. Pre- and post-sampling wash water may be collected in the same container.

If decontamination of the sampling tools is not possible or practical, the tools may be discarded at the discretion of the team coordinator. If applicable, the tools will be discarded as hazardous waste. When tools are used for sampling a TRU-mixed waste in a radiological area, they shall be disposed of appropriately.

3.3.12 Maintaining Sampling Equipment

Sampling tools and other equipment must be kept in a controlled area, preferably locked, in order to maintain the integrity of the tools and to prevent sample cross-contamination. If instruments are used for field parameter testing, they will be calibrated periodically. Control and calibration of these instruments (if applicable) will be the responsibility of the WIPP Metrology Office. When applicable, field measurements will be verified by specifying them as parameters requested for analysis by the contract laboratory.

SEC must maintain a database of Monitoring and Data Collection (M&DC) equipment. The database must contain the following information:

- Accuracy specifications or location of the specifications for each piece of M&DC
- Calibration records
- Location of operating manuals and/or operating instructions for using each M&DC
- Records that reconcile "Out-of-Tolerance," damaged, or expired M&DC calibration conditions
- "As found" vendor calibrations

In addition, the following shall be performed:

- Store all Certifications of Calibration and data in fire proof cabinets, until transfer in accordance with the applicable Records Inventory and Disposition Schedule.
- Check each piece of M&DC for a current calibration label before use.
- Tag, segregate, or otherwise control equipment with expired calibration labels to prevent its use until it has been recalibrated.
- Store M&DC so that the equipment will not be subjected to extremes outside the manufacturer's recommendation for temperature, humidity, vibration, electromagnetic interference, dust and accidental damage.

3.4 Quality Assurance Samples

3.4.1 Field Duplicates and Blanks

Field duplicates will be collected at specified frequencies and are employed to document precision. The precision resulting from field duplicates is a function of the variance of waste composition, the variance of sampling technique, and the variance of the analytical technique. Duplicates will be collected in the same manner as samples. When a duplicate sample is drawn, the technique, location, and amount should be identical to the corresponding sample. Documentation and identification of duplicate samples and split or subdivided samples shall reference the sample identification of the original sample.

Equipment rinseates will be collected at specified frequencies and will vary according to the probability of contamination or cross-contamination. Equipment rinseates are analyzed to detect any contamination from the equipment, cross-contamination from previously collected samples, or conditions during the sampling activity. Rinseates are conducted by using deionized or reagent water.

The sampling team will collect field duplicates and rinseates as instructed by the team coordinator. As a best management practice, one out of every ten samples will be a field duplicate and/or equipment rinseate.

3.4.2 Disposition of Nonconforming Samples

The WIPP Sampling Team's samples are normally collected for waste characterization prior to disposal versus a compliance related monitoring program. In the unusual event that a sample is identified by the contract laboratory as a nonconforming sample (i.e., a sample has exceeded the holding time for a specific test) another sample shall be taken of the media and submitted to the contract laboratory for analysis. If another sample cannot be taken, discussions between the lab manager and the sampling team coordinator may be held indicating that the test be run on the sample as received. Any impact on the test results shall be noted and the discussion shall be documented and included as part of the analytical file.

3.5 Sample Containers

Each type of sample must be contained in a specific way, suitable for the type of substance being sampled. The types of sampling containers for each type of sample are listed in Table 2.

Special care must be taken to ensure the outside of the containers are not contaminated with the sampled substance. This could cause cross-contamination between samples and pose a health risk.

3.6 Sample Preservation

Samples shall be preserved as applicable immediately following collection. The different preservation techniques used are listed in Table 2. The contract laboratory and the sampling team coordinator will determine the applicability of sample preservation for samples that are not compliance regulated or samples containing high ionic strength brine water.

Preservatives should be stored in proper chemical lockers. Care should be taken not to store incompatible chemicals in the same locker. Guidelines for the handling and storage of the preservative chemicals are available in the hazardous materials management plan or from the Industrial Hygienist.

4.0 SAMPLE DOCUMENTATION

4.1 Sample Numbers

A sample number will be assigned to each sample collected. The format for the sample numbers is as follows:

- "WST" (WIPP Sampling Team), followed by
- The last two digits of the current year, followed by
- Three-digit sequential numbering starting with "001"

Example: WST-03-032

The first available sequential number will be determined by examining the field logbook.

Equipment rinseates and duplicates will be numbered in the same way as other samples. A notation should be made in the field logbook to identify samples as equipment rinseates or duplicates, as appropriate.

4.2 Sample Logbooks

Two logbooks will be maintained for all sampling team activities. The logbooks will include all samples taken by the team. The samples will be logged by the sample number. One logbook will be the sample tracking logbook and the other will be the field logbook. Both log books are considered quality records and shall be stored in locked fireproof cabinets at the end of each work day. Only copies of the logbook entries may be taken off-site, unless the sample team members are using the field logbook during a sampling activity. The logbooks will include the information specified in WP 02-EC1001.

In addition to this information, a detailed description of how the sample was collected should be recorded in the field logbook, including the in situ orientation of the sample, where appropriate.

The team coordinator is responsible for reviewing the logbooks for accuracy and completeness periodically. The team coordinator should document the reviews with initials or signature and date.

4.3 Container Identification

The sample container must be labeled with the information specified in WP 02-EC1001.

Sample identification shall be maintained through final disposition of the sample.

Care shall be taken to ensure that sample identification does not compromise or cross-contaminate the sample. If physical markings are used, they shall not be obliterated or hidden by surface treatments or sample preparation unless other means of identification are substituted.

4.4 Tamper-Proof Seals

After the sample has been collected, the container must be sealed to resist tampering. Sample bottles are sealed by wrapping sealing tape or electrical tape around the lid and the neck of the container. A custody seal shall be placed over the tape so that it will break if the container is opened. The custody seal must be placed on the container before the sample leaves the sample location. The custody seal should contain the information specified in WP 02-EC1001.

4.5 Sample Custody

4.5.1 Sample Chain-of-Custody Forms

Sample Chain-of-Custody (COC) forms must be generated for every sample collected. A sample team member will initiate the COC form by filling in the required information. Information required to be on the COC form when the samples are shipped to the contract lab includes:

- Unique COC number (preprinted on the COC form)
- Sample number
- Sample location and description
- Date and time collected
- Sample type
- Container type
- Sampling program (i.e., WIPP Sampling Team)
- Names of sampling team members involved in the sampling event
- Name of the laboratory being used for analysis

In addition, there must be space to document the condition of the samples upon receipt at the laboratory and an area to be used to document changes in sample custody.

An example of a COC form is maintained as Attachment 2, to WP 02-EM3001, Administrative Processes for Environmental Monitoring and Hydrology Processes. This is an example form only. There is not a required format for a COC form, if the form being used contains the required information.

A sample is considered to be in a person's custody if it is in their physical possession, is in the their view, or they have prevented tampering of the sample by securing it. Changes of sample custody must be documented on the COC form. The custody is exchanged by the current custodian signing to release custody, and the new custodian signing to receive custody. The signatures should be accompanied by a date and time of transfer and an indication of each person's employer.

When samples are being shipped, the carrier is not required to sign for custody of the sample. The shipping documentation will be proof of custody until the samples are received at the analytical laboratory.

4.5.2 Request for Analysis

A Request for Analysis (RFA) form should accompany the sample COC form when the samples are shipped for analysis. A sample team member will initiate the RFA form by filling in the required information for both the sample collection and the requested analyses. Information required to be on the RFA form includes:

- Sample number
- Sample type
- Sample quantity
- Preservative (if applicable)
- Required testing program
- Special Instructions (if applicable)
- Sampling program
- Purchase order number
- Date of shipment
- Name of the laboratory being used for analysis
- Name of the laboratory contact
- Address to send the laboratory report to
- Date the laboratory report is due
- Name of the project contact
- Project contact's phone number

In addition, there must be space to document any known sample hazards and instructions for sample disposal. The preprinted number on the COC form should be written on the upper right-hand side of the RFA form.

An example of an RFA form is maintained as Attachment 3 to WP 02-EM3001. This is an example form only. There is not a required format for an RFA form, if the form being used contains the required information.

The original copy of the COC and RFA forms will be sent to the contracted laboratory and all remaining copies shall be part of the documentation packet. Instructions to the laboratory will be sent with the forms. The original copies will be sent back with the data report. (An example of instructions for the analytical laboratory is included in Attachment 2, Instructions to the Contract Analytical Laboratory.) All other copies are filed in the custody records for tracking purposes.

5.0 SAFETY

5.1 Material Safety Data Sheets [3]

MSDSs and/or process knowledge will be the main source of safety information when approaching a sampling activity. The MSDS contains information that will be used when deciding the appropriate sample container and how the material should be sampled. The MSDS also contains information on the necessary personal protective equipment (PPE) when required.

5.2 Industrial Hygiene

When an MSDS is not available, or the substance to be sampled is of unknown composition, the Industrial Hygienist will be responsible for determining the safest way to sample the substance and the PPE that is required. If the Industrial Hygienist, is absent, a Certified Safety Professional will make the determination. Examples of the levels of PPE are included in Attachment 3, Personal Protective Equipment.

5.3 Personal Protective Equipment [8]

Personal protective equipment that becomes saturated due to spillage or splashes during sampling, shall be evaluated for disposal via the Request for Disposal process outlined in WP 02-RC3108, Request for Disposal. Noncontaminated PPE shall be disposed of as nonhazardous waste.

All PPE and sampling equipment used while sampling TRU-mixed waste shall be disposed of as site-derived waste.

5.4 General Safety and Sample Integrity [3]

Safety of the sampling activity shall be evaluated before sampling commences. When there are unknown materials, all appropriate precautions should be taken. Sample collectors shall avoid contact with any of the media being sampled. Training will be provided to ensure the safety of the sampling activities, but every situation is different and shall be approached with caution.

Safety goggles and rubber gloves are required when handling preservatives. MSDSs must be current and readily available.

Sample integrity is an issue closely related to safety. If the sample is taken in a sloppy or inconsistent manner, the sample will not provide valid data, and will require resampling.

In addition to hazards posed by materials to be sampled, there are other dangers that may be encountered. The area around the WIPP site is undeveloped and contains many tripping and falling hazards, as well as buried electric and gas lines, animals, and insects that could be harmful to the sampling team members. All persons involved in sampling activities shall be aware of the sampling location's surroundings. If necessary, samplers shall have surveys conducted to map locations of buried lines. Adverse weather conditions pose additional hazards to sampling team members. Samplers should plan sampling activities so that weather conditions such as extreme heat, lightning, and high winds do not pose a threat to the health and safety of the sampling team members.

Even when the utmost care is taken, an emergency situation can occur as a result of an unanticipated explosion, electrical hazard, fall, or exposure to a hazardous substance. To minimize the impact of an emergency, sampling personnel should be aware of basic first aid and have immediate access to a first aid kit.

Before personnel function as part of the sampling team, they will have a medical examination in accordance with the requirements in WP 15-HS.02, WIPP Occupational Health Program. The initial examination includes:

- Spirometry
- Basic Physical Examination
- Complete Blood Count
- Urinalysis
- Chest X-ray (optional)
- Respirator Medical Evaluation Questionnaire

The examination will document the initial quality of a sampling team member's health and ensure the maintenance of good health. Annual examinations, in accordance with WP 15-HS.02, will be performed if the individual remains on the sampling team. Unscheduled medical examinations should be performed in the event of an accident, illness, exposure, or suspected exposure to toxic materials. Personnel will not participate in further sampling team activities until cleared by the medical director.

6.0 ANALYSES

6.1 Field General Chemistry Analyses

General field parameters, such as pH, temperature, and conductivity, may be performed in the field by the sampling personnel. If it is not possible to perform these tests when the sample is taken, the analyses must be performed as soon as possible. These tests will aid in determining how the sample is contained, preserved, and analyzed. If a sample is of unknown composition, the characteristics of the material give the sampler an idea of what the composition might be, making it easier to determine the analyses needed to be conducted by the analytical laboratory. The forms generated by the corresponding field test procedures will be maintained with the sample logbook or the applicable data report file.

6.1.1 pH Measurement

In most cases, the pH will be measured by the contract laboratory. For purposes of shipping, pH may be measured in the field using pH strips. As required, the pH of a substance may be measured per WP 02-EM1005, Groundwater Serial Sample Analysis, or applicable instrument instructions, using calibrated equipment. The pH can be measured only if the sample media is aqueous or multiphase with the aqueous part of the sample media being at least 20 percent of the total volume. This procedure also includes a calibration of the pH meter and electrode.

6.1.2 Temperature Measurement

When it is necessary to determine the temperature of a substance, it will be measured per WP 02-EM1005 or the applicable instrument instructions.

6.1.3 Conductivity Analysis

When it is necessary to determine the conductivity of a solution, it will be measured per WP 02-EM1005 or the applicable instrument instructions.

6.2 Qualitative and Quantitative Analyses

There are minimum analyses that must be performed on certain types of samples. In some cases, only characterization will be required, and in other cases, a qualitative and quantitative analysis will be needed. The minimum analyses are listed in Table 4. If additional analyses are needed, they must be specified on the RFA form sent with the sample.

The contracted analytical laboratory will be responsible for providing the results to the qualitative and quantitative analyses, according to their contract. For each parameter of interest, there are suggested methods of analysis. The suggested methods are listed in Table 3. The contracted laboratory will specify which analysis will be performed, and present the deviations from this analysis for approval at the time of contract placement.

7.0 TRANSPORTATION [9, 10]

7.1 Shipment of Samples for Laboratory Analysis

Samples being transported to a laboratory for the purpose of testing to determine their characteristics or composition are exempted from RCRA regulations under 40 CFR §261.4(d), "Exclusions." However, sample shipment shall be coordinated with Shipping Coordination to ensure that the applicable U.S. Department of Transportation regulations for packaging and shipping have been met. Verification of this process shall be indicated by a signature from a designated Shipping Coordination representative on the Shipping Authorization form in accordance with WP 15-PM3525.

8.0 DATA PACKAGE REVIEW [11]

The data package for the sampling activity will consist of the following:

- Data summary report
- Analytical narrative
- Sample custody papers
- RFA form

- Copies of the general chemistry results
- Analytical equipment calibration data
- Analytical equipment calibration check data
- Analytical equipment control charts (if appropriate)
- Equipment rinseates analysis data (if appropriate)
- Duplicate analysis data (if appropriate)

The data package will be reviewed by the sampling team coordinator. The sampling team coordinator may also request the data package be reviewed by additional SEC, Environmental Monitoring and Hydrology, or Quality Assurance personnel.

SEC will review the data package for validity and compliance with the sampling plan. If responding to a spill or release, SEC will also look at the levels of contaminants found, determine whether the quantities are reportable, and whether or not the levels warrant further action. If levels are reportable, SEC must respond according to WP 02-EC3506, Environmental Incident Reporting, and contact the Facility Manager per the requirements of the applicable WIPP procedure for reporting occurrences in accordance with DOE Order 231.1A, *Environment, Safety, and Health Reporting.*

If necessary, the sampling team coordinator may request that Quality Assurance review the data package validity.

The review will be documented on Attachment 1, Review Form for Sample Analysis Data Package. After all reviews are completed, the data package will be validated by the sampling team coordinator.

9.0 RECORDS

Records generated by this plan are:

- COC form
- RFA form
- Data packages
- Field logbook
- Sample tracking logbook
- Review form for sample analysis data package

10.0 REFERENCES

29 CFR §1910.120, "Hazardous Waste Operations and Emergency Response"

40 CFR §261.4, "Exclusions"

40 CFR §268.2, "Definitions"

40 CFR Part 279, "Used Oil Management Standards"

40 CFR §302.4, "Designation of Hazardous Substances"

DOE Order 231.1A, *Environment, Safety, and Health Reporting*

20.7.10 New Mexico Administrative Code, *Drinking Water*

DOE/WIPP 00-2001, WIPP Sampling and Analysis Plan for Solid Waste Management Units and Areas of Concern

WP 02-EC.05, Quality Assurance Project Plan for WIPP Site Effluent and Hazardous Materials Sampling

WP 02-EC1001, Characterization Sampling, Shipping, and Documentation

WP 02-EC3506, Environmental Incident Reporting

WP 02-EM3001, Administrative Processes for Environmental Monitoring and Hydrology Processes

WP 02-EM1005, Groundwater Serial Sample Analysis

WP 02-RC3108, Request for Disposal

WP 12-ES3918, Reporting Occurrences in Accordance With DOE Order 232.1A

WP 12-IH.02-9, WIPP Industrial Hygiene Program - Beryllium Exposure Prevention Program

WP 15-HS.02, WIPP Occupational Health Program

WP 15-PM3525, Preparation and Processing of Shipping Authorization and Express Mail

Table 1 - Sampling Equipment for Particular Materials

Solid Samplers		
Samplers	**Application**	**Limitations**
Solid Thief (Grain Sampler)	Powdered or granular solids.	Maximum sampling depth approximately 6 feet. Grains may be approximately the size of a kernel of corn. Limited application for sampling moist or sticky solids.
Sampling Trier	Preferred when powdered or granular materials are moist or sticky. Soft or loosened soil samples.	Maximum sampling depth approximately 2 feet. Difficult to retain core sample of very dry granular materials.
Trowel or Scoop	Dry, granular or powdered material or surface soil collection. Material consisting of large particles.	Maximum sampling depth approximately 3 inches. Difficult to obtain reproducible mass of samples.
Soil Auger	Soil samples 3 inches or deeper.	Maximum sampling depth approximately 6 feet. Cutting diameter up to 8 inches.
Waste Pile Sampler	Waste piles and granular or powdered material.	Maximum sampling depth approximately 6 feet. Unable to sample solid material with dimensions greater than half the diameter of the sampling tube.
Coliwasa	Liquids, sludges, and slurries in drums, vacuum trucks, barrels, and similar containers.	Maximum sampling depth approximately 5 feet.
Liquid Thief	Use with containers that have smaller openings. Liquids, sludges, slurries, immiscible phases, and sediments.	Maximum sampling depth to about 3 feet. With immiscible phases, problems keeping sample in tube due to loss of surface tension.
Soil Sampler	Use for collecting small samples of soil for analysis of volatile constituents.	Maximum sampling depth approximately 2 inches.
Peristaltic Pump	Variable speed collection, depending on pump head type. Used for both composite samples and individual samples.	Difficult to obtain representative sample with immiscible phases. Vacuum in tubing may cause out-gassing of organics.
Dipper	Liquids and sludges from surface of ponds, lagoons, or similar reservoirs.	Maximum length about 12 feet. Loss of sample when transferring to sample container.
Weighted Bottle	Storage tanks, deep wells, sumps or other containers too deep for coliwasa. Multiple depth sampling.	Difficult to use with viscous liquids. Must be aware of chemical compatibility with weight sinker and line or frame.

Table 2 - Containers, Preservatives, and Holding Times

Name	Amount	Container	Preservation	Max Hold
Cyanide	1L	P,G	≤4°C, if oxidizing agents present add 5 ml 0.1N $NaAsO_2$ per L or .06 g ascorbic acid per L; adjust pH to 12 with NaOH	14 days
Hydrogen ion pH	25 ml	P,G	None	24 hours
Nitrate/Nitrite	100ml	P	≤4°C, H_2SO_4 to pH<2	28 days
Nitrate	1L	P,G	≤4°C	48 hours
Metals	1L	P,G	HNO_3 to pH<2	6 months
Dissolved Metals	1L	P	≤4°C	6 months
Oil and Grease	100 ml	G	≤4°C	28 days
Organic Carbon TOC	15 ml (4)	P,G	≤4°C	28 days
Volatiles	40 ml (2)	G, Teflon	≤4°C, 4 drops HCl	14 days
Semivolatiles	2L	AG	≤4°C	7 days
Pesticides	½ gal	AG	≤4°C	7 days
Phenols	500 ml	G	≤4°C, H_2SO_4 to pH<2	28 days
Total Suspended Solids TSS	1L	AG	HNO_3 to pH<2	180 days
TCLP Metals	1L	P	None	6 months
TCLP Semivolatiles	1L	G	None	7 days
TCLP Volatiles	40 ml (2)/250ml/125ml	WMG/Septum Lid	None	14 days
BTEX	250ml	WMG/Septum Lid	25 drops (2.5 ml HCL) ≤4°C	14 days
BOD	1L	P	≤4°C	48 hours

G - Glass
P - Polyethylene
AG - Amber Glass

Table 3 - Target Analytes and Proposed EPA Analytical Methods

Parameter	EPA Analytical Method (or equal)
Arsenic***	6010/7060A
Barium***	6010
Beryllium***	6010
Cadmium***	6010
Chromium***	6010
Lead***	6010/7421
Mercury***	7470/7471
Nickel***	6010
Selenium***	6010/7740
Silver***	6010
Thallium***	6010
Acetone*	8240/8260
Benzene*	8240/8260
Bromoform*	8240/8260
n-Butyl alcohol*	8260
Carbon disulfide*	8240/8260
Carbon tetrachloride*	8240/8260
Chlorobenzene*	8240/8260
Chloroform*	8240/8260
Cresols**	8040
Cyclohexane*	8240/8260
Cyclohexanone	8315
o-Dichlorobenzene*	8260
p-Dichlorobenzene*	8260
1,1-Dichloroethane*	8240/8260
1,2-Dichloroethane*	8240/8260
1,1-Dichloroethene*	8240/8260
cis-1,2-Dichloroethene*	8240/8260
Diethyl ether*	8240/8260
2,4-Dinitrotoluene**	8250/8270
2-Ethoxyethanol*	8240/8260

Table 3 - Target Analytes and Proposed EPA Analytical Methods

Parameter	EPA Analytical Method (or equal)
Ethyl acetate*	8240/8260
Ethylbenzene*	8240/8260
Trichloroethylene*	8240/8260
Formaldehyde*	8240/8260
Hexachloroethane**	8250/8270
Hydrazine*	8240/8260
Isobutanol*	8240/8260
Methanol*	8240/8260
Methylene Chloride*	8240/8260
Methyl Ethyl Ketone*	8240/8260
Methyl isobutylketone*	8240/8260
Nitrobenzene**	8250/8270
2-Nitropropane*	8240/8260
Polychlorinated biphenyls (PCBs)	8080/8081
,1,2-Trichloroethane*	8240/8260
Pyridine**	8250/8270
1,1,2,2-Tetrachloroethane*	8240/8260
Tetrachloroethylene*	8240/8260
Toluene*	8240/8260
1,1,1-Trichloroethane*	8240/8260
Trichlorofluoromethane*	8240/8260
1,3,5-Trimethylbenzene*	8240/8260
1,2,4-Trimethylbenzene*	8240/8260
1,1,2-Trichloro-1,2,2-trifluoroethane*	8240/8260
Vinyl chloride*	8240/8260
Xylenes*	8240/8260
Zinc***	6010

* - Volatile
** - Semivolatile
*** - Metal

Table 4 - Analytical Requirements for Different Sample Programs

Program	Required Analyses
Hazardous Material Characterization	- pH - Ignitability - TCLP metals and organics - TSS - TOC
Soil Samples	- pH (if possible) - Conductance - Na - Mg - Cl - Ca - K
Used Oils	- Total Halogens - Volatiles - Semivolatiles
Site Effluent	- Metals - Phenols - pH - Conductance - TOC - Volatiles - Semivolatiles
TRU-Mixed Waste Samples	- pH - Ignitability - TCLP metals and organics - TSS - TOC - Gross alpha and gross beta/gamma
Drinking Water Samples	- Lead - Copper - Total Coliform - Chlorine Note: Total Coliform and Chlorine will be run on an as-requested basis.

Attachment 1 - Review Form for Sample Analysis Data Package WIPP Site Effluent and Hazardous Material Sampling Program

Sample ID Number:____________________
Lab Requisition Number:________________

Date of Sampling:________________

Description of Sample:____

____

____

SAMPLING TEAM

Are the following constituents present in the data package:

_____ Sample Data	Sample Chain-of-Custody Form _____
_____ Equipment Rinseates Data (if applicable)	Request for Analysis Form _____
_____ Calibration Data	Duplicate Data _____
_____ Laboratory Control Sample Data	Sample Time _______

Comments:____

Reviewed by:______________________________ _______________
Signature Date

SITE ENVIRONMENTAL COMPLIANCE
(This section must be completed when responding to a spill or release.)

Are any of the constituents present in reportable quantities according to 40 CFR §302.4, "Designation of Hazardous Substances"? _______________

If so, enact WP 02-EC3506, Environmental Incident Reporting, and WP 12-ES3918, Reporting Occurrences in Accordance with DOE Order 231.1A.

Comments:____

____

Reviewed by:______________________________ ____________________
Signature Date

Attachment 2 - Instructions to the Contract Analytical Laboratory

To Contract Analytical Laboratory:

Please relinquish custody on the Chain-of-Custody form by signing and dating on the next appropriate line and return original with the sample analyses data to:

Washington Regulatory and Environmental Services
Sampling Team Coordinator's Name MS 486-06
WIPP Site/Jal Highway
32 miles SE of Carlsbad
Carlsbad, NM 88220

Attachment 3 - Personal Protective Equipment

There are four levels of personal protective equipment that are used when approaching a hazardous material. These levels are as follows:

A - Full-positive pressure suit
- Full-face piece self-contained breathing apparatus (SCBA) or positive pressure supplied air respirator with escape SCBA
- Totally encapsulated chemical protective suit
- Inner and outer chemical resistant gloves
- Hard hat (if appropriate)
- Chemical resistant steel toe boots

B - Positive pressure suit
- Full-face piece SCBA or positive pressure supplied air respirator with escape SCBA
- Hooded chemical resistant clothing
- Inner and outer chemical resistant gloves
- Chemical resistant steel toe boots
- Disposable boot covers

C - Full-face or half-mask air purifying respirator
- Hooded chemical resistant clothing
- Inner and outer chemical resistant gloves
- Steel toe boots
- Disposable boot covers

D - Work uniform
- Steel toe boots
- Safety glasses
- Work gloves (if appropriate)
- Hard hat (if appropriate)

The level of personal protective equipment to be used will be determined by the MSDS or the Industrial Hygienist.

ENCLOSURE 5

Analytical and Quality Control Report

Koreen Guillermo
WRES
P.O.Box 2078
Carlsbad, NM 88221-2078

Report Date: November 3, 2004

Work Order: 4100808

Project Number: 402560

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description		Matrix	Date Taken	Time Taken	Date Received
45370	WST-04-061		water	2004-10-07	08:59	2004-10-08
45371	WST-04-062	RETENTION	water	2004-10-07	09:00	2004-10-08
45372	WST-04-063	POND A	water	2004-10-07	09:07	2004-10-08
45373	WST-04-064		water	2004-10-07	09:09	2004-10-08
45374	WST-04-065		water	2004-10-07	09:11	2004-10-08
45375	WST-04-066		water	2004-10-07	09:11	2004-10-08
45376	WST-04-067		water	2004-10-07	09:34	2004-10-08
45377	WST-04-068	WATERSHED	water	2004-10-07	09:36	2004-10-08
45378	WST-04-069	C	water	2004-10-07	09:38	2004-10-08
45379	WST-04-070	POND 1	water	2004-10-07	09:40	2004-10-08
45380	WST-04-071		water	2004-10-07	09:41	2004-10-08
45381	WST-04-072		water	2004-10-07	09:41	2004-10-08
45382	WST-04-073		water	2004-10-07	09:57	2004-10-08
45383	WST-04-074	WATERSHED	water	2004-10-07	09:59	2004-10-08
45384	WST-04-075	C	water	2004-10-07	10:03	2004-10-08
45385	WST-04-076	POND	water	2004-10-07	10:04	2004-10-08
45386	WST-04-077		water	2004-10-07	10:05	2004-10-08
45387	WST-04-078	2	water	2004-10-07	10:05	2004-10-08

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 38 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Michael Abel

Dr. Blair Leftwich, Director

Analytical Report

Sample: 45370 - WST-04-061

Analysis:	Volatiles	Analytical Method:	S 8260B	Prep Method:	S 5030B
QC Batch:	13191	Date Analyzed:	2004-10-09	Analyzed By:	JG
Prep Batch:	11659	Date Prepared:	2004-10-09	Prepared By:	JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane		<1.00	μg/L	1	1.00
Dichlorodifluoromethane		<1.00	μg/L	1	1.00
Chloromethane (methyl chloride)		<1.00	μg/L	1	1.00
Vinyl Chloride		<1.00	μg/L	1	1.00
Bromomethane (methyl bromide)		<5.00	μg/L	1	5.00
Chloroethane		<1.00	μg/L	1	1.00
Trichlorofluoromethane		<1.00	μg/L	1	1.00
Acetone		13.7	μg/L	1	10.0
Iodomethane (methyl iodide)		<5.00	μg/L	1	5.00
Carbon Disulfide		<1.00	μg/L	1	1.00
Acrylonitrile		<1.00	μg/L	1	1.00
2-Butanone (MEK)		<5.00	μg/L	1	5.00
4-Methyl-2-pentanone (MIBK)		<5.00	μg/L	1	5.00
2-Hexanone		<5.00	μg/L	1	5.00
trans 1,4-Dichloro-2-butene		<10.0	μg/L	1	10.0
1,1-Dichloroethene		<1.00	μg/L	1	1.00
Methylene chloride		<5.00	μg/L	1	5.00
MTBE		<1.00	μg/L	1	1.00
trans-1,2-Dichloroethene		<1.00	μg/L	1	1.00
1,1-Dichloroethane		<1.00	μg/L	1	1.00
cis-1,2-Dichloroethene		<1.00	μg/L	1	1.00
2,2-Dichloropropane		<1.00	μg/L	1	1.00
1,2-Dichloroethane (EDC)		<1.00	μg/L	1	1.00
Chloroform		<1.00	μg/L	1	1.00
1,1,1-Trichloroethane		<1.00	μg/L	1	1.00
1,1-Dichloropropene		<1.00	μg/L	1	1.00
Benzene		<1.00	μg/L	1	1.00
Carbon Tetrachloride		<1.00	μg/L	1	1.00
1,2 Dichloropropane		<1.00	μg/L	1	1.00
Trichloroethene (TCE)		<1.00	μg/L	1	1.00
Dibromomethane (methylene bromide)		<1.00	μg/L	1	1.00
Bromodichloromethane		<1.00	μg/L	1	1.00
2-Chloroethyl vinyl ether		<5.00	μg/L	1	5.00
cis-1,3-Dichloropropene		<1.00	μg/L	1	1.00
trans-1,3-Dichloropropene		<1.00	μg/L	1	1.00
Toluene		<1.00	μg/L	1	1.00
1,1,2-Trichloroethane		<1.00	μg/L	1	1.00
1,3-Dichloropropane		<1.00	μg/L	1	1.00
Dibromochloromethane		<1.00	μg/L	1	1.00
1,2-Dibromoethane (EDB)		<1.00	μg/L	1	1.00
Tetrachloroethene (PCE)		<1.00	μg/L	1	1.00
Chlorobenzene		<1.00	μg/L	1	1.00
1,1,1,2-Tetrachloroethane		<1.00	μg/L	1	1.00
Ethylbenzene		<1.00	μg/L	1	1.00
m,p-Xylene		<1.00	μg/L	1	1.00

continued ...

sample 45370 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Bromoform		<1.00	µg/L	1	1.00
Styrene		<1.00	µg/L	1	1.00
o-Xylene		<1.00	µg/L	1	1.00
1,1,2,2-Tetrachloroethane		<1.00	µg/L	1	1.00
2-Chlorotoluene		<1.00	µg/L	1	1.00
1,2,3-Trichloropropane		<1.00	µg/L	1	1.00
Isopropylbenzene		<1.00	µg/L	1	1.00
Bromobenzene		<1.00	µg/L	1	1.00
n-Propylbenzene		<1.00	µg/L	1	1.00
1,3,5-Trimethylbenzene		<1.00	µg/L	1	1.00
tert-Butylbenzene		<1.00	µg/L	1	1.00
1,2,4-Trimethylbenzene		<1.00	µg/L	1	1.00
1,4-Dichlorobenzene (para)		<1.00	µg/L	1	1.00
sec-Butylbenzene		<1.00	µg/L	1	1.00
1,3-Dichlorobenzene (meta)		<1.00	µg/L	1	1.00
p-Isopropyltoluene		<1.00	µg/L	1	1.00
4-Chlorotoluene		<1.00	µg/L	1	1.00
1,2-Dichlorobenzene (ortho)		<1.00	µg/L	1	1.00
n-Butylbenzene		<1.00	µg/L	1	1.00
1,2-Dibromo-3-chloropropane		<5.00	µg/L	1	5.00
1,2,3-Trichlorobenzene		<5.00	µg/L	1	5.00
1,2,4-Trichlorobenzene		<5.00	µg/L	1	5.00
Naphthalene		<5.00	µg/L	1	5.00
Hexachlorobutadiene		<5.00	µg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		54.4	µg/L	1	50.0	109	70 - 130
Toluene-d8		48.0	µg/L	1	50.0	96	70 - 130
4-Bromofluorobenzene (4-BFB)		44.5	µg/L	1	50.0	89	70 - 130

Sample: 45371 - WST-04-062

Analysis:	TOC	Analytical Method:	E 415.1	Prep Method:	N/A
QC Batch:	13212	Date Analyzed:	2004-10-19	Analyzed By:	RC
Prep Batch:	11674	Date Prepared:	2004-10-19	Prepared By:	RC

Parameter	Flag	RL Result	Units	Dilution	RL
Total Organic Carbon		1.31	mg/L	1	1.00

Sample: 45372 - WST-04-063

Analysis:	Semivolatiles	Analytical Method:	S 8270C	Prep Method:	S 3510C
QC Batch:	13383	Date Analyzed:	2004-10-17	Analyzed By:	RC
Prep Batch:	11816	Date Prepared:	2004-10-14	Prepared By:	RC

Parameter	Flag	RL Result	Units	Dilution	RL
Pyridine		<0.00500	mg/L	0.001	5.00
n-Nitrosodimethylamine		<0.00500	mg/L	0.001	5.00
2-Picoline		<0.00500	mg/L	0.001	5.00
Methyl methanesulfonate		<0.00500	mg/L	0.001	5.00
Ethyl methanesulfonate		<0.00500	mg/L	0.001	5.00
Phenol		<0.00500	mg/L	0.001	5.00
Aniline		<0.00500	mg/L	0.001	5.00
bis(2-chloroethyl)ether		<0.00500	mg/L	0.001	5.00
2-Chlorophenol		<0.00500	mg/L	0.001	5.00
1,3-Dichlorobenzene (meta)		<0.00500	mg/L	0.001	5.00
1,4-Dichlorobenzene (para)		<0.00500	mg/L	0.001	5.00
Benzyl alcohol		<0.00500	mg/L	0.001	5.00
1,2-Dichlorobenzene (ortho)		<0.00500	mg/L	0.001	5.00
2-Methylphenol		<0.00500	mg/L	0.001	5.00
bis(2-chloroisopropyl)ether		<0.00500	mg/L	0.001	5.00
4-Methylphenol / 3-Methylphenol		<0.00500	mg/L	0.001	5.00
n-Nitrosodi-n-propylamine		<0.00500	mg/L	0.001	5.00
Hexachloroethane		<0.00500	mg/L	0.001	5.00
Acetophenone		<0.00500	mg/L	0.001	5.00
Nitrobenzene		<0.00500	mg/L	0.001	5.00
n-Nitrosopiperidine		<0.00500	mg/L	0.001	5.00
Isophorone		<0.00500	mg/L	0.001	5.00
2-Nitrophenol		<0.00500	mg/L	0.001	5.00
2,4-Dimethylphenol		<0.00500	mg/L	0.001	5.00
bis(2-chloroethoxy)methane		<0.00500	mg/L	0.001	5.00
2,4-Dichlorophenol		<0.00500	mg/L	0.001	5.00
1,2,4-Trichlorobenzene		<0.00500	mg/L	0.001	5.00
Benzoic acid		<0.0200	mg/L	0.001	20.0
Naphthalene		<0.00500	mg/L	0.001	5.00
a,a-Dimethylphenethylamine		<0.00500	mg/L	0.001	5.00
4-Chloroaniline		<0.00500	mg/L	0.001	5.00
2,6-Dichlorophenol		<0.00500	mg/L	0.001	5.00
Hexachlorobutadiene		<0.00500	mg/L	0.001	5.00
n-Nitroso-di-n-butylamine		<0.00500	mg/L	0.001	5.00
4-Chloro-3-methylphenol		<0.00500	mg/L	0.001	5.00
2-Methylnaphthalene		<0.00500	mg/L	0.001	5.00
1-Methylnaphthalene		<0.00500	mg/L	0.001	5.00
1,2,4,5-Tetrachlorobenzene		<0.00500	mg/L	0.001	5.00
Hexachlorocyclopentadiene		<0.00500	mg/L	0.001	5.00
2,4,6-Trichlorophenol		<0.00500	mg/L	0.001	5.00
2,4,5-Trichlorophenol		<0.00500	mg/L	0.001	5.00
2-Chloronaphthalene		<0.00500	mg/L	0.001	5.00
1-Chloronaphthalene		<0.00500	mg/L	0.001	5.00
2-Nitroaniline		<0.00500	mg/L	0.001	5.00
Dimethylphthalate		<0.00500	mg/L	0.001	5.00
Acenaphthylene		<0.00500	mg/L	0.001	5.00
2,6-Dinitrotoluene		<0.00500	mg/L	0.001	5.00
3-Nitroaniline		<0.00500	mg/L	0.001	5.00
Acenaphthene		<0.00500	mg/L	0.001	5.00
2,4-Dinitrophenol		<0.0200	mg/L	0.001	20.0
Dibenzofuran		<0.00500	mg/L	0.001	5.00
Pentachlorobenzene		<0.00500	mg/L	0.001	5.00

continued ...

sample 45372 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
4-Nitrophenol		<0.00500	mg/L	0.001	5.00
2,4-Dinitrotoluene		<0.00500	mg/L	0.001	5.00
1-Naphthylamine		<0.00500	mg/L	0.001	5.00
2,3,4,6-Tetrachlorophenol		<0.00500	mg/L	0.001	5.00
2-Naphthylamine		<0.00500	mg/L	0.001	5.00
Fluorene		<0.00500	mg/L	0.001	5.00
4-Chlorophenyl-phenylether		<0.00500	mg/L	0.001	5.00
Diethylphthalate		<0.00500	mg/L	0.001	5.00
4-Nitroaniline		<0.00500	mg/L	0.001	5.00
Diphenylhydrazine		<0.00500	mg/L	0.001	5.00
4,6-Dinitro-2-methylphenol		<0.00500	mg/L	0.001	5.00
Diphenylamine		<0.00500	mg/L	0.001	5.00
4-Bromophenyl-phenylether		<0.00500	mg/L	0.001	5.00
Phenacetin		<0.00500	mg/L	0.001	5.00
Hexachlorobenzene		<0.00500	mg/L	0.001	5.00
4-Aminobiphenyl		<0.00500	mg/L	0.001	5.00
Pentachlorophenol		<0.00500	mg/L	0.001	5.00
Anthracene		<0.00500	mg/L	0.001	5.00
Pentachloronitrobenzene		<0.00500	mg/L	0.001	5.00
Pronamide		<0.00500	mg/L	0.001	5.00
Phenanthrene		<0.00500	mg/L	0.001	5.00
Di-n-butylphthalate		<0.00500	mg/L	0.001	5.00
Fluoranthene		<0.00500	mg/L	0.001	5.00
Benzidine		<0.0150	mg/L	0.001	15.0
Pyrene		<0.00500	mg/L	0.001	5.00
p-Dimethylaminoazobenzene		<0.00500	mg/L	0.001	5.00
Butylbenzylphthalate		<0.00500	mg/L	0.001	5.00
Benzo(a)anthracene		<0.00500	mg/L	0.001	5.00
3,3-Dichlorobenzidine		<0.00500	mg/L	0.001	5.00
Chrysene		<0.00500	mg/L	0.001	5.00
bis(2-ethylhexyl)phthalate		<0.0100	mg/L	0.001	10.0
Di-n-octylphthalate		<0.00500	mg/L	0.001	5.00
Benzo(b)fluoranthene		<0.00500	mg/L	0.001	5.00
Benzo(k)fluoranthene		<0.00500	mg/L	0.001	5.00
7,12-Dimethylbenz(a)anthracene		<0.00500	mg/L	0.001	5.00
Benzo(a)pyrene		<0.00500	mg/L	0.001	5.00
3-Methylcholanthrene		<0.00500	mg/L	0.001	5.00
Dibenzo(a,j)acridine		<0.00500	mg/L	0.001	5.00
Indeno(1,2,3-cd)pyrene		<0.00500	mg/L	0.001	5.00
Dibenzo(a,h)anthracene		<0.00500	mg/L	0.001	5.00
Benzo(g,h,i)perylene		<0.00500	mg/L	0.001	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
2-Fluorophenol		0.0209	mg/L	0.001	80.0	26	0 - 69.3
Phenol-d5		0.0127	mg/L	0.001	80.0	16	0 - 52.5
Nitrobenzene-d5		0.0395	mg/L	0.001	80.0	49	21.1 - 93.6
2-Fluorobiphenyl		0.0415	mg/L	0.001	80.0	52	25.4 - 87
2,4,6-Tribromophenol		0.0446	mg/L	0.001	80.0	56	14.9 - 110
Terphenyl-d14		0.0472	mg/L	0.001	80.0	59	28.9 - 124

Sample: 45373 - WST-04-064

Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	13234	Date Analyzed:	2004-10-08	Analyzed By:	WB
Prep Batch:	11690	Date Prepared:	2004-10-08	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride	[1]	125	mg/L	5	0.500

Sample: 45373 - WST-04-064

Analysis:	NO3 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	13234	Date Analyzed:	2004-10-08	Analyzed By:	WB
Prep Batch:	11690	Date Prepared:	2004-10-08	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N	[2]	1.01	mg/L	5	0.200

Sample: 45373 - WST-04-064

Analysis:	pH	Analytical Method:	SM 4500-H+	Prep Method:	N/A
QC Batch:	13209	Date Analyzed:	2004-10-08	Analyzed By:	RS
Prep Batch:	11679	Date Prepared:	2004-10-08	Prepared By:	RS

Parameter	Flag	RL Result	Units	Dilution	RL
pH		7.69	s.u.	1	0.00

Sample: 45373 - WST-04-064

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	13268	Date Analyzed:	2004-10-12	Analyzed By:	WB
Prep Batch:	11720	Date Prepared:	2004-10-12	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		6.77	mg/L	5	0.500

Sample: 45373 - WST-04-064

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	13272	Date Analyzed:	2004-10-13	Analyzed By:	WB
Prep Batch:	11727	Date Prepared:	2004-10-12	Prepared By:	WB

[1] Matrix % EA is 92 and Matrix RPD is 1 for chloride.
[2] Matrix % EA is 100 and Matrix RPD is 1 for nitrate.

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		325.0	mg/L	1	10.00

Sample: 45373 - WST-04-064

Analysis:	TSS	Analytical Method:	SM 2540D	Prep Method:	N/A
QC Batch:	13277	Date Analyzed:	2004-10-14	Analyzed By:	RS
Prep Batch:	11733	Date Prepared:	2004-10-13	Prepared By:	RS

Parameter	Flag	RL Result	Units	Dilution	RL
Total Suspended Solids		7.00	mg/L	1	1.00

Sample: 45374 - WST-04-065

Analysis:	Total 8 Metals	Analytical Method:	S 7470A	Prep Method:	N/A
QC Batch:	13293	Date Analyzed:	2004-10-14	Analyzed By:	TP
Prep Batch:	11746	Date Prepared:	2004-10-14	Prepared By:	TP
Analysis:	Total 8 Metals	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	13576	Date Analyzed:	2004-10-26	Analyzed By:	RR
Prep Batch:	11667	Date Prepared:	2004-10-11	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Silver	3	<0.00300	mg/L	1	0.00300
Total Arsenic		<0.00500	mg/L	1	0.00500
Total Barium		0.0700	mg/L	1	0.0100
Total Cadmium		<0.00100	mg/L	1	0.00100
Total Chromium		<0.00500	mg/L	1	0.00500
Total Mercury		<0.000200	mg/L	1	0.000200
Total Lead		<0.00500	mg/L	1	0.00500
Total Selenium		<0.0100	mg/L	1	0.0100

Sample: 45374 - WST-04-065

Analysis:	Zn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	13576	Date Analyzed:	2004-10-26	Analyzed By:	RR
Prep Batch:	11667	Date Prepared:	2004-10-11	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Zinc		0.0100	mg/L	1	0.0100

Sample: 45375 - WST-04-066

Analysis:	Total 8 Metals	Analytical Method:	S 7470A	Prep Method:	N/A
QC Batch:	13293	Date Analyzed:	2004-10-14	Analyzed By:	TP

[3] Matrix spike being rerun due to poor recovery.

Prep Batch:	11746	Date Prepared:	2004-10-14	Prepared By:	TP
Analysis:	Total 8 Metals	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	13576	Date Analyzed:	2004-10-26	Analyzed By:	RR
Prep Batch:	11667	Date Prepared:	2004-10-11	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Silver		<0.00300	mg/L	1	0.00300
Total Arsenic		<0.00500	mg/L	1	0.00500
Total Barium		0.0710	mg/L	1	0.0100
Total Cadmium		<0.00100	mg/L	1	0.00100
Total Chromium		<0.00500	mg/L	1	0.00500
Total Mercury		<0.000200	mg/L	1	0.000200
Total Lead		<0.00500	mg/L	1	0.00500
Total Selenium		<0.0100	mg/L	1	0.0100

Sample: 45375 - WST-04-066

Analysis:	Zn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	13576	Date Analyzed:	2004-10-26	Analyzed By:	RR
Prep Batch:	11667	Date Prepared:	2004-10-11	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Zinc		0.0100	mg/L	1	0.0100

Sample: 45376 - WST-04-067

Analysis:	Volatiles	Analytical Method:	S 8260B	Prep Method:	S 5030B
QC Batch:	13191	Date Analyzed:	2004-10-09	Analyzed By:	JG
Prep Batch:	11659	Date Prepared:	2004-10-09	Prepared By:	JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane		<1.00	μg/L	1	1.00
Dichlorodifluoromethane		<1.00	μg/L	1	1.00
Chloromethane (methyl chloride)		<1.00	μg/L	1	1.00
Vinyl Chloride		<1.00	μg/L	1	1.00
Bromomethane (methyl bromide)		<5.00	μg/L	1	5.00
Chloroethane		<1.00	μg/L	1	1.00
Trichlorofluoromethane		<1.00	μg/L	1	1.00
Acetone		<10.0	μg/L	1	10.0
Iodomethane (methyl iodide)		<5.00	μg/L	1	5.00
Carbon Disulfide		<1.00	μg/L	1	1.00
Acrylonitrile		<1.00	μg/L	1	1.00
2-Butanone (MEK)		<5.00	μg/L	1	5.00
4-Methyl-2-pentanone (MIBK)		<5.00	μg/L	1	5.00
2-Hexanone		<5.00	μg/L	1	5.00
trans 1,4-Dichloro-2-butene		<10.0	μg/L	1	10.0
1,1-Dichloroethene		<1.00	μg/L	1	1.00
Methylene chloride		<5.00	μg/L	1	5.00
MTBE		<1.00	μg/L	1	1.00

continued ...

sample 45376 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
trans-1,2-Dichloroethene		<1.00	μg/L	1	1.00
1,1-Dichloroethane		<1.00	μg/L	1	1.00
cis-1,2-Dichloroethene		<1.00	μg/L	1	1.00
2,2-Dichloropropane		<1.00	μg/L	1	1.00
1,2-Dichloroethane (EDC)		<1.00	μg/L	1	1.00
Chloroform		<1.00	μg/L	1	1.00
1,1,1-Trichloroethane		<1.00	μg/L	1	1.00
1,1-Dichloropropene		<1.00	μg/L	1	1.00
Benzene		<1.00	μg/L	1	1.00
Carbon Tetrachloride		<1.00	μg/L	1	1.00
1,2-Dichloropropane		<1.00	μg/L	1	1.00
Trichloroethene (TCE)		<1.00	μg/L	1	1.00
Dibromomethane (methylene bromide)		<1.00	μg/L	1	1.00
Bromodichloromethane		<1.00	μg/L	1	1.00
2-Chloroethyl vinyl ether		<5.00	μg/L	1	5.00
cis-1,3-Dichloropropene		<1.00	μg/L	1	1.00
trans-1,3-Dichloropropene		<1.00	μg/L	1	1.00
Toluene		<1.00	μg/L	1	1.00
1,1,2-Trichloroethane		<1.00	μg/L	1	1.00
1,3-Dichloropropane		<1.00	μg/L	1	1.00
Dibromochloromethane		<1.00	μg/L	1	1.00
1,2-Dibromoethane (EDB)		<1.00	μg/L	1	1.00
Tetrachloroethene (PCE)		<1.00	μg/L	1	1.00
Chlorobenzene		<1.00	μg/L	1	1.00
1,1,1,2-Tetrachloroethane		<1.00	μg/L	1	1.00
Ethylbenzene		<1.00	μg/L	1	1.00
m,p-Xylene		<1.00	μg/L	1	1.00
Bromoform		<1.00	μg/L	1	1.00
Styrene		<1.00	μg/L	1	1.00
o-Xylene		<1.00	μg/L	1	1.00
1,1,2,2-Tetrachloroethane		<1.00	μg/L	1	1.00
2-Chlorotoluene		<1.00	μg/L	1	1.00
1,2,3-Trichloropropane		<1.00	μg/L	1	1.00
Isopropylbenzene		<1.00	μg/L	1	1.00
Bromobenzene		<1.00	μg/L	1	1.00
n-Propylbenzene		<1.00	μg/L	1	1.00
1,3,5-Trimethylbenzene		<1.00	μg/L	1	1.00
tert-Butylbenzene		<1.00	μg/L	1	1.00
1,2,4-Trimethylbenzene		<1.00	μg/L	1	1.00
1,4-Dichlorobenzene (para)		<1.00	μg/L	1	1.00
sec-Butylbenzene		<1.00	μg/L	1	1.00
1,3-Dichlorobenzene (meta)		<1.00	μg/L	1	1.00
p-Isopropyltoluene		<1.00	μg/L	1	1.00
4-Chlorotoluene		<1.00	μg/L	1	1.00
1,2-Dichlorobenzene (ortho)		<1.00	μg/L	1	1.00
n-Butylbenzene		<1.00	μg/L	1	1.00
1,2-Dibromo-3-chloropropane		<5.00	μg/L	1	5.00
1,2,3-Trichlorobenzene		<5.00	μg/L	1	5.00
1,2,4-Trichlorobenzene		<5.00	μg/L	1	5.00
Naphthalene		<5.00	μg/L	1	5.00
Hexachlorobutadiene		<5.00	μg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		54.4	µg/L	1	50.0	109	70 - 130
Toluene-d8		47.8	µg/L	1	50.0	96	70 - 130
4-Bromofluorobenzene (4-BFB)		44.4	µg/L	1	50.0	89	70 - 130

Sample: 45377 - WST-04-068

Analysis:	TOC	Analytical Method:	E 415.1	Prep Method:	N/A
QC Batch:	13212	Date Analyzed:	2004-10-19	Analyzed By:	RC
Prep Batch:	11674	Date Prepared:	2004-10-19	Prepared By:	RC

Parameter	Flag	RL Result	Units	Dilution	RL
Total Organic Carbon		2.28	mg/L	1	1.00

Sample: 45378 - WST-04-069

Analysis:	Semivolatiles	Analytical Method:	S 8270C	Prep Method:	S 3510C
QC Batch:	13383	Date Analyzed:	2004-10-17	Analyzed By:	RC
Prep Batch:	11816	Date Prepared:	2004-10-14	Prepared By:	RC

Parameter	Flag	RL Result	Units	Dilution	RL
Pyridine		<0.00500	mg/L	0.001	5.00
n-Nitrosodimethylamine		<0.00500	mg/L	0.001	5.00
2-Picoline		<0.00500	mg/L	0.001	5.00
Methyl methanesulfonate		<0.00500	mg/L	0.001	5.00
Ethyl methanesulfonate		<0.00500	mg/L	0.001	5.00
Phenol		<0.00500	mg/L	0.001	5.00
Aniline		<0.00500	mg/L	0.001	5.00
bis(2-chloroethyl)ether		<0.00500	mg/L	0.001	5.00
2-Chlorophenol		<0.00500	mg/L	0.001	5.00
1,3-Dichlorobenzene (meta)		<0.00500	mg/L	0.001	5.00
1,4-Dichlorobenzene (para)		<0.00500	mg/L	0.001	5.00
Benzyl alcohol		<0.00500	mg/L	0.001	5.00
1,2-Dichlorobenzene (ortho)		<0.00500	mg/L	0.001	5.00
2-Methylphenol		<0.00500	mg/L	0.001	5.00
bis(2-chloroisopropyl)ether		<0.00500	mg/L	0.001	5.00
4-Methylphenol / 3-Methylphenol		<0.00500	mg/L	0.001	5.00
n-Nitrosodi-n-propylamine		<0.00500	mg/L	0.001	5.00
Hexachloroethane		<0.00500	mg/L	0.001	5.00
Acetophenone		<0.00500	mg/L	0.001	5.00
Nitrobenzene		<0.00500	mg/L	0.001	5.00
n-Nitrosopiperidine		<0.00500	mg/L	0.001	5.00
Isophorone		<0.00500	mg/L	0.001	5.00
2-Nitrophenol		<0.00500	mg/L	0.001	5.00
2,4-Dimethylphenol		<0.00500	mg/L	0.001	5.00
bis(2-chloroethoxy)methane		<0.00500	mg/L	0.001	5.00
2,4-Dichlorophenol		<0.00500	mg/L	0.001	5.00
1,2,4-Trichlorobenzene		<0.00500	mg/L	0.001	5.00
Benzoic acid		<0.0200	mg/L	0.001	20.0

continued ...

sample 45378 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Naphthalene		<0.00500	mg/L	0.001	5.00
a,a-Dimethylphenethylamine		<0.00500	mg/L	0.001	5.00
4-Chloroaniline		<0.00500	mg/L	0.001	5.00
2,6-Dichlorophenol		<0.00500	mg/L	0.001	5.00
Hexachlorobutadiene		<0.00500	mg/L	0.001	5.00
n-Nitroso-di-n-butylamine		<0.00500	mg/L	0.001	5.00
4-Chloro-3-methylphenol		<0.00500	mg/L	0.001	5.00
2-Methylnaphthalene		<0.00500	mg/L	0.001	5.00
1-Methylnaphthalene		<0.00500	mg/L	0.001	5.00
1,2,4,5-Tetrachlorobenzene		<0.00500	mg/L	0.001	5.00
Hexachlorocyclopentadiene		<0.00500	mg/L	0.001	5.00
2,4,6-Trichlorophenol		<0.00500	mg/L	0.001	5.00
2,4,5-Trichlorophenol		<0.00500	mg/L	0.001	5.00
2-Chloronaphthalene		<0.00500	mg/L	0.001	5.00
1-Chloronaphthalene		<0.00500	mg/L	0.001	5.00
2-Nitroaniline		<0.00500	mg/L	0.001	5.00
Dimethylphthalate		<0.00500	mg/L	0.001	5.00
Acenaphthylene		<0.00500	mg/L	0.001	5.00
2,6-Dinitrotoluene		<0.00500	mg/L	0.001	5.00
3-Nitroaniline		<0.00500	mg/L	0.001	5.00
Acenaphthene		<0.00500	mg/L	0.001	5.00
2,4-Dinitrophenol		<0.0200	mg/L	0.001	20.0
Dibenzofuran		<0.00500	mg/L	0.001	5.00
Pentachlorobenzene		<0.00500	mg/L	0.001	5.00
4-Nitrophenol		<0.00500	mg/L	0.001	5.00
2,4-Dinitrotoluene		<0.00500	mg/L	0.001	5.00
1-Naphthylamine		<0.00500	mg/L	0.001	5.00
2,3,4,6-Tetrachlorophenol		<0.00500	mg/L	0.001	5.00
2-Naphthylamine		<0.00500	mg/L	0.001	5.00
Fluorene		<0.00500	mg/L	0.001	5.00
4-Chlorophenyl-phenylether		<0.00500	mg/L	0.001	5.00
Diethylphthalate		<0.00500	mg/L	0.001	5.00
4-Nitroaniline		<0.00500	mg/L	0.001	5.00
Diphenylhydrazine		<0.00500	mg/L	0.001	5.00
4,6-Dinitro-2-methylphenol		<0.00500	mg/L	0.001	5.00
Diphenylamine		<0.00500	mg/L	0.001	5.00
4-Bromophenyl-phenylether		<0.00500	mg/L	0.001	5.00
Phenacetin		<0.00500	mg/L	0.001	5.00
Hexachlorobenzene		<0.00500	mg/L	0.001	5.00
4-Aminobiphenyl		<0.00500	mg/L	0.001	5.00
Pentachlorophenol		<0.00500	mg/L	0.001	5.00
Anthracene		<0.00500	mg/L	0.001	5.00
Pentachloronitrobenzene		<0.00500	mg/L	0.001	5.00
Pronamide		<0.00500	mg/L	0.001	5.00
Phenanthrene		<0.00500	mg/L	0.001	5.00
Di-n-butylphthalate		<0.00500	mg/L	0.001	5.00
Fluoranthene		<0.00500	mg/L	0.001	5.00
Benzidine		<0.0150	mg/L	0.001	15.0
Pyrene		<0.00500	mg/L	0.001	5.00
p-Dimethylaminoazobenzene		<0.00500	mg/L	0.001	5.00
Butylbenzylphthalate		<0.00500	mg/L	0.001	5.00

continued . . .

sample 45378 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Benzo(a)anthracene		<0.00500	mg/L	0.001	5.00
3,3-Dichlorobenzidine		<0.00500	mg/L	0.001	5.00
Chrysene		<0.00500	mg/L	0.001	5.00
bis(2-ethylhexyl)phthalate		<0.0100	mg/L	0.001	10.0
Di-n-octylphthalate		<0.00500	mg/L	0.001	5.00
Benzo(b)fluoranthene		<0.00500	mg/L	0.001	5.00
Benzo(k)fluoranthene		<0.00500	mg/L	0.001	5.00
7,12-Dimethylbenz(a)anthracene		<0.00500	mg/L	0.001	5.00
Benzo(a)pyrene		<0.00500	mg/L	0.001	5.00
3-Methylcholanthrene		<0.00500	mg/L	0.001	5.00
Dibenzo(a,j)acridine		<0.00500	mg/L	0.001	5.00
Indeno(1,2,3-cd)pyrene		<0.00500	mg/L	0.001	5.00
Dibenzo(a,h)anthracene		<0.00500	mg/L	0.001	5.00
Benzo(g,h,i)perylene		<0.00500	mg/L	0.001	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
2-Fluorophenol		0.0183	mg/L	0.001	80.0	23	0 - 69.3
Phenol-d5		0.0117	mg/L	0.001	80.0	15	0 - 52.5
Nitrobenzene-d5		0.0356	mg/L	0.001	80.0	44	21.1 - 93.6
2-Fluorobiphenyl		0.0365	mg/L	0.001	80.0	46	25.4 - 87
2,4,6-Tribromophenol		0.0420	mg/L	0.001	80.0	52	14.9 - 110
Terphenyl-d14		0.0410	mg/L	0.001	80.0	51	28.9 - 124

Sample: 45379 - WST-04-070

Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	13234	Date Analyzed:	2004-10-08	Analyzed By:	WB
Prep Batch:	11690	Date Prepared:	2004-10-08	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride	4	8.70	mg/L	2	0.500

Sample: 45379 - WST-04-070

Analysis:	NO3 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	13234	Date Analyzed:	2004-10-08	Analyzed By:	WB
Prep Batch:	11690	Date Prepared:	2004-10-08	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N	5	1.09	mg/L	2	0.200

Sample: 45379 - WST-04-070

[4] Matrix % EA is 92 and Matrix RPD is 1 for chloride.
[5] Matrix % EA is 100 and Matrix RPD is 1 for nitrate.

Analysis:	pH	Analytical Method:	SM 4500-H+	Prep Method:	N/A
QC Batch:	13209	Date Analyzed:	2004-10-08	Analyzed By:	RS
Prep Batch:	11679	Date Prepared:	2004-10-08	Prepared By:	RS

Parameter	Flag	RL Result	Units	Dilution	RL
pH		7.96	s.u.	1	0.00

Sample: 45379 - WST-04-070

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	13268	Date Analyzed:	2004-10-12	Analyzed By:	WB
Prep Batch:	11720	Date Prepared:	2004-10-12	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		8.86	mg/L	2	0.500

Sample: 45379 - WST-04-070

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	13272	Date Analyzed:	2004-10-13	Analyzed By:	WB
Prep Batch:	11727	Date Prepared:	2004-10-12	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		218.0	mg/L	1	10.00

Sample: 45379 - WST-04-070

Analysis:	TSS	Analytical Method:	SM 2540D	Prep Method:	N/A
QC Batch:	13277	Date Analyzed:	2004-10-14	Analyzed By:	RS
Prep Batch:	11733	Date Prepared:	2004-10-13	Prepared By:	RS

Parameter	Flag	RL Result	Units	Dilution	RL
Total Suspended Solids		50.0	mg/L	1	1.00

Sample: 45380 - WST-04-071

Analysis:	Total 8 Metals	Analytical Method:	S 7470A	Prep Method:	N/A
QC Batch:	13293	Date Analyzed:	2004-10-14	Analyzed By:	TP
Prep Batch:	11746	Date Prepared:	2004-10-14	Prepared By:	TP
Analysis:	Total 8 Metals	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	13576	Date Analyzed:	2004-10-26	Analyzed By:	RR
Prep Batch:	11667	Date Prepared:	2004-10-11	Prepared By:	TP

continued . . .

sample 45380 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Total Silver		<0.00300	mg/L	1	0.00300
Total Arsenic		<0.00500	mg/L	1	0.00500
Total Barium		0.105	mg/L	1	0.0100
Total Cadmium		<0.00100	mg/L	1	0.00100
Total Chromium		<0.00500	mg/L	1	0.00500
Total Mercury		<0.000200	mg/L	1	0.000200
Total Lead		<0.00500	mg/L	1	0.00500
Total Selenium		<0.0100	mg/L	1	0.0100

Sample: 45380 - WST-04-071

Analysis:	Zn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	13576	Date Analyzed:	2004-10-26	Analyzed By:	RR
Prep Batch:	11667	Date Prepared:	2004-10-11	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Zinc		0.0280	mg/L	1	0.0100

Sample: 45381 - WST-04-072

Analysis:	Total 8 Metals	Analytical Method:	S 7470A	Prep Method:	N/A
QC Batch:	13293	Date Analyzed:	2004-10-14	Analyzed By:	TP
Prep Batch:	11746	Date Prepared:	2004-10-14	Prepared By:	TP
Analysis:	Total 8 Metals	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	13576	Date Analyzed:	2004-10-26	Analyzed By:	RR
Prep Batch:	11667	Date Prepared:	2004-10-11	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Silver		<0.00300	mg/L	1	0.00300
Total Arsenic		<0.00500	mg/L	1	0.00500
Total Barium		0.108	mg/L	1	0.0100
Total Cadmium		<0.00100	mg/L	1	0.00100
Total Chromium		<0.00500	mg/L	1	0.00500
Total Mercury		<0.000200	mg/L	1	0.000200
Total Lead		<0.00500	mg/L	1	0.00500
Total Selenium		<0.0100	mg/L	1	0.0100

Sample: 45381 - WST-04-072

Analysis:	Zn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	13576	Date Analyzed:	2004-10-26	Analyzed By:	RR
Prep Batch:	11667	Date Prepared:	2004-10-11	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Zinc		0.0280	mg/L	1	0.0100

Sample: 45382 - WST-04-073

Analysis: Volatiles
QC Batch: 13191
Prep Batch: 11659

Analytical Method: S 8260B
Date Analyzed: 2004-10-09
Date Prepared: 2004-10-09

Prep Method: S 5030B
Analyzed By: JG
Prepared By: JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane		<1.00	μg/L	1	1.00
Dichlorodifluoromethane		<1.00	μg/L	1	1.00
Chloromethane (methyl chloride)		<1.00	μg/L	1	1.00
Vinyl Chloride		<1.00	μg/L	1	1.00
Bromomethane (methyl bromide)		<5.00	μg/L	1	5.00
Chloroethane		<1.00	μg/L	1	1.00
Trichlorofluoromethane		<1.00	μg/L	1	1.00
Acetone		<10.0	μg/L	1	10.0
Iodomethane (methyl iodide)		<5.00	μg/L	1	5.00
Carbon Disulfide		<1.00	μg/L	1	1.00
Acrylonitrile		<1.00	μg/L	1	1.00
2-Butanone (MEK)		<5.00	μg/L	1	5.00
4-Methyl-2-pentanone (MIBK)		<5.00	μg/L	1	5.00
2-Hexanone		<5.00	μg/L	1	5.00
trans 1,4-Dichloro-2-butene		<10.0	μg/L	1	10.0
1,1-Dichloroethene		<1.00	μg/L	1	1.00
Methylene chloride		<5.00	μg/L	1	5.00
MTBE		<1.00	μg/L	1	1.00
trans-1,2-Dichloroethene		<1.00	μg/L	1	1.00
1,1-Dichloroethane		<1.00	μg/L	1	1.00
cis-1,2-Dichloroethene		<1.00	μg/L	1	1.00
2,2-Dichloropropane		<1.00	μg/L	1	1.00
1,2-Dichloroethane (EDC)		<1.00	μg/L	1	1.00
Chloroform		<1.00	μg/L	1	1.00
1,1,1-Trichloroethane		<1.00	μg/L	1	1.00
1,1-Dichloropropene		<1.00	μg/L	1	1.00
Benzene		<1.00	μg/L	1	1.00
Carbon Tetrachloride		<1.00	μg/L	1	1.00
1,2-Dichloropropane		<1.00	μg/L	1	1.00
Trichloroethene (TCE)		<1.00	μg/L	1	1.00
Dibromomethane (methylene bromide)		<1.00	μg/L	1	1.00
Bromodichloromethane		<1.00	μg/L	1	1.00
2-Chloroethyl vinyl ether		<5.00	μg/L	1	5.00
cis-1,3-Dichloropropene		<1.00	μg/L	1	1.00
trans-1,3-Dichloropropene		<1.00	μg/L	1	1.00
Toluene		<1.00	μg/L	1	1.00
1,1,2-Trichloroethane		<1.00	μg/L	1	1.00
1,3-Dichloropropane		<1.00	μg/L	1	1.00
Dibromochloromethane		<1.00	μg/L	1	1.00
1,2-Dibromoethane (EDB)		<1.00	μg/L	1	1.00
Tetrachloroethene (PCE)		<1.00	μg/L	1	1.00

continued ...

sample 45382 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Chlorobenzene		<1.00	μg/L	1	1.00
1,1,1,2-Tetrachloroethane		<1.00	μg/L	1	1.00
Ethylbenzene		<1.00	μg/L	1	1.00
m,p-Xylene		<1.00	μg/L	1	1.00
Bromoform		<1.00	μg/L	1	1.00
Styrene		<1.00	μg/L	1	1.00
o-Xylene		<1.00	μg/L	1	1.00
1,1,2,2-Tetrachloroethane		<1.00	μg/L	1	1.00
2-Chlorotoluene		<1.00	μg/L	1	1.00
1,2,3-Trichloropropane		<1.00	μg/L	1	1.00
Isopropylbenzene		<1.00	μg/L	1	1.00
Bromobenzene		<1.00	μg/L	1	1.00
n-Propylbenzene		<1.00	μg/L	1	1.00
1,3,5-Trimethylbenzene		<1.00	μg/L	1	1.00
tert-Butylbenzene		<1.00	μg/L	1	1.00
1,2,4-Trimethylbenzene		<1.00	μg/L	1	1.00
1,4-Dichlorobenzene (para)		<1.00	μg/L	1	1.00
sec-Butylbenzene		<1.00	μg/L	1	1.00
1,3-Dichlorobenzene (meta)		<1.00	μg/L	1	1.00
p-Isopropyltoluene		<1.00	μg/L	1	1.00
4-Chlorotoluene		<1.00	μg/L	1	1.00
1,2-Dichlorobenzene (ortho)		<1.00	μg/L	1	1.00
n-Butylbenzene		<1.00	μg/L	1	1.00
1,2-Dibromo-3-chloropropane		<5.00	μg/L	1	5.00
1,2,3-Trichlorobenzene		<5.00	μg/L	1	5.00
1,2,4-Trichlorobenzene		<5.00	μg/L	1	5.00
Naphthalene		<5.00	μg/L	1	5.00
Hexachlorobutadiene		<5.00	μg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		54.8	μg/L	1	50.0	110	70 - 130
Toluene-d8		47.9	μg/L	1	50.0	96	70 - 130
4-Bromofluorobenzene (4-BFB)		43.9	μg/L	1	50.0	88	70 - 130

Sample: 45383 - WST-04-074

Analysis:	TOC	Analytical Method:	E 415.1	Prep Method:	N/A
QC Batch:	13212	Date Analyzed:	2004-10-19	Analyzed By:	RC
Prep Batch:	11674	Date Prepared:	2004-10-19	Prepared By:	RC

Parameter	Flag	RL Result	Units	Dilution	RL
Total Organic Carbon		2.46	mg/L	1	1.00

Sample: 45384 - WST-04-075

Analysis:	Semivolatiles	Analytical Method:	S 8270C	Prep Method:	S 3510C

QC Batch: 13383 Date Analyzed: 2004-10-17 Analyzed By: RC
Prep Batch: 11816 Date Prepared: 2004-10-14 Prepared By: RC

Parameter	Flag	RL Result	Units	Dilution	RL
Pyridine		<0.00500	mg/L	0.001	5.00
n-Nitrosodimethylamine		<0.00500	mg/L	0.001	5.00
2-Picoline		<0.00500	mg/L	0.001	5.00
Methyl methanesulfonate		<0.00500	mg/L	0.001	5.00
Ethyl methanesulfonate		<0.00500	mg/L	0.001	5.00
Phenol		<0.00500	mg/L	0.001	5.00
Aniline		<0.00500	mg/L	0.001	5.00
bis(2-chloroethyl)ether		<0.00500	mg/L	0.001	5.00
2-Chlorophenol		<0.00500	mg/L	0.001	5.00
1,3-Dichlorobenzene (meta)		<0.00500	mg/L	0.001	5.00
1,4-Dichlorobenzene (para)		<0.00500	mg/L	0.001	5.00
Benzyl alcohol		<0.00500	mg/L	0.001	5.00
1,2-Dichlorobenzene (ortho)		<0.00500	mg/L	0.001	5.00
2-Methylphenol		<0.00500	mg/L	0.001	5.00
bis(2-chloroisopropyl)ether		<0.00500	mg/L	0.001	5.00
4-Methylphenol / 3-Methylphenol		<0.00500	mg/L	0.001	5.00
n-Nitrosodi-n-propylamine		<0.00500	mg/L	0.001	5.00
Hexachloroethane		<0.00500	mg/L	0.001	5.00
Acetophenone		<0.00500	mg/L	0.001	5.00
Nitrobenzene		<0.00500	mg/L	0.001	5.00
n-Nitrosopiperidine		<0.00500	mg/L	0.001	5.00
Isophorone		<0.00500	mg/L	0.001	5.00
2-Nitrophenol		<0.00500	mg/L	0.001	5.00
2,4-Dimethylphenol		<0.00500	mg/L	0.001	5.00
bis(2-chloroethoxy)methane		<0.00500	mg/L	0.001	5.00
2,4-Dichlorophenol		<0.00500	mg/L	0.001	5.00
1,2,4-Trichlorobenzene		<0.00500	mg/L	0.001	5.00
Benzoic acid		<0.0200	mg/L	0.001	20.0
Naphthalene		<0.00500	mg/L	0.001	5.00
a,a-Dimethylphenethylamine		<0.00500	mg/L	0.001	5.00
4-Chloroaniline		<0.00500	mg/L	0.001	5.00
2,6-Dichlorophenol		<0.00500	mg/L	0.001	5.00
Hexachlorobutadiene		<0.00500	mg/L	0.001	5.00
n-Nitroso-di-n-butylamine		<0.00500	mg/L	0.001	5.00
4-Chloro-3-methylphenol		<0.00500	mg/L	0.001	5.00
2-Methylnaphthalene		<0.00500	mg/L	0.001	5.00
1-Methylnaphthalene		<0.00500	mg/L	0.001	5.00
1,2,4,5-Tetrachlorobenzene		<0.00500	mg/L	0.001	5.00
Hexachlorocyclopentadiene		<0.00500	mg/L	0.001	5.00
2,4,6-Trichlorophenol		<0.00500	mg/L	0.001	5.00
2,4,5-Trichlorophenol		<0.00500	mg/L	0.001	5.00
2-Chloronaphthalene		<0.00500	mg/L	0.001	5.00
1-Chloronaphthalene		<0.00500	mg/L	0.001	5.00
2-Nitroaniline		<0.00500	mg/L	0.001	5.00
Dimethylphthalate		<0.00500	mg/L	0.001	5.00
Acenaphthylene		<0.00500	mg/L	0.001	5.00
2,6-Dinitrotoluene		<0.00500	mg/L	0.001	5.00
3-Nitroaniline		<0.00500	mg/L	0.001	5.00
Acenaphthene		<0.00500	mg/L	0.001	5.00
2,4-Dinitrophenol		<0.0200	mg/L	0.001	20.0

continued ...

sample 45384 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Dibenzofuran		<0.00500	mg/L	0.001	5.00
Pentachlorobenzene		<0.00500	mg/L	0.001	5.00
4-Nitrophenol		<0.00500	mg/L	0.001	5.00
2,4-Dinitrotoluene		<0.00500	mg/L	0.001	5.00
1-Naphthylamine		<0.00500	mg/L	0.001	5.00
2,3,4,6-Tetrachlorophenol		<0.00500	mg/L	0.001	5.00
2-Naphthylamine		<0.00500	mg/L	0.001	5.00
Fluorene		<0.00500	mg/L	0.001	5.00
4-Chlorophenyl-phenylether		<0.00500	mg/L	0.001	5.00
Diethylphthalate		<0.00500	mg/L	0.001	5.00
4-Nitroaniline		<0.00500	mg/L	0.001	5.00
Diphenylhydrazine		<0.00500	mg/L	0.001	5.00
4,6-Dinitro-2-methylphenol		<0.00500	mg/L	0.001	5.00
Diphenylamine		<0.00500	mg/L	0.001	5.00
4-Bromophenyl-phenylether		<0.00500	mg/L	0.001	5.00
Phenacetin		<0.00500	mg/L	0.001	5.00
Hexachlorobenzene		<0.00500	mg/L	0.001	5.00
4-Aminobiphenyl		<0.00500	mg/L	0.001	5.00
Pentachlorophenol		<0.00500	mg/L	0.001	5.00
Anthracene		<0.00500	mg/L	0.001	5.00
Pentachloronitrobenzene		<0.00500	mg/L	0.001	5.00
Pronamide		<0.00500	mg/L	0.001	5.00
Phenanthrene		<0.00500	mg/L	0.001	5.00
Di-n-butylphthalate		<0.00500	mg/L	0.001	5.00
Fluoranthene		<0.00500	mg/L	0.001	5.00
Benzidine		<0.0150	mg/L	0.001	15.0
Pyrene		<0.00500	mg/L	0.001	5.00
p-Dimethylaminoazobenzene		<0.00500	mg/L	0.001	5.00
Butylbenzylphthalate		<0.00500	mg/L	0.001	5.00
Benzo(a)anthracene		<0.00500	mg/L	0.001	5.00
3,3-Dichlorobenzidine		<0.00500	mg/L	0.001	5.00
Chrysene		<0.00500	mg/L	0.001	5.00
bis(2-ethylhexyl)phthalate		<0.0100	mg/L	0.001	10.0
Di-n-octylphthalate		<0.00500	mg/L	0.001	5.00
Benzo(b)fluoranthene		<0.00500	mg/L	0.001	5.00
Benzo(k)fluoranthene		<0.00500	mg/L	0.001	5.00
7,12-Dimethylbenz(a)anthracene		<0.00500	mg/L	0.001	5.00
Benzo(a)pyrene		<0.00500	mg/L	0.001	5.00
3-Methylcholanthrene		<0.00500	mg/L	0.001	5.00
Dibenzo(a,j)acridine		<0.00500	mg/L	0.001	5.00
Indeno(1,2,3-cd)pyrene		<0.00500	mg/L	0.001	5.00
Dibenzo(a,h)anthracene		<0.00500	mg/L	0.001	5.00
Benzo(g,h,i)perylene		<0.00500	mg/L	0.001	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
2-Fluorophenol		0.00612	mg/L	0.001	80.0	8	0 - 69.3
Phenol-d5		0.00347	mg/L	0.001	80.0	4	0 - 52.5
Nitrobenzene-d5	6	0.0162	mg/L	0.001	80.0	20	21.1 - 93.6

continued ...

[6] Sample surrogate recovery out of limits due to sample matrix.

sample continued ...

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
2-Fluorobiphenyl	7	0.0165	mg/L	0.001	80.0	21	25.4 - 87
2,4,6-Tribromophenol		0.0179	mg/L	0.001	80.0	22	14.9 - 110
Terphenyl-d14	8	0.0211	mg/L	0.001	80.0	26	28.9 - 124

Sample: 45385 - WST-04-076

Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	13234	Date Analyzed:	2004-10-08	Analyzed By:	WB
Prep Batch:	11690	Date Prepared:	2004-10-08	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride	9	75.0	mg/L	5	0.500

Sample: 45385 - WST-04-076

Analysis:	NO3 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	13234	Date Analyzed:	2004-10-08	Analyzed By:	WB
Prep Batch:	11690	Date Prepared:	2004-10-08	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Nitrate-N	10	1.11	mg/L	5	0.200

Sample: 45385 - WST-04-076

Analysis:	pH	Analytical Method:	SM 4500-H+	Prep Method:	N/A
QC Batch:	13209	Date Analyzed:	2004-10-08	Analyzed By:	RS
Prep Batch:	11679	Date Prepared:	2004-10-08	Prepared By:	RS

Parameter	Flag	RL Result	Units	Dilution	RL
pH		7.85	s.u.	1	0.00

Sample: 45385 - WST-04-076

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	13437	Date Analyzed:	2004-10-19	Analyzed By:	WB
Prep Batch:	11878	Date Prepared:	2004-10-19	Prepared By:	WB

continued ...

[7] Sample surrogate recovery out of limits due to sample matrix.
[8] Sample surrogate recovery out of limits due to sample matrix.
[9] Matrix % EA is 92 and Matrix RPD is 1 for chloride.
[10] Matrix % EA is 100 and Matrix RPD is 1 for nitrate.

sample 45385 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		10.3	mg/L	5	0.500

Sample: 45385 - WST-04-076

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	13272	Date Analyzed:	2004-10-13	Analyzed By:	WB
Prep Batch:	11727	Date Prepared:	2004-10-12	Prepared By:	WB

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		244.0	mg/L	1	10.00

Sample: 45385 - WST-04-076

Analysis:	TSS	Analytical Method:	SM 2540D	Prep Method:	N/A
QC Batch:	13277	Date Analyzed:	2004-10-14	Analyzed By:	RS
Prep Batch:	11733	Date Prepared:	2004-10-13	Prepared By:	RS

Parameter	Flag	RL Result	Units	Dilution	RL
Total Suspended Solids		11.0	mg/L	1	1.00

Sample: 45386 - WST-04-077

Analysis:	Total 8 Metals	Analytical Method:	S 7470A	Prep Method:	N/A
QC Batch:	13293	Date Analyzed:	2004-10-14	Analyzed By:	TP
Prep Batch:	11746	Date Prepared:	2004-10-14	Prepared By:	TP
Analysis:	Total 8 Metals	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	13576	Date Analyzed:	2004-10-26	Analyzed By:	RR
Prep Batch:	11667	Date Prepared:	2004-10-11	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Silver		<0.00300	mg/L	1	0.00300
Total Arsenic		<0.00500	mg/L	1	0.00500
Total Barium		0.102	mg/L	1	0.0100
Total Cadmium		<0.00100	mg/L	1	0.00100
Total Chromium		<0.00500	mg/L	1	0.00500
Total Mercury		<0.000200	mg/L	1	0.000200
Total Lead		<0.00500	mg/L	1	0.00500
Total Selenium		<0.0100	mg/L	1	0.0100

Sample: 45386 - WST-04-077

Analysis:	Zn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	13576	Date Analyzed:	2004-10-26	Analyzed By:	RR
Prep Batch:	11667	Date Prepared:	2004-10-11	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Zinc		0.0140	mg/L	1	0.0100

Sample: 45387 - WST-04-078

Analysis:	Total 8 Metals	Analytical Method:	S 7470A	Prep Method:	N/A
QC Batch:	13293	Date Analyzed:	2004-10-14	Analyzed By:	TP
Prep Batch:	11746	Date Prepared:	2004-10-14	Prepared By:	TP
Analysis:	Total 8 Metals	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	13576	Date Analyzed:	2004-10-26	Analyzed By:	RR
Prep Batch:	11667	Date Prepared:	2004-10-11	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Silver		<0.00300	mg/L	1	0.00300
Total Arsenic		<0.00500	mg/L	1	0.00500
Total Barium		0.102	mg/L	1	0.0100
Total Cadmium		<0.00100	mg/L	1	0.00100
Total Chromium		<0.00500	mg/L	1	0.00500
Total Mercury		<0.000200	mg/L	1	0.000200
Total Lead		<0.00500	mg/L	1	0.00500
Total Selenium		<0.0100	mg/L	1	0.0100

Sample: 45387 - WST-04-078

Analysis:	Zn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	13576	Date Analyzed:	2004-10-26	Analyzed By:	RR
Prep Batch:	11667	Date Prepared:	2004-10-11	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Zinc		<0.0100	mg/L	1	0.0100

Method Blank (1) QC Batch: 13191

Parameter	Flag	Result	Units	RL
Bromochloromethane		<1.00	μg/L	1
Dichlorodifluoromethane		<1.00	μg/L	1
Chloromethane (methyl chloride)		<1.00	μg/L	1
Vinyl Chloride		<1.00	μg/L	1
Bromomethane (methyl bromide)		<5.00	μg/L	5
Chloroethane		<1.00	μg/L	1

continued ...

method blank continued . . .

Parameter	Flag	Result	Units	RL
Trichlorofluoromethane		<1.00	μg/L	1
Acetone		<10.0	μg/L	10
Iodomethane (methyl iodide)		<5.00	μg/L	5
Carbon Disulfide		<1.00	μg/L	1
Acrylonitrile		<1.00	μg/L	1
2-Butanone (MEK)		<5.00	μg/L	5
4-Methyl-2-pentanone (MIBK)		<5.00	μg/L	5
2-Hexanone		<5.00	μg/L	5
trans 1,4-Dichloro-2-butene		<10.0	μg/L	10
1,1-Dichloroethene		<1.00	μg/L	1
Methylene chloride		<5.00	μg/L	5
MTBE		<1.00	μg/L	1
trans-1,2-Dichloroethene		<1.00	μg/L	1
1,1-Dichloroethane		<1.00	μg/L	1
cis-1,2-Dichloroethene		<1.00	μg/L	1
2,2-Dichloropropane		<1.00	μg/L	1
1,2-Dichloroethane (EDC)		<1.00	μg/L	1
Chloroform		<1.00	μg/L	1
1,1,1-Trichloroethane		<1.00	μg/L	1
1,1-Dichloropropene		<1.00	μg/L	1
Benzene		<1.00	μg/L	1
Carbon Tetrachloride		<1.00	μg/L	1
1,2-Dichloropropane		<1.00	μg/L	1
Trichloroethene (TCE)		<1.00	μg/L	1
Dibromomethane (methylene bromide)		<1.00	μg/L	1
Bromodichloromethane		<1.00	μg/L	1
2-Chloroethyl vinyl ether		<5.00	μg/L	5
cis-1,3-Dichloropropene		<1.00	μg/L	1
trans-1,3-Dichloropropene		<1.00	μg/L	1
Toluene		<1.00	μg/L	1
1,1,2-Trichloroethane		<1.00	μg/L	1
1,3-Dichloropropane		<1.00	μg/L	1
Dibromochloromethane		<1.00	μg/L	1
1,2-Dibromoethane (EDB)		<1.00	μg/L	1
Tetrachloroethene (PCE)		<1.00	μg/L	1
Chlorobenzene		<1.00	μg/L	1
1,1,1,2-Tetrachloroethane		<1.00	μg/L	1
Ethylbenzene		<1.00	μg/L	1
m,p-Xylene		<1.00	μg/L	1
Bromoform		<1.00	μg/L	1
Styrene		<1.00	μg/L	1
o-Xylene		<1.00	μg/L	1
1,1,2,2-Tetrachloroethane		<1.00	μg/L	1
2-Chlorotoluene		<1.00	μg/L	1
1,2,3-Trichloropropane		<1.00	μg/L	1
Isopropylbenzene		<1.00	μg/L	1
Bromobenzene		<1.00	μg/L	1
n-Propylbenzene		<1.00	μg/L	1
1,3,5-Trimethylbenzene		<1.00	μg/L	1
tert-Butylbenzene		<1.00	μg/L	1
1,2,4-Trimethylbenzene		<1.00	μg/L	1
1,4-Dichlorobenzene (para)		<1.00	μg/L	1

continued . . .

method blank continued . . .

Parameter	Flag	Result	Units	RL
sec-Butylbenzene		<1.00	μg/L	1
1,3-Dichlorobenzene (meta)		<1.00	μg/L	1
p-Isopropyltoluene		<1.00	μg/L	1
4-Chlorotoluene		<1.00	μg/L	1
1,2-Dichlorobenzene (ortho)		<1.00	μg/L	1
n-Butylbenzene		<1.00	μg/L	1
1,2-Dibromo-3-chloropropane		<5.00	μg/L	5
1,2,3-Trichlorobenzene		<5.00	μg/L	5
1,2,4-Trichlorobenzene		<5.00	μg/L	5
Naphthalene		<5.00	μg/L	5
Hexachlorobutadiene		<5.00	μg/L	5

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		50.5	μg/L	1	50.0	101	70 - 130
Toluene-d8		48.8	μg/L	1	50.0	98	70 - 130
4-Bromofluorobenzene (4-BFB)		47.3	μg/L	1	50.0	95	70 - 130

Method Blank (1) QC Batch: 13212

Parameter	Flag	Result	Units	RL
Total Organic Carbon		<1.00	mg/L	1

Method Blank (1) QC Batch: 13234

Parameter	Flag	Result	Units	RL
Chloride		<0.500	mg/L	0.5

Method Blank (1) QC Batch: 13234

Parameter	Flag	Result	Units	RL
Nitrate-N		<0.200	mg/L	0.2

Method Blank (1) QC Batch: 13268

Parameter	Flag	Result	Units	RL
Sulfate		<0.500	mg/L	0.5

Method Blank (1) QC Batch: 13272

Parameter	Flag	Result	Units	RL
Total Dissolved Solids		<10.00	mg/L	10

Method Blank (1) QC Batch: 13277

Parameter	Flag	Result	Units	RL
Total Suspended Solids		<1.00	mg/L	1

Method Blank (1) QC Batch: 13293

Parameter	Flag	Result	Units	RL
Total Mercury		<0.000200	mg/L	0.0002

Method Blank (1) QC Batch: 13383

Parameter	Flag	Result	Units	RL
Pyridine		<0.00500	mg/L	5
n-Nitrosodimethylamine		<0.00500	mg/L	5
2-Picoline		<0.00500	mg/L	5
Methyl methanesulfonate		<0.00500	mg/L	5
Ethyl methanesulfonate		<0.00500	mg/L	5
Phenol		<0.00500	mg/L	5
Aniline		<0.00500	mg/L	5
bis(2-chloroethyl)ether		<0.00500	mg/L	5
2-Chlorophenol		<0.00500	mg/L	5
1,3-Dichlorobenzene (meta)		<0.00500	mg/L	5
1,4-Dichlorobenzene (para)		<0.00500	mg/L	5
Benzyl alcohol		<0.00500	mg/L	5
1,2-Dichlorobenzene (ortho)		<0.00500	mg/L	5
2-Methylphenol		<0.00500	mg/L	5
bis(2-chloroisopropyl)ether		<0.00500	mg/L	5
4-Methylphenol / 3-Methylphenol		<0.00500	mg/L	5
n-Nitrosodi-n-propylamine		<0.00500	mg/L	5
Hexachloroethane		<0.00500	mg/L	5
Acetophenone		<0.00500	mg/L	5
Nitrobenzene		<0.00500	mg/L	5
n-Nitrosopiperidine		<0.00500	mg/L	5
Isophorone		<0.00500	mg/L	5
2-Nitrophenol		<0.00500	mg/L	5
2,4-Dimethylphenol		<0.00500	mg/L	5
bis(2-chloroethoxy)methane		<0.00500	mg/L	5
2,4-Dichlorophenol		<0.00500	mg/L	5
1,2,4-Trichlorobenzene		<0.00500	mg/L	5
Benzoic acid		<0.0200	mg/L	20
Naphthalene		<0.00500	mg/L	5
a,a-Dimethylphenethylamine		<0.00500	mg/L	5

continued ...

method blank continued . . .

Parameter	Flag	Result	Units	RL
4-Chloroaniline		<0.00500	mg/L	5
2,6-Dichlorophenol		<0.00500	mg/L	5
Hexachlorobutadiene		<0.00500	mg/L	5
n-Nitroso-di-n-butylamine		<0.00500	mg/L	5
4-Chloro-3-methylphenol		<0.00500	mg/L	5
2-Methylnaphthalene		<0.00500	mg/L	5
1-Methylnaphthalene		<0.00500	mg/L	5
1,2,4,5-Tetrachlorobenzene		<0.00500	mg/L	5
Hexachlorocyclopentadiene		<0.00500	mg/L	5
2,4,6-Trichlorophenol		<0.00500	mg/L	5
2,4,5-Trichlorophenol		<0.00500	mg/L	5
2-Chloronaphthalene		<0.00500	mg/L	5
1-Chloronaphthalene		<0.00500	mg/L	5
2-Nitroaniline		<0.00500	mg/L	5
Dimethylphthalate		<0.00500	mg/L	5
Acenaphthylene		<0.00500	mg/L	5
2,6-Dinitrotoluene		<0.00500	mg/L	5
3-Nitroaniline		<0.00500	mg/L	5
Acenaphthene		<0.00500	mg/L	5
2,4-Dinitrophenol		<0.0200	mg/L	20
Dibenzofuran		<0.00500	mg/L	5
Pentachlorobenzene		<0.00500	mg/L	5
4-Nitrophenol		<0.00500	mg/L	5
2,4-Dinitrotoluene		<0.00500	mg/L	5
1-Naphthylamine		<0.00500	mg/L	5
2,3,4,6-Tetrachlorophenol		<0.00500	mg/L	5
2-Naphthylamine		<0.00500	mg/L	5
Fluorene		<0.00500	mg/L	5
4-Chlorophenyl-phenylether		<0.00500	mg/L	5
Diethylphthalate		<0.00500	mg/L	5
4-Nitroaniline		<0.00500	mg/L	5
Diphenylhydrazine		<0.00500	mg/L	5
4,6-Dinitro-2-methylphenol		<0.00500	mg/L	5
Diphenylamine		<0.00500	mg/L	5
4-Bromophenyl-phenylether		<0.00500	mg/L	5
Phenacetin		<0.00500	mg/L	5
Hexachlorobenzene		<0.00500	mg/L	5
4-Aminobiphenyl		<0.00500	mg/L	5
Pentachlorophenol		<0.00500	mg/L	5
Anthracene		<0.00500	mg/L	5
Pentachloronitrobenzene		<0.00500	mg/L	5
Pronamide		<0.00500	mg/L	5
Phenanthrene		<0.00500	mg/L	5
Di-n-butylphthalate		<0.00500	mg/L	5
Fluoranthene		<0.00500	mg/L	5
Benzidine		<0.0150	mg/L	15
Pyrene		<0.00500	mg/L	5
p-Dimethylaminoazobenzene		<0.00500	mg/L	5
Butylbenzylphthalate		<0.00500	mg/L	5
Benzo(a)anthracene		<0.00500	mg/L	5
3,3-Dichlorobenzidine		<0.00500	mg/L	5
Chrysene		<0.00500	mg/L	5

continued . . .

method blank continued . . .

Parameter	Flag	Result	Units	RL
bis(2-ethylhexyl)phthalate		<0.0100	mg/L	10
Di-n-octylphthalate		<0.00500	mg/L	5
Benzo(b)fluoranthene		<0.00500	mg/L	5
Benzo(k)fluoranthene		<0.00500	mg/L	5
7,12-Dimethylbenz(a)anthracene		<0.00500	mg/L	5
Benzo(a)pyrene		<0.00500	mg/L	5
3-Methylcholanthrene		<0.00500	mg/L	5
Dibenzo(a,j)acridine		<0.00500	mg/L	5
Indeno(1,2,3-cd)pyrene		<0.00500	mg/L	5
Dibenzo(a,h)anthracene		<0.00500	mg/L	5
Benzo(g,h,i)perylene		<0.00500	mg/L	5

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
2-Fluorophenol		0.0185	mg/L	0.001	80.0	23	0 - 69.3
Phenol-d5		0.0116	mg/L	0.001	80.0	14	0 - 52.5
Nitrobenzene-d5		0.0453	mg/L	0.001	80.0	57	21.1 - 93.6
2-Fluorobiphenyl		0.0481	mg/L	0.001	80.0	60	25.4 - 87
2,4,6-Tribromophenol		0.0486	mg/L	0.001	80.0	61	14.9 - 110
Terphenyl-d14		0.0533	mg/L	0.001	80.0	67	28.9 - 124

Method Blank (1) QC Batch: 13437

Parameter	Flag	Result	Units	RL
Sulfate		<0.500	mg/L	0.5

Method Blank (1) QC Batch: 13576

Parameter	Flag	Result	Units	RL
Total Zinc		<0.0100	mg/L	0.01

Method Blank (1) QC Batch: 13576

Parameter	Flag	Result	Units	RL
Total Silver		<0.00300	mg/L	0.003
Total Arsenic		<0.00500	mg/L	0.005
Total Barium		<0.0100	mg/L	0.01
Total Cadmium		<0.00100	mg/L	0.001
Total Chromium		<0.00500	mg/L	0.005
Total Lead		<0.00500	mg/L	0.005
Total Selenium		<0.0100	mg/L	0.01

Duplicate (1) QC Batch: 13209

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH	8.69	8.69	s.u.	1	0	0.4

Duplicate (1) QC Batch: 13272

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	1180	1196	mg/L	2	1	8.7

Duplicate (1) QC Batch: 13277

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Suspended Solids	82.0	86.0	mg/L	2	5	12.4

Laboratory Control Spike (LCS-1) QC Batch: 13191

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
1,1-Dichloroethene	94.0	94.6	μg/L	1	100	<0.136	94	1	70 - 130	20
Benzene	98.4	97.1	μg/L	1	100	<0.146	98	1	70 - 130	20
Trichloroethene (TCE)	94.0	93.4	μg/L	1	100	<0.117	94	1	70 - 130	20
Toluene	95.3	94.9	μg/L	1	100	<0.0600	95	0	70 - 130	20
Chlorobenzene	95.0	93.6	μg/L	1	100	<0.0540	95	1	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Dibromofluoromethane	49.2	49.2	μg/L	1	50.0	98	98	70 - 130
Toluene-d8	49.5	49.1	μg/L	1	50.0	99	98	70 - 130
4-Bromofluorobenzene (4-BFB)	49.1	47.9	μg/L	1	50.0	98	96	70 - 130

Laboratory Control Spike (LCS-1) QC Batch: 13212

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Organic Carbon	4.85	4.86	mg/L	1	5.00	<0.382	97	0	77 - 122	13

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 13234

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Chloride	11.5	11.6	mg/L	1	12.5	<0.337	92	1	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 13234

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Nitrate-N	2.39	2.40	mg/L	1	2.50	<0.0217	96	0	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 13268

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Sulfate	12.1	11.9	mg/L	1	12.5	<0.409	97	2	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 13277

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Suspended Solids	94.0	95.0	mg/L	1	100	<1.00	94	1	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 13293

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Mercury	0.000990	0.000980	mg/L	1	0.00100	<0.0000329	99	1	82 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 13383

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Phenol	5.64	5.60	mg/L	1	80.0	<0.490	7	1	0 - 52.1	20
2-Chlorophenol	19.5	19.7	mg/L	1	80.0	<1.63	24	1	9.7 - 98.2	20
1,4-Dichlorobenzene (para)	18.0	18.2	mg/L	1	80.0	<1.93	22	1	18.1 - 111	20
n-Nitrosodi-n-propylamine [11][12]	21.7	24.2	mg/L	1	80.0	<2.26	27	11	36.6 - 121	20
1,2,4-Trichlorobenzene	22.3	21.7	mg/L	1	80.0	<1.52	28	3	20.8 - 112	20
4-Chloro-3-methylphenol	21.5	21.2	mg/L	1	80.0	<1.60	27	1	14.3 - 102	20
Acenaphthene	30.1	29.5	mg/L	1	80.0	<1.58	38	2	32.6 - 123	20
4-Nitrophenol	10.2	9.86	mg/L	1	80.0	<3.83	13	3	0 - 51.9	20
2,4-Dinitrotoluene	49.4	47.8	mg/L	1	80.0	<2.09	62	3	32.6 - 138	20
Pentachlorophenol	44.2	43.8	mg/L	1	80.0	<3.04	55	1	0 - 121	20
Pyrene	61.9	61.8	mg/L	1	80.0	<1.81	77	0	38.4 - 146	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

[11] The average of the spike compounds shows that the process is in control.
[12] The average of the spike compounds shows that the process is in control.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
2-Fluorophenol	9.59	9.84	mg/L	1	80.0	12	12	0 - 69.3
Phenol-d5	6.30	6.10	mg/L	1	80.0	8	8	0 - 52.5
Nitrobenzene-d5	23.0	22.2	mg/L	1	80.0	29	28	21.1 - 93.6
2-Fluorobiphenyl	24.5	23.9	mg/L	1	80.0	31	30	25.4 - 87
2,4,6-Tribromophenol	39.7	39.0	mg/L	1	80.0	50	49	14.9 - 110
Terphenyl-d14	55.1	55.2	mg/L	1	80.0	69	69	28.9 - 124

Laboratory Control Spike (LCS-1) QC Batch: 13437

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Sulfate	12.4	12.5	mg/L	1	12.5	<0.409	99	1	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 13576

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Zinc	0.240	0.240	mg/L	1	0.250	<0.00300	96	0	85 - 115	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 13576

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Silver	0.122	0.122	mg/L	1	0.125	<0.00274	98	0	85 - 115	20
Total Arsenic	0.494	0.493	mg/L	1	0.500	<0.00489	99	0	85 - 115	20
Total Barium	0.971	0.980	mg/L	1	1.00	<0.000450	97	1	85 - 114	20
Total Cadmium	0.245	0.245	mg/L	1	0.250	<0.000268	98	0	86 - 115	20
Total Chromium	0.102	0.100	mg/L	1	0.100	<0.00357	102	2	85 - 115	20
Total Lead	0.501	0.499	mg/L	1	0.500	<0.00310	100	0	86.1 - 112	20
Total Selenium	0.467	0.475	mg/L	1	0.500	<0.00556	93	2	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 13191

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
1,1-Dichloroethene	105	106	μg/L	1	100	<0.136	105	1	70 - 130	20
Benzene	94.9	94.0	μg/L	1	100	<0.146	95	1	70 - 130	20
Trichloroethene (TCE)	92.8	91.2	μg/L	1	100	<0.117	93	2	70 - 130	20
Toluene	93.5	92.3	μg/L	1	100	<0.0600	94	1	70 - 130	20
Chlorobenzene	95.2	92.9	μg/L	1	100	<0.0540	95	2	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Dibromofluoromethane	54.1	53.5	μg/L	1	50	108	107	70 - 130
Toluene-d8	48.0	46.7	μg/L	1	50	96	93	70 - 130
4-Bromofluorobenzene (4-BFB)	43.9	42.2	μg/L	1	50	88	84	70 - 130

Matrix Spike (MS-1) QC Batch: 13212

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Organic Carbon	8.69	8.73	mg/L	1	5.00	<0.382	174	0	24 - 207	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 13268

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Sulfate	67100	67300	mg/L	5000	12.5	9080	93	0	77.8 - 112	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 13293

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Mercury	0.000960	0.000850	mg/L	1	0.00100	<0.0000329	96	12	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 13437

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Sulfate	1130	1140	mg/L	50	12.5	519	98	1	77.8 - 112	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Standard (CCV-1) QC Batch: 13191

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Vinyl Chloride		μg/L	50.0	44.3	89	80 - 120	2004-10-09
1,1-Dichloroethene		μg/L	50.0	47.1	94	80 - 120	2004-10-09
Chloroform		μg/L	50.0	50.2	100	80 - 120	2004-10-09
1,2-Dichloropropane		μg/L	50.0	53.2	106	80 - 120	2004-10-09
Toluene		μg/L	50.0	52.9	106	80 - 120	2004-10-09
Chlorobenzene		μg/L	50.0	52.1	104	80 - 120	2004-10-09
Ethylbenzene		μg/L	50.0	55.5	111	80 - 120	2004-10-09

Standard (ICV-1) **QC Batch: 13209**

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7.00	6.97	100	98 - 102	2004-10-08

Standard (CCV-1) **QC Batch: 13209**

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7.00	6.96	99	98 - 102	2004-10-08

Standard (ICV-1) **QC Batch: 13212**

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Organic Carbon		mg/L	5.00	4.84	97	85 - 115	2004-10-19

Standard (CCV-1) **QC Batch: 13212**

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Organic Carbon		mg/L	5.00	4.87	97	85 - 115	2004-10-19

Standard (ICV-1) **QC Batch: 13234**

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.4	91	90 - 110	2004-10-08

Standard (ICV-1) **QC Batch: 13234**

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.39	96	90 - 110	2004-10-08

Standard (CCV-1) **QC Batch: 13234**

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.5	92	90 - 110	2004-10-08

Standard (CCV-1) **QC Batch: 13234**

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.39	96	90 - 110	2004-10-08

Standard (ICV-1) QC Batch: 13268

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	11.8	94	90 - 110	2004-10-12

Standard (CCV-1) QC Batch: 13268

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	12.1	97	90 - 110	2004-10-12

Standard (ICV-1) QC Batch: 13272

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1014	101	90 - 110	2004-10-13

Standard (CCV-1) QC Batch: 13272

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1009	101	90 - 110	2004-10-13

Standard (ICV-1) QC Batch: 13293

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.00100	0.00105	105	80 - 120	2004-10-14

Standard (CCV-1) QC Batch: 13293

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.00100	0.000980	98	80 - 120	2004-10-14

Standard (CCV-1) QC Batch: 13383

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Phenol		mg/L	60.0	57.3	96	80 - 120	2004-10-17
1,4-Dichlorobenzene (para)		mg/L	60.0	64.1	107	80 - 120	2004-10-17
2-Nitrophenol		mg/L	60.0	56.7	94	80 - 120	2004-10-17
2,4-Dichlorophenol		mg/L	60.0	57.3	96	80 - 120	2004-10-17
Hexachlorobutadiene		mg/L	60.0	71.2	119	80 - 120	2004-10-17
4-Chloro-3-methylphenol		mg/L	60.0	55.6	93	80 - 120	2004-10-17
2,4,6-Trichlorophenol		mg/L	60.0	51.9	86	80 - 120	2004-10-17
Acenaphthene		mg/L	60.0	51.9	86	80 - 120	2004-10-17
Diphenylamine		mg/L	60.0	60.1	100	80 - 120	2004-10-17
Pentachlorophenol		mg/L	60.0	68.7	114	80 - 120	2004-10-17
Fluoranthene		mg/L	60.0	59.8	100	80 - 120	2004-10-17
Di-n-octylphthalate		mg/L	60.0	69.7	116	80 - 120	2004-10-17
Benzo(a)pyrene		mg/L	60.0	65.8	110	80 - 120	2004-10-17

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limit
2-Fluorophenol		57.4	mg/L	1	60.0	96	80 - 120
Phenol-d5		61.0	mg/L	1	60.0	102	80 - 120
Nitrobenzene-d5		55.2	mg/L	1	60.0	92	80 - 120
2-Fluorobiphenyl		54.5	mg/L	1	60.0	91	80 - 120
2,4,6-Tribromophenol		57.4	mg/L	1	60.0	96	80 - 120
Terphenyl-d14		70.2	mg/L	1	60.0	117	80 - 120

Standard (ICV-1) QC Batch: 13437

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	12.2	98	90 - 110	2004-10-19

Standard (CCV-1) QC Batch: 13437

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	12.4	99	90 - 110	2004-10-19

Standard (ICV-1) QC Batch: 13576

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Zinc		mg/L	1.00	0.997	100	90 - 110	2004-10-26

Standard (ICV-1) QC Batch: 13576

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Silver		mg/L	0.125	0.124	99	90 - 110	2004-10-26
Total Arsenic		mg/L	1.00	0.998	100	90 - 110	2004-10-26
Total Barium		mg/L	1.00	0.991	99	90 - 110	2004-10-26
Total Cadmium		mg/L	1.00	0.996	100	90 - 110	2004-10-26
Total Chromium		mg/L	1.00	0.994	99	90 - 110	2004-10-26
Total Lead		mg/L	1.00	0.989	99	90 - 110	2004-10-26
Total Selenium		mg/L	1.00	0.994	99	90 - 110	2004-10-26

Standard (CCV-1) QC Batch: 13576

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Zinc		mg/L	1.00	0.990	99	90 - 110	2004-10-26

Standard (CCV-1) QC Batch: 13576

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Silver		mg/L	0.125	0.124	99	90 - 110	2004-10-26
Total Arsenic		mg/L	1.00	0.991	99	90 - 110	2004-10-26
Total Barium		mg/L	1.00	0.994	99	90 - 110	2004-10-26
Total Cadmium		mg/L	1.00	0.990	99	90 - 110	2004-10-26
Total Chromium		mg/L	1.00	0.994	99	90 - 110	2004-10-26
Total Lead		mg/L	1.00	0.989	99	90 - 110	2004-10-26
Total Selenium		mg/L	1.00	0.982	98	90 - 110	2004-10-26

4100808

REQUEST FOR ANALYSIS

R/A Control
C/C Control No. № 3457

WASTE ISOLATION PILOT PLANT
WESTINGHOUSE ELECTRIC CORP.
P.O. BOX 2078
CARLSBAD, NM 88221-2078

DATE SAMPLES SHIPPED 10/7/04
LAB DESTINATION Trace Analysis
LABORATORY CONTACT Mike Able
SEND LAB REPORT TO WIPP Site - Jal Highway Carlsbad, NM 88220

SAMPLING PROGRAM WIPP Sampling Team
PURCHASE ORDER NO. 402560

DATE REPORT REQUIRED ~~10/7/04~~ ~~11/18/04~~ 11/18/04
PROJECT CONTACT Doreen Guillermo
PROJECT CONTACT PHONE NO. (505) 234-8753

Sample Number	Sample Type	Sample Quantity	Preservative	Req'd. Testing Program	Special Instructions
WST-04-061	Storm Water	(2) 40-mL	HCl, 4°C	Total Volatiles	45370
WST-04-062	Storm Water	(2) 40-mL	H_2SO_4, 4°C	TOC	71
WST-04-063	Storm Water	~~(2)~~ 1-L	4°C	Total Semi-Volatiles	72
WST-04-064	Storm Water	2 L	4°C	pH, TSS, TDS, Cl, SO_4^{2-}, NO_3	73
WST-04-065	Storm Water	250 mL	HNO_3, 4°C	Total RCRA Metals + Zinc	74
WST-04-066	Storm Water	250 mL	HNO_3, 4°C	Total RCRA Metals + Zinc	75
WST-04-067	Storm Water	(2) 40-mL	HCl, 4°C	Total Volatiles	76
WST-04-068	Storm Water	(2) 40-mL	H_2SO_4, 4°C	TOC	77
WST-04-069	Storm Water	1 L	4°C	Total Semi-Volatiles	78
WST-04-070	Storm Water	2 L	4°C	pH, TSS, TDS, Cl, SO_4^{2-}, NO_3	79
WST-04-071	Storm Water	250 mL	HNO_3, 4°C	Total RCRA Metals + Zinc	80
WST-04-072	Storm Water	250 mL	HNO_3, 4°C	Total RCRA Metals + Zinc	81
WST-04-073	Storm Water	(2) 40-mL	HCl, 4°C	Total Volatiles	82
WST-04-074	Storm Water	(2) 40-mL	H_2SO_4, 4°C	TOC	83
WST-04-075	Storm Water	1 L	4°C	Total Semi-Volatiles	84

TURNAROUND TIME REQUIRED: (Rush must be approved by appropriate Manager) NORMAL ✓ RUSH____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)

NONHAZARD____ FLAMMABLE____ SKIN IRRITANT____ HIGHLY TOXIC____ BIOLOGICAL____ OTHER pH<2 (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis.) RETURN TO CLIENT____ DISPOSAL BY LAB ✓

FOR LAB USE ONLY

RECEIVED BY [signature] 10-8-04 9:58 DATE/TIME

4°C
TNM40 903-234-086-9

WP Form 1177; 11/3/89
Page 1 of 2

WHITE - Original, to accompany samples   YELLOW - Field Copy   PINK - Other

Report Date: November 3, 2004
402560
Work Order: 4100808

4100808

REQUEST FOR ANALYSIS

R/A Control
C/C Control No. № 3458

WASTE ISOLATION PILOT PLANT
WESTINGHOUSE ELECTRIC CORP.
P.O. BOX 2078
CARLSBAD, NM 88221-2078

DATE SAMPLES SHIPPED 10/7/04
LAB DESTINATION Trace Analysis
LABORATORY CONTACT Mike Able
SEND LAB REPORT TO WIPP Site
Jal Highway
Carlsbad, NM 88220

SAMPLING PROGRAM WIPP Sampling Team
PURCHASE ORDER NO. 402560

DATE REPORT REQUIRED 11/18/04
PROJECT CONTACT Doreen Guillermo
PROJECT CONTACT PHONE NO. (505) 234-8753

Sample Number	Sample Type	Sample Quantity	Preservative	Req't. Testing Program	Special Instructions
WST-04-076	Storm Water	2 L	4°C	pH, TSS, TDS, Cl⁻, SO_4^-, NO_3^-	45385
WST-04-077	Storm Water	250 mL	HNO_3, 4°C	Total RCRA Metals + Zinc	86
WST-04-078	Storm Water	250 mL	HNO_3, 4°C	Total RCRA Metals + Zinc	87

No further entries

TURNAROUND TIME REQUIRED: (Rush must be approved by appropriate Manager) NORMAL ✓ RUSH____ (Subject to rush surcharge)
POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)
NONHAZARD____ FLAMMABLE____ SKIN IRRITANT____ HIGHLY TOXIC____ BIOLOGICAL ✓ OTHER pH < 2 (Please Specify)
SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis.) RETURN TO CLIENT____ DISPOSAL BY LAB ✓

FOR LAB USE ONLY
RECEIVED BY [signature] 10-8-04 9:58 DATE/TIME

WP Form 1177; 11/3/89
Page 1 of 2

4°C TNHO 903-234-0889

WHITE - Original, to accompany samples YELLOW - Field Copy PINK - Other

Report Date: November 3, 2004
402560
Work Order: 4100808
Page Number: 36 of 38

4100808

CHAIN-OF-CUSTODY RECORD

WASTE ISOLATION PILOT PLANT
WESTINGHOUSE ELECTRIC CORP.
P. O. BOX 2078
CARLSBAD, NM 88221-2078

C/C Control
R/A Control No. 3457

SAMPLING PROGRAM WIPP Sampling Team
LAB DESTINATION Trace Analysis
SAMPLE TEAM MEMBERS Koreen Guillermo, Steve Travis
CARRIER/WAYBILL NO.

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
WST-04-061	Retention Pond A Storm Water	10/7/04 0859	liquid	glass	45370	
WST-04-062	Retention Pond A Storm Water	10/7/04 0900	liquid	glass	71	
WST-04-063	Retention Pond A Storm Water	10/7/04 0907	liquid	glass	72	
WST-04-064	Retention Pond A Storm Water	10/7/04 0909	liquid	plastic	73	
WST-04-065	Retention Pond A Storm Water	10/7/04 0911	liquid	plastic	74	
WST-04-066	Retention Pond A Storm Water	10/7/04 0911	liquid	plastic	75	
WST-04-067	Watershed C, Pond 1 Stormwater	10/7/04 0934	liquid	glass	76	
WST-04-068	Watershed C, Pond 1 Stormwater	10/7/04 0936	liquid	glass	77	
WST-04-069	Watershed C, Pond 1 Stormwater	10/7/04 0938	liquid	glass	78	
WST-04-070	Watershed C, Pond 1 Stormwater	10/7/04 0940	liquid	plastic	79	
WST-04-071	Watershed C, Pond 1 Stormwater	10/7/04 0941	liquid	plastic	80	
WST-04-072	Watershed C, Pond 1 Stormwater	10/7/04 0941	liquid	plastic	81	
WST-04-073	Watershed C, Pond 2 Stormwater	10/7/04 0957	liquid	glass	82	
WST-04-074	Watershed C, Pond 2 Stormwater	10/7/04 0959	liquid	glass	83	
WST-04-075	Watershed C, Pond 2 Stormwater	10/7/04 1003	liquid	glass	84	

Special Instructions: Return coolers and blue ice

Possible Sample Hazards: pH<2

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [signature] WRES 10-7-04 - 2100pm
   Received By: [signature] 10-8-04 9:58
2. Relinquished By:
   Received By:
3. Relinquished By:
   Received By:
4. Relinquished By:
   Received By:

WHITE To accompany samples
YELLOW - Field Copy
PINK - Other

4°C TNM+D 903-234-088-9

Report Date: November 3, 2004
402560

Work Order: 4100808

Page Number: 37 of 38

4100808

CHAIN-OF-CUSTODY RECORD

WASTE ISOLATION PILOT PLANT
WESTINGHOUSE ELECTRIC CORP.
P. O. BOX 2078
CARLSBAD, NM 88221-2078

C/C Control
R/A Control No. 3458

SAMPLING PROGRAM WIPP Sampling Team
LAB DESTINATION Trace Analysis
SAMPLE TEAM MEMBERS Koreen Guillermo, Steve Travis
CARRIER/WAYBILL NO.

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
WST-04-076	Watershed C, Pond 2 Storm Water	10/7/04 1004	liquid	plastic	45385	
WST-04-077	Watershed C, Pond 2 Storm Water	10/7/04 1005	liquid	plastic	86	
WST-04-078	Watershed C, Pond 2 Storm Water	10/7/04 1005	liquid	plastic	87	
	No further entries					

Special Instructions: ~~pH<2~~ Return coolers and blue ice

Possible Sample Hazards: pH<2

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [signature] WRES 10-7-04 2:00 pm
   Received By: [signature] 10-8-04 9:58
2. Relinquished By:
   Received By:
3. Relinquished By:
   Received By:
4. Relinquished By:
   Received By:

WHITE - To accompany samples
YELLOW - Field Copy
PINK - Other

4°C TNM+O 903-234-088-9

Report Date: November 3, 2004
402560
Work Order: 4100808
Page Number: 38 of 38

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

January 27, 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

RECEIVED
FEB 04 2005

Subject: Notification of the December 2004 and January 2005 Freeboard Levels for the Sewage Lagoons and the H-19 Evaporation Pond

Dear Mr. Marshall:

Your letter dated December 28, 2004, approving the corrective actions proposed by the Waste Isolation Pilot Plant (WIPP) for the loss of freeboard in the sewage lagoons and H-19 requires us to notify you of the freeboard levels in each pond by the last day of each month. The freeboard levels for December 2004 and January 2005 were as follows:

Area	December 31, 2004	January 16, 2005
Settling Pond 1A	20 inches	20 inches
Polishing Pond 1B	20 inches	20 inches
Settling Pond 2A	21 inches	18 inches
Settling Pond 2B	19 inches	17 inches
Evaporation Pond A	20 inches	25 inches
Evaporation Pond B	29 inches	27 inches
Evaporation Pond C	29 inches	27 inches
H-19	22 inches	22 inches

During the week of January 17, 2005, the sewage lagoons were configured to allow the ponds with the least freeboard, Ponds 2A and 2B, to drain into Pond A.

If you have any questions or require additional information, please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

for Inés Triay
Acting Manager

CBFO:AMO:HLP:VW:05-0205:UFC:5486

cc:
J. Kieling, NMED *ED
J. Bearzi, NMED ED
J. Plum, CBFO ED
CBFO M&RC

*ED denotes Electronic Distribution

CBFO:AMO:HLP:VW:05-0205:UFC:5486

Notice is hereby given pursuant to 20.6.2.3108 NMAC, the following Ground Water Discharge Permit applications have been proposed for approval. To request additional information or to obtain a copy of a draft permit, contact the Ground Water Quality Bureau in Santa Fe at (505) 827-2900. Draft permits may also be viewed on-line at www.nmenv.state.nm.us/gwb/New%20Pages/public_notice.htm

NOTE – If viewing by WEB - Click on facility name to review a copy of the draft permit.

DP #	Facility/Applicant	Closest City	County	Notice	NMED Permit Contact
929	Former Texaco Bulk Fuels Terminal Gary Jacobson, Environmental Manager Chevron Environmental Management Inc. 4800 Fournace Pl, E534A Bellaire, TX 77401	Albuquerque	Bernalillo	Former Texaco Bulk Fuels Terminal, Gary Jacobson, Environmental Manager, proposes to renew the Discharge Permit for the discharge of up to 213,120 gallons per day of treated ground water from a remediation system into five injection wells. Potential contaminants associated with this type of discharge include organic compounds. The facility is located at 3209 Broadway Boulevard SE, Albuquerque, in Section 32, T10N, R03E, Bernalillo County. Ground water beneath the site is at a depth of approximately 20 feet and has a total dissolved solids concentration of approximately 1,470 milligrams per liter.	Naomi Davidson
1178	Indian Hills/Canyon Auto Remediation Site James Davis, Chief NMED Petroleum Storage Tank Bureau 2044 Galisteo St. Santa Fe, NM 87505	Tijeras	Bernalillo	Indian Hills/Canyon Auto Remediation Site, James Davis, Chief of Petroleum Storage Tank Bureau, proposes to discharge up to 10,800 gallons per day of treated ground water from a remediation system into four injection wells. Potential contaminants associated with this type of discharge include organic compounds. The facility is located at 844 East Highway 66, Zuzax, in Section 7, T10N, R06E, Bernalillo County. Ground water beneath the site is at a depth of approximately 50 feet and has a total dissolved solids concentration of approximately 870 milligrams per liter.	Steven Pedro
1195	Elmira Dairy Earl Heilbult, Owner 5560 Jacqueline Dr. Albuquerque, NM 8712	Albuquerque	Bernalillo	Elmira Dairy, Earl Heibult, Owner, proposes to renew and modify the Discharge Permit for the discharge of up to 9,999 gallons per day of agricultural wastewater. Dairy wastewater is discharged from the milking parlor to a concrete holding tank and is then pumped to a solids settling separator followed by a synthetically lined lagoon for disposal by evaporation. Potential contaminants associated with this type of discharge include nitrogen	Bill Pearson

				compounds. The facility is located at 5560 Jacqueline Dr. SW, in Section 33, T09N, R02E, Bernalillo County. Ground water beneath the site is at a depth of approximately 108-127 feet and has a total dissolved solids concentration of approximately 844 milligrams per liter.	
646	Rio Vista Dairy Raymond Vaz, Owner 3909 Woodbine Way Roswell, NM 88203	Roswell	Chaves	Rio Vista Dairy, Raymond Vaz, Owner, proposes to renew and modify the Discharge Permit for the discharge of up to 60,000 gallons per day of agricultural wastewater. Up to 60,000 gallons per day of dairy wastewater is discharged from the milking parlor to a sand separator followed by a concrete sump and is pumped through a screen solids separator to a synthetically lined lagoon for storage. Wastewater from the lagoon is land applied to 161 acres of center pivot and flood irrigated cropland under cultivation. The modification consists of increasing the wastewater discharge from 48,000 to 60,000 gallons per day and increasing the land application area from 100 acres of flood irrigated cropland to 161 acres of center pivot and flood irrigated cropland under cultivation. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 3909 Woodbine Way, approximately 3 miles southeast of Roswell in Section 16, T11S, R25E, Chaves County. Ground water beneath the site is at a depth of approximately 20 feet and has a total dissolved solids concentration of approximately 2,300 milligrams per liter.	Bill Pearson
1030	Mighty Vac Rocky Horton, Owner Mighty Vac 1319 N. Main Clovis, NM 88101	Clovis	Curry	Mighty Vac, Rocky Horton, Owner, proposes to renew the Discharge Permit for the discharge of up to 6,000 gallons per day of restaurant grease interceptor waste and car wash sand trap waste to two concrete decanting beds for dewatering. Wastewater from the beds is discharged to a concrete lined evaporative lagoon. Grease is decanted and mixed with dirt in a concrete drying/mixing bed. The dewatered grease mixture and sand trap solids are disposed of at the City of Clovis Landfill. Potential contaminants associated with this type of discharge include nitrogen compounds, metals, and organic compounds. The facility is located at 601 CR L, approximately 1 mile southwest of Clovis, in Section 23, T02N, R35E, Curry County. Ground water beneath the site is at a depth of	Kathie Deal

				approximately 290 feet and has a total dissolved solids concentration of approximately 450 milligrams per liter.	
1199	Palla Dairy Eric Palla, Manager 902 Colonial Parkway Clovis, NM 88101	Clovis	Curry	Palla Dairy, Eric Palla, Manager, proposes to renew and modify the Discharge Permit for the discharge of up to 160,000 gallons per day of agricultural wastewater. Wastewater is discharged from the milking parlor to a concrete settling basin from which it is pumped through a solids separator to a synthetically lined lagoon for storage. Wastewater from the lagoon is land applied by center pivot/sprinkler irrigation to 400 acres of irrigated cropland under cultivation. The modification consists of increasing the discharge from 80,000 to 160,000 gallons per day and increasing the land application area from 220 to 400 acres. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located approximately 11 miles north of Clovis on State Highway 288, in Sections 7 and 18, T04N, R36E, Curry County. Ground water beneath the site is at a depth of approximately 410 feet and has a total dissolved solids concentration of approximately 373 milligrams per liter.	Steven Pedro
74	Buena Vista Dairy 2 Mike Weatherly Buena Vista Dairy 2 PO Box 346 Mesquite, NM 88880	Vado	Doña Ana	Buena Vista Dairy 2, Mike Weatherly, Owner, proposes to renew and modify the Discharge Permit for up to 55,000 gallons per day of agricultural wastewater. Wastewater is discharged from the milking parlor through a solids separator system to two synthetically lined combination wastewater/stormwater lagoons (Cell A & B) and an additional synthetically lined wastewater lagoon for storage. Wastewater from the lagoons is land applied by flood irrigation to 156 acres of irrigated cropland under cultivation. The modification consists of increasing the wastewater discharge from 26,000 to 55,000 gallons per day and increasing the land application area from 115 to 156 acres of flood irrigated cropland under cultivation. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located approximately 1 mile east of Vado in Sections 21, T25S, R03E, Dona Ana County. Ground water beneath the site is at a depth of approximately 13-32 feet and has a total dissolved solids concentration of approximately 1,500 milligrams per liter.	Bill Pearson

126	Daybreak Dairy Jon Gorzeman PO Box 170 Mesquite, NM 88048	Mesquite	Doña Ana	Daybreak Dairy, Jon Gorzeman, Owner, proposes to renew and modify the Discharge Permit for the discharge of up to 24,000 gallons per day of agricultural wastewater. Up to 24,000 gallons per day of dairy wastewater is discharged to a concrete sump and pumped through a screen solids separator to a synthetically lined lagoon for storage. Wastewater is discharged to 119 acres of irrigated cropland under cultivation. The modification consists of decreasing the wastewater discharge from 40,500 to 24,000 gallons per day. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located approximately 1.5 miles east of Mesquite in Sections 5 & 6, T25S, R03E, Dona Ana County. Ground water beneath the site is at a depth of approximately 10 feet and has a total dissolved solids concentration of approximately 3,000 milligrams per liter.	Bill Pearson
167	River Valley Dairy Bruce Bonestroo, Owner River Valley Dairy P.O. Box 1929 Anthony, NM 88021	Vado	Doña Ana	River Valley Dairy, Bruce Bonestroo, Owner, proposes to renew and modify the Discharge Permit for the discharge of up to 35,000 gallons per day (gpd) of agricultural wastewater. Wastewater discharged from the milking parlor flows to a concrete-lined sump, is pumped over a screen solids separator and collects in a synthetically lined lagoon for storage. Wastewater is then land applied by flood irrigation to 129 acres of irrigated cropland. The modification consists of increasing the discharge volume from 27,000 to 35,000 gpd and the land application area from 98 to 129 acres of irrigated cropland. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located approximately 1.5 miles southeast of Vado, in Sections 28 and 33, T25S, R3E, Doña Ana County. Ground water beneath the site is at a depth of approximately 11 feet and has a total dissolved solids concentration of approximately 1800 milligrams per liter.	Kimberly Kirby
692	Del Oro Dairy Jerry Settles P.O. Box 1846 Anthony, NM 88021	Anthony	Doña Ana	Del Oro Dairy, Jerry Settles, Owner, proposes to renew and modify the Discharge Permit for the discharge of up to 60,000 gallons per day of agricultural wastewater. Wastewater is discharged from the milking parlor through a screen solids separator to a concrete sump and pumped to	Bill Pearson

				a synthetically lined lagoon followed by a second synthetically lined lagoon for disposal by evaporation. Wastewater, when needed, is authorized to be discharged to two synthetically lined stormwater impoundments (Pond C & D) as long as these impoundments are maintained, at a minimum, to contain run-off from a 25-year, 24-hour rainfall event at all times. The modification consists of discontinuing wastewater applications to the 7 acre land application area. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located approximately 2 miles north of Anthony in Section 23, T26S, R03E, Dona Ana County. Ground water beneath the site is at a depth of approximately 55 feet and has a total dissolved solids concentration of approximately 1,500 milligrams per liter.	
833	Big Sky Dairy Ed DeRuyter, Owner Big Sky Dairy PO Box 10 Mesquite, NM 88048	Mesquite	Doña Ana	Big Sky Dairy, Ed DeRuyter, Owner, proposes to renew and modify the Discharge Permit for the discharge of up to 80,000 gallons per day (gpd) of agricultural wastewater from two milking parlors. Wastewater from the Big Sky Dairy milking parlor is pumped through a screen solids separator and a solids settling separator to two synthetically lined lagoons for storage. Wastewater from the former Desertland Dairy milking parlor is pumped through a screen solids separator to a holding tank. Wastewater from this holding tank is pumped to the Big Sky Dairy synthetically lined lagoons for storage. Wastewater from the Big Sky Dairy storage lagoon is land applied by center pivot and sprinkler irrigation to 151 acres of irrigated cropland under cultivation. The modifications consist of combining the wastewater discharge from the former Desertland Dairy, DP-260, into the Big Sky Dairy Discharge Permit, DP-833. This modification will increase the discharge volume from 36,000 to 80,000 gpd and increase the land application area from 101.2 to 151 acres. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 17900 S. Stern Drive, Mesquite, in Section 27, T25S, R3E, Doña Ana County. Ground water beneath the site is at a depth of approximately 40 feet and has a total dissolved solids concentration of approximately 2,000 - 4,000 milligrams per liter.	Bill Pearson

831	U.S. Department of Energy, Waste Isolation Pilot Plant David C. Moody, Manager U.S. Dept. of Energy Carlsbad Field Office P.O. Box 3090 Carlsbad, NM 88221	Carlsbad	Eddy	U.S. Department of Energy, Waste Isolation Pilot Plant, Dave Moody, Manager, proposes to modify the Discharge Permit, which presently allows for the discharge of up to 23,000 gallons per day (gpd) of sewage effluent, up to 2,000 gpd of non-hazardous high-TDS and brine water, up to 8,000 gpd of non-hazardous miscellaneous water, up to 100 gpd of neutralized acid waste, and a designed flow of 3,231,260 gpd of storm water runoff based on a 24-hour, 25-year storm event. The permit modification includes an increase of the designed storm water discharge to 4,224,835 gpd, the inclusion of the Site Preliminary Design Validation (SPDV) material pile, and the inclusion of a comprehensive closure plan. The facility is located approximately 26 miles east of Carlsbad, New Mexico, in Sections 20, 28 and 29, T22S, R31E, Eddy County. Depth to ground water in the area of the permitted discharge is approximately 225 feet and has a total dissolved solids concentration of approximately 3,920 milligrams per liter.	Clint Marshall
363	Phelps Dodge Tyrone, Inc. Rick Moore, General Manager Phelps Dodge Tyrone, Inc. P.O. Drawer 571 Tyrone, NM 88065	Silver City	Grant	Phelps Dodge Tyrone, Inc., Rick Moore, General Manager, proposes to renew the Discharge Permit, which presently allows for the discharge of up to 10,000 gallons per minute of an acidic leach solution with a pH of 2 to the No. 1A Leach Stockpile. Leach solution is applied to the top of the stockpile to remove copper. The leach solution is collected at the base of the stockpile and transferred to a solvent extraction/electrowinning plant for processing. The facility is located approximately 12 miles southwest of Silver City, New Mexico, in parts of Sections 24 and 25, T19S, R15W, Grant County. Depth to ground water in the area of the permitted discharge ranges from approximately 300 to 650 feet and has a total dissolved solids concentration of approximately 280 milligrams per liter.	Clint Marshall
435	Phelps Dodge Tyrone, Inc., Rick Moore, General Manager Phelps Dodge Tyrone, Inc.	Silver City	Grant	Phelps Dodge Tyrone, Inc., Rick Moore, General Manager, proposes to renew and modify the Discharge Permit, which presently allows for the discharge of up to 12,000 gallons per minute of an acidic leach solution with a pH of 2 to the No. 2A Leach Stockpile. Leach solution is applied to the top of the stockpile to remove copper. The leach solution is	Keith Ehlert

	P.O. Drawer 571 Tyrone, NM 88065			collected at the base of the stockpile and transferred to a solvent extraction/electrowinning plant for processing. The proposed modification to this permit renewal includes increasing the discharge rate of leach solution to the No. 2A Leach Stockpile to 15,000 gallons per minute, bringing into operation an existing synthetically lined mine dewatering surge pond, and creating a new stockpile (9A Stockpile) consisting of waste rock from the Little Rock Mine. The 9A Stockpile will be located immediately northwest of the 2A Leach Stockpile and will not be leached. The facilities are located approximately 12 miles southwest of Silver City, New Mexico, in parts of Section 15, 16, 21, and 22, T19S, R15W, Grant County. Depth to ground water in the area of the permitted discharge ranges from approximately 180 to 210 feet and has a total dissolved solids concentration of approximately 250 to 880 mg/l.	
526	Phelps Dodge-Chino Mine Timothy Eastep, Manager Chino Mines Company 210 Cortez St. Hurley, NM 88043	Bayard/ Hurley	Grant	Phelps Dodge-Chino Mine, Timothy Eastep, Manager, proposes to renew and modify the discharge permit for the discharge of up to 24,500,000 gallons per day of mining process water from a Copper Mine. Potential contaminants from this type of discharge include metals and non-metals. The Whitewater Leach System includes the South Stockpile, Upper South Waste Rock Pile and West Stockpile. Acidic leach solution (raffinate) may be discharged up to 20,180,000 gallons per day (gpd) on the South Stockpile and up to 4,320,000 gpd on the eastern portion of the West Stockpile. The raffinate infiltrates through the stockpiles, dissolving copper minerals and the resultant pregnant leachate solution (PLS) is collected and processed at the SX/EW Plant that has a separate discharge permit, DP-591. The South Stockpile and eastern portion of the West Stockpile may receive ore from the open pit and ore blended with Lake One material for leaching. The Upper South Waste Rock Pile is for storage of waste rock only and is not permitted to be leached. The western portion of the West Stockpile includes a ground water interceptor system that collects contaminated ground water. Modifications to DP-526 include the addition of Reservoir 9, which has a capacity of approximately 15 million gallons to receive storm water from the Upper South Waste Rock Pile as well as the surrounding area south of	Tom Dewers

				the reservoir. Also, wastewater discharges up to 60,000 gallons per day from Mine Maintenance and General Offices, located at the southwestern toe of the West Stockpile, will be included in this renewal. The Whitewater Leach System is located approximately 2 miles northeast of Bayard and includes the reach of Whitewater Creek from Hanover Creek to the northern end of Hurley at the northern boundary of the former Lake One in Sections 28, 29, 32, 33 and 34, T17S, R12W; Sections 3, 4, 5, 6, 7, 18, 19, 30 and 31, T18S, R12W; and Sections 12 and 13, T18S, R13W; in Grant County. Ground water most likely to be affected is at a depth of approximately 0 to over 300 feet below ground surface and has a total dissolved solids concentration of approximately 1,000 milligrams per liter.	
1237	Village of Mosquero Wastewater Treatment Plant Pablo Trujillo, Mayor 38 Main St. PO Box 116 Mosquero, NM 87733	Mosquero	Harding	Village of Mosquero Wastewater Treatment Plant, Pablo Trujillo, Mayor, proposes to renew and modify the Discharge Permit for the discharge of up to 9,000 gallons per day of domestic wastewater through two synthetically lined lagoons. After disinfection, treated wastewater is land applied via spray irrigation to 3 acres of native vegetation. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located approximately 0.5 miles southeast of Mosquero in Section 22, T18N, R28E, Harding County. Ground water beneath the site is at a depth of approximately 45 - 80 feet and has a total dissolved solids concentration of approximately 280 milligrams per liter.	Rebecca Cook
1311	Village of Roy-Wastewater Treatment Plant Edward Fluhman, Mayor PO Box 8 Roy, NM 87743	Roy	Harding	Village of Roy-Wastewater Treatment Plant, Edward Fluhman, Mayor, proposes to renew the Discharge Permit for the discharge of up to 40,000 gallons per day of domestic wastewater through one clay-lined and one synthetically-lined lagoon to 1.5 acres of flood irrigated native vegetation. Excess wastewater collects in a synthetically-lined overflow lagoon at the down slope end of the land application area. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located approximately 0.5 miles north east of Roy in Section 21, T20N, R26E, Harding County. Ground water beneath the site is at a depth of approximately 70-90 feet and has a total dissolved solids	Rebecca Cook

				concentration of approximately 660 milligrams per liter.	
950	Santa Fe Ingredients Company Mr. Dean Rodriguez Santa Fe Ingredients Co. 1448 Hwy 338 Animas, NM 88020	Animas	Hidalgo	Santa Fe Ingredients Company, Henry Rodriguez, Owner, proposes to renew and modify the Discharge Permit for the discharge of up to 150,000 gallons per day of agricultural wastewater. Process wastewater from a vegetable processing plant is discharged to a concrete sump, pumped through a screen solids separator to a 5,000 gallon storage tank and land applied by flood irrigation to 50 acres of irrigated cropland under cultivation. If wastewater cannot be applied to the irrigated cropland, it shall be applied by flood irrigation to 70 acres for surface disposal. The modification consists of decreasing the wastewater discharge from 750,000 to 150,000 gallons per day and changing the land application area from 120 acres for surface disposal to 50 acres of flood irrigated cropland under cultivation and 70 acres of flood irrigated land for surface disposal. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located approximately 15 miles north of Animas in Section 3, T26S, R20W, Hidalgo County. Ground water beneath the site is at a depth of approximately 150 feet and has a total dissolved solids concentration of approximately 500 milligrams per liter.	Bill Pearson
120	Columbus-Industrial Park Martha Skinner, Mayor Village of Columbus PO Box 350 Columbus, NM 88029	Columbus	Luna	Columbus-Industrial Park, Martha Skinner, Mayor, proposes to renew and modify the Discharge Permit to treat up to 6,300 gallons per day of domestic wastewater that includes 1,200 gallons per day of domestic septage and chemical toilet waste in a lined facultative lagoon before it is discharged to a clay-lined evaporative lagoon for disposal. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 26162 East Oro Ave, approximately 2 miles south of Columbus in Section 14, T29S, R08W, Luna County. Ground water beneath the site is at a depth of approximately 60 feet and has a total dissolved solids concentration of approximately 750 milligrams per liter.	Kathie Deal
209	City of Deming-Wastewater Treatment Plant	Deming	Luna	City of Deming-Wastewater Treatment Plant, Louis Jenkins, Director, proposes to renew and modify the Discharge Permit to treat up to 3.0 million gallons per day of domestic	Kathie Deal

	Louis Jenkins, Director City of Deming PO Box 706 Deming, NM 88031			wastewater in a combined lagoon and trickling filter system. Reclaimed wastewater is distributed to two storage ponds and disinfected for municipal reuse on 122 acres of the Rio Mimbres Golf Course, the Mountain View Cemetery and recreational fields. Reclaimed wastewater is also land applied to 265 acres of cropland under cultivation and distributed to Border Foods Inc., for land application practices regulated under DP-1058. The majority of the treated wastewater from the settling ponds undergoes additional treatment in a series of sand filters before it is distributed to Luna Energy Facility (DP-1305) for reuse as cooling water. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 4370 J Street, approximately 3 miles southeast of Deming, in Section 6, T24S, R08W, Luna County. Discharges from the facility also occur in Sections 7 and 18, T24S, R08W, Section 36, T23S, R09W, and Section 01, T24S, R09W. Ground water beneath the site is at a depth of approximately 125 feet and has a total dissolved solids concentration of approximately 300 milligrams per liter.	
1526	Naturally NM Food Products Donald Martinez, Owner PO Box 52 El Rito, NM 87530	El Rito	Rio Arriba	Naturally NM Food Products, Donald Martinez, Owner, proposes to discharge up to 750 gallons per day of combined agricultural and domestic wastewater to a septic tank/leachfield system for disposal. Wastewater generated from the washdown of slaughterhouse operations is discharged through a grease trap to the septic tank/leachfield system. Blood and offal are collected in plastic drums and removed for offsite disposal. Domestic wastewater from one restroom at the facility is also discharged to the septic tank/leachfield system. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 1138 Highway 554 in El Rito, in Section 3, T24N, R07E, Rio Arriba County. Ground water beneath the site is at a depth of approximately 26 feet and has a total dissolved solids concentration of approximately 366 milligrams per liter.	Sarah McGrath
880	W-Diamond Dairy Robert Rogers, Owner P.O. Box 206	Portales	Roosevelt	W-Diamond Dairy, Robert Rogers, Owner, proposes to renew and modify the discharge permit for the discharge of 49,999 gallons per day of agricultural wastewater. Up to 49,999 gallons per day of dairy wastewater is discharged	Bill Pearson

	Portales, NM 88130			from two milking parlors to a synthetically lined combination wastewater/stormwater lagoon, through a solids separator, followed by two additional synthetically lined combination wastewater/stormwater lagoons for disposal by evaporation. The modification consists of increasing the discharge volume from 12,000 to 49,999 gallons per day, discontinuing wastewater applications to the land application area, and disposing of wastewater by evaporation in a synthetically lined lagoon system. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located 9 miles southwest from Portales in Section 7, T02S, R33E, Roosevelt County. Ground water most likely to be affected is at a depth of approximately 75 feet and has a total dissolved solids concentration of approximately 640 milligrams per liter.	
1001	James Idsinga, Sr. & Son Dairy James Idsinga 2116 East Third St. Portales, NM 88130	Portales	Roosevelt	James Idsinga, Sr. & Son Dairy, James Idsinga, Sr., Owner, proposes to renew and modify the Discharge Permit for the discharge of up to 32,000 gallons per day of agricultural wastewater. Up to 32,000 gallons per day of dairy wastewater will be discharged from the milking parlor to a clay-lined lagoon and then land applied to 150 acres of center-pivot sprinkler irrigated cropland under cultivation. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 43321 US Hwy 70 approximately 9 miles northeast of Portales in Sections 29 & 30, T01N, R36E, Roosevelt County. Ground water beneath the site is at a depth of approximately 150 feet and has a total dissolved solids concentration of approximately 360 milligrams per liter.	Bill Pearson
1250	Sky Country Farms Al Fiske, Owner 1392 Baseline Rd. Portales, NM 88130	Portales	Roosevelt	Sky Country Farms, Al Fiske, Owner, proposes to renew the Discharge Permit for the discharge of up to 90,000 gallons per day of dairy wastewater from the milking parlor through a solids separator to a synthetically lined lagoon for storage. Wastewater is land applied by center pivot irrigation to 601 acres of cropland under cultivation. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 1392 Baseline Rd, Portales in Section 33, T01N,	Christopher Vick

				R35E, Roosevelt County. Ground water beneath the site is at a depth of approximately 133 feet and has a total dissolved solids concentration of approximately 350 milligrams per liter.	
1139	Village of Corrales-Recreation Center Nora Scherzinger, Administrator Village of Corrales 4324 Corrales Rd. Corrales, NM 87048	Corrales	Sandoval	Village of Corrales-Recreation Center, Nora Scherzinger, Administrator, proposes to renew the Discharge Permit for the discharge of up to 1,200 gallons per day of domestic wastewater to four 5,200 gallon underground holding tanks. Wastewater from the holding tanks is periodically pumped and disposed of off-site. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 500 Jones Road, in Corrales, in Sections 33 and 34, T12N, R03E, Sandoval County. Ground water beneath the site is at a depth of approximately 5 feet and has a total dissolved solids concentration of approximately 288 milligrams per liter.	Melanie Sanchez
1295	City of Farmington-Family Sports Complex Mr. Jeff Bowman, Director Parks & Recreation Dept. 901 Fairgrounds Rd. Farmington, NM 87401	Farmington	San Juan	City of Farmington-Family Sports Complex, Jeff Bowman, Director, proposes to renew the Discharge Permit for the discharge of up to 9,600 gallons per day of domestic wastewater from the Family Sports Complex to three septic tank/leachfield systems. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 2301 Pinon Hills Boulevard, approximately 1 mile west of Farmington, in Section 5, T29N, R13W, San Juan County. Ground water beneath the site is at a depth of approximately 30 feet and has a total dissolved solids concentration of approximately 3,721 milligrams per liter.	Melanie Sanchez
234	New Mexico (State of) Correctional Facility-State Penitentiary Stephen Wust, Director Santa Fe County Water Resources Dept. 205 Montezuma Ave. Santa Fe, NM 87501	Santa Fe	Santa Fe	New Mexico (State of) Correctional Facility-State Penitentiary, Stephen Wust of Santa Fe County Utilities Department, proposes to renew and modify the Discharge Permit for the discharge of up to 280,000 gallons per day of domestic wastewater from the New Mexico State Penitentiary Complex, the New Mexico National Guard Complex, the Santa Fe County Detention Center, and the proposed Santa Fe County Business Park Development. The wastewater is treated in two synthetically-lined stabilization ponds. Effluent from the stabilization ponds is disinfected in a chlorine contact chamber and then held in a	Steve Pedro

				clay lined storage pond prior to use for irrigation of 95 acres of fescue and/or alfalfa. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 4311 Highway 14 approximately 12 miles south of Santa Fe in Section 35, T16N, R08E, Santa Fe County. Ground water beneath the site is at a depth of approximately 85-100 feet and has a total dissolved solids concentration of approximately 170 milligrams per liter.	
1037	The Agora Shopping Center Gary Grable, Manager MA Agora WW LLC C/O Security Bank of Kansas City 1000 Minnesota Ave. Kansas City, KS 66101	Santa Fe	Santa Fe	The Agora Shopping Center, Gary Grable, Manager, proposes to renew the Discharge Permit for the discharge of up to 5,802 gallons per day of treated wastewater from a mechanical treatment system to a 4,200 square foot leachfield. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 7 Avenida Vista Grande, approximately 13 miles east of Santa Fe in Section 9, T15N, R10E, Santa Fe County. Ground water beneath the site is at a depth of approximately 100 feet and has a total dissolved solids concentration of approximately 500 milligrams per liter.	Christopher Vick
563	A and M Dairy Pedram Ghoreishi, Owner PO Box 591 Veguita, NM 87062	Veguita	Socorro	A and M Dairy, Pedram Ghoreishi, Owner, proposes to renew the Discharge Permit for the discharge of up to 4,200 gallons per day of agricultural wastewater. Dairy wastewater from the milking parlor is discharged through a concrete holding tank for solids settling to a clay-lined lagoon for disposal by evaporation. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 125 Carlos Martinez Road, approximately 1.5 miles south of Veguita, in Section 16, T03N, R02E, Socorro County. Ground water beneath the site is at a depth of approximately 65 feet and has a total dissolved solids concentration of approximately 250 milligrams per liter.	Melanie Sanchez
731	Peñasco Schools Dorothy Sanchez, Superintendent PO Box 520 Peñasco, NM 87553	Peñasco	Taos	Peñasco Schools, Dorothy Sanchez, Superintendent, proposes to renew the Discharge Permit for the discharge of up to 10,000 gallons per day of treated domestic wastewater from a package treatment plant to a leachfield for disposal. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located in Peñasco, in Section 5, T22N, R12E, Taos	Christopher Vick

				County. Ground water beneath the site is at a depth of approximately 16 feet and has a total dissolved solids concentration of approximately 250 milligrams per liter.	
1063	Sanchez Mobile Home Park Joe Sanchez, Owner Sanchez MHP 3803 Alta Monte, NE Albuquerque, NM 87110	El Prado	Taos	Sanchez Mobile Home Park, Joe Sanchez, Owner, proposes to renew the Discharge Permit for the discharge of up to 5,000 gallons per day of domestic wastewater to two septic tank/leachfield systems. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 194 Valencia Rd, approximately 2 miles north of Taos, El Prado, within the Antonio Martinez de Godoi Land Grant, Section 24 (projected), T26N, R12E, Taos County. Ground water beneath the site is at a depth of approximately 115 feet and has a total dissolved solids concentration of approximately 135 milligrams per liter.	Kathie Deal
1004	Zens Dairy Galen (Butch) Zens, Owner Zens Dairy PO Box 200 Willard, NM 87063	Willard	Torrance	Zens Dairy, Galen (Butch) Zens, Owner, proposes to renew the Discharge Permit for the discharge of up to 80,000 gallons per day of dairy wastewater from the milking parlor to a concrete sump before it is pumped through a solids separator to a synthetically lined lagoon for storage. Wastewater is mixed with irrigation water in a holding tank prior to land application by sprinkler irrigation to 440 acres of irrigated cropland under cultivation. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 190 Dairy Rd, approximately 1 mile southwest of Willard, in Sections 18 and 19, T04N, R09E, Torrance County. Ground water beneath the site is at a depth of approximately 95 feet and has a total dissolved solids concentration of approximately 528 milligrams per liter.	Kathie Deal
1176	Jarratt Dairy Raymond Jarratt, Owner 2104 Los Lentes Rd., SE Los Lunas, NM 87031	Los Lunas	Valencia	Jarratt Dairy, Raymond Jarratt, Owner, proposes to renew and modify the Discharge Permit for the discharge of up to 27,000 gallons per day of dairy wastewater from the milking parlor through a solids separator to a synthetically lined lagoon for storage. Wastewater is land applied with a vacuum truck to 335 acres of irrigated cropland under cultivation. The modification consists of increasing the discharge volume from 2,000 gallons per day to 27,000 gallons per day. Potential contaminants associated with	Christopher Vick

				this type of discharge include nitrogen compounds. The facility is located at 2520 Los Lentes Rd SE, Los Lunas, in Section 4, T06N, R02E, Valencia County. Ground water beneath the site is at a depth of approximately 5 feet and has a total dissolved solids concentration of approximately 240 milligrams per liter.	

Prior to ruling on any proposed Discharge Permit or its modification, the New Mexico Environment Department (NMED) will allow thirty days after the date of publication of this notice to receive written comments and during which a public hearing may be requested by any interested person, including the applicant. Requests for public hearing shall be in writing and shall set forth the reasons why the hearing should be held. A hearing will be held if NMED determines that there is substantial public interest. Comments or requests for hearing should be submitted to the Ground Water Quality Bureau at PO Box 26110, Santa Fe, NM 87502.

To view this and other public notices issued by the Ground Water Quality Bureau on-line, go to: www.nmenv.state.nm.us/Common/public_notice.htm and select Ground Water Quality Bureau

GROUND WATER

JUL 03 2006

BUREAU

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUN 29 2006

William C. Olson, Chief
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Completion of Public Notice Requirements for the March 4, 2005 Discharge Plan Modification

Reference: Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant, dated May 23, 2006

Dear Mr. Olson:

The purpose of this letter is to provide proof of the completion of the public notice requirements (Option #2) for the March 4, 2005, Discharge Plan (DP-831) modification in accordance with your letter dated May 23, 2006, and the public notice requirements of 20.6.2.3108 NMAC. Public Notice Option #2 requires that within 15 days of the completion of the public notice requirements, the Permittee must submit proof of notice to NMED containing:

1. A signed affidavit that the public notice sign was posted at the facility.
2. A copy of the published display notice indicating the newspaper and date of publication.
3. The list of discharge site owners' names and addresses and copies of certified mail return receipts for owners, if different from the applicant.

Enclosed is a copy of the public notice that was published in the *Carlsbad Current Argus* newspaper on June 20, 2006. Also enclosed is the signed affidavit, payment fee (check #012717) and photograph of the public notice that was posted in a prominent location in front of the facility where it would be visible to the public passing by the site. Pertaining to the requirements for item 3, the discharge site owner is the same as the applicant, the U.S. Department of Energy, Manager, Dr. David C. Moody; therefore, no change is necessary.

If you have any questions or need additional information regarding this information, please contact Mr. H. L. Plum of my staff at (505) 234-7462.

Sincerely,

David C. Moody

David C. Moody,
Manager

cc: w/o enclosures
J. Kieling, NMED *ED
J. Bearzi, NMED ED
*ED denotes electronic distribution

CBFO:AMO:HLP:KJB:06-0568:UFC5486

01219

GROUND WATER

JUL 03 2006

BUREAU

7A Tuesday June 20, 2006
CURRENT-ARGUS

PUBLIC NOTICE 1

DP-831

Public Notice Correction

DP-831, U.S. Department of Energy's Waste Isolation Pilot Plant, Dave Moody, Manager, proposes to modify the Discharge Permit for the discharge and treatment of up to 33,000 gallons per day of domestic and industrial wastewater and up to 4,224,835 gallons per day of storm water runoff from synthetically lined and/or capped salt storage piles. This permit modification addresses additional potential contamination sources at the WIPP facility and incorporates all potential sources into a comprehensive closure plan. The sources addressed in the closure plan include three salt storage piles that are the result of constructing underground access drifts and rooms for the disposal of transuranic radioactive waste and transuranic radioactive mixed waste. Potential contaminants from these types of discharges include total dissolved solids, chloride and nitrogen compounds.

The previous public notice for this discharge permit incorrectly stated the storm water runoff volume as 3,231,360 gallons per day and originating from facility grounds and parking lots as well as the salt storage piles. The storm water volumes covered under this permit originate only from the salt storage piles and are based on the maximum runoff that could occur form a 24-hour/25-year storm event.

The facility is located 26 miles southeast of Carlsbad, in Sections 20, 21, 28, and 29, T22S, R31E, Eddy County, New Mexico. Ground water that could potentially be affected by the discharges ranges from the Culebra Member of the Rustler Formation at a depth of approximately 608 feet with a total dissolved solids concentration of approximately 234,000 mg/l to water in the Dewey Lake Formation south of the site at a depth of 225 feet with a total dissolved solids concentration of approximately 3,920 mg/l.

Information in this public notice was provided by the applicant and will be verified by the New Mexico Environment Department during the permit application process. NMED will accept comments and statements of interest regarding the application and will create a facility specific mailing list for persons who wish to receive future notices. Comments and statements of interest should be sent to Clint Marshall, DP-831, Ground Water Quality Bureau, PO Box 26110, Santa Fe, NM 87502. For additional information please call (505) 827-2900.

Applicant:
Dave Moody, Manager
U.S. Department of Energy
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

GROUND WATER

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BUREAU

AFFIDAVIT OF SIGN POSTING, DP- *831*

I certify, under penalty of law, that I fulfilled the ground water Discharge Permit public notice requirements of Section 20.6.2.3108.A.1 NMAC. I prominently posted a synopsis of the public notice (prepared by NMED), in English and in Spanish, at a conspicuous public location, approved by NMED, at or near the proposed facility for 30 days. I am aware that there are significant penalties for false certification including the possibility of fines. I have included a payment of $15.00 for the poster (If public notice option 1 or 2 was selected).

David C. Mooty

Signature of Applicant

6/29/06

Date

cm

New Mexico Environmental Department
Ground V[illegible] Quality Bureau

Acknowledgement of Receipt

Acknowledgement of Receipt of Check/Cash

I hereby acknowledge receipt of Check No. #012717 Dated. 6/19/06
or cash, received in the amount of $ 15.00 from Washington Tru Solutions
for Waste Isolation Pilot Plant DP-831 318
(Facility Name) (DP No.) (AI ID)

Copy Made for Check Processing ____________ Date ____________

For Central File Activity ____________

Submitted to ASD by: ____________ Date: ____________

Received in ASD by: ____________ Date: ____________

Filing Fee [ ] New Facility [ ] Renewal [ ]

Modification [ ] Other [X] (Explain) Poster fee

Organization Code ____________ Application FY ____________

To be Deposited in the Ground Water Section Discharge Plan Fees.

Full Payment [ ] or Annual Increment [ ]

WASHINGTON TRU SOLUTIONS LLC
P.O. Box 2078
Carlsbad, NM 88221

CARLSBAD NATIONAL BANK
PO Box 1359
Carlsbad, NM 88220

012717

VOID

Date Jun/19/2006 Pay Amount 15.00***

Pay ****FIFTEEN AND XX / 100 DOLLAR****

To The Order Of
NEW MEXICO ENVIRONMENT DEPARTMENT
PO Box 26110
1190 St. Francis Dr.
Santa Fe, NM 87502

Authorized Signature

DP-831

⑈012717⑈ ⑆112017971⑆ 51225⑈

State of New Mexico
ENVIRONMENT DEPARTME...
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2918
Fax (505) 827-2965

BILL RICHARDSON
GOVERNOR

RO[N CURRY]
SECRETARY

CINDY PADILLA
ACTING *DEPUTY SECRETARY*

May 23, 2006

RE: Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant

Dear Discharge Permit Applicant:

The New Mexico Environment Department (NMED) received a Ground Water Discharge Permit Application from you on March 8, 2005. Pursuant to Section 20.6.2.3106 NMAC of the New Mexico Water Quality Control Commission Regulations (20.6.2 NMAC), NMED determined on March 10, 2005 that your application is administratively complete.

Within 30 days of the submission of an administratively complete Discharge Permit Application, you must provide public notice using one of the 3 options listed in Section 20.6.2.3108 NMAC. You selected public notice option # 2. The instructions and materials needed to complete this option are enclosed.

A technical reviewer will contact you within the next few months if additional information is needed to process your application. If you have a deadline of concern in the interim or any questions, please call the Ground Water Quality Bureau at (505) 827-2900.

Sincerely,

Naomi Davidson

for William C. Olson, Chief
Ground Water Quality Bureau

Attachments: Public Notice 1 (mail to property owner)
Public Notice Synopsis (for newspaper display ad)
Instructions for Option #2
Affidavit (return to NMED)
Invoice ($15 fee for poster – please submit payment to NMED)
Poster

Public Notice 1
DP-831

Public Notice Correction

DP-831, U.S. Department of Energy's Waste Isolation Pilot Plant, Dave Moody, Manager, proposes to modify the Discharge Permit for the discharge and treatment of up to 33,000 gallons per day of domestic and industrial wastewater and up to 4,224,835 gallons per day of storm water runoff from synthetically lined and/or capped salt storage piles. This permit modification addresses additional potential contamination sources at the WIPP facility and incorporates all potential sources into a comprehensive closure plan. The sources addressed in the closure plan include three salt storage piles that are the result of constructing underground access drifts and rooms for the disposal of transuranic radioactive waste and transuranic radioactive mixed waste. Potential contaminants from these types of discharges include total dissolved solids, chloride and nitrogen compounds.

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The facility is located 26 miles southeast of Carlsbad, in Sections 20, 21, 28 and 29, T22S, R31E, Eddy County, New Mexico. Ground water that could potentially be affected by the discharges ranges from the Culebra Member of the Rustler Formation at a depth of approximately 608 feet with a total dissolved solids concentration of approximately 234,000 mg/l to water in the Dewey Lake Formation south of the site at a depth of 225 feet with a total dissolved solids concentration of approximately 3,920 mg/l.

Information in this public notice was provided by the applicant and will be verified by the New Mexico Environment Department during the permit application process. NMED will accept comments and statements of interest regarding the application and will create a facility specific mailing list for persons who wish to receive future notices. Comments and statements of interest should be sent to Clint Marshall, DP-831, Ground Water Quality Bureau, PO Box 26110, Santa Fe, NM 87502. For additional information please call (505) 827-2900.

Applicant:
Dave Moody, Manager
U.S. Department of Energy
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

Public Notice Synopsis, DP-831
(for sign & newspaper display ad)

Newspaper display ad must be at least 2 inches by 3 inches in size and must be published for at least one day in a section other than the classifieds or legals.

PUBLIC NOTICE
NOTICIA PUBLICA

Correction of Discharge Permit Modification / Corrección del Aplicación para Modificación del Permiso de Descarga: For up to 4,224,835 gallons per day of stormwater and up to 33,000 gallons per day of domestic and industrial wastewater to evaporation ponds / Hasta 4,224,835 galones por día de agua de lluvia y hasta 33,000 galones por día de aguas residuales domésticas y industriales a las charcas de evaporación

Applicant & Discharge Location / Solicitante & Sitio de Descarga: Waste Isolation Pilot Plant, US Dept of Energy, 26 miles southeast of Carlsbad

For More Information / Para Más Información (DP-831):
Ground Water Quality Bureau / Sección de Agua Subterranea
NM Environment Department / Departamento del Medio Ambiente
(505) 827-2900 www.nmenv.state.nm.us (public notices)

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
May 11, 2006

GROU:::D WATER

MAY 1 8 2006

BUREAU

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Infiltration Controls, As-Built Run-Off Volumes, and Pond Design Capacities Associated With the Draft DP-831 Permit

Dear Mr. Marshall:

The purpose of this letter is to provide you with the run-off volumes for each of the stormwater Infiltration Control Ponds noted in the draft DP-831 permit in accordance with your verbal request on May 2, 2006. This information was requested by you due to our comment regarding the draft permit's condition that states:

The permitted discharge consists of up to 23,000 gallons per day (gpd) of sewage effluent, up to 2,000 gpd of non-hazardous brine water, up to 8,000 gpd of non-hazardous miscellaneous water, up to 100 gpd of neutralized acid wste, and up to 3,231,260 gpd of stormwater runoff.

In lieu of the permit establishing a maximum allowable discharge, the Permittees suggest the following language:

The permitted activities consist of:

- The discharge of up to 23,000 gallons per day of wastewater to the sewage lagoons and up to 2,000 gallons per day to Evaporation Pond B.
- The discharge of up to 8,000 gallons per day of non-hazardous wastewater into the H-19 Evaporation Pond.
- The collection and evaporation of stormwater run-off in evaporation ponds as follows:

Evaporation Pond	Drainage Area	Run-off volumes (3.90 inch rainfall event)[1]	Pond Capacity[2]
Salt Pile Evaporation Pond	690,100 square feet	1,677,633 gallons	5,506,989 gallons
Salt Storage Extension Basin w/ Cell A and Cell B	1,047,800[3] square feet	2,547,202 gallons	4,170,732 gallons

[1] Run-off volumes assume 100 percent run-off since infiltration coefficients are unknown and can only be estimated. This also includes the volume that falls onto the surface area of the pond.
[2] Capacity is the maximum capacity without any freeboard.
[3] Current configuration with only Cell A has a drainage area of 538,000 square feet, run-off volumes for the 3.90 inch rainfall event is 1,307,878 gallons.

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With respect to the stormwater infiltration controls, the suggested permit language quantifies the volume of run-off from the drainage areas reporting to each evaporation pond in the event of the 25-year, 24-hour storm event of 3.90 inches. As noted in our September 12, 2005 letter outlining our maintenance plan for erosion control and drainage enhancements for the Salt Pile cover, a berm has been constructed on the north side of the covered salt pile that will divert run-off during significant storm events to a [still to be constructed] armored discharge chute in the north east corner of the pile. The volume of diverted water will be dependent upon the intensity and duration of the precipitation event; however the Salt Pile Evaporation Pond has sufficient available capacity to contain the additional diverted water.

If you have any questions or require additional information, please contact me at (505) 234-7462.

Sincerely,

H. L. Plum
RCRA Program Manager

cc:

J. Bearzi, NMED	*ED
J. Kieling, NMED	ED
S. Zappe, NMED	ED
W. Olsen, NMED	ED
CBFO M & RC	

*ED denotes electronic distribution

CBFO:AMO:HLP:KJB:06-0554:UFC 5486.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JAN 26 2006

GROUND

JAN 30 2006

BUREAU

Mr. Clint Marshall
Groundwater Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Sewage Lagoon Leak Testing Results and Liner Integrity Evaluations, Corrective Action Plan, Conditional Approval, December 22, 2005

We received your letter granting conditional approval of our proposed corrective action plan December 28, 2005. You requested that we provide you additional information regarding plans to address protection of synthetic lining materials at the edges of the sewage lagoons, control of surface water drainage away from pond perimeters, correction of erosion problems, and placement of permanent or sacrificial material to allow removal of solids from a facility. In our telephone conversation on Friday, January 20, 2006, we discussed these issues. By this letter, I am providing written confirmation of the actions discussed that will address your concerns.

- What measures will be taken to protect the edges of Ponds 1A, 1B, 2A, 2B, A, B, C, from stone damage and traffic damage?

We are implementing administrative controls to limit the amount of foot and vehicle traffic to these areas. This will lessen the possibility of such traffic on the liners at the edges of these facilities. Vehicle traffic will be limited to required maintenance and construction activities. Sign(s) will be posted to assure that personnel are aware of the need to avoid walking on the liner and to take care not to damage the liner when it is absolutely necessary to walk on the liner.

- How will we control surface water drainage to direct rainfall runoff away from the pond perimeters?

We have planned maintenance for these facilities that includes a repair or replacement schedule for the synthetic liners used. Due to the nature of the materials of construction of these facilities (turf re-enforcement mats filled with soil and covered to stabilize the banks) and the fact that these would be damaged should grading be done at prior to planned work occurring, we are planning to address the drainage issues at the time repair or when liner replacement of liners occurs. This work will begin with the replacement of the liners for Ponds 2A and 2B. This is anticipated to begin by July 2006. Due to the location of these facilities many of the drainage issues that exist at the east end of the sewage lagoon facility are expected to be addressed with the completion of this work.

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- How will we correct erosion control problem and redirect drainage away from the edges of H-19 Evaporation Pond?

Appropriate grading will occur where needed at this facility. The silt fence will continue to be maintained and soil will be graded on the outside of this facility as needed.

- Will you be installing a layer of sacrificial material or concrete ramp to allow access into the facility to prevent damage during the movement or removal of materials?

Installation of either a sacrificial layer of synthetic liner or placement of a mat of cement to provide access to this facility will be made to allow access and lessen the possibility of damage to the integrity of the facility liner.

It is my understanding that you concur with the proposed actions discussed above and that they address the concerns expressed in your conditional approval of our Corrective Action Plan on December 22, 2005. All other work will be performed as described in the Corrective Action Plan submitted to your office on November 3, 2005.

Sincerely,

R. C. Plum, Manager
RCRA Program

cc:

C. Padilla, NMED	* ED
J. Bearzi, NMED	ED
J. Kieling, NMED	ED
S. Zappe, NMED	ED
T. Klein, NMED/AIP	ED

CBFO:AMO:HJP:KJB:06-0506:UFC5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JAN 10 2006

GROUND WATER

JAN 11 2006

BUREAU

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Salt Pile Infiltration Controls Project As-Built Drawings

Dear Mr. Marshall:

The purpose of this letter is to provide you with As-Built Drawings of the Salt Pile Infiltration Controls Project. These drawings are being submitted in accordance with your letter dated August 25, 2005, regarding response to proposed construction design changes to the SWIC Pond A. The following drawings are enclosed:

23-C-011-W1, Salt Pile Infiltration Controls New Design
23-C-011-W2, Salt Pile Infiltration Controls Salt Storage Extension New Topography & Grading Plan
23-C-011-W3, Salt Pile Infiltration Controls Salt Pile Evaporation Pond Plan and Details
23-C-011-W4, Salt Pile Infiltration Controls Salt Pile South-North Cross Section
23-C-011-W5, Salt Pile Infiltration Controls Salt Pile West-East Cross Section
23-C-011-W6, Salt Pile Infiltration Controls Salt Storage Extension North-South Cross Section
23-C-011-W7, Salt Pile Infiltration Controls Salt Storage Extension West-East Section
23-C-011-W8, Salt Pile Infiltration Controls Engineering Details
23-C-011-W9, Salt Pile Infiltration Controls Engineering Details
23-C-011-W10, Salt Pile Infiltration Controls Engineering Details
23-C-011-W11, Salt Pile Infiltration Controls Storm Water Ponds No.1 & No.2 Plan and Sections
23-C-011-W12, Salt Pile Infiltration Controls Storm Water Pond "A" New Topography and Details
23-C-011-W13, Salt Pile Infiltration Controls Salt Pile Run-off Ditches Evaporation Pond
23-C-011-W14, Salt Pile Infiltration Controls Salt Hauling Road Culvert
23-C-011-W15, Salt Pile Infiltration Controls Salt Hauling Road Concrete Culvert

If you have any questions or require additional information, please contact me at (505)234-7462.

Sincerely,

H. L. Plum
RCRA Program Manager

Enclosure

*ED Denotes Electronic Distribution
CBFO:AMO:HJP:KJB:06-0501:UFC5486

cc: w/enclosure
S. Zappe, NMED * ED
CBFO M & RC

cc: w/o enclosure
W. Olsen, NMED ED
J. Bearzi, NMED ED
J. Kieling, NMED ED

*ED Denotes Electronic Distribution
CBFO:AMO:HJP:KJB:06-0501:UFC5486

BILL RICHARDSON
Governor

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

RON CURRY

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(Domestic Mail Only; No Insu
For delivery information visit our
OFFICI
Postage $
Certified Fee
Return Reciept Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
Total Postage & Fees $
Lloyd L. Piper, Ac
Waste Isolation Pi
US Dept. of Energy
P.O. Box 3090
Carlsbad, New Mexi
PS Form 3800, June 2002

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

December 22, 2005

Lloyd L. Piper, Acting Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Conditional Approval of the Corrective Action Plan based on the Sewage Lagoon Leak Testing Results and Liner Integrity Evaluations, DP-831, Waste Isolation Pilot Plant

Dear Mr. Piper:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received the November 3, 2005 letter titled, *Sewage Lagoon Electrical Leak Testing Results, Liner Integrity Evaluations and Corrective Action Plan*, from the U.S. Department of Energy Waste Isolation Pilot Plant (WIPP). The liner inspections and evaluations were conducted by Leak Location Services, Inc. (LLSI), which also provided recommendations for liner repairs. The leak testing and evaluations were conducted based on a request from NMED personnel during a site inspection conducted on August 11, 2004. The inspection plan for the sewage lagoon system was proposed in a letter from WIPP dated March 10, 2005, and approved in a letter from NMED dated April 7, 2005. NMED approves the Corrective Action Plan (CAP) with conditions described below.

The proposed CAP described in the November 3, 2005 letter is summarized as follows.

1. The Pond 2A and Pond 2B liners will be replaced in FY2006.
2. The Pond 1A and Pond 1B liners will be replaced in FY2007.
3. The Pond A liner will be inspected and repaired in FY2008.
4. The Pond B liner will be inspected and repaired in FY 2009.
5. The Pond C liner will be inspected and repaired in FY2010.

6. A single leak detected in the H-19 Pond will be repaired in FY2006.

While the proposed CAP goes beyond some of the repair recommendations of the contractor, LLSI, there are additional actions recommended by the contractor in Appendix 1B that are not included in the proposed CAP. NMED requires that the following corrective actions be included in the CAP for the sewage lagoon system and H-19 Evaporation Pond.

1. WIPP shall protect the edges of Ponds 1A, 1B, 2A, 2B, A, B and C from stone and stone/traffic damage. All surface water drainage shall be redirected away from pond perimeters. These actions shall be completed according to the recommendations in Appendix 1B of the July 8, 2005 report titled, *Sewage Lagoon Electrical Leak Testing Results, Liner Integrity Evaluations* by June 30, 2006. A report documenting the completion of these actions shall be submitted to NMED by July 31, 2006.

2. WIPP shall correct all erosion problems and redirect the drainage away from the edges of the H-19 Evaporation Pond. Eroded areas around the anchor berm and anchor trench areas shall be refilled and compacted. A sacrificial layer of Hypalon or similar material, or a concrete ramp shall be installed in one corner of the pond to prevent damage during movement of materials within the pond. These actions shall be completed according to the recommendations in Appendix 1B of the July 8, 2005 report titled, *Sewage Lagoon Electrical Leak Testing Results, Liner Integrity Evaluations* by June 30, 2006. A report documenting the completion of these actions shall be submitted to NMED by July 31, 2006.

Please respond to this letter within 30 days of receipt. If you have any questions, please contact me at 505-827-0027.

Sincerely,

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office
Steve Zappe, NMED-HWB

Gregory D. Huffaker, Jr.
Michael J. Moffett

huffaker@handmllc.com
mmoffett@handmllc.com

HUFFAKER & MOFFETT LLC

ATTORNEYS AT LAW

155 Grant Avenue
Post Office Box 1868
Santa Fe, New Mexico
87504-1868

Telephone: (505) 988-8921
Facsimile: (505) 983-3927

GROUND WATER

DEC 19 2005

BUREAU

December 16, 2005

Bill Olson
Groundwater Bureau Chief
Groundawater Quality Bureau
New Mexico Environmental Dept.
Harold Runnells Bldg., Room N-2250
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502-26110

Re: Inspection of Public Records Act Request

Dear Mr. Olson:

I have been referred to Mr. Clint Marshall for access to the bureau's public records concerning Discharge Permit DP831. Mr. Marshall has been very cooperative in making this information available. He requested that I send you this letter formalizing my request under the New Mexico Inspection of Public Records Act and under NMED Policy and Procedure 25-09.

Please call me if you have any questions.

Sincerely,

Gregory D. Huffaker, Jr.
For the Firm

GDH/daw

cc: Clint Marshall

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

GROUND WATER

NOV 07 2005

BUREAU

NOV 0 3 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Sewage Lagoon Electrical Leak Testing Results, Liner Integrity Evaluations and Corrective Action Plan

Dear Mr. Marshall:

We are writing to follow-up to our August 3, 2005, letter to you notifying the Ground Water Quality Bureau that the evaluation of the sewage lagoon and H-19 Evaporation Pond liners using an electrical leak detection methodology has been completed. In that letter, we committed to provide you with the results of the sewage lagoon electrical leak test results, the laboratory liner integrity results, and a corrective action plan within 90 days of our receipt of the liner laboratory results. We received those results on August 22, 2005.

LEAK TEST RESULTS AND EVALUATION

Attachment 1 contains three reports regarding the sewage lagoon liner inspections and evaluations conducted by Leak Location Services, Inc. (LLSI) and an independent specialist in geomembrane liners. The reports include:

- *Geomembrane Leak Location Surveys of Seven Sewage Lagoons and One Evaporation Pond Located at the WIPP Facility Near Carlsbad, New Mexico* dated July 8, 2005 (Attachment 1-A):
    - Results of Electrical leak testing of the liners for the sewage lagoons and the H-19 Evaporation Pond

- *Sewage Lagoons and Evaporation Pond Lining Inspection Site Visitation Summary Report* prepared by Ronald K. Frobel, dated June 24, 2005 (Attachment 1-B):
    - An expert geotechnical specialist's evaluation of the sewage lagoons and the H-19 Evaporation Pond.

*ED denotes electronic distribution

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- *Sewage Lagoons Pond Lining Evaluation Summary Laboratory Testing* dated August 22, 2005 (Attachment 1-C):
  - o The results of laboratory tests conducted on samples of the liner materials used in the construction of the sewage lagoons;
  - o Expert advice concerning the expected life of the liners in the lagoons;
  - o Recommendations related to the repair or replacement of the existing sewage and evaporation facilities.

In summary, a total of 46 leak signals were noted, with at least one leak signal recorded in each of the eight facilities inspected.

Fourteen leak signals are known to be the result of metal pipe penetrations through the liner to convey wastewater from one pond to another. Electrical conduction paths such as steel piping or fasteners that make continuity with ground establish a circuit and result in false leak signals. Therefore, only 32 of the 46 leak signals can be attributed to other causes and may be actual leaks in the liner material.

It is generally accepted that geomembrane liners installed with even the most rigorous construction quality assurance/quality control (CQA/QC) techniques have some leakage based on: (1) the permeability of the geomembrane material and (2) errors undetected by the CQA/QC techniques.

We have reviewed reports that investigated the potential presence of leaks occurring in impermeable liners. We believe that the number of leaks detected in the WIPP Sewage Lagoon synthetic liners is typical of the number of leaks that occur in newly installed single lined ponds using conventional methods following rigorous CQA/QC techniques and standards. In spite of the rigorous application of CQA/QC standards and protocols for installing synthetic liners, some incidental damage may occur during installation, inadequate field seaming or failures in factory seams that go undetected at installation.

The attached report by Southwest Research Institute (SwRI) (Attachment 2) discusses the development of the electrical leak detection method for the Environmental Protection Agency in the early 1980s. SwRI surveyed 61 sites (new and active waste storage sites). The 61 sites comprised 4,368,785 square feet of geomembrane. SwRI found an average of 3.23 leaks per 10,000 square feet of liner material surveyed with a range of 0.3 to 5 leaks per 10,000 square feet.

The results of the survey of the WIPP Sewage Lagoon System and H-19 Evaporation Pond performed by LLSI equates to 2.56 leaks per 10,000 square feet. The table below provides a comparison of the survey results for the WIPP Sewage Lagoon System and the H-19 Evaporation Pond to four different electrical leak detection surveys.

*ED denotes electronic distribution

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Comparison of leaks detected in WIPP Sewage Lagoon System and the H-19 Evaporation Pond to Typical Geomembrane Lined Facilities Constructed Using Modern Technology and CQA/QC Techniques

Survey Area	Surface Area (sq ft)	Total Leak Signals	Average Leaks per 10,000 (sq ft)	Total Leaks Detected minus known Pipe Penetrations (WIPP Ponds)	Leaks per 10,000 sq ft without known penetrations (WIPP Ponds)
SwRI (61 sites)*	4,368,785	1409	3.23 Range (0.3 to 5.0)	NA	NA
Study 1*	Not known	Not known	1.45	NA	NA
Study 2*	Not known	Not known	2.09	NA	NA
Study 3*	741,493.5	380	5.13	NA	NA
Cell 1A	21,156	1	0.47	1.00	0.47
Cell 2A	21,156	6	2.84	4.00	1.89
Cell 1B	9,480	3	3.16	0	0
Cell 2B	9,480	4	4.22	2.00	2.11
Pond A	15,912	11	6.91	10.00	6.28
Pond B	20,608	11	5.34	9.00	4.37
Pond C	20,608	9	4.37	7.00	3.40
H-19	14,400	1	0.69	1.00	0.69
WIPP total	132,800	46	3.46	34.00	2.56
WIPP total minus H-19	118,400	45	3.80	2.61	2.79

* See the following notes:

Referenced leak detection studies correspond to the following references included in Attachment 2.

SwRI: Detection and Location of Leaks in Geomembrane Liners Using an Electrical Method: Case Histories, Daren L. Laine and Michael P. Miklas, Jr. Southwest Research Institute, San Antonio Texas

Study 1: Leakage through Liner Systems, George Yazdani, MSc., P.E., Polyfex Inc. Geomembrane Lining Systems, Issue No. 7- March 1997

Study 2: Cost and Benefits of Geomembrane Liner Installation CQA, Geo Synthetics Conference 2001

Study 3: Lessons Learned from Electrical Surveys: Improvement of Leachate Collection Ponds Design, A.L. Rollin and T. Jacquelin, Somers International, Quebec, Canada

Analysis of the WIPP Sewage Lagoons and H-19 Evaporation Pond data and the referenced studies show that the sewage lagoons and evaporation ponds are in generally good condition and the number of leaks is comparable to the number of leaks found in newly installed single lined facilities.

In addition to the synthetic liners installed in each of the subject ponds, the ponds are lined with compacted caliche to at least 90 percent standard proctor density in

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accordance with ASTM D 698. The secondary liners meet the recommendations for sewage facilities with only soil or clay liners outlined in the New Mexico Environment

Department's publication titled *Recommended Standards for Wastewater Facilities, Policies for the design, review and approval of Plans and Specifications for Wastewater Collection and Treatment Facilities* (2003 Edition). Attachment 3 contains the specifications for the secondary liner for the sewage lagoons constructed in the mid-1980s (02203-009/010 *Stripping and Grading*) and the specifications for secondary liner for Evaporation Pond A and the addition of Ponds B and C in the mid-1990s (E-Z-261, *Specification for Earthwork*).

The only domestic water wells near the WIPP site are in groundwater from the upper portion of the Dewey Lake Formation. These are on the J. C. Mills Ranch located approximately three miles south-southwest of the WIPP surface facilities. These wells are the Barn Well and Ranch Well used for livestock watering and the commercial sale of water for construction and oil field use.

The WIPP sewage facilities perform an essential function by treating wastewater from the plant in an environmentally sound manner. Despite the age of the current system, it was well installed using rigorous CQA/QC techniques and has held up well. The leak detection and inspection results confirm that the liners are in generally good condition.

RECOMMENDATIONS OF LINER CONSULTING SERVICE

Below are the recommendations made by liner specialists in the attached report on the WIPP sewage lagoons and an evaporation pond (Attachment 1-C):

- Replace all temporary patches, repair visible damage and repair all leaks found by leak testing. (The temporary patches are used on small holes and tears above the water line until a qualified liner repair contractor can be brought in for permanent repair.)
- Remove all effluents and sediment.
- Perform a visual inspection of the liner below water line.
- Protect edges from stone and traffic damage.
- Provide positive drainage away from the pond edges.
- Replace the liner of Settling Pond 2A due to de-lamination of the top Hypalon® surface at the water line.
- Repair the liners in the remaining seven ponds.

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PROPOSED CORRECTIVE ACTION PLAN

The leak detection procedure indicated one leak in the H-19 Evaporation Pond which is located in an easily accessible area that will be repaired in FY2006. Rather than attempting to repair the aged liners in the 2A/2B and 1A/1B pond systems, DOE has decided to replace both liners in the next two years. DOE has also determined, based on information provided in the consultant's report (Attachment 1-C) that we should expect another 10+ years of service life for Evaporation Pond A, B, and C liners. We have decided that we will perform an inspection of these liners by removing the sediment in the area indicated to have a leak and make needed repairs. If a liner's condition is found upon inspection to be in a much worse condition than expected, it will be scheduled for replacement. The following schedule is proposed for the liners in each pond, weather permitting and subject to contractor availability.

Replace Pond 2A and 2B liner	FY2006
Replace Pond 1A and 1B liner	FY2007
Inspect/Repair Evaporation Pond A liner	FY2008
Inspect/Repair Evaporation Pond B liner	FY2009
Inspect/Repair Evaporation Pond C liner	FY2010

The DOE will notify the NMED of the status of liner activities semi-annually at the time the discharge monitoring report is submitted. The schedule allows sufficient time to rotate ponds in and out of service and dry them to allow construction activities to take place. We believe that the proposed corrective actions outlined above are protective of human health and the environment and represent a reasonable time frame to complete the work.

Please contact me at (505) 234-7462, if you have any questions or concerns regarding the planned liner replacement activities or require additional information.

Sincerely,

H. L. Plum
RCRA Program Manager

Enclosure

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cc: w/enclosure
W. Olsen, NMED
S. Zappe, NMED
T. Klein, NMED/AIP

cc: w/o enclosure

J. Bearzi, NMED	*ED
J. Kieling, NMED	ED
C. Padilla, NMED	ED
N. Stone, EPA-Region VI	ED

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State of New Mexico
ENVIRONMENT DEPARTMENT
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BILL RICHARDSON
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RON CURRY
Secretary

DERRITH WATCHMAN-MOORE
Deputy Secretary

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7004 0750 0001 3310 3428

Sent To Dr. Ines R. Triay,
Waste Isolation Pl
US Dept. of Energy
P.O. Box 3090

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 20, 2005

Dr. Ines R. Triay, Acting Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Approval of Extension Request for Construction of Cell B of the Salt Storage Area Extension, DP-831, Waste Isolation Pilot Plant

Dear Dr. Triay:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received a letter dated September 12, 2005 from the U.S. Department of Energy Waste Isolation Pilot Plant (WIPP) requesting an extension of time to construct Cell B of the Salt Storage Area Extension. Condition 2 of the Discharge Permit Modification, DP-831, dated December 22, 2003 requires construction activities for Cell B to be completed by October 2006 in accordance with the schedule provided by WIPP dated July 24, 2003.

The reason stated for the extension is that based on current mining rates, the storage capacity provided by Cell B will not be needed until late 2007. Due to variability in excavation rates, WIPP requests that the October 2006 completion date be replaced with 60-day notification prior to beginning construction of Cell B.

NMED hereby approves the extension request as provided for in Condition 2 of the Discharge Permit Modification dated December 22, 2003.

If you have any questions regarding this action, please contact me at 505-827-0027, or by e-mail at clint.marshall@state.nm.us.

Sincerely,

Clint Marshall

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office
Steve Zappe, NMED-HWB

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

SEP 2 3 2005

Mr. Steve Zappe
Hazardous Waste Bureau
New Mexico Environment Department
2909 Rodeo Park Drive East, Bldg 1
Santa Fe, New Mexico 87505

Subject: Waste Isolation Pilot Plant HWFP No. NM 4890139088 Exhaust Shaft Catch Basin

Dear Mr. Zappe:

The purpose of this letter is to provide follow-up information regarding the release of water from the Exhaust Shaft Catch Basin (Catch Basin) on August 18, 2005. You were initially provided information in a verbal notification of this occurrence on August 19, 2005, followed by a letter dated September 1, 2005.

The release was caused by damage to the sidewalls and the bottom of the basin due to material and debris falling down the shaft. The specific debris that caused the damage has not yet been identified. A video inspection of the Exhaust Shaft was performed on August 19, 2005. This inspection found damage to an electrical cable and a loose piece of salt evaporite buildup. Inspection of the Catch Basin from a safe distance showed an apparent increase in the amount of fallen salt debris and instrumentation cable in the basin. It should be noted that access to the Exhaust Shaft is not possible due to safety concerns caused by falling material and debris.

The use and operation of the Catch Basin were discussed in NMED's letter to the Permittees dated July 7, 2000 (enclosed). As indicated in that letter, the use of "This catch basin is an integral part of the mine dewatering process.... It is a collection device necessary to control the accumulation of mine water." NMED's determination in this letter indicated the management practice(i.e, the use of the Catch Basin) met the intent of EPA's discussion of alternative controls in its November 30, 1989 letter referenced in NMED's response. We have now determined that continued use of the Catch Basin in the confined work space at the base of the Exhaust Shaft is unacceptable. This area has significant worker safety issues due to falling debris barring safe entry to perform maintenance. The continued operation of the Catch Basin in this location is considered unsafe. To address worker safety concerns, an alternative approach for collection of water at the exhaust shaft follows.

During our conversation on August 19, 2005, an alternative means of collecting water in the Exhaust Shaft was proposed. As we discussed, a new system will be put in place to collect the water from the Exhaust Shaft that fully replaces the Catch Basin.

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The new system will consist of a series of boreholes drilled in the South 400 drift at selected locations in the area between the East 140 drift and the East 300 drift, which will intercept the open fracture water flow in Marker Bed 139. This location was selected because the system can be installed, operated, and maintained without entering the exhaust air flow of the waste disposal circuit. The final number, locations, and size of boreholes will be determined as installation progresses. Dissolution is not expected to be a problem since flow in the open fractures in Marker Bed 139 will be fast, much of the flow path is in anhydrite, and the boreholes will be pumped as quickly as water is produced. Past experience indicates that vertical boreholes are quite stable and require little, if any, maintenance compared to excavations of other shapes.

Fractional horsepower submersible pumps capable of operating in either automatic or manual mode will be placed near the bottom of each borehole. The pumps will feed into a hose that will carry the water from the borehole location to a collection point located in the east S550 alcove off of the E140 drift. The collection point will include closed and appropriately labeled containers (typically of 55 or 500 gallon capacity). These containers will be transported to the surface where the water will be surveyed, analyzed, and dispositioned in accordance with applicable permit conditions and regulations.

This method of collecting Exhaust Shaft water is expected to be as effective as the former configuration utilizing the Catch Basin, and eliminates potential hazards to workers from material that may fall from within the Exhaust Shaft. The existing Catch Basin will be removed from under the shaft, cleaned, and disposed of appropriately.

If you have any questions or require additional information, please contact Mr. H. L. Plum at 505-234-7462.

Sincerely,

Lloyd L. Piper, Acting Manager
DOE Carlsbad Field Office

R. D. Raaz, General Manager
Washington TRU Solutions LLC

Enclosure

cc:

C. Padilla, NMED	*ED
J. Bearzi, NMED	ED
J. Kieling, NMED	ED
W. Olson, NMED	ED
C. Marshall, NMED	ED

*ED denotes electronic distribution

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

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SEP 1 4 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Maintenance Plan for Erosion Control and Drainage Enhancements for the Salt Pile Cover

Dear Mr. Marshall:

The purpose of this letter is to advise you of our maintenance plans for the repair of erosion on the salt pile soil cover and installation of certain erosion control and drainage enhancements.

As you are aware, intense precipitation events received in September and November of 2004 resulted in significant erosion on the side slopes of the salt pile soil cover. The erosion was repaired in March 2005 and the hydromulch/seed mix was applied in April 2005. Heavy rains received in May and June of 2005 resulted in new erosion primarily on the south and east sides of the salt pile soil cover before vegetation could be established. This has resulted in more extensive initial maintenance action than had been anticipated for the soil cover.

An engineering evaluation has been conducted to develop a plan for repairing the soil cover erosion that includes features that minimize recurrence of the need for such extensive maintenance. The phased implementation and description of the planned enhancements is outlined below and depicted on the enclosed draft drawing:

- First, as part of Phase 1, we plan to construct a new haul road routed to the east of the salt pile to Cell A of the Salt Storage Extension. The construction of the new haul road facilitates the construction of the erosion controls and drainage enhancements discussed below in Phase 2. Additionally, relocation of the haul road will eliminate interruptions to salt handling operations should significant precipitation cause additional erosion to occur and will guard against potential damage to the underlying liner on the salt pile. The haul road will not alter the infiltration controls.
- Also included in Phase 1, a berm is planned to be constructed on the salt pile cap at the top of the north 3:1 slope that will divert water from the north east quarter of the salt pile down a lined discharge channel to the salt pile run-off ditch. The run-off ditch will convey the water to the salt pile evaporation pond. Existing accumulation of sediments in the lined ditches will also be removed.
- In Phase 2, the plan is to repair the erosion to the salt pile soil cover when the weather will be more suitable to promote the germination and establishment of native vegetation.

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Additional erosion control and drainage enhancements to the salt pile cover under consideration for Phase 2 include berms to direct run-off to a discharge chute near the center of the south side of the salt pile and the use of turf reinforcement mats. Such features are enhancements to the original design and the decision to implement these will be based on actual or anticipated performance of the cover system in resisting erosion. Conducting the repairs to erosion of the salt pile soil cover as Phase 2 of the effort will not impact the ability of the infiltration controls to collect, transport and store rainwater run-off for evaporation. The main function of the soil is to act as a ballast to prevent wind damage to the liner.

Please contact me at (505) 234-7462, if you have any questions or concerns regarding the planned maintenance and erosion control enhancements or require additional information.

Sincerely,

H. L. Plum, Manager
RCRA Program

Enclosure

cc:

C. Padilla, NMED	* ED
J. Bearzi, NMED	ED
J. Kieling, NMED	ED
W. Olsen, NMED	ED

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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

SEP 1 2 2005

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SEP 1 4 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Response to Request for Additional Information dated August 5, 2005

Dear Mr. Marshall:

The purpose of this letter is to respond to your August 5, 2005, request for additional information regarding the March 4, 2005, Discharge Permit Application. Enclosed is our response to each of the nine requests.

If you have any questions or require additional information, please contact me at (505) 234-7462.

Sincerely,

H. L. Plum
RCRA Program Manager

Enclosure

cc:
C. Padilla, NMED * ED
J. Kieling, NMED ED
J. Bearzi, NMED ED
W. Olsen, NMED ED
CBFO M & RC
*ED denotes electronic Distribution

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Responses to NMED Letter Dated August 5, 2005
RE: Request for Additional Information, D-831, Waste Isolation Pilot Plant
September 7, 2005

<u>NMED Item 1</u>. In Section 6.b, Monitoring Plan, WIPP refers to Tab 1 of the Application titled, "Additional Potential Contamination Sources" for the required information. Information for monitoring is not located in Tab 1. The application should make reference to the approved Discharge Permits dated April 29, 2003, and December 22, 2003 for this information.

<u>Response to Item 1</u>: We concur with your conclusion. Section 6.b. of the application should read "Not the subject of this DP Modification. See approved Discharge Permits Dated April 29, 2003 and December 23, 2003."

<u>NMED Item 2</u>. On Page 3 under Tab 1, Item 5 of the reclamation activities states that the Site Preliminary Design Validation (SPDV) pile was seeded with shallow rooted plants. Please provide the seed mix used in the revegetation activities.

<u>Response to Item 2</u>: The seed mix used for the SPDV re-vegetation activity included seeds for cool and warm seasons. Cool season (over-winter) planting included Millet and Winter Wheat. Warm season native grasses planted the following spring included: (Hachita) Blue Gramma, Buffalo Grass, Firewheel/Indian Blanket, Little Bluestem, Sand Dropseed and Plains Bristlegrass.

<u>NMED Item 3</u>. On Page 3 under Tab 1, Item 6 of the reclamation activities states that the SPDV pile is regularly inspected, monitored and maintained. Please provide more details on the frequency and type of inspections, monitoring and maintenance conducted at the SPDV pile.

<u>Response to Item 3</u>: Between 1994 and May of 2001, documented inspections of the SPDV pile were conducted by the Environmental Compliance Department. Following the second quarter of 2001, the WIPP Environmental Monitoring personnel have conducted inspections approximately every other month and following severe rain events. Repairs have been conducted on minor surface erosion channels and subsidence holes as necessary. These inspections and repairs were not conducted in accordance with a formal inspection procedure and were not documented.

Beginning in October 2005 SPDV Pile inspections will be incorporated into the WIPP procedure *Site Discharge Area Inspections*, WP 02-EM1022. This procedure contains the inspection protocols for the Salt Storage Areas and other infiltration controls currently conducted by Environmental Monitoring Personnel. The inspections will be conducted monthly and the observations and corrective measures will be documented and maintained a minimum of five years.

<u>NMED Item 4</u>. On Page 4 under Tab I, three piezometers are proposed, one each on the east, west and south sides of the SPDV pile. Please provide a map showing the locations of the proposed piezometers.

<u>Response to Item 4</u>: Three piezometers are proposed for installation around the Site Preliminary Design Validation (SPDV) pile to evaluate if shallow subsurface water (SSW) was generated beneath the SPDV pile prior to lining. Figure 1 (enclosed) is a map of the WIPP site identifying the location of the SPDV pile approximately 2000 feet east of the WIPP waste-handling shaft. Locations for the piezometers were determined by evaluating the contact between the Santa Rosa (SR) Formation and Dewey Lake (DL) Formation. An isopach map of the contact was developed using well log descriptions from shallow wells and borings. From this isopach map the dip of the contact was estimated to trend west-southwest from the SPDV pile.

All piezometers will be located beyond the liner cover anchor trench as presented in Figure 2 (enclosed). It is assumed that if infiltration into the pile had occurred prior to liner installation and a SSW zone had developed

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at the DL/SR contact, a mounded w... able would have occurred creating a rad... gradient predominantly in the direction of the contact slope. Piezometers PZ-13 and PZ-14 are located to the west-southwest of the SPDV pile to determine what down-gradient impact there might have been. PZ-15 is located up the presumed gradient of the SR/DL contact. This well will serve to assess any up-gradient impacts. The total depth of each of the three proposed wells will be determined in the field based upon examination of core and drill cuttings. Expected depths are not expected to exceed 100 feet for any of the proposed wells.

NMED Item 5. On Page 5 under Tab 2, Section A, the Application refers to language in the December 16, 1996, DP-831 Permit Renewal Application stating, "Closure plans for the sewage facility and evaporation ponds will specifically require that all lagoons and ponds will be pumped or evaporated and that all sludges be sampled to determine if hazardous constituents exist as defined by the Resource Conservation and Recovery Act (RCRA - 40 CFR 261). If hazardous constituents are detected, the sludges will be managed accordingly." DP-831 regulates discharges that are not necessarily defined as hazardous by RCRA. Please provide more details on how liquids and sludges will be disposed of upon closure of the facultative lagoon system and evaporation ponds regardless of whether they are classified as hazardous.

Response to Item 5: In accordance with the Discharge Permit Issued on April 29, 2003, any sludge from the sewage lagoons will be disposed in accordance with 40 CFR Part 503, Standards for the Use or Disposal of Sewage Sludge.

Sludge from storm water or brine evaporation ponds will be managed in the following manner. Upon closure, any liquids that have not evaporated will be collected in an acceptable container and characterized to determine that it meets the waste acceptance criteria for disposal at a permitted off-site disposal facility.

Any solids that remain in the lagoons will be removed, containerized and characterized as necessary to determine that they meet the waste acceptance criteria for a permitted off-site disposal facility. A flow diagram of the characterization and disposal process is included as Figure 3 (enclosed). Liquids and solids removed from any ponds will be disposed in accordance with applicable federal, state and local regulations.

NMED Item 6. On Pages 5-6 under Tab 2, Section B, the Application states that the active salt piles will be closed in accordance with the requirements of the Land Withdrawal Act (LWA), Section 4(b)(4). The LWA makes further reference to Sections 2 and 3 of the Act of July 31, 1947 (30 D.S.C. 602, 603) commonly referred to as the "Materials Act of 1947." NMED recognizes that WIPP is required to dispose of the salt tailings according to federal law, however more specificity is needed regarding the final disposition of the salt piles whether onsite or off site. Options for onsite disposal should include conceptual descriptions regarding technical components such as covers and storm water diversion structures. Plans for off site disposal should discuss possible entities to receive the salt product as well as expected uses. WIPP may amend closure plans at a future date to adjust for unforeseen circumstances and federal requirements.

Response to Item 6

As stated on pages 5, 6 under Tab 2, Section B, the salt tailings may be used on-site for backfilling the repository or as a construction for the perimeter berm that is proposed as part of the passive institutional controls. Under the WIPP Land Withdrawal Act, P.L. 102-579, as amended, salt tailings that are not needed for berm construction or facility backfill are to be sold under the Materials Act of 1947, 30 USC 602, 603. DOE is in the process of identifying possible uses for the tailings, potential buyers, and on-site and off-site disposal alternatives if needed. It is anticipated that the purchase and removal of salt by interested entities would occur during current facility operations.

NMED Item 7. On Pages 6-7 under Tab 2, Section C, the Application states that an investigation of the SPDV pile determined that no remedial measures were required according to NMED guidelines. Please specify the guidelines to which the Application is referring.

Response to Item 7: The investigation of the SPDV Pile identified total petroleum hydrocarbons (TPH) concentrations for samples analyzed in the laboratory that ranged from less than 10 mg/kg to 43 mg/kg. Specific guidelines for TPH concentrations in soils are found in 20.9.1.708.E. NMAC which states, "remediation shall be deemed adequate when the following conditions are met in a soil sample of what appears to be the most heavily contaminated soil:

1. the sum of benzene, toluene, ethyl benzene and xylene isomer concentrations is less than 500 mg/kg, with benzene individually less than 10 mg/kg; and

2. the TPH concentration is less than 1,000 mg/kg"

Any metals, VOCs and SVOCs detected were at very low levels that would not be considered significant and are orders of magnitude below current levels outlined in the New Mexico Environment Department guidance, NMED Technical Background Document for Development of Soil Screening Levels, Rev. 2.0 (February 2004; updated August 2004). A copy of the report entitled Characterization of the Site Preliminary Design Validation Salt Pile dated January 5, 1996, is enclosed. Not in file – separate bound document.

NMED Item 8. Please provide as-built plans and specifications for the grading and cover of the SPDV pile.

Response to Item 8: Plans and specifications that were included in the Request for Proposals are included as Attachment 1 to this response. This information includes the SPDV Salt Pile Reclamation Scope of Work with section and plan views, a letter recommending Claymax 600CL, and properties and installation guidelines pertaining to the recommended geosynthetic clay liner. However, note that the side slopes and grades were modified in the field during construction. The SPDV Pile was constructed with the following slopes:

West Slope	12:1 H/V
East Slope	16:1 H/V
North Slope	6:1 H/V
South Slope	6:1 H/V

The SPDV Pile was surveyed on August 30, 2005 to produce an As-Built drawing of the current topographic expression which is included in Attachment 1.

NMED Item 9. On Page 8 of Table 2 under Tab 4, Evaporation Pond 007b is described as once containing soap, cleaning fluids, oil and brine. Please provide additional information on the current status of this facility, the pond dimensions, descriptions of any liners, and a map showing its location.

Response to Item 9: Solid Waste Management Unit (SWMU 007b) was an unlined evaporation pond that was approximately 145 feet long by 145 feet wide. SWMU 007b was used between late 1983 and early 1984 to receive grey water from temporary showers that were used during the construction phase of the facility.

A sketch illustrating the former approximate location of Solid Waste Management Unit (SWMU) 007b is included in Attachment 2 in this response as Figure 16.1 – Sample Location Sketch – taken from the WIPP No Further Action (NFA) Petition for Solid Waste Management Units and Areas of Concern, DOE/WIPP 02-3221, Rev. 0. The evaporation pond SWMU 007b was located approximately 770 feet due west of the Waste Handling Shaft. NMED documented in The Assessment of Solid Waste Management Units at the Waste Isolation Pilot Plant (NMED/DOE/AIP-94/1) that based on process knowledge SWMU 007b received grey water from the showers and the waste contained soap, cleaning solutions and trace amounts of oil. Samples collected in October 1992 found that iron, barium, and aluminum were above background control sample results; however, the concentrations are well below RCRA Action Levels. No semi-volatile compounds or hydrocarbons were detected.

The current status of SWMU 007b evaporation pond is that the area was graded and seeded in the mid 1980's and is currently within the footprint of Storm Water Infiltration Control Pond A which is lined with a high density polyethylene liner. A No Further Action Petition has been filed with the NMED Hazardous Waste Bureau based on the rationale that concentrations of hazardous constituents are at acceptably low levels. A letter dated December 4, 2000 to Dr. Ines Triay and Mr. Joe Epstein from Mr. Steve Zappe, Subject: Review and Comments on the Facility Work Plan, Sampling and Analysis Plan is included in Attachment 2 and contains the Hazardous Waste Bureau's comments on WIPP Sampling and Analyses Plan for Solid Waste Management Units and Areas of Concern dated May 2000. Item 31 notes NMED's comments relative to the sampling plan for SWMU 007b stating:

- "Based on historical informa... provided for this site, NMED does not se... need to perform additional sampling at the subject SWMU."

NMED made this determination based on the fact that 1) the pond presumably only received grey water from personnel showers and currently receives storm water and domestic water resulting form fire flow performance testing, and 2) detected concentration of lead and nickel are only slightly above background concentrations. NMED believes that enough information is available from this site to warrant NFA."

FIGURES

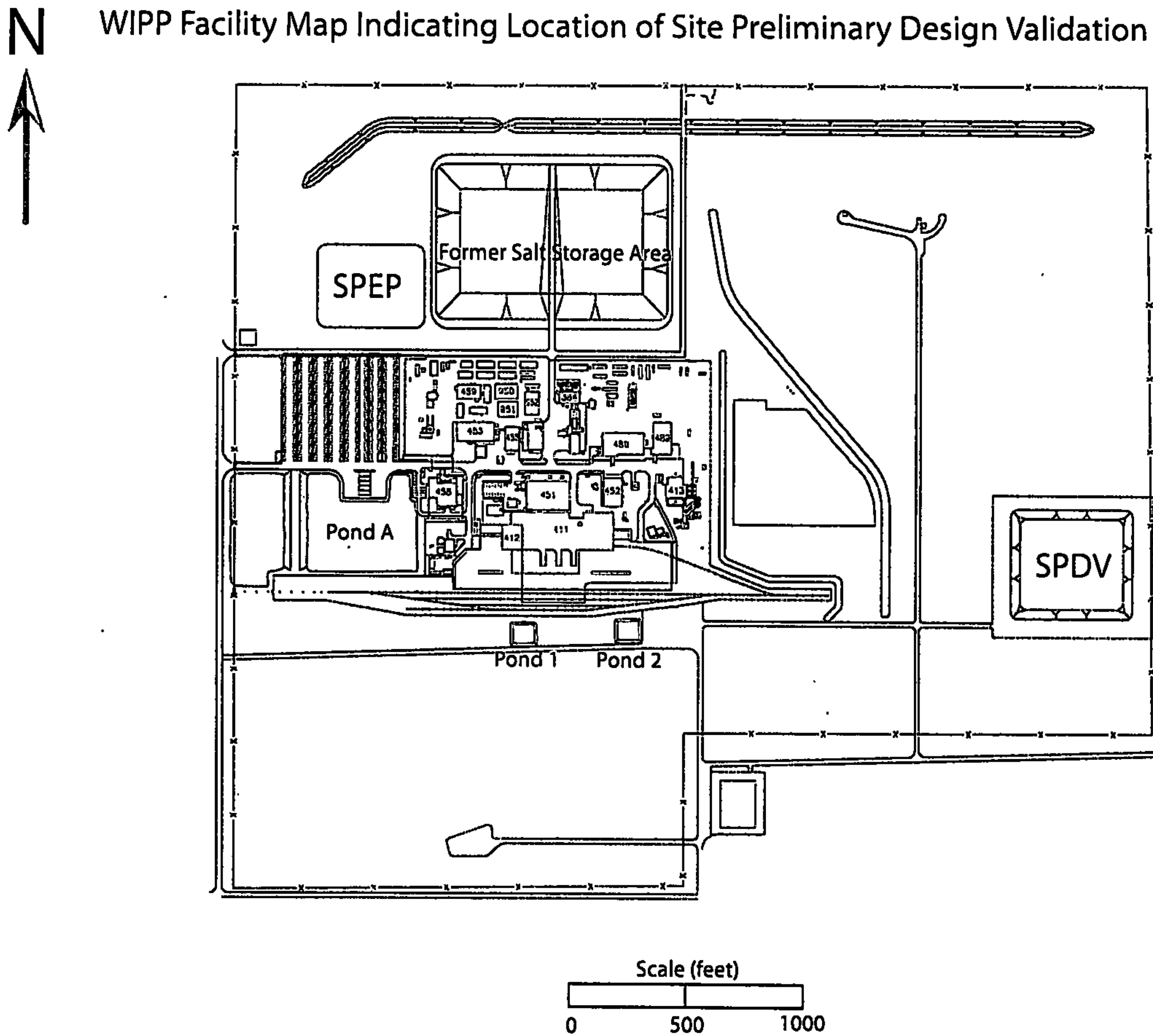
Figure 1
WIPP Facility Map Indicating Location of Site Preliminary Design Validation Pile

Figure 2
Site Preliminary Design Validation Pile with Identified Proposed Piezometer Locations

Figure 3
Characterization and Disposal of Liquids and Sludge from Sewage Treatment and Infiltration Control Ponds

Figure 1

WIPP Facility Map Indicating Location of Site Preliminary Design Validation (SPDV) Pile



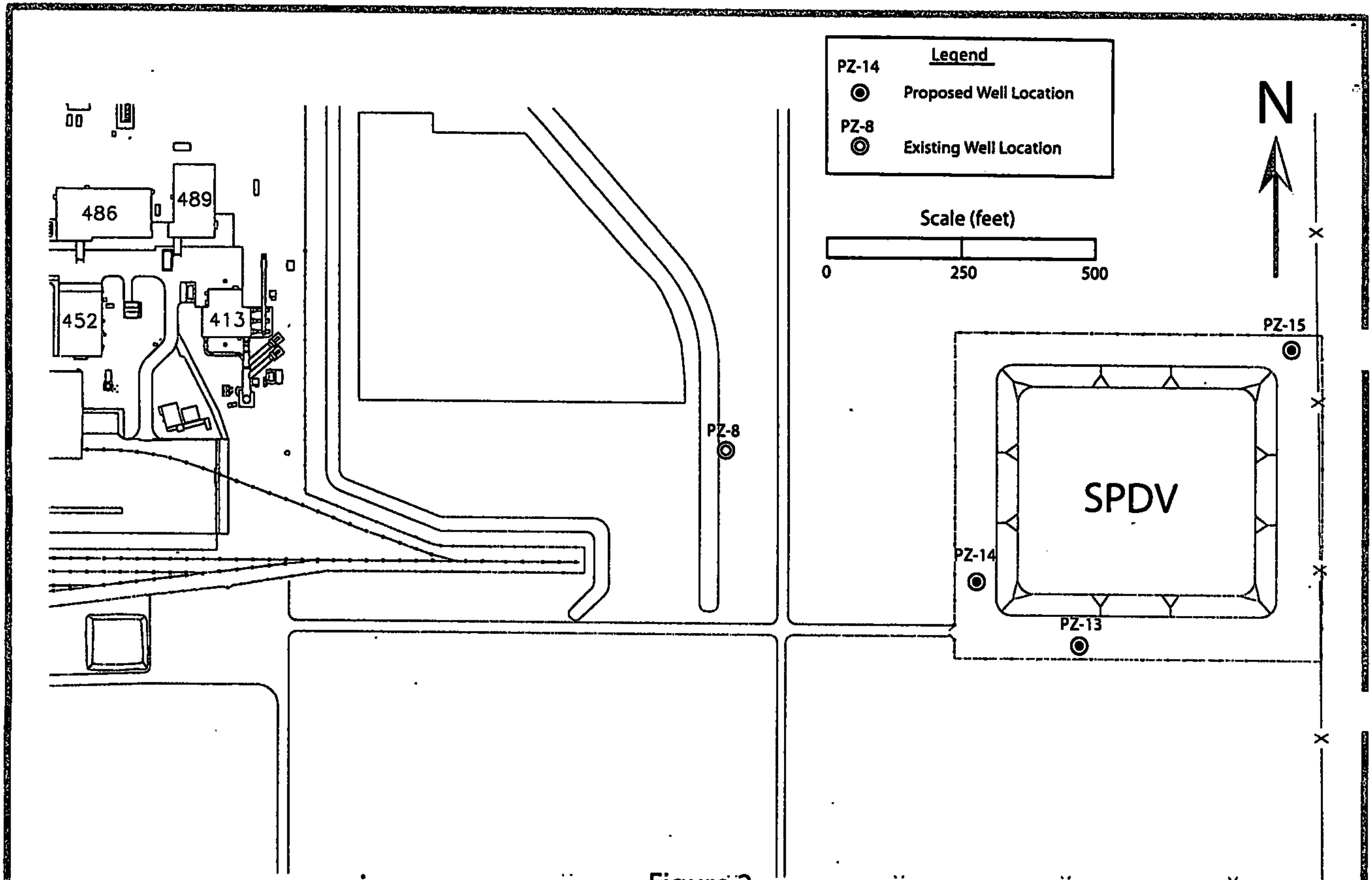


Figure 2
Site Preliminary Design Validation (SPDV) Pile With Identified Proposed Piezometer Locations

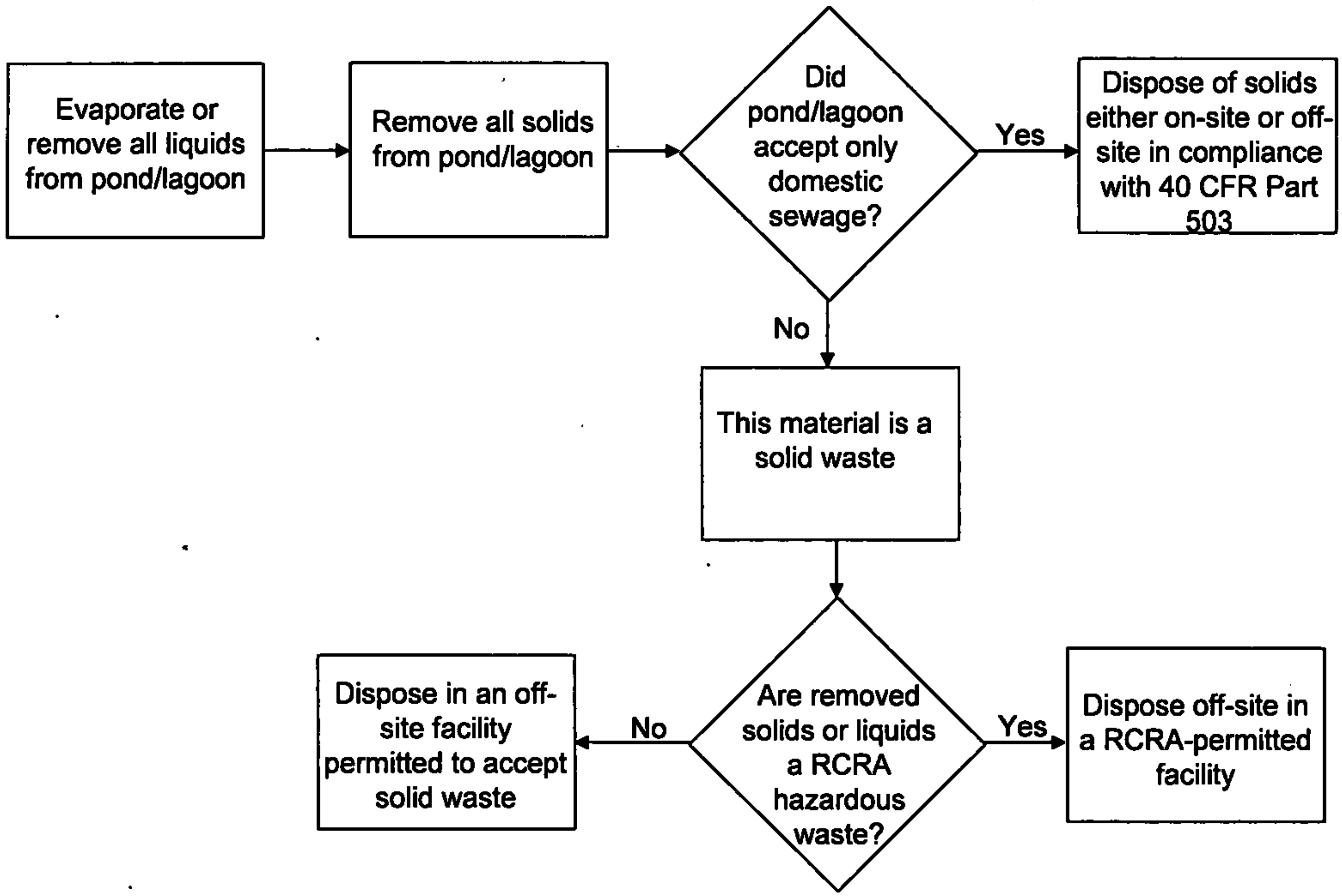


Figure 3: Characterization and Disposal of Liquids and Sludge from Sewage Treatment and Infiltration Control Ponds

Attachment 1

SPDV Salt Pile Reclamation Scope of Work and SPDV Pile Cross Section and Plan Views

October 11, 1999 Letter from Mr. David Pope, Ag Services Re: GCL Commitment and Submittals, WIPP SPDV Salt Pile Reclamation Project

Topographic Map of SPDV Salt Pile 8/30/05

SPDV SALT PILE
RECLAMATION
Scope of Work

Purchase Requisition Number: 2735
Date: 14 July 1999
Requestor: D.C. Lynn, WIPP Land Use Coordinator

I. Scope of Work:

Phase 1: Re-Contour the existing salt pile of an estimated average height of 15 feet above near ground surface elevation while maintaining the initial basal footprint of the pile (see attachment).

Phase 2: Establish a 4:1 horizontal to vertical slope ratio along the sides to deter veneer failure. The bulk of the pile should slope at (approximately) a three per cent grade toward the center crown to prevent ponding (see attachment).

Phase 3: Once contouring is complete, the pile will be capped with a geosynthetic liner that will encompass approximately 319,000 square feet. The liner will be rolled out over a subbase of approximately six inches of native material that contains no particles larger than ¾ inch in diameter (see attachment).

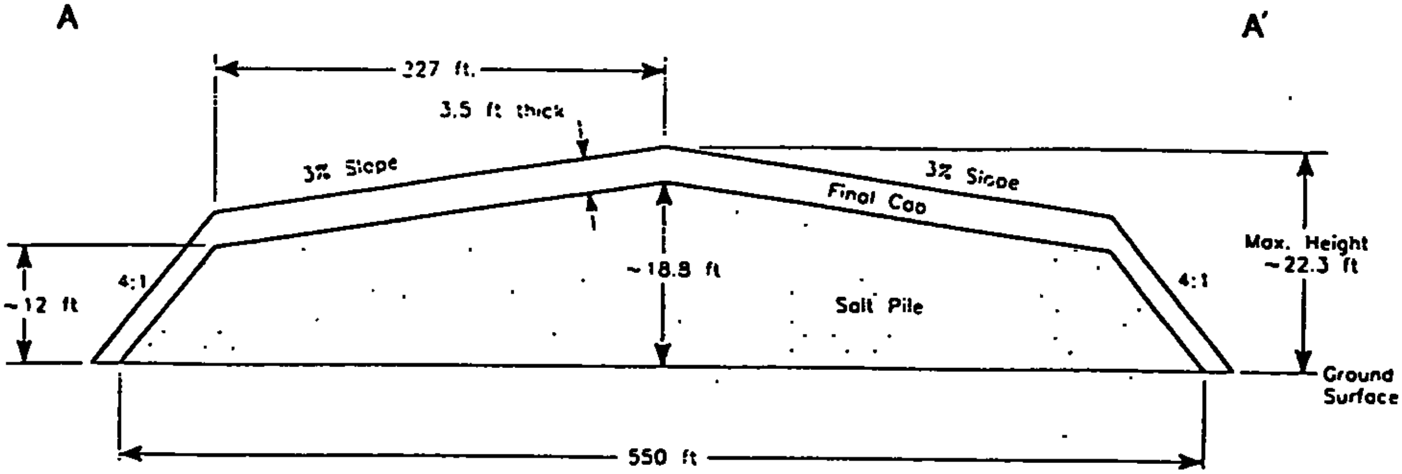
Phase 4: After the liner has been deployed, (a minimum of) three feet of soil rooting medium consisting of 15% (by weight) ½ inch crushed rock (to minimize wind erosion) will be established (see attachment). [Note: The majority of topsoil, excluding the crushed rock, is located near the existing pile, therefore, transportation of this material will be unnecessary. Mixing of the rock with the topsoil will be the responsibility of the contractor.] After establishing the rooting medium, the area will be seeded by WIPP Land Management personnel.

Phase 5: Hydromulch the surface after planting.

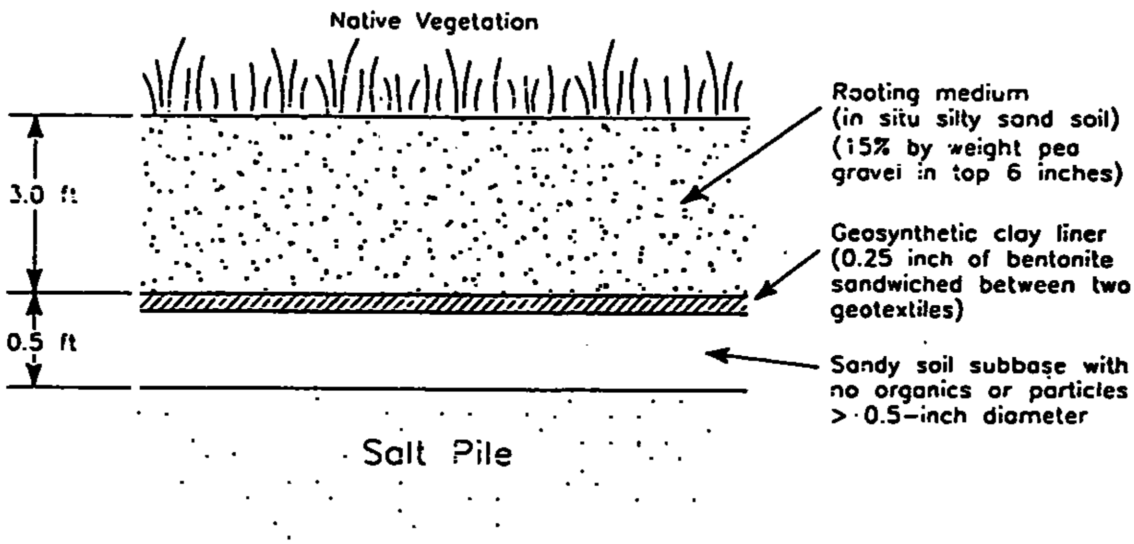
II. Period of Performance:
1. Work commencement within one month of notification from WIPP Land Use Coordinator that site conditions are ready for reclamation (e.g., archaeological clearance is complete)
2. Project completion should not exceed 90 days.

III. Contingencies:
1. Each phase of reclamation will be followed by an inspection. These will be conducted by Environmental Monitoring/Land Management personnel and are required before contractor can proceed to the next phase.
2. WIPP (Land Management) will provide:
   - technical expertise
   - appropriate seed mix
   - equipment for planting
   - manpower to seed the area
   - requisite authorization (e.g., Land Use Request)

IV. Contractor Shall:
1. Submit a complete job hazard analysis in accordance with WIPP safety requirements
2. Adhere to all WIPP safety requirements
3. Respond immediately to any stop work order

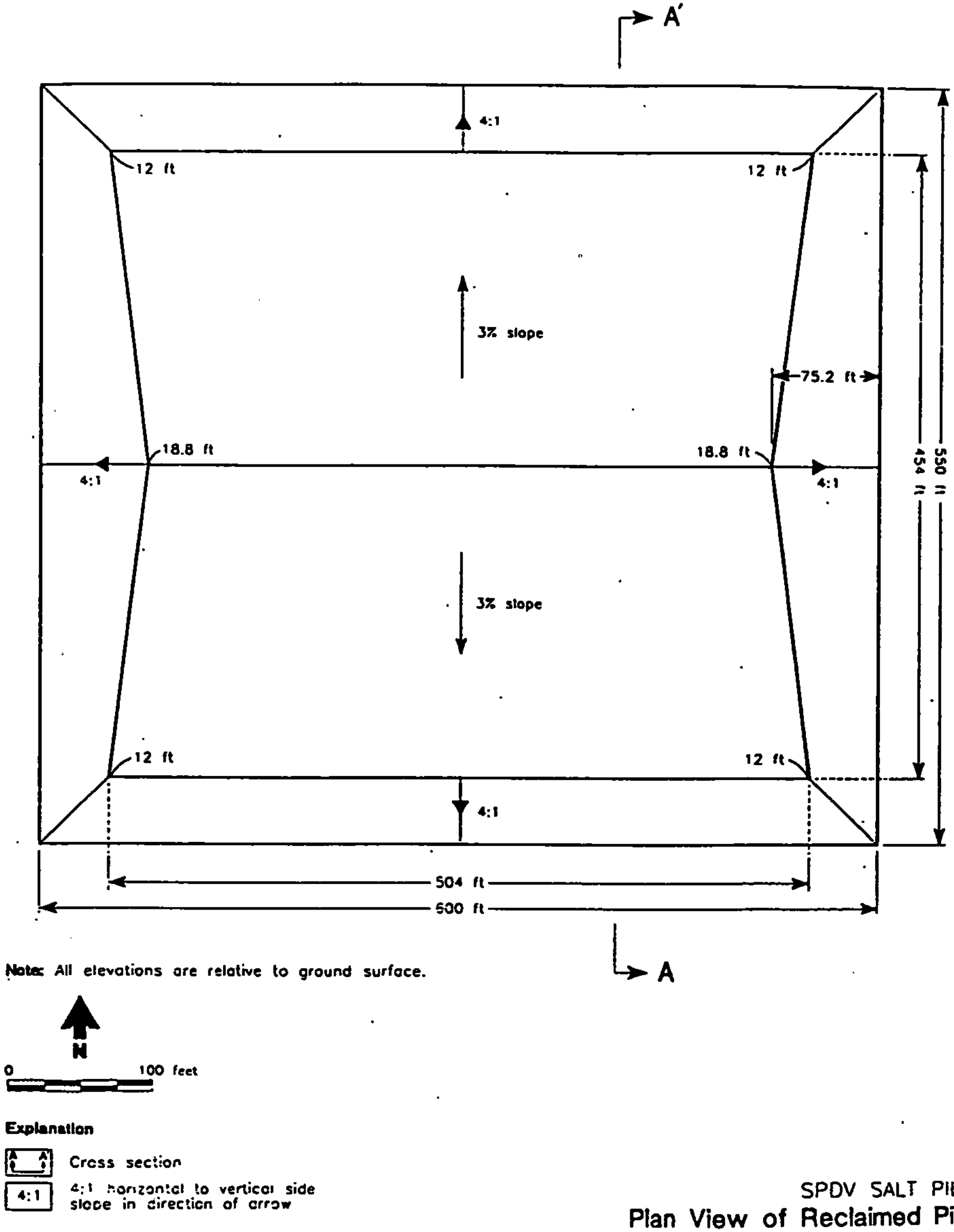


Cross Section A-A' of Reclaimed Pile
5X Vertical Exaggeration



Cross Section of Final Cap

SPDV SALT PILE
Cross Section of Reclaimed Pile and Cover Design



SPDV SALT PILE.
Plan View of Reclaimed Pile

October 11, 1999

Mr. David Pope
Ag Services
1905 Old Dexter Highway
Roswell, New Mexico 88201

Subject: GCL Commitment and Submittals, WIPP SPDV Salt Pile Reclamation Project

Dear Mr. Pope:

This letter is to explain CETCO's position in the matter regarding the recommended GCL to be used at the above-mentioned project. CETCO outlined these concerns to you before the bid and would like to highlight these issues once again with the submittals.

CETCO recommends that you utilize the unreinforced Claymax 600CL instead of the Claymax 200R because it contains a polyethylene laminate that should provide a barrier to minimize the upward migration of the salts into the GCL bentonite. This Claymax 600CL can only be placed on slopes gentler than 10:1. The needlepunched reinfomced Bentomat ST can be placed on slopes steeper than 10:1, however, the Bentomat ST does not have the polyethylene laminate moisture barrier. CETCO, therefore, recommends that the owner consider regrading all of the slopes on the salt pile to gentler than 10:1, so that Claymax 600CL can be utilized everywhere.

The price quoted for Bentomat ST and Claymax 600CL are the same. Please note, however, that CETCO pricing increased effective September 15, 1999, and that the prices quoted to you are good only until November 1st, 1999 and shipped to the jobsite by December 31, 1999. Please forward a purchase order to CETCO by November 1, 1999 in order to keep your preferred pricing for the Claymax 600CL.

I have also included five (5) copies of product submittals for the Claymax 600CL and Bentomat ST.

- Certified properties sheet and roll specification for Bentomat ST & Claymax 600CL.
- Installation Guidelines.
- Samples of Bentomat ST and Claymax 600CL.
- General product brochure.

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Printed on recycled paper.

Bentomat® ST Certified Properties

Bentomat "ST" is a reinforced GCL consisting of a layer of sodium bentonite between woven and non-woven geotextiles, which are needlepunched together.

MATERIAL PROPERTY	TEST METHOD	TEST FREQUENCY, ft^2 (m^2)	CERTIFIED VALUES
Bentonite Swell Index[1]	ASTM D 5890	1 per 50 tons	24 mL/2g min.
Bentonite Fluid Loss[1]	ASTM D 5891	1 per 50 tons	18 mL max.
Bentonite Mass/Area[2]	ASTM D 5993	40,000 ft^2 (4,000 m^2)	0.75 lb/ft^2 (3.6 kg/m^2)
GCL Grab Strength[3]	ASTM D 4632	200,000 ft^2 (20,000 m^2)	90 lbs (400 N)
GCL Peel Strength[3]	ASTM D 4632	40,000 ft^2 (4,000 m^2)	15 lbs (65 N)
GCL Index Flux[4]	ASTM D 5887	Weekly	1×10^{-8} $m^3/m^2/sec$
GCL Permeability[4]	ASTM D 5084	Weekly	5×10^{-9} cm/sec
GCL Hydrated Internal Shear Strength[5]	ASTM D 5321	Periodic	500 psf (24 kPa) typical

Notes:

1 Bentonite property tests performed at CETCO's bentonite processing facility before shipment to CETCO's GCL production facilities.

2 Bentonite mass/area reported at 0 percent moisture content.

3 All tensile testing is performed in the machine direction, with results as minimum average roll values unless otherwise indicated.

4 Index flux and permeability testing with deaired distilled/deionized water at 80 psi (551 kPa) cell pressure, 77 psi (531 kPa) headwater pressure and 75 psi (517 kPa) tailwater pressure. Reported value is equivalent to 925 gal/acre/day. This flux value is equivalent to a permeability of 5×10^{-9}cm/sec for typical GCL thickness. This flux value should not be used for equivalency calculations unless the gradients used represent field conditions. A flux test using gradients that represent field conditions must be performed to determine equivalency. The last 20 weekly values prior the end of the production date of the supplied GCL may be provided.

5 Peak value measured at 200 psf (10 kPa) normal stress. Site-specific materials, GCL products, and test conditions must be used to verify internal and interface strength of the proposed design.

1500 West Shure Drive Arlington Heights Illinois 60004 (800) 527.9948 tel (847) 392.5800 fax (847) 577.5571

Bentomat® ST Panel and Roll Specifications

STANDARD PANEL SPECIFICATIONS

Panel Dimensions*........................15 ft. (4.6 m) wide; 150 ft. (45.7 m) long
Total Panel Area...........................2,250 sq. ft. (209 sq. m)
Effective Area..............................2,145 sq. ft. (200 sq. m)
{Assumes 6-in. (150 mm) edge overlap and 2-ft. (600 mm) end overlap}

STANDARD ROLL SPECIFICATIONS

Dimensions.................................16 ft. (4.88 m) wide w/ core; 24 in. (610 mm) diameter
Nominal Weight...........................2,700 lbs. (1,225 kg)
Core Size (I.D.)............................4 in. (100 mm) I.D. Inner core plug measures 2.5 in. (63 mm)
Packaging..................................8-mil (0.2 mm) U.V.-resistant polyethylene sleeve

STANDARD SHIPPING SPECIFICATIONS

Shipment Size..............................15 rolls per truckload or container load
Granular Bentonite.......................50-lb. (23 kg) bags

UNLOADING AND HANDLING EQUIPMENT

Core Pipe and Spreader Bar.............18 ft. (5.5 m) long, 2.5 in. (63 mm) Nominal Pipe Size, XXH
OR: Solid steel pipe
OR: Stinger attachment for forklift
Chains or Straps...........................2 required; each approximately 12 ft. (3.7 m) long
Equipment..................................Front end loader or forklift (typical)

* Custom lengths/widths available

The information and data contained herein are believed to be accurate and reliable. CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information.

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CETCO
COLLOID ENVIRONMENTAL TECHNOLOGIES COMPANY
Lining Technologies www.cetco.com

Claymax® 600CL Certified Properties

Claymax "600CL" is an unreinforced GCL consisting of a layer of sodium bentonite between a geotextile and a laminate comprised of a geotextile and a polyethylene membrane, which are continuously adhered together.

MATERIAL PROPERTY	TEST METHOD	TEST FREQUENCY, ft^2 (m^2)	CERTIFIED VALUES
Bentonite Swell Index[1]	ASTM D 5890	1 per 50 tons	24 mL/2g min.
Bentonite Fluid Loss[1]	ASTM D 5891	1 per 50 tons	18 mL max.
Bentonite Mass/Area[2]	ASTM D 5993	40,000 ft^2 (4,000 m^2)	0.75 lb/ft^2 (3.6 kg/m^2)
GCL Grab Strength[3]	ASTM D 4632	200,000 ft^2 (20,000 m^2)	75 lbs (330 N)
GCL Peel Strength	ASTM D 4632	N/A	N/A
GCL Index Flux[4]	ASTM D 5887 or E96	Weekly	1×10^{-9} $m^3/m^2/sec$
GCL Permeability[4]	ASTM D 5084 or E96	Weekly	5×10^{-10} cm/s
GCL Hydrated Internal Shear Strength[5]	ASTM D 5321	Periodic	50 psf (2.4 kPa) typical

Notes:

1 Bentonite property tests performed at CETCO's bentonite processing facility before shipment to CETCO's GCL production facilities.

2 Bentonite mass/area reported at 0 percent moisture content, the GCL industry standard.

3 All tensile testing is performed in the machine direction, with results as minimum average roll values unless otherwise indicated.

4 Index flux and permeability testing with deaired distilled/deionized water at 80 psi (551 kPa) cell pressure, 77 psi (531 kPa) headwater pressure and 75 psi (517 kPa) tailwater pressure. Reported value is equivalent to 95 gal/acre/day. This flux value is equivalent to a permeability of 5×10^{-10} cm/sec for typical GCL thickness. Alternatively, hydraulic conductivity can be determined by performing water vapor transmissivity testing (ASTM E96) on the membrane side of the GCL and use conversion outlined by Koerner (1994). This flux value should not be used for equivalency calculations unless the gradients used represent field conditions. A flux test using gradients that represent field conditions must be performed to determine equivalency. The last 20 weekly values prior to the end of the production date of the supplied GCL may be provided.

5 Peak value measured at 200 psf (10 kPa) normal stress. Site-specific materials, GCL products, and test conditions must be used to verify internal and interface strength of the proposed design.

1500 West Shure Drive Arlington Heights, Illinois 60004 [800] 527.9948 tel [847] 392.5800 fax [847] 577.5571

Claymax® 600CL Panel and Roll Specifications

STANDARD PANEL SPECIFICATIONS

Panel Dimensions*........................13.8 ft. (4.2 m) wide; 150 ft. (45.7 m) long
Total Panel Area............................2,075 sq. ft. (193 sq. m)
Effective Area...............................1,973 sq. ft. (183 sq. m)
{Assumes 6-in. (150 mm) edge overlap and 2-ft. (600 mm) end overlap}

STANDARD ROLL SPECIFICATIONS

Dimensions.................................14.5 ft. (4.4 m) wide w/ core; 20 in. (510 mm) diameter
Nominal Weight...........................2,700 lbs. (1,225 kg)
Core Size....................................4 in. (100 mm) I.D. Inner core plug measures 2.5 in. (63 mm)
Packaging...................................8-mil (0.2 mm) U.V.-resistant polyethylene sleeve

STANDARD SHIPPING SPECIFICATIONS

Shipment Size.............................15 rolls per truckload

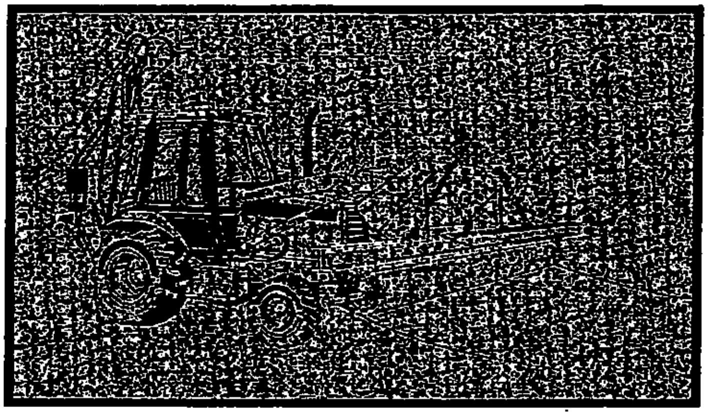
UNLOADING AND HANDLING EQUIPMENT

Core Pipe and Spreader Bar............16 ft. (4.3 m) long, 3.5 in. (89 mm) O.D., XXH
OR: Solid steel pipe
OR: Stinger attachment for forklift
Chains or Straps...........................2 required; each approximately 12 ft. (3.7 m) long
Equipment...................................Front end loader or forklift (typical)

* Custom lengths/widths available

The information and data contained herein are believed to be accurate and reliable. CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information.

Installation Guidelines



BENTOMAT® CLAYMAX®

Geosynthetic Clay Liner

CETCO
COLLOID ENVIRONMENTAL TECHNOLOGIES COMPANY
LINING TECHNOLOGIES GROUP www.cetco.com

1 Introduction

1.1 This document provides procedures for the installation of CETCO's GCLs in a manner that maximizes safety, efficiency, and the physical integrity of the GCL.

1.2 These guidelines are based upon several years of experience at a variety of sites and should be generally applicable to any type of lining project using CETCO's GCLs. The user should contact CETCO if it is believed that conditions at a particular site warrant modifications to these guidelines.

1.3 The performance of the GCL is wholly dependent on the quality of its installation. It is the installer's responsibility to adhere to these guidelines, and to the project specifications and drawings, as closely as possible. It is the engineer's and owner's responsibility to provide construction quality assurance (CQA) for the installation, to ensure that the installation has been executed properly. This document covers only installation procedures.

2 Equipment Requirements

2.1 CETCO GCLs are delivered in rolls weighing 2,500-2,700 lbs. (1,2251 - 1,140 kg). It is necessary to support this weight using an appropriate core pipe as indicated in Table 1. For any installation, the core pipe must not deflect more than 3 inches (75 mm) as measured from end to midpoint when a full GCL roll is lifted.

Table 1. Core Pipe Requirements

Product	Nominal GCL Roll Size, W x L Ft. (m)	Typical GCL Roll Wt., lbs. (kg)	Interior Core Size, in. (mm)	Core Pipe Length x Diameter, ft. x in. (m x mm)	Minimum Core Pipe Strength
Bentomat CL, ST, DN	15 x 150 (4.6 x 45)	2,700 (1,225)	4 (100)	18 x 3 (5.5 x 75)	XXH
Claymax 200R, 600CL	13.8 x 125 (4.2 x 38)	2,500 (1,140)	4 (100)	16 x 3 (4.9 x75)	XXH

2.2 Lifting chains or straps appropriately rated, should be used in combination with a spreader bar made from an I-beam as shown in the cover illustration. The spreader bar ensures that the lifting chains or straps do not chafe against the ends of the GCL roll, allowing it to rotate freely during installation.

2.3 A front end-loader, backhoe, dozer, or other equipment can be utilized with the spreader bar and core bar. Alternatively, a forklift with a "stinger" attachment may be used for on-site handling and, in certain cases, installation. A forklift without a stinger attachment should not be used to lift or handle the GCL rolls. Stinger attachments specially fabricated to fit various forklift makes and models are available through CETCO.

2.4 When installing over certain geosynthetic materials, a 4-wheel, all-terrain vehicle (ATV) can be used to deploy the GCL from behind. An ATV can be driven directly on the GCL provided that no sudden stops, starts, or turns are made.

2.5 Additional equipment needed for installation of CETCO's GCLs includes:

- Utility knife and spare blades (for cutting the GCL).
- Granular bentonite or bentonite mastic (for overlapped seams of GCLs with needle-punched, non-woven geotextiles and for sealing around structures and details). Both are available from CETCO.
- Waterproof tarpaulins (for temporary cover on installed material as well as for stock-piled rolls).
- Optional chalk line marker to simplify bentonite placement at seams (when installing a GCL with needlepunched, non-woven geotextile components).
- Optional flat-bladed vise grips (for positioning the GCL panel by hand).

3 Subgrade Preparation

3.1 Subgrade surfaces consisting of granular soils or gravel may not be acceptable due to their large void fraction and puncture potential. In high head (greater than one foot) applications subgrade soils should possess a particle size distribution such that at least 80 percent of the soil is finer than a #60 sieve (0.250 mm).

3.2 When the GCL is placed over an earthen subgrade, the subgrade surface must be in accordance with the project specifications. Engineer's approval of the subgrade must be obtained prior to installation. The finished surface should be firm and unyielding, without abrupt elevation changes, voids, cracks, ice, or standing water.

3.3 The subgrade surface must be smooth and free of vegetation, sharp-edged rocks, stones, sticks, construction debris, and other foreign matter that could contact the GCL. The subgrade should be rolled with a smooth-drum compactor to remove any wheel ruts, footprints, or other abrupt grade changes. Furthermore, all protrusions extending more than 0.5 inch (12 mm) from the subgrade surface shall either be removed, crushed, or pushed into the surface with a smooth-drum compactor. The GCL may be installed on a frozen subgrade, but the subgrade soil in the unfrozen state should meet the above requirements.

4 Unloading

4.1 In most cases, CETCO GCLs are delivered on flatbed trucks. To unload the rolls from the flatbed, insert the core pipe through the roll. This may require removal of the core plug, which should be replaced after the roll is unloaded. Secure the lifting straps or chains to each end of the core pipe, and to the spreader bar mounted on the lifting equipment. Hoist the roll straight up; make sure its weight is evenly distributed so that it does not tilt or sway when lifted.

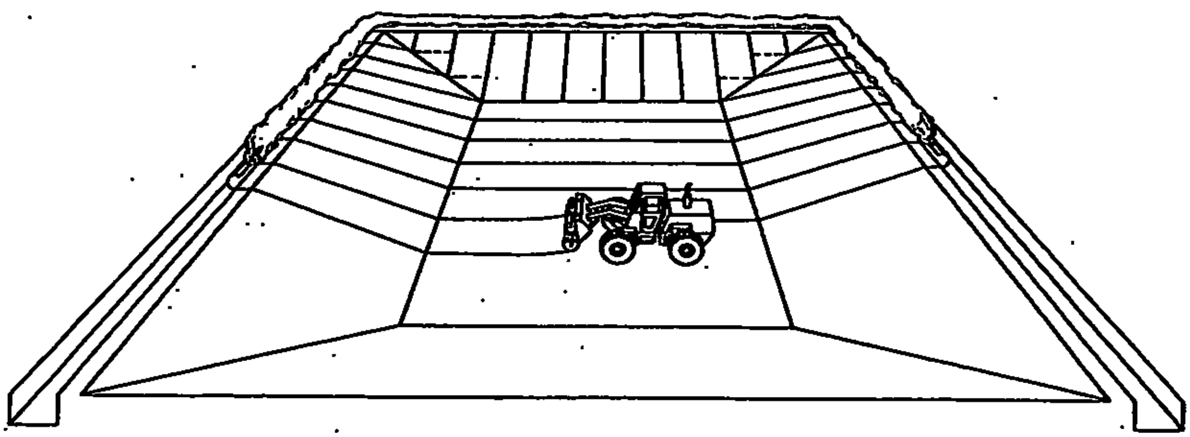
4.2 CETCO GCLs are also delivered in closed shipping containers. To remove the roll from the container, it is best to utilize a forklift mounted with a "stinger" attachment. Guide the stinger as far as possible through the core and lift the roll up and out of the container.

5 Installation

5.1 GCL rolls should be taken to the working area of the site in their original packaging. Prior to deployment, the packaging should be carefully removed without damaging the GCL. The orientation of the GCL (i.e., which side faces up) may be important if the GCL has two different geotextiles. Unless otherwise specified, however, the GCL should be installed such that the product name printed on one side of the GCL faces up.

5.2 Equipment which could damage the GCL should not be allowed to travel directly on it. Acceptable installation, therefore, may be accomplished such that the GCL is unrolled in front of the backwards-moving equipment (Figure 1). If the installation equipment causes rutting of the subgrade, the subgrade must be restored to its originally accepted condition before placement continues.

Figure 1. Typical Bentomat®/Claymax® installation strategy



5.3 GCL rolls should not be released on the slope and allowed to unroll freely by gravity.

5.4 Care must be taken to minimize the extent to which the GCL is dragged across the subgrade in order to avoid damage to the bottom surface of the GCL. A temporary geosynthetic subgrade covering commonly known as a slip sheet or rub sheet may be used to reduce friction damage during placement.

5.5 The GCL should be placed so that seams are parallel to the direction of the slope. End-of-roll seams should also be located at least 3 ft. (1 m) from the toe and crest of slopes steeper than 4H:1V.

5.6 All GCL panels should lie flat on the underlying surface, with no wrinkles or folds, especially at the exposed edges of the panels.

5.7 The GCL should not be installed in standing water or during rainy weather. Only as much GCL shall be deployed as can be covered at the end of the working day with soil, a geomembrane, or a temporary waterproof tarpaulin. The GCL shall not be left uncovered overnight. If the GCL is hydrated when no confining stress is present, it may be necessary to remove and replace the hydrated material. The project engineer and CQA inspector should be consulted for specific guidance if premature hydration occurs.

5.8 In hot weather conditions, Claymax must be covered with a soil layer within eight hours of deployment.

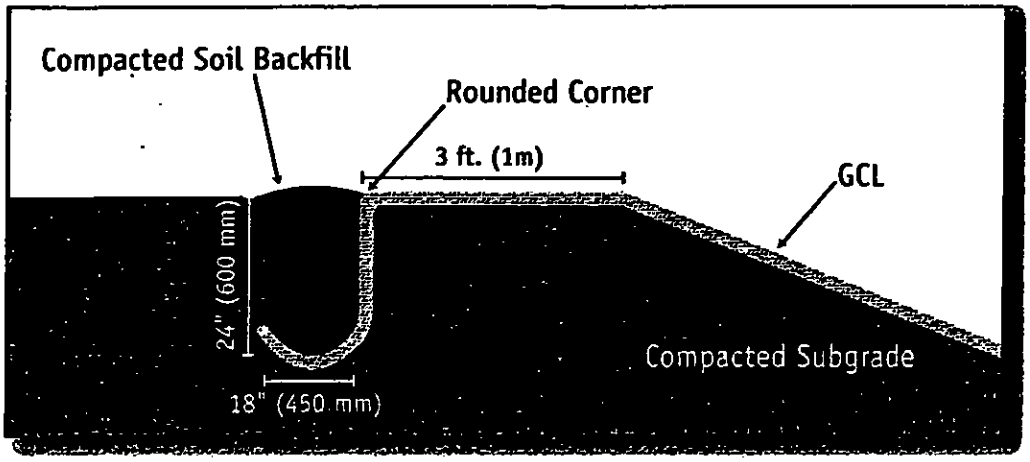
6 Anchorage

6.1 If required by the project drawings, the end of the GCL roll should be placed in an anchor trench at the top of a slope. The front edge of the trench should be rounded to eliminate any sharp corners that could cause excessive stress on the GCL. Loose soil should be removed or compacted into the floor of the trench.

6.2 Sufficient anchorage may alternately be obtained by extending the end of the GCL roll back from the crest of the slope. The length of this "runout" anchor is project-specific.

6.3 If a trench is used for anchoring the end of the GCL, soil backfill should be placed in the trench to provide resistance against pullout. The size and shape of the trench, as well as the appropriate backfill procedures, should be in accordance with the project drawings and specifications. Typical dimensions are shown in Figure 2.

Figure 2. Typical anchor trench design



6.4 The GCL should be placed in the anchor trench such that it covers the entire trench floor but does not extend up the rear trench wall.

7 Seaming

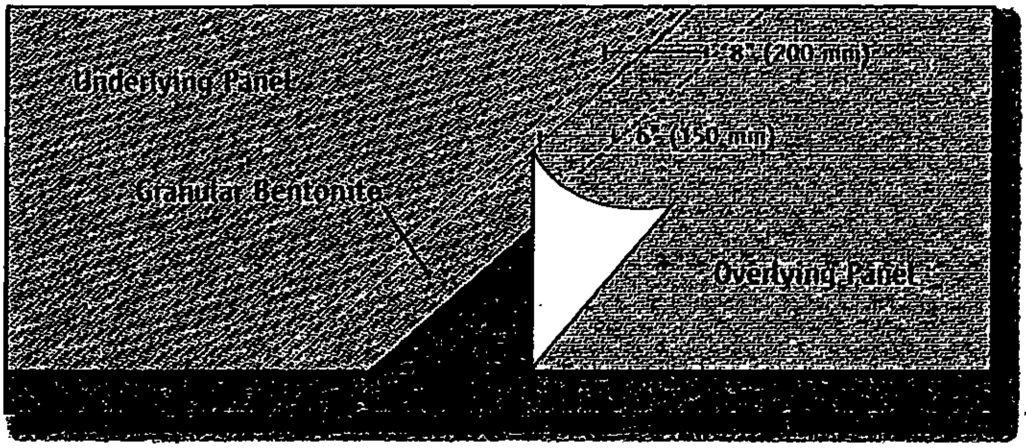
7.1 GCL seams are constructed by overlapping their adjacent edges. Care should be taken to ensure that the overlap zone is not contaminated with loose soil or other debris. Supplemental bentonite is required for CETCO Bentomat GCLs but not Claymax 200R or 600CL.

7.2 Unless otherwise specified, the minimum dimension of the longitudinal overlap should be 6 inches (150 mm). End-of-roll overlapped seams should be similarly constructed, but the minimum overlap should measure 24 inches (600 mm).

7.3 Seams at the ends of the panels should be constructed such that they are shingled in the direction of the grade to prevent the potential for runoff flow to enter the overlap zone. End panel overlap seams on slopes are permissible, provided adequate slope stability analysis has been conducted (i.e. the GCL is not expected to be in tension).

7.4 Bentonite-enhanced seams are constructed first by overlapping the adjacent panels as instructed above, exposing the underlying edge, and then applying a continuous bead or fillet of granular sodium bentonite (supplied with the GCL) along a zone defined by the edge of the underlying panel and the 6-inch (150 mm) line (Figure 3). The minimum application rate at which the bentonite is applied is one quarter pound per lineal foot (0.4 kg/m).

Figure 3. Bentonite-enhanced overlapped seam

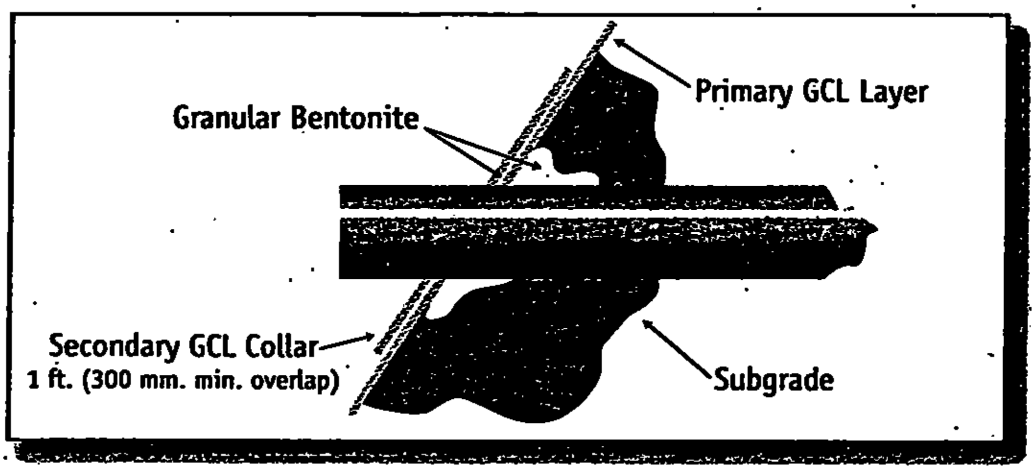


8 Sealing Around Penetrations and Structures

8.1 Cutting the GCL should be performed using a sharp utility knife. Frequent blade changes are recommended to avoid irregular tearing of the geotextile components of the GCL during the cutting process.

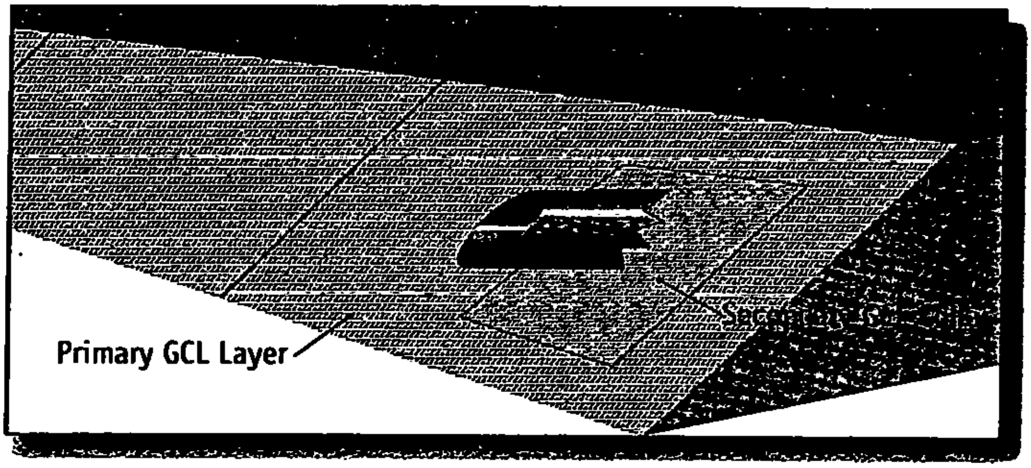
8.2 The GCL should be sealed around penetrations and structures embedded in the subgrade in accordance with Figures 4 through 6. Granular bentonite or a bentonite mastic shall be used liberally (approx. 2 lbs./ln ft. or 3 kg/m) to seal the GCL to these structures.

Figure 4a. Cross-section of a horizontal pipe penetration



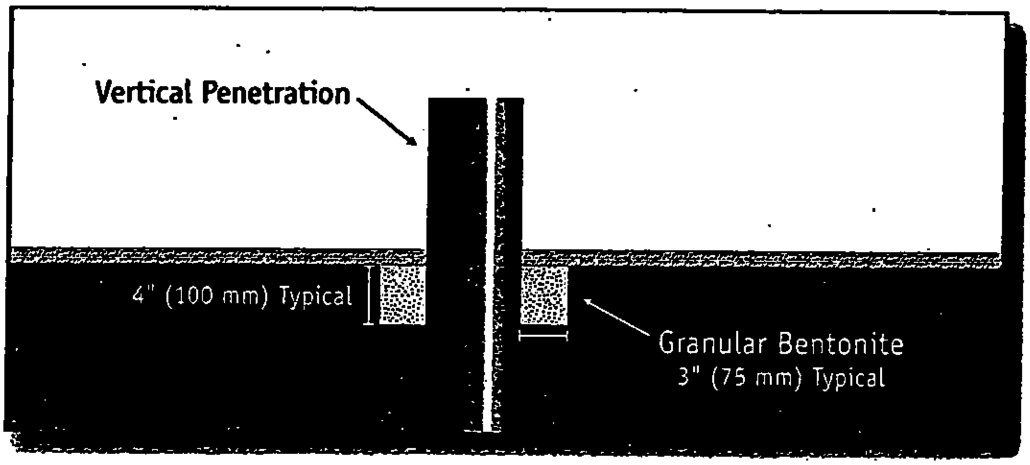
8.3 When the GCL is placed over an earthen subgrade, a "notch" should be excavated into the subgrade around the penetration (Figure 4a). The notch should then be backfilled with granular bentonite or bentonite mastic.

Figure 4b. Isometric view of a completed horizontal pipe penetration



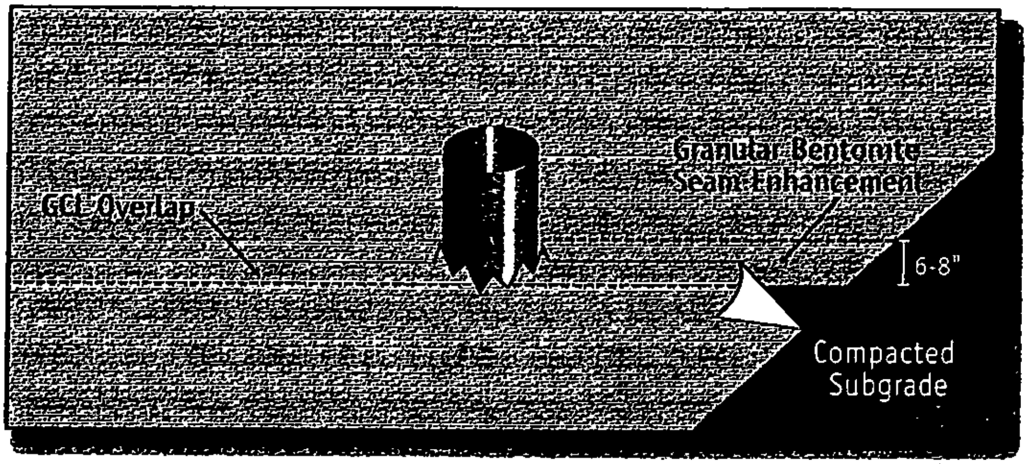
8.4 A secondary collar of GCL should be placed around the penetration as shown in Figure 4b. It is helpful to first trace an outline of the penetration on the GCL and then cut a "star" pattern in the collar to enhance the collar's fit to the penetration.

Figure 5a. Cross-section of a vertical penetration



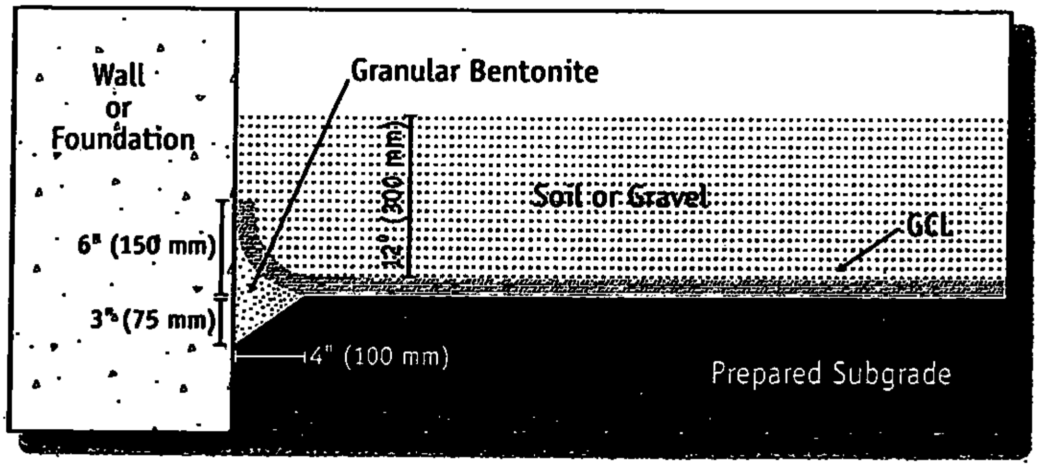
8.5 Vertical penetrations are prepared by notching into the subgrade as shown in Figure 5a. The penetration is completed with two separate pieces of GCL as shown in Figure 5b. A secondary collar is optional in this case.

Figure 5b. Isometric view of the completed vertical penetration



8.6 When the GCL is terminated at a structure or wall that is embedded into the subgrade, the subgrade should be notched as described in sections 8.3 and 8.5. The notch is filled with granular bentonite, and the GCL should be placed over the notch and up against the structure (Figure 6). The connection to the structure can be accomplished by placement of soil or stone backfill in this area.

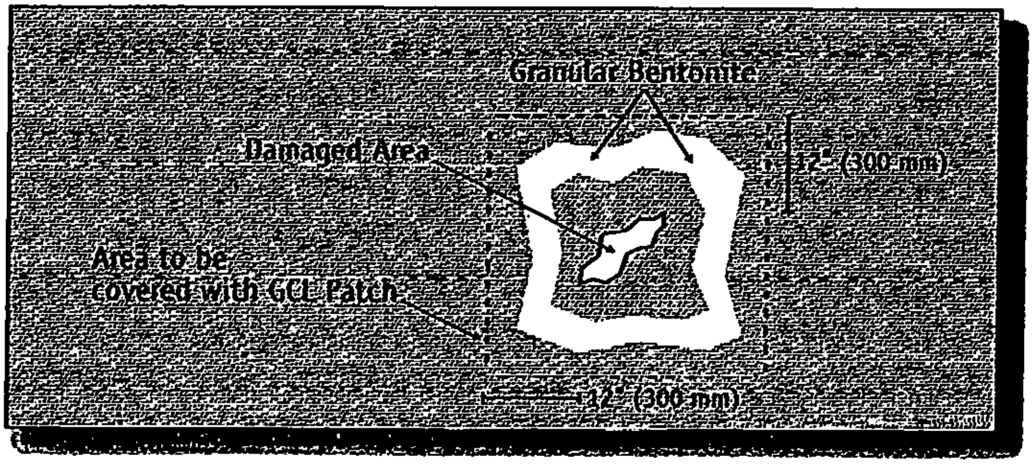
Figure 6. Cross-section of GCL seal against an embedded structure or wall



9 Damage Repair

9.1 If the GCL is damaged (torn, punctured, perforated, etc.) during installation, it may be possible to repair it by cutting a patch to fit over the damaged area (Figure 7). The patch should be obtained from a new GCL roll and should be cut to size such that a minimum overlap of 12 inches (300 mm) is achieved around all parts of the damaged area. Granular bentonite or bentonite mastic should be applied around the damaged area prior to placement of the patch. It may be necessary to use an adhesive such as wood glue to affix the patch in place so that it is not displaced during cover placement. Smaller patches also may be tucked under the damaged area to prevent patch movement.

Figure 7. Damage repair by patching



10 Cover Placement

10.1 Cover soils should be free of angular stones or other foreign matter that could damage the GCL. Cover soils should be approved by the Engineer with respect to particle size, uniformity, and chemical compatibility. Consult your CETCO representative if cover soils with high concentrations of calcium (e.g., limestone, dolomite) are present.

10.2 Recommended cover soils typically have a particle size distribution ranging between fines and 1 inch (25 mm).

10.3 Soil cover shall be placed over the GCL using construction equipment that minimizes stresses on the GCL. A minimum thickness of 1 foot (300 mm) of cover should be maintained between the equipment tires/tracks and the GCL at all times during the covering process. In frequently trafficked areas or roadways, a minimum thickness of 2 feet (600 mm) is required.

10.4 The final thickness of soil cover on the GCL varies with the application. A minimum cover layer must be at least 1 foot (300 mm) thick to provide confining stress to the GCL and prevent damage by equipment, erosion, etc.

10.5 Soil cover should be placed in a manner that prevents the soil from entering the GCL overlap zones. Soil cover should be pushed up slopes, not down slopes, to minimize tensile forces on the GCL.

10.6 When a textured geomembrane is installed over the GCL, a temporary geosynthetic covering known as a slip sheet or rub sheet should be used to minimize friction during placement and to allow the textured geomembrane to be more easily moved into its final position.

11 Hydration

11.1 In cases where the containment of non-aqueous liquids is required, it may be necessary to hydrate the covered GCL with water prior to use. Hydration is usually accomplished by natural rainfall and/or absorption of moisture from soil.

11.2 If manual hydration is necessary, water can be introduced by flooding the lined area or using a sprinkler system. Contact CETCO for specific procedures in these cases.

12 Shipping, Handling and Storage

12.1 All lot and roll numbers should be recorded and compared to the packing list. Each roll of GCL should also be visually inspected during unloading to determine if any packaging has been damaged. Damage, whether obvious or suspected, should be recorded and marked.

12.2 Major damage suspected to have occurred during transit should be reported immediately to the carrier and to CETCO. The nature of the damage should also be indicated on the bill of lading with the specific lot and roll numbers.

12.3 The party directly responsible for unloading the GCL should refer to this manual prior to shipment to ascertain the appropriateness of their unloading equipment and procedures. Unloading and on-site handling of the GCL should be supervised to ensure these goals are achieved. Roll dimensions and weights will vary with the dimensions of the product ordered.

12.4 Rolls should be stacked in a manner that prevents them from sliding or rolling from the stacks. This can be accomplished by frequent chocking of the bottom layer of rolls. Rolls should be stacked no higher than the height at which the spreader bar assembly can be safely handled by laborers (typically no higher than four). Rolls should never be stacked on end.

12.5 Rolls should be stored at the job site away from high-traffic areas but sufficiently close to the active work area to minimize handling. The designated storage area should be flat, dry and stable. Moisture protection of the GCL is provided by its packaging; however, an additional tarpaulin or plastic sheet is recommended.

Attachment 2

Figure 16.1 – Sample Location Sketch – taken from the WIPP No Further Action Petition for Solid Waste Management Units and Areas of Concern, DOE/WIPP 02-3221, Rev. 0.

Letter dated December 4, 2000 to Dr. Ines Triay and Mr. Joe Epstein from Mr. Steve Zappe, Subject: Review and Comments on the Facility Work Plan, Sampling and Analysis Plan is included in Attachment 2 and contains the Hazardous Waste Bureau's comments on WIPP Sampling and Analyses Plan for Solid Waste Management Units and Areas of Concern dated May 2000

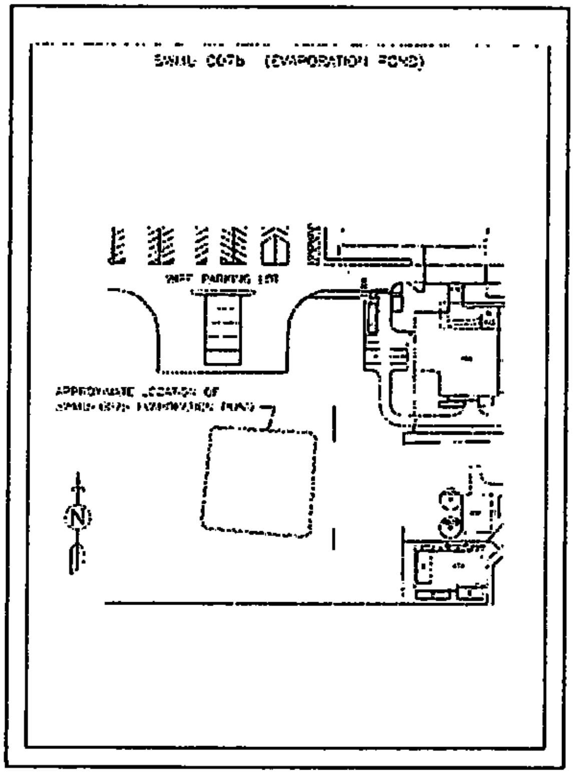


Figure 16.1 - Sample Location Sketch - SWMU 007b (SW Evaporation Pond)

Not to Scale

ENVIRONMENT DEPARTMENT
Hazardous Waste Bureau
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PAUL R. RITZMA
DEPUTY SECRETARY

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

December 4, 2000

Post-it® Fax Note 7671	Date	# of pages
To Cindy Plum	From Steve Zappe	
Co./Dept. DOE/CAO	Co. NMED	
Phone # 234-7462	Phone # 827-1560 x1013	
Fax # 234-7008	Fax # 827-1544	

Dr. Inés Triay, Manager
Carlsbad Field Office
Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: REVIEW AND COMMENTS ON FACILITY WORK PLAN, SAMPLING AND ANALYSIS PLAN
WIPP HAZARDOUS WASTE FACILITY PERMIT
EPA I.D. NUMBER NM4890139088

Dear Dr. Triay and Mr. Epstein:

The New Mexico Environmental Department (NMED) Hazardous Waste Bureau has completed the review of two corrective action documents submitted for the Waste Isolation Pilot Plant (WIPP). The Department of Energy/Carlsbad Field Office and Westinghouse Waste Isolation Division (Permittees) prepared both reports as required by Module VII (Corrective Action for Solid Waste Management, Sections VII.M.1 and .2) of the WIPP Hazardous Waste Facility Permit. The two reports are "WIPP Facility Work Plan for Solid Waste Management Units and Areas of Concern" (Work Plan), received by NMED on February 24, 2000 (report dated February 2000) and "WIPP Sampling and Analysis Plan for Solid Waste Management Units and Areas of Concern" (Sampling and Analysis Plan), received by NMED on May 24, 2000 (report dated May 2000). The scope of both reports is limited to those Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) identified in the permit.

The Work Plan describes the facility-wide approach to future investigations at the SWMUs and AOCs. The Sampling and Analysis Plan describes in greater detail the approach of investigations (past and proposed) at each of the SWMUs and AOCs. In general, NMED has found both documents are sufficiently complete to proceed with the proposed investigations; however, in order for these documents to meet NMED standards for technical adequacy, the following comments need to be addressed. While some of the comments are for informational purposes that may not require a response, others are of a more technical nature and require a response from the Permittees.

Please respond to the attached comments to NMED within thirty (30) calendar days from the date this letter is received. Should you have any questions or require additional explanation on any of the items discussed in this letter, please contact Will Fetner at 505-827-1558, extension 1038.

Sincerely,

Steve Zappe
Project Leader
Hazardous Waste Bureau

Attachments:
NMED Comments on Work Plan and SAP
NMED Figures 1 through 4
NMED Draft Soil Screening Levels (Appendix A only)

cc: James Bearzi, NMED HWB
John Kieling, NMED HWB
William Fetner, NMED HWB
Robert S. Dinwiddie, NMED HRMB
Susan McMichael, NMED OGC
David Neleigh, EPA Region 6
Connie Walker, TechLaw
File: WIPP Red '00

NMED comments on the Work Plan

1. General comment:- Based on current NMED policy, chemicals of concern detected in soil samples must be compared against the more stringent residential risk-based screening levels established by NMED (Soil Screening Levels, attached) or, for chemicals with no NMED values, EPA Region 6 (Human Health Medium-Specific Screening Levels) and not with industrial criteria as referenced in the Work Plan. This policy is based on the fact that, at the present time, NMED has no mechanism or authority to impose or enforce land-use restrictions at any facility in the State. NMED is unable to accept guarantees that the current land use of an individual site or facility will not change over time, even if such guarantees are a matter of federal law. As a result, NMED requires the Permittees to evaluate the more conservative assumption (i.e., residential) for soil screening values. NMED notes that soil analytical data available thus far from all the SWMUs and AOCs do not exceed the residential risk-based soil screening levels and, therefore, this requirement should not affect the general approach of investigations as proposed by the Permittees and those recommended in these comments.

2. Section 2.2, first sentence, page 6 - Section 2.1.4 should be referenced instead of 2.1.3.

3. Section 3.0, second bullet under DCQAP objectives, page 7 - Please provide more details or be more specific about the meaning of this particular item.

4. Section 3.1.2, first sentence of the second paragraph under the title "Completeness", page 9 - Please justify how the 85 percent completeness goal was derived.

5. Section 3.2.9, first sentence, page 14 - Note that laboratory bottleware typically consist of glass containers for the analysis of organic and inorganic soil samples; polyethylene containers are used for the analysis of inorganic water samples.

6. Section 3.2.12, page 15 - Clarification: since a number of soil samples have shown concentrations of contaminants above background levels (i.e., barium, chromium, lead, nickel and methanol), the possibility of generating contaminated materials does exist. At a minimum, field personnel should use Level D personal protection equipment and all waste generated from the investigations should be temporarily stored on-site pending analysis of samples.

7. Section 3.3, first paragraph, page 15 - It is the Permittees' responsibility to make sure that the selected analytical laboratory meets the minimum requirements set forth by EPA's Contract Laboratory Program (CLP).

NMED comments on the Sampling and Analysis Plan

1. Table of Contents, page i - "Acronyms and Abbreviations" are located in page xi and "Definitions" are located in page xiii.

2. Section 1.1, second sentence, page 1 - In addition to total metals, the objective of the SAP should include defining the extent of specific organic compounds, such as methanol detected in SWMU 004a (Portacamp Storage Yard, West Side).

3. Section 1.3.1.1, fifth bullet, page 3 - Remove the asterisks "**" for SWMU 001L (WIPP-12/P-5) since additional soil sampling to determine the extent of barium is proposed for this site.

4. Section 1.3.2, third paragraph, page 4 - The Permittees will need to provide additional documentation to justify "closure" and, therefore, No Further Action (NFA) for the relevant sites. Provide hard copy documentation from "another regulatory authority" that state that the specific sites were properly closed under their authority and why they are exempt from RCRA. If possible, also include more detailed information on the procedures used to "close" these sites (provide guideline(s)/rule(s), etc). This information should be included in the NFA request report for these sites.

5. Section 1.3.2.2, third sentence, page 5 - Note that there was a minor detection of thallium [0.13 parts per million (ppm)] in SWMU 001s (ERDA-9). The Permittees need to reference this exception in the text of this section.

6. Section 1.4.2, page 6 - See above NMED's Comment #1 on the Work Plan. Residential (not industrial) risk-based soil screening levels established by NMED (or EPA Region 6, as applicable) will be used as action levels.

7. Section 1.4.4, page 6 - NMED agrees with the Permittees' definition of "study boundary" (physical boundary) as contained in this section. However, horizontal and vertical boundaries should also be based on the extent of contaminant migration, if any. Therefore, should contamination (chemicals of concern showing concentrations above background levels) be found beyond the initial horizontal and vertical boundaries, these boundaries should be expanded accordingly to accommodate the extent of the contaminant plume.

8. Section 1.4.5, last two sentences, pages 6 and 7 - As previously stated, residential (not industrial) risk-based soil screening levels established by NMED (or EPA Region 6, as applicable) will be used as action levels. For those sites with constituent concentrations exceeding screening criteria, ecological risks must be evaluated in addition to human

health risk evaluations (in order to protect both human health and the environment) before NFA can be requested.

9. Section 1.4.6, next to last sentence, page 7 - See above NMED's Comment #1 on the Work Plan [residential (not industrial) risk-based soil screening levels established by NMED (or EPA Region 6, as applicable) will be used as action levels].

10. Section 1.4.7, third sentence, page 7 - Random sampling design does not seem appropriate. Sampling locations should target areas of concern (where soil impacts would most likely be found) and other areas that would fully delineate the extent of the contaminant plume, if one exists.

11. General comment - The SAP should include map(s) showing the location of all the SWMUs and AOCs in respect to each other and to other relevant WIPP surface features (buildings and other structures, access roads, drainage features, etc.).

12. Section 1.5, last sentence, page 7 - Table 27.1 should be introduced in the text of this section so it can be used as reference to subsequent sections (Sections 2.0 through 24.0).

13. Sections 2.0, 3.0, 6.0, 11.0, and 14.0 through 16.0, "Sampling" sections - The number of samples that are reported to have been collected under the "Sampling" section versus those shown on the respective figure and table need to be consistent. All samples locations (at minimum the 1996 sampling events for sites 001g, 001h, 001L, 001x and 004a) need to be shown on the respective table and figure including a summary of analytical results.

14. Figure 2.1, page 11 - Note that the industrial criteria for lead is 1,000 ppm according to the NMED Soil Screening Levels table (vs. 780 ppm shown on the figure). The residential criteria for lead is 400 ppm. The figure should list the residential criteria.

15. General comment - In reference to those sites that have been closed under another authority, under the "Nature and Extent of Contamination" section, the SAP should mention results of analyses that were below method detection limits (or below background levels) and, therefore, further support a NFA request (i.e., thallium and mercury results).

16. Section 6.1.2, page 24 - It is not clear in this section if WIPP-12 borehole was a continuation of the P-5 borehole (the location of P-5 needs to be shown on Figure 6.1). Are there any details on the total depth of P-5? How does the closure of the P-5 site by USGS in 1976 relate to subsequent drilling of WIPP-12 on the same pad from 1978 through 1982?

17. Figure 6.1 and Section 6.2.3.1, pages 26 and 28, respectively - NMED recommends the following:

- Advance at least one borehole and collect two samples (shallow and deep) from each of the two WIPP-12 mud pits that were not previously sampled (see attached NMED Figure 1 which is based on Figure 6.1 of the SAP for location). These samples should be analyzed for total barium and lead.

- Collect a "deeper" sample at the location of Hole 6 in order to delineate the vertical extent of total barium contamination [suggested depth - 8 to 9 feet below land surface (bls)].

- Collect sufficient samples "around" Hole 6 location so as to fully determine the horizontal extent of barium impacts (see attached NMED Figure 1 for suggested locations).

- The Permittees should keep in mind that any drainage feature or "low point" that may lead away from Hole 6 should also be evaluated and/or sampled in order to determine if any migration of contaminants has occurred due to surface runoff.

18. General comment - Under the "Nature and Extent of Contamination" section of those SWMUs that will be further investigated, the Permittees should specify the following in the text: 1) which borehole location exceeded background levels and 2) that the analytes that were detected above background levels were also significantly below the residential risk-based soil screening levels established by NMED (or EPA Region 6, as applicable).

19. Section 11.2.1.2, first paragraph, page 38 - In order to be consistent, please state in the text the number of samples (and QA/QC) collected from this SWMU. Please correct typographical error on second sentence: should be SWMU 001q instead of SWMU 001p. Also specify that the samples were collected only from the mud pit that was used (primary pit), if this is the case.

20. Figure 11.1 and Section 11.2.3.1, pages 40 and 42, respectively - NMED recommends the following:

- Collect a "deeper" sample at the previous sample location in order to delineate the vertical extent of total chromium, nickel and lead contamination (suggested depth - 4 to 5 feet bls).

- Collect enough samples "around" previous sample location so as to fully determine the horizontal extent of total chromium, nickel and lead impacts (for suggested locations, see attached NMED Figure 2 which is based on Figure11.1 of the SAP).

- The Permittees should keep in mind that any drainage feature or "low point" that may lead away from DOE-1 mud pit should also be evaluated and/or sampled in order to determine if any migration of contaminants has occurred due to surface runoff.

21. Table 11.1, pages 41 - The table should include nickel concentrations that also exceeded background concentrations. OK

22. Section 11.2.3.2, first sentence, page 43 - Samples should be analyzed for total chromium, nickel and lead, not barium. OK

23. Section 12.2.2.1, third sentence, page 45 - Emphasize that thallium was detected only slightly above the method detection limit. OK

24. Figure 14.1 and Section 14.2.3.1, pages 50 and 53, respectively - NMED recommends the following:

    - Collect a "deeper" sample at the location of Hole 4 in order to delineate the vertical extent of total barium, chromium and lead contamination (suggested depth - 8 to 9 feet bls).

    - Collect enough samples "around" Hole 4 location so as to fully determine the horizontal extent of total barium, chromium and lead impacts (for suggested locations, see attached NMED Figure 3 which is based on Figure14.1 of the SAP).

25. The Permittees should keep in mind that any drainage feature or "low point" that may lead away from Hole 4 should also be evaluated and/or sampled in order to determine if any migration of contaminants has occurred due to surface runoff.

26. Sections 15.2.1.2 and 15.2.2.1, pages 55 and 56, respectively - Numerous parameters (VOCs, metals and PCBs) were sampled at this SWMU; the text should specify the analyses performed on the samples. Regarding the last sentence of Section 15.2.1.2: Figure 15.1 does not show lead concentrations but does present nickel concentrations that are not mentioned in the text. Third sentence of Section 15.2.2.1: Table 15.1 does not (but should) include lead concentrations.

27. Table 15.1, Section 15.2.3.1 and Figure 15.1, pages 57, 58 and 59, respectively - NMED recommends the following:

   - To be consistent with other SWMUs (SWMU 001L and 001q), lead concentrations should be included in Table 15.1 and Figure 15.1 even if all concentrations of lead were below background.

   - On Figure 15.1, show NMED residential risk-based soil screening level for nickel and show background concentration for lead.

   - Collect "deeper" samples at the locations of Holes 1 through 4 in order to delineate the vertical extent of total chromium, nickel and methanol contamination (suggested depths - 8 to 9 feet bls).

   - Collect enough samples "around" previous sample locations exceeding background levels so as to fully determine the horizontal extent of total chromium, nickel and methanol impacts (for suggested locations, see attached NMED Figure 4 which is based on Figure 15.1 of the SAP).

   - The Permittees should keep in mind that any drainage feature or "low point" that may lead away from the SWMU 004a storage yard should also be evaluated and/or sampled in order to determine if any migration of contaminants has occurred due to surface runoff.

28. Section 15.2.3.1, third sentence, page 58 - To be consistent with previous sample intervals, the second set of subsurface samples should be collected 60 to 72 inches bls instead of the proposed 48 to 60 inches bls.

29. Table 16.1, page 61 - The table should include lead concentrations (<5 ppm) analyzed in the NMED sample collected from 12-24 inches bls.

30. Figure 16.1, page 63 - Please show the Permittees' and NMED's sample locations on this figure, if known.

31. Section 16.2.3, page 62 - Based on historical information provided for this site, NMED does not see the need to perform additional sampling at the subject SWMU. This suggestion is based on: 1) the evaporation pond presumably received only grey water from personnel showers and currently receives storm water and domestic water resulting from fire flow performance testing, and 2) detected concentrations of lead and nickel are only slightly above background concentrations. NMED believes that enough information is

available from this site to warrant NFA. However, the Permittees may proceed with the proposed scope of work if they believe that additional sampling is warranted for this SWMU.

32. Section 25.1, last paragraph, second sentence, page 82 - in addition to metals, VOCs need to be included in the text (i.e., methanol at SWMU 004a).

33. Section 25.3.2, first paragraph, page 83 - See above NMED's Comment #7 on the Work Plan.

34. Section 26.1, third paragraph, page 85 - Please clarify the Permittees' reporting intentions. The Permittees are intending to submit to NMED a draft SAP that will summarize the results of investigations at each of the SWMUs; however, there is no mention how the final report will be structured.

   NMED would like to receive one RFI report for all of the SWMUs and AOCs. The report should be structure as described in Module VII.O and VII.U.5 of the WIPP Hazardous Waste Facility Permit. The report should contain detailed historical information, describe previous and recent sampling efforts and results, and contain recommendations. All recommendations (i.e., NFA, proposal for additional investigations, etc.) need to be fully supported in the report. For those SWMUs that exceed the NMED residential screening criteria for soils, human health and ecological risks will have to be evaluated and included in the final report.

35. Section 27.0, page 87 - For consistency, name the six AOCs (in the first paragraph, next to last sentence) and the four SWMUs (in the second paragraph, next to last sentence).

36. Appendix A, Section 2.2.2, first sentence, page 92 - Text should also include mercury in the evaluation of data distributions.

37. General comments on those SWMUs that will be further investigated (SWMUs 001L, 001q, 001x, 004a and, if applicable, 007b):

   - Permittees need prior NMED approval before any significant changes are made to the scope of work (i.e., reduction of sampling locations, modifying sample analyses, etc.).
   - Relevant surface features (i.e., borehole locations, mud pits, site boundaries, access roads, etc.) and sample locations (previous and proposed sample locations) need to be surveyed for each site by professional surveyors. This will assure that accurate scaled site maps are provided in the final report(s).

NMED Figures

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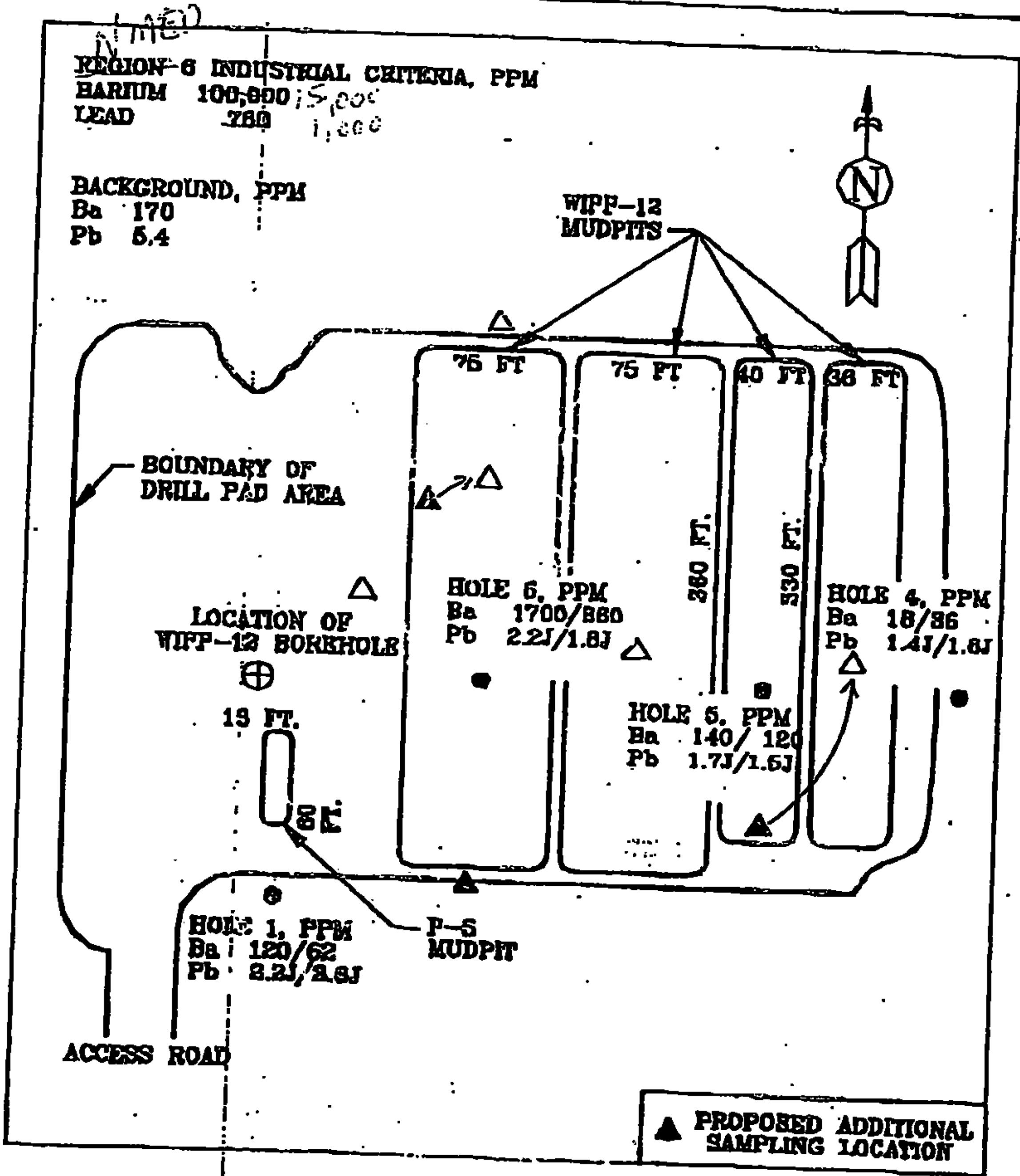

Figure 6.1 Sample Location Map – SWMU 001L (WIPP-12 & P-5)

△= ADDITIONAL SAMPLE LOCATIONS PROPOSED BY NMED
(NOTE THAT THE DOE PROPOSED SAMPLE LOCATIONS HAVE BEEN RE-LOCATED) WMF 9/13/00

NMED FIGURE 1

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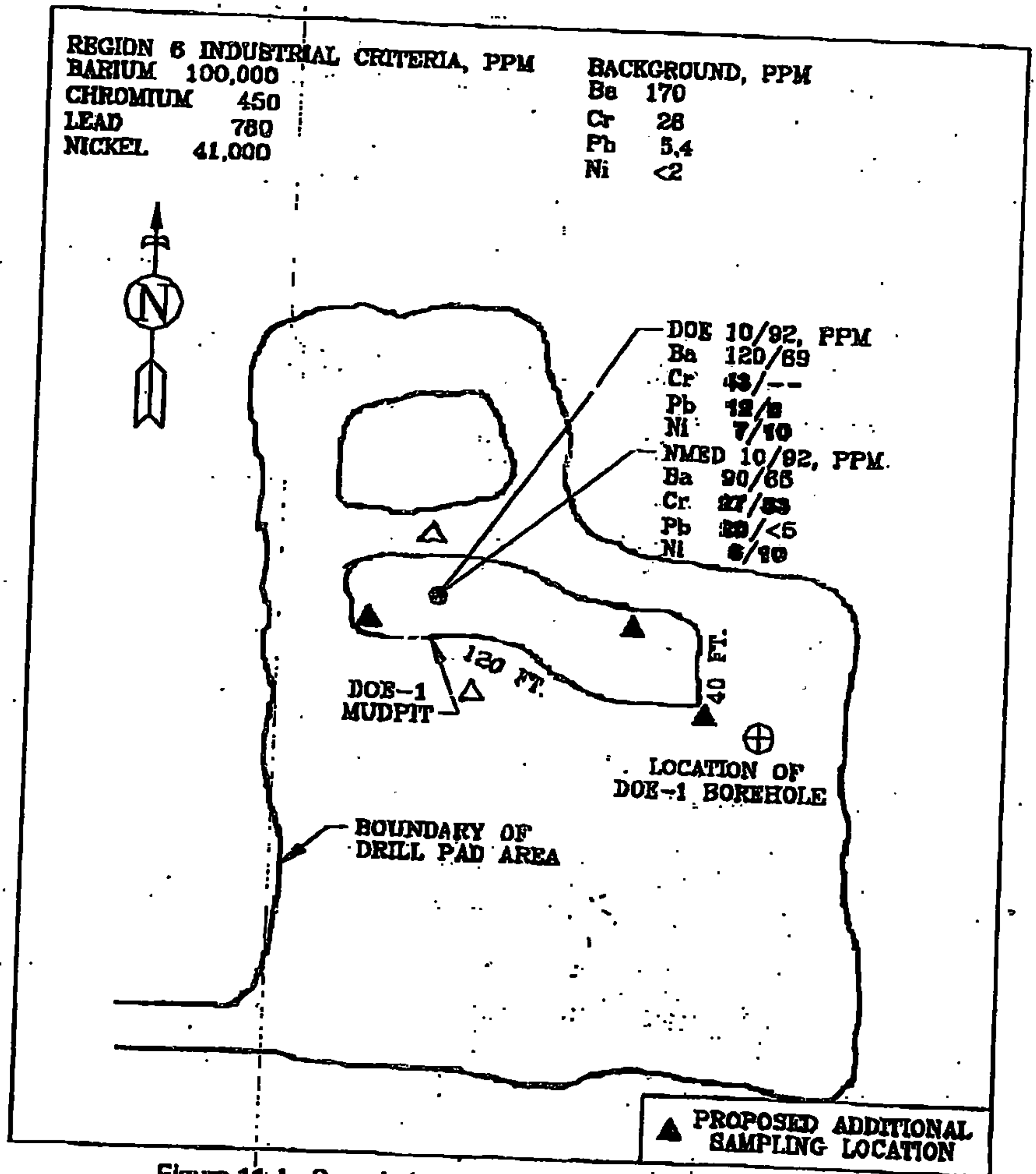
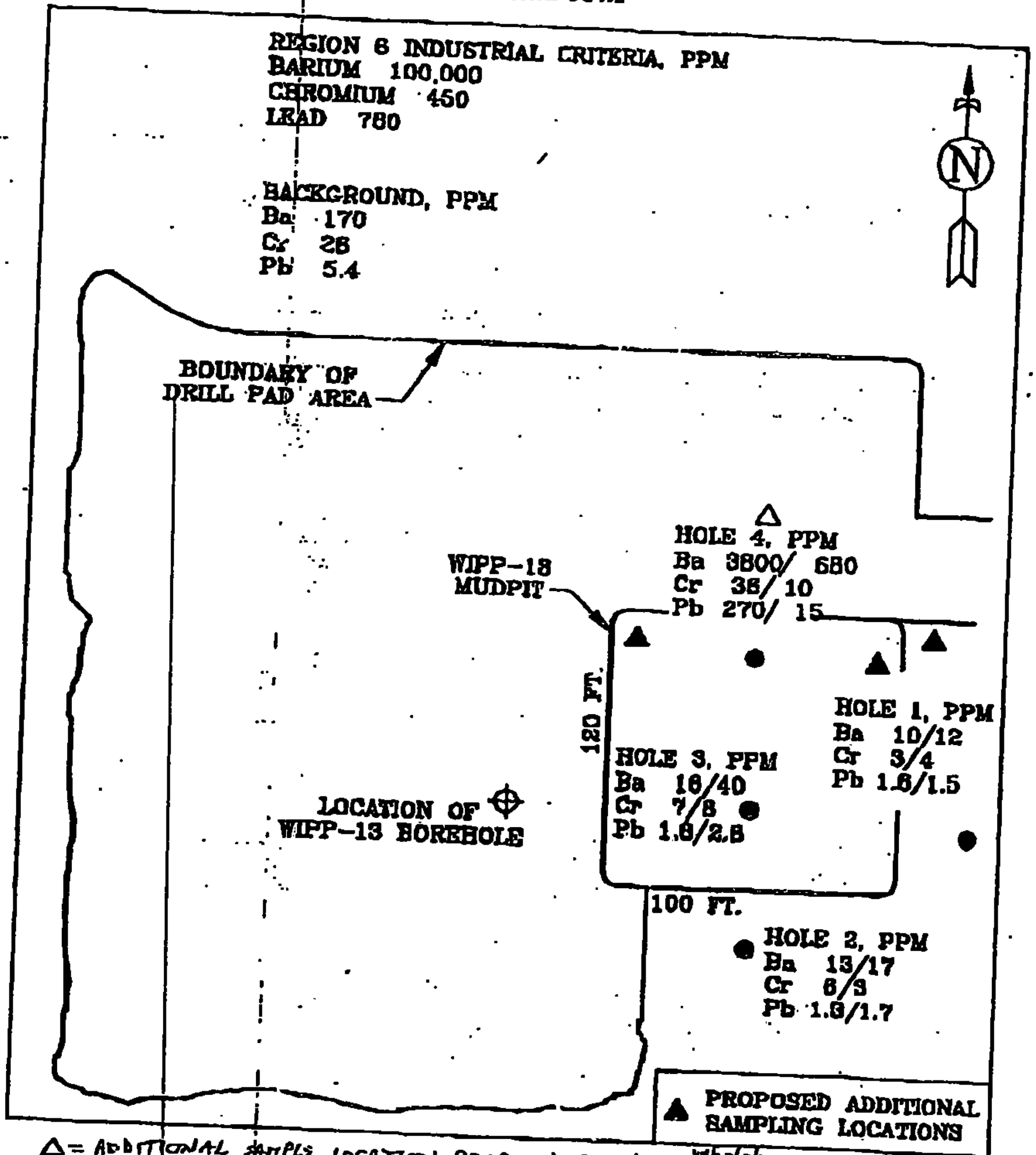


Figure 11.1 - Sample Location Map – SWMU 001q (DOE-1)

△ = ADDITIONAL SAMPLE LOCATIONS PROPOSED BY NMED WAF 9/13/00

NMED FIGURE 2

hazardous constituents was anticipated. Samples collected at the 60- to 72-inch depth were used to quantify the maximum vertical extent of potential constituent migration. Figure 14.1 is a site map showing sample locations and barium, chromium, and lead concentrations for sample locations at SWMU 001x.



△= ADDITIONAL SAMPLE LOCATION PROPOSED BY NMED [illegible]

Figure 14.1 - Sample Location Map – SWMU 001x (WIPP-13)

NMED FIGURE 3

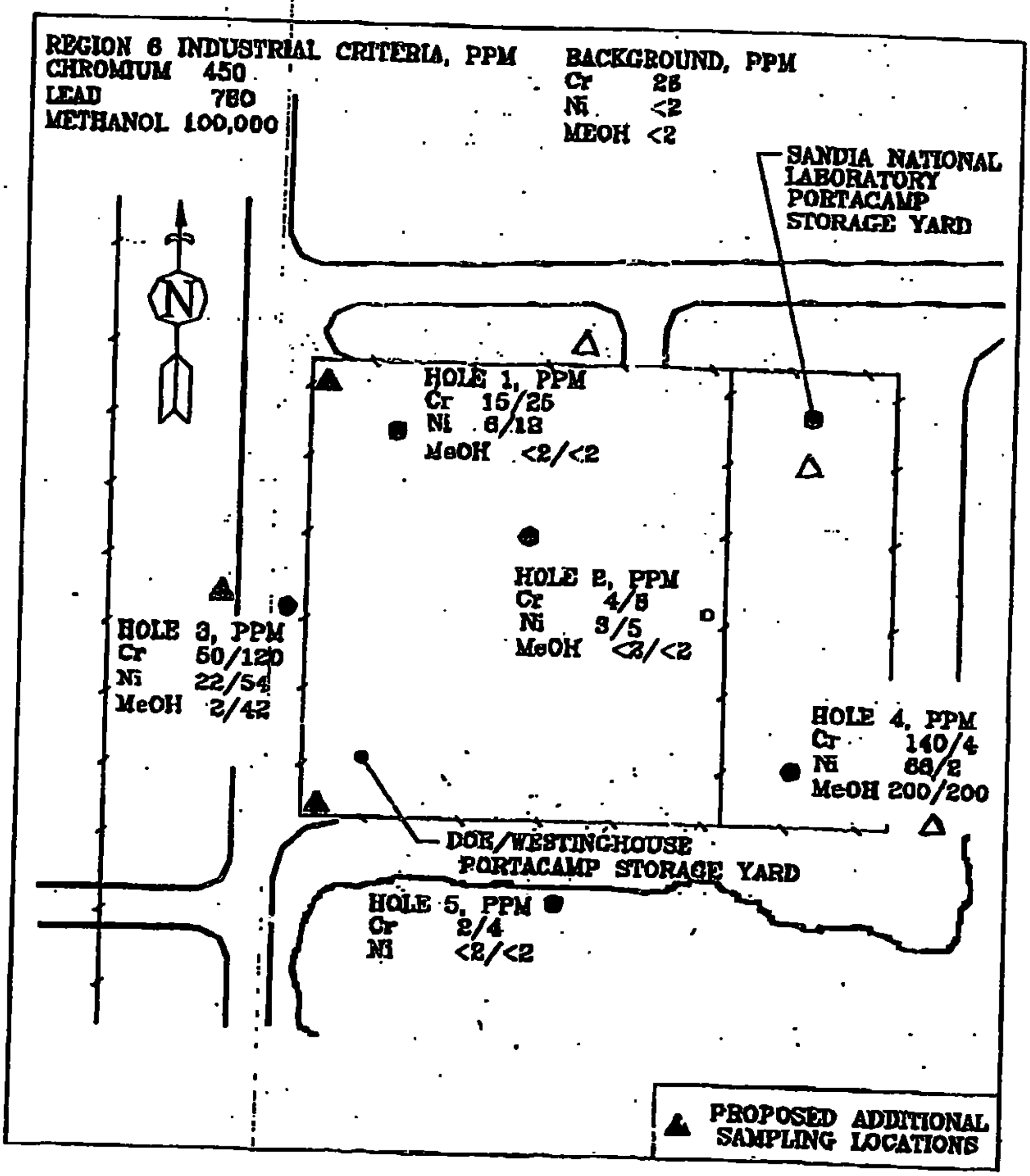


Figure 15.1 - Sample Location Map – SWMU 004a (Portacamp Storage Yard)

Δ = ADDITIONAL SAMPLE LOCATIONS PROPOSED BY NMED MWF 9/12/00

NMED FIGURE 4

Appendix A

State of New Mexico Soil Screening Levels

Table A-1 provides State of New Mexico Soil Screening Levels (SSLs), as developed by the New Mexico Environment Department (NMED) Hazardous Waste Bureau (HWB) and the Ground Water Quality Bureau Voluntary Remediation Program for 133 chemicals most commonly associated with environmental releases within the state. These NMED SSLs are derived using default exposure parameter values (as presented in Table A-2) and chemical- and State of New Mexico-specific physical parameters (as presented in Table B-1 of Appendix B). These default values are assumed to be appropriately conservative in the face of uncertainty and are likely to be protective for the majority of site conditions relevant to soil exposures within New Mexico.

However, the NMED SSLs are not necessarily protective of all known human exposure pathways, reasonable land uses or ecological threats. Thus, before applying NMED SSLs at a site, it is extremely important to compare the conceptual site model (CSM) with the assumptions upon which the NMED SSLs are predicated to ensure that the site conditions and exposure pathways match those used to develop the NMED SSLs. If this comparison indicates that the site at issue is more complex than the corresponding SSL scenarios, or that there are significant exposure pathways not accounted for by the NMED SSLs, then the NMED SSLs are insufficient for use in a defensible assessment of the site. A more detailed site-specific approach will be necessary to evaluate the additional pathways or site conditions.

TABLE A-1

Column 1: The first column in Table A-1 presents the names of the 133 chemicals for which NMED has developed SSLs.

Column 2: The second column presents NMED SSLs predicated on residential soil exposures.

Column 3: The third column presents indicator categories for the NMED SSL residential basis, whether predicated on carcinogenic effects (ca), noncarcinogenic effects (nc), soil saturation limits (sat) or a non-risk based "max" determination. NMED SSLs predicated on a carcinogenic endpoint reflect age-adjusted child-to-adult exposures. NMED SSLs predicated on a noncarcinogenic endpoint reflect child-only exposures. Detected concentrations above the "sat" value may indicate the presence of nonaqueous phase liquid (NAPL). For certain inorganic and semivolatile organic compounds (SVOCs) that exhibit relatively low toxicity, a non risk-based maximum concentration of 10^5 mg/kg is given when the risk-based SSL exceeds that level. These are noted as "max" in the tables.

Columns 4 and 6: The fourth and sixth columns present NMED SSLs analogous to Column 1, with the exception that these values correspond to Industrial/Occupational and Construction worker (adult-only) exposures, respectively.

Columns 5 and 7: The fifth and seventh columns present endpoint bases analogous to Column 3

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for the Industrial/Occupational and Construction worker receptor populations, respectively. Unlike the Residential population, noncarcinogenic endpoint notes for these receptor populations are predicated on adult-only exposures.

Column 8: The eighth column notes which chemicals are considered VOCs (for inhalation considerations). Those chemicals not considered VOCs are evaluated within the SSLs relative to inhalation of particulate emissions.

Columns 9 and 10: The ninth column presents NMED SSLs for the migration to groundwater pathway developed using a default dilution attenuation factor (DAF) of 1, which assumes no effective dilution or attenuation. These values can be considered at sites where little or no dilution or attenuation of soil leachate concentrations is expected (e.g., shallow water tables, karst topography). Column 10 presents NMED SSLs for the migration to groundwater pathway developed using a DAF of 20 to account for natural processes that reduce contaminant concentrations in the subsurface.

As noted above, separate NMED SSLs are presented for use in evaluating three discrete potential receptor populations: Residential, Industrial/Occupational, and Construction. Each NMED SSL considers incidental ingestion of soil, inhalation of volatiles (limited to those chemicals noted as volatile organic compounds [VOCs] within Table A-1) or particulate emissions from impacted soil, and dermal contact with soil.

Generally, if a contaminant is detected at a level in soil exceeding the most relevant NMED SSL, and the site-specific CSM is in general agreement with the underlying assumptions upon which the NMED SSLs are predicated, this result indicates the potential for adverse human health effects to occur. Conversely, if no contaminants are detected above the most relevant NMED SSL, this tends to indicate to the user that environmental conditions may not necessitate remedial action of the surface soil or the vadose zone.

A detection above an NMED SSL does not indicate that unacceptable exposures are, in fact, occurring. The NMED SSLs are predicated on relatively conservative exposure assumptions and an exceedance only tends to indicate the potential for adverse effects. The NMED SSLs do not account for additive exposures, whether for carcinogenic or noncarcinogenic endpoints. Section 5 of Part A addresses a methodology by which an environmental manager may determine whether further site-evaluation is warranted, however, this methodology does not replace the need for defensible risk assessment where indicated.

The NMED SSLs address a basic subset of exposures fundamental to the widest array of environmentally-impacted sites within the State of New Mexico. The NMED SSLs cannot address all relevant exposure pathways associated with all sites. The utility of the NMED SSLs depends heavily upon the understanding of site conditions as accurately reflected in the CSM and nature and extent of contamination determinations. Consideration of the NMED SSLs does not preclude the need for site-specific risk assessment in all instances.

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Table A-1

NMED Soil Screening Levels

Chemical	Residential Soil (mg/kg)	Endpoint	Industrial/Occupational Soil (mg/kg)	Endpoint	Construction Worker Soil (mg/kg)	Endpoint	VOC	DAF 1 (mg/kg)	DAF 20 (mg/kg)
Acenaphthene	2.1E+01	sat	2.1E+01	sat	2.1E+01	sat	X	3.E+03	6.E+04
Acrolein	9.9E-02	nc	7.7E-02	nc	4.1E-01	nc	X	6.E-06	2.E-04
Acrylonitrile	1.9E+00	ca	4.6E+00	ca	2.6E+01	nc	X	7.E-05	1.E-03
Aldrin	2.9E-01	ca	1.2E+00	ca	1.6E-02	nc		6.E-03	1.E-01
Aluminum	7.4E+04	nc	1.0E+05	max	7.5E-01	nc		6.E-01	2.E+01
Anthracene	9.9E-01	sat	9.9E-01	sat	9.9E-01	sat	X	8.E+01	1.E
Antimony	3.0E+01	nc	9.2E+01	nc	1.1E+02	nc		3.E-03	5.E
Arsenic	3.9E+00	ca	1.7E+01	ca	1.9E-02	ca		3.E+00	6.E+01
Barium	5.2E+03	nc	1.5E+04	nc	7.7E-02	nc		4.E+01	8.E+02
Benzene	6.4E+00	ca	5.6E+00	nc	2.9E+01	nc	X	3.E-03	6.E-02
Benzidine	2.1E-02	ca	8.9E-02	ca	1.3E-03	ca		5.E-07	1.E-05
Benzo(a)anthracene	6.2E+00	ca	2.6E+01	ca	9.4E-01	ca		2.E+00	4.E+01
Benzo(a)pyrene	6.2E-01	ca	2.6E+00	ca	9.4E-02	ca		6.E+00	1.E+02
Benzo(b)fluoranthene	6.2E+00	ca	2.6E+01	ca	8.4E-01	ca		6.E-01	2.E+01
Benzo(k)fluoranthene	6.2E+01	ca	2.6E+02	ca	9.4E+00	ca		6.E+00	2.E+02
Beryllium	1.5E+02	nc	4.4E+02	nc	3.1E-03	nc		1.E-02	2.E-01
α-BHC	9.0E-01	ca	3.9E+00	ca	4.6E-02	ca		2.E-05	4.E-04
β-BHC	3.2E+00	ca	1.4E+01	ca	1.6E-01	nc		2.E-03	4.E-02
γ-BHC	4.4E+00	ca	1.9E+01	ca	1.6E-01	nc		4.E-04	7.E-03
Bis(2-chloroethyl) ether	4.4E+00	ca	1.9E+01	ca	2.5E-01	ca		2.E-05	3.E-04
Bis(2-chloroisopropyl) ether	5.9E+01	ca	2.9E+02	ca	8.3E+00	ca		5.E-04	9.E-03
Bis(chloromethyl) ether	2.2E-02	ca	9.3E-02	ca	1.3E-03	ca		9.E-08	2.E-06
Boron	5.5E+03	nc	1.3E+04	nc	3.1E+00	nc		1.E-01	3.E+[illegible]
Bromodichloromethane	9.6E+00	ca	2.2E+01	ca	4.5E+02	ca	X	3.E-02	7.E-[illegible]
Bromomethane	3.7E+00	nc	3.0E+00	nc	1.5E+01	nc	X	2.E-03	4.E-0[illegible]
2-Butanone	3.7E+04	nc	6.9E+04	nc	1.5E+02	nc		3.E-01	7.E+00
tert-Butyl methyl ether	6.1E+03	nc	1.5E+04	nc	4.5E+02	nc		4.E-03	6.E-02
Cadmium	7.0E+01	nc	1.9E+02	nc	4.7E-02	ca		6.E-01	2.E+01
Carbon tetrachloride	1.6E+00	nc	1.3E+00	nc	6.6E+00	nc	X	5.E-03	1.E-01
Chlordane	1.6E+01	ca	7.0E+01	ca	1.1E-01	nc		4.E-01	8.E+00
Chlorobenzene	1.4E+02	nc	1.2E+02	nc	1.9E+02	sat	X	5.E-02	1.E+00
Chloroform	3.9E-01	nc	3.0E-01	nc	1.6E+00	nc	X	3.E-02	6.E-01
Chloromethane	1.2E+01	ca	2.6E+01	ca	6.0E+02	ca	X	5.E-04	1.E-02
Chromium III	1.0E+05	max	1.0E+05	max	1.0E+05	max		9.E+00	2.E+02
Chromium VI	2.3E+02	nc	6.5E+02	ca	1.0E-03	ca		1.E+00	2.E+01
Chrysene	6.2E-01	sat	6.2E-01	sat	8.2E-01	sat	X	5.E+01	1.E+03
Cobalt	4.6E+03	nc	1.3E+04	nc	1.6E-01	nc		6.E-03	2.E-01

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Table A-1

NMED Soil Screening Levels

Chemical	Residential Soil (mg/kg)	Endpoint	Industrial/Occupational Soil (mg/kg)	Endpoint	Construction Worker Soil (mg/kg)	Endpoint	VOC	DAF 1 (mg/kg)	DAF 20 (mg/kg)
Copper	2.8E+03	nc	8.5E+03	nc	1.0E+04	nc		4.E+02	7.E+03
Cyanide	1.2E+03	nc	3.0E+03	nc	1.1E+01	nc		5.E-02	1.E+00
DDD	2.4E+01	ca	1.0E+02	nc	2.7E-01	nc		3.E+00	6.E+01
DDE	1.7E+01	ca	7.5E+01	ca	2.7E-01	nc		1.E+01	3.E+02
DDT	1.7E+01	ca	7.5E+01	ca	2.7E-01	nc		7.E-01	1.E+01
Di(2-ethylhexyl) phthalate	3.5E+02	ca	1.5E+03	ca	1.2E+01	nc		4.E-01	8.
Dibenz(a,h)anthracene	6.2E-01	ca	2.8E+00	ca	9.4E-02	ca		6.E-01	9.
1,2-Dibromoethane	6.3E-02	ca	2.1E-01	ca	1.4E+00	ca	X	2.E-05	4.E-04
1,2-Dichlorobenzene	8.5E+01	sat	6.5E+01	sat	6.5E+01	sat	X	4.E-01	8.E+00
1,3-Dichlorobenzene	1.2E+01	nc	1.1E+01	nc	5.0E+01	nc	X	4.E-03	6.E-02
1,4-Dichlorobenzene	3.2E+01	ca	5.7E+01	sat	5.7E+01	sat	X	8.E-02	2.E+00
3,3-Dichlorobenzidine	1.1E+01	ca	4.5E+01	ca	6.5E-01	ca		3.E-04	5.E-03
Dichlorodifluoromethane	9.0E+01	nc	7.1E+01	nc	3.6E+02	nc	X	6.E+00	1.E+02
1,1-Dichloroethane	5.6E+02	nc	4.8E+02	nc	1.2E+03	sat	X	7.E-03	1.E-01
1,2-Dichloroethane	3.3E+00	ca	7.2E+00	ca	4.3E+01	nc	X	1.E-03	2.E-02
cis-1,2-Dichloroethene	4.1E+01	nc	3.3E+01	nc	1.7E+02	nc	X	2.E-02	3.E-01
trans-1,2-Dichloroethene	6.0E+01	nc	4.8E+01	nc	2.6E+02	nc	X	2.E-02	4.E-01
1,1-Dichloroethene	8.1E+00	ca	3.4E+01	ca	1.7E+00	ca		3.E-03	5.E-02
Dichloromethane	8.5E+02	ca	2.7E+03	ca	1.6E+02	ca		2.E-02	4.E-01
2,4-Dichlorophenol	1.8E+02	nc	4.4E+02	nc	1.6E+00	nc		2.E-02	4.E-01
1,3-Dichloropropene	7.8E-01	ca	1.7E+00	ca	3.1E+01	nc	X	2.E-04	5.E-03
Dieldrin	3.0E-01	ca	1.3E+00	ca	1.6E-02	ca		1.E-04	2.E-03
Diethyl phthalate	4.9E+04	nc	1.0E+05	max	4.3E+02	nc		8.E+00	2.E
Dimethyl phthalate	1.0E+05	max	1.0E+05	max	5.4E+03	nc		8.E+01	1.E
Dibutyl phthalate	6.1E+03	nc	1.5E+04	nc	6.4E+01	nc		9.E+00	2.E
2,4-Dinitro-2-methylphenol	1.2E+02	nc	3.0E+02	nc	1.1E+00	nc		1.E-02	2.E-01
2,4-Dinitrophenol	1.2E+02	nc	3.0E+02	nc	1.1E+00	nc		1.E-02	2.E-01
2,4-Dinitrotoluene	1.2E+02	nc	3.0E+02	nc	1.1E+00	nc		1.E-02	2.E-01
1,2-Diphenylhydrazine	6.1E+00	ca	2.8E+01	ca	3.8E-01	ca		1.E-04	3.E-03
Endosulfan	3.7E+02	nc	8.9E+02	nc	3.2E+00	nc		3.E-01	6.E+00
Endrin	1.8E+01	nc	4.4E+01	nc	1.6E-01	nc		3.E-04	7.E-03
Ethylbenzene	6.8E+01	sat	6.8E+01	sat	6.8E+01	sat	X	4.E-01	8.E+00
Flouride	3.7E+03	nc	8.9E+03	nc	1.4E+04	nc		3.E-01	5.E+00
Fluoranthene	2.3E+03	nc	6.3E+03	nc	2.1E+01	nc		9.E+01	2.E+03
Fluorene	1.6E+01	sat	1.5E+01	sat	1.5E+01	sat	X	3.E+00	6.E+01
Fluorotrichloromethane	1.2E+04	nc	3.0E+04	nc	3.1E+01	nc		7.E-02	1.E+00
Heptachlor	1.1E+00	ca	4.5E+00	ca	6.4E-02	ca		4.E-03	6.E-02

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Table A-1

NMED Soil Screening Levels									
Chemical	Residential Soil (mg/kg)	Endpoint	Industrial/Occupational Soil (mg/kg)	Endpoint	Construction Worker Soil (mg/kg)	Endpoint	VOC	DAF 1 (mg/kg)	DAF 20 (mg/kg)
Hexachlorobenzene	3.0E+00	ca	1.3E+01	ca	1.8E-01	ca		2.E-04	3.E-03
Hexachlorobutadiene	1.2E+01	nc	3.0E+01	nc	1.1E-01	nc		7.E-02	1.E+00
Hexachlorocyclopentadiene	4.2E+02	nc	1.0E+03	nc	1.1E-02	nc		1.E-02	3.E-01
Hexachloroethane	6.1E+01	nc	1.5E+02	nc	5.4E-01	nc		9.E-03	2.E-01
HMX	3.1E+03	nc	7.4E+03	nc	1.1E+04	nc		1.E-03	2.E-02
Indeno(1,2,3-c,d)pyrene	6.2E+00	ca	2.6E+01	ca	9.4E-01	ca		2.E+00	4.
Iron	2.3E+04	nc	6.9E+04	nc	8.0E+04	nc		2.E-01	3.
Isophorone	5.1E+03	ca	2.2E+04	ca	1.1E+0[illegible]	nc		1.E-01	3.E+00
Lead	4.0E+02	NC	1.0E+03	nc	1.0E+0[illegible]	nc		6.E-03	2.E-01
Lead (tetraethyl-)	6.1E-03	nc	1.5E-02	nc	2.3E-02	nc		1.E-02	2.E-01
Manganese	7.8E+03	nc	1.4E+04	nc	7.5E-03	nc		3.E-02	7.E-01
Mercury and compounds	2.3E+01	nc	6.8E+01	nc	8.0E+01	nc		1.E-01	2.E+00
Mercury (elemental)	6.5E+00	nc	2.0E+01	nc	4.6E-02	nc		1.E-01	2.E+00
Mercury (methyl)	6.1E+00	nc	1.5E+01	nc	2.3E+01	nc		1.E-03	2.E-02
Molybdenum	3.8E+02	nc	1.2E+03	nc	1.3E+03	nc		2.E-01	3.E+00
Naphthalene	4.1E+01	sat	4.1E+01	sat	4.1E+01	sat	X	1.E-02	2.E-01
Nickel	1.5E+03	nc	4.4E+03	nc	3.1E-02	nc		1.E+01	3.E+02
Nitrate	8.8E+04	nc	1.0E+05	max	8.8E+02	nc		2.E+00	3.E+01
Nitrite	6.1E+03	nc	1.5E+04	nc	5.4E+01	nc		2.E-01	3.E+00
Nitrobenzene	1.7E+01	nc	2.1E+01	nc	6.6E+01	nc	X	9.E-04	2.E-02
Nitroglycerin	3.5E+02	ca	1.5E+03	ca	2.1E+01	ca		3.E-02	6.E-01
N-Nitrosodiethylamine	3.2E-02	ca	1.4E-01	ca	1.9E-03	ca		9.E-07	2.E-05
N-Nitrosodimethylamine	9.5E-02	ca	4.0E-01	ca	8.0E-03	ca		1.E-05	2.E-
N-Nitrosodi-n-butylamine	2.2E-01	ca	5.4E-01	ca	9.3E+00	ca	X	1.E-05	2.E-
N-Nitrosodiphenylamine	9.9E+02	ca	4.2E+03	ca	6.0E+01	ca		9.E-02	2.E+00
N-Nitrosopyrrolidine	2.3E+00	ca	9.7E+00	ca	1.4E-01	ca		6.E-06	1.E-04
Aroclor 1016	3.9E+00	nc	6.9E+00	nc	3.8E-02	nc		2.E-04	3.E-03
Aroclor 1221	2.2E+00	ca	9.2E+00	ca	1.5E-01	ca		2.E-04	3.E-03
Aroclor 1232	2.2E+00	ca	9.2E+00	ca	1.5E-01	ca		2.E-04	3.E-03
Aroclor 1242	2.2E+00	ca	9.2E+00	ca	1.5E-01	ca		2.E-04	3.E-03
Aroclor 1248	1.1E+00	nc	2.5E+00	nc	1.1E-02	nc		8.E-01	2.E+01
Aroclor 1254	1.1E+00	nc	2.5E+00	nc	1.1E-02	nc		8.E-01	2.E+01
Aroclor 1260	1.1E+00	nc	2.5E+00	nc	1.1E-02	nc		8.E-01	2.E+01
Pentachlorobenzene	4.9E+01	nc	1.2E+02	nc	4.3E-01	nc		6.E-03	1.E-01
Phenanthrene	1.8E+03	nc	4.4E+03	nc	1.6E+01	nc		4.E+03	8.E+04
Phenol	3.7E+04	nc	6.9E+04	nc	3.2E+02	nc		2.E-09	4.E-02
Pyrene	6.9E+00	sat	6.9E+00	sat	8.9E+00	sat	X	3.E-02	8.E-01

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Table A-1

NMED Soil Screening Levels

Chemical	Residential Soil (mg/kg)	Endpoint	Industrial/Occupational Soil (mg/kg)	Endpoint	Construction Worker Soil (mg/kg)	Endpoint	VOC	DAF 1 (mg/kg)	DAF 20 (mg/kg)
RDX	4.4E+01	ca	1.9E+02	ca	1.8E+00	no		2.E-03	4.E-02
Selenium	3.8E+02	nc	1.2E+03	no	1.3E+03	nc		3.E-01	5.E+00
Silver	3.8E+02	nc	1.2E+03	no	1.3E+03	nc		4.E-01	8.E+00
Strontium	3.7E+04	nc	6.9E+04	no	1.0E+05	max		4.E+00	7.E+01
1,2,4,5-Tetrachlorobenzene	1.6E+01	nc	4.4E+01	nc	1.8E-01	nc		2.E-03	4.E-02
1,1,2,2-Tetrachloroethane	3.6E+00	ca	6.2E+03	ca	1.8E+02	ca	X	2.E-03	3
Tetrachloroethene	4.9E+01	ca	1.0E+02	sat	1.0E+02	sat	X	5.E-03	1.
Thallium	6.1E+00	nc	1.8E+01	no	2.1E+01	no		5.E-04	1.E-02
Toluene	1.8E+02	sat	1.8E+02	sat	1.8E+02	sat	X	2.E-01	5.E+00
Toxaphene	4.4E+00	ca	1.9E+01	ca	2.6E-01	ca		5.E-04	1.E-02
Tribromomethane	8.1E+02	ca	2.6E+03	ca	1.1E+01	no		2.E-02	3.E-01
1,2,4-Trichlorobenzene	5.2E+02	nc	5.3E+02	sat	5.3E+02	sat	X	5.E-01	1.E+01
1,1,1-Trichloroethane	5.1E+02	sat	5.1E+02	sat	5.1E+02	sat	X	3.E-02	6.E-01
1,1,2-Trichloroethane	7.8E+00	ca	1.8E+01	ca	1.6E+02	nc	X	3.E-03	6.E-02
Trichloroethene	1.6E+01	ca	1.8E+01	no	9.2E+01	no	X	4.E-02	7.E-01
2,4,5-Trichlorophenol	6.1E+03	nc	1.5E+04	nc	5.4E+01	no		8.E-01	1.E+01
2,4,6-Trichlorophenol	4.4E+02	ca	1.9E+03	ca	2.7E+01	ca		1.E-02	2.E-01
2,4,6-Trinitrotoluene	3.1E+01	nc	7.4E+01	nc	2.7E-01	nc		4.E+01	7.E+02
Vanadium	5.3E+02	nc	1.8E+03	no	1.9E+07	nc		4.E-02	9.E-01
Vinyl chloride	2.1E-01	ca	4.5E-01	ca	1.0E+01	ca	X	3.E-04	6.E-03
Xylenes	6.3E+01	sat	6.3E+01	sat	8.3E+01	sat	X	5.E+00	1.E+02
Zinc	2.3E+04	nc	6.9E+04	no	8.0E+04	nc		8.E+01	1.E+03

ca – carcinogenic effect basis
nc – noncarcinogenic effect basis
sat – soil saturation limit basis
max – low toxicity maximum, health based SSL exceeds [10⁵] mg/kg

NMED – New Mexico Environment Department
VOC – Volatile organic compound
DAF – Dilution attenuation factor

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

SEP 12 2005

RECEIVED
SEP 14 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Status of the Infiltration Controls Construction Project and Request for an Extension for the Construction of Cell B of the Salt Storage Area Extension

Dear Mr. Marshall:

The purpose of this letter is to:

1. Notify you of the status of the construction of the Infiltration Controls Project, and
2. Request a modification to the schedule referenced in the Discharge Permit issued on December 22, 2003 for the construction of Cell B of the Salt Storage Extension Area.

The infiltration controls proposed in the Design Basis Summary contained in Attachment A of the April 24, 2003 Discharge Plan Application have been completed, with the exception of Cell B of the Salt Storage Extension Area. Drawings depicting the as-built features of this project are currently being compiled and will be provided for your information when complete. The features constructed to date include:

- The Salt Storage Extension Cell A
- The Salt Storage Extension Evaporation Pond
- Capping the existing salt storage area with a High Density Polyethylene (HDPE) liner and cover
- The Salt Pile Evaporation Pond
- Storm water Infiltration Control Ponds 1, 2 and A

We are requesting a modification regarding the schedule for the construction of Cell B of the Salt Storage Extension Area. The December 23, 2003 Discharge Permit Modification states that the infiltration controls structures shall be constructed according to the schedule provided to NMED dated July 24, 2003. The scheduled dates are May 2006 to begin construction and October 2006 to complete Cell B of the Salt Storage Extension Area. The salt storage capacity for Cell B is not necessary until midway through the excavation of the underground Hazardous Waste Disposal Unit, Panel 6. Based on current mining rates, which are driven by waste shipment receipt rates, we anticipate that the excavation of Panel 6 will begin in late 2007. Because these rates

CBFO:AMO:HJP:KJB:05-1519:UFC5486

are subject to variation, we propose that Cell B be constructed and made available when additional salt storage capacity is necessary and that the schedule currently referenced in the Discharge Permit be modified such that notice to NMED would be given no later than 60 calendar days prior to the planned start of construction of Cell B.

Thank you for your consideration of our request to modify the plan for Cell B construction.

Please contact me at (505) 234-7462, if you have any questions or require additional information.

Sincerely,

H. L. Plum, Manager
RCRA Program

cc:

C. Padilla, NMED	*ED
J. Bearzi, NMED	ED
J. Kieling, NMED	ED
W. Olsen, NMED	ED

ED denotes electronic distribution

CBFO:AMO:HJP:KJB:05-1519:UFC5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

AUG 05 2005

AUG 03 2005

Mr. Bill Olson, Chief
State of New Mexico
Environment Department
Ground Water Quality Bureau
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Subject: Notice of Discharge, July 27, 2005, U.S. Department of Energy, Waste Isolation Pilot Plant Discharge Permit-831

Dear Mr. Olson:

The purpose of this letter is to verify the U.S. Department of Energy's (DOE) verbal report to you of potential discharge from the Sewage Lagoon System and Evaporation Pond H-19 that are in operation at the Waste Isolation Pilot Plant (WIPP). These facilities are subject to Discharge Plan-831 (DP-831) issued by the State of New Mexico, Environment Department (NMED) on December 23, 2003. The verbal report and this letter verifying the report are being made under the requirements of NMAC 20.6.2.1203, NOTIFICATION OF DISCHARGE-REMOVAL. Our Notification of Discharge in the format indicated by the above citation is attached for your review.

DOE's initial Notification of Discharge to NMED occurred at approximately 3:30 p.m., July 27, 2005 when H.L. Plum called the Ground Water Quality Bureau (GWQB). A message was left with your Administrative Assistant regarding the purpose of the call. When he was informed that you and staff were engaged in meetings, Mr. Plum agreed to call back and did provide a report of the occurrence to you at approximately 8:30 a.m., July 28, 2005.

In response to a request by the GWQB that we inspect the Sewage Lagoon System and Evaporation Pond H-19 geo-synthetic liners for potential leaks below the water line, DOE provided an inspection plan to the GWQB for review and approval in March 2005. The GWQB approved this plan on April 7, 2005. DOE implemented the approved plan utilizing an electronic leak detection methodology to inspect the referenced facilities for potential leaks. This work occurred June 7-11, 2005. GWQB staff was notified of the dates of the inspection, but were unable to be present due to other responsibilities. The NMED's Oversight Bureau staff at WIPP did, however, observe this work.

DOE has received a report from the consultant performing the stated work on July 26, 2005. A total of 46 leak signals were noted in the report received. At least one leak signal was recorded in each of the eight facilities inspected. DOE is currently reviewing

CBFO:AMO:HLP:LR:05-1507:UFC:5486

the information provided in the report. DOE believes that it is appropriate to notify the NMED of the information received and the potential that leaks have occurred due to the requirements of the NMAC 20.6.2.1203 Notice of Discharge Step and the WIPP DP-831 Permit conditions.

DOE believes that some percentage of the leak signals may actually be leaks. We do know that studies have confirmed that some leakage in geo-synthetic lined facilities is present in the form of small gaps in seams and where pipe penetrations are present. We are currently developing a plan to respond to the information provided in the report received. We have begun our discussion to determine what actions are appropriate to physically inspect the liners to confirm the accuracy of the leak signals, what corrective action may be appropriate, the extent of work required, the budgetary impacts, and the development of a schedule to implement the actions needed. Much of this information must be available to provide a final report, Corrective Action Plan that may be necessary to the GWQB within 90 days of our receiving our report.

In addition to the inspection of the geo-synthetic liner, the GWQB"s April 7, 2005 letter approving the inspection plan required "...liner material will be collected...above the waterline and subjected to laboratory testing to further determine the condition of the liners." The collection of liner samples for laboratory analysis was delayed until after the testing occurred. Sample coupons measuring approximately 2 feet square were collected from ponds 2A and Evaporation Pond A. The consultant performing the work believed it was appropriate to limit the number of penetrations of the liners to reduce the potential for introduction of leaks. Laboratory results on the potential serviceability and condition of the geo-synthetic liners are not yet available This information is needed prior to the development of any corrective action plan for these facilities. The final report regarding the inspection results and corrective action plan the DOE will submit to the GWQB will provide the results of this laboratory testing.

Should you have any additional questions, please call Mr. H.L. Plum at (505) 234-7462.

Sincerely,

Lloyd L. Piper
Acting Manager

Enclosure

cc: w/enclosure
C. Marshall, NMED *ED
C. Padilla, NMED ED

*ED denotes electronic distribution

CBFO:AMO:HLP:LR:05-1507:UFC:5486

bcc: w/enclosure

G. Basabilvazo, CBFO	ED
D. Mercer, CBFO	ED
M. Rose, CBFO	ED
H. L. Plum, CBFO	ED
S. Jones, WTS	ED
D. Bignell, WTS	ED

CBFO:AMO:HLP:LR:05-1507:UFC:5486

NMAC 20.6.2.1203, NOTIFICATION OF DISCHARGE...July 27,2005, 3:30 p.m.

(1)(a) Name, address, and telephone number of the person...in charge of the facility:

Lloyd Piper, Acting Manager
U. S. Department of Energy
Carlsbad Field Office
P. O. Box 3090
4021 National Parks Highway
Carlsbad, NM 88221-3090

(b) The name and address of the facility:

Waste Isolation Pilot Plant (WIPP)
34 Louis Whitlock Road (formerly WIPP North Access Road)
26 miles E-SE of Carlsbad
Eddy County
New Mexico

(c) The date, time, location, and duration of the discharge:

July 26, 2005, 3:30 p.m., first knowledge of potential leaks from the WIPP Sewage Lagoon System and Evaporation Pond H-19 was provided to DOE by its management and operations contractor; the duration and potential impact of any leakage that may have occurred has not yet been defined, however, no obvious leakage outside of the lined facilities has been or is observed.

(d) The source and cause of discharge:

Potential leaks in the Sewage Lagoon System and Evaporation Pond H-19 geo-synthetic liner material, in the seams joining liner panels together, or locations where pipe penetrations occur.

(e) A description of the discharge, including its chemical composition:

Sewage effluent discharged to a series of seven synthetically lined ponds for treatment and evaporation (facultative lagoon system) and non-hazardous brine water discharged to a synthetically lined evaporation cell (H-19).

(f) The estimated volume of the discharge:

Unknown if any significant quantity has leaked from any geo-synthetically lined facility. Investigation is ongoing to determine the size and extent of any leakage that may have occurred

(g) Any actions taken to mitigate immediate damage from the discharge:

Coupon samples of the liner material have been submitted to a laboratory to determine material condition and to assist in determination of the options available for corrective action to be implemented if required. A final report on what the inspection found and a corrective action plan will be developed and submitted to NMED. These will be based on the laboratory analysis of the geo-synthetic liner materials in use and confirmation of conditions discussed in the contractor's report on the conditions present in the facilities inspected. Information on the condition of the liners will be used to determine the ability of the liners to be repaired or need for replacement.

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

BILL RICHARDSON
Governor

RON CURRY
Secretary

DERRITH WATCHMAN-MOORE
Deputy Secretary

August 11, 2005

Mr. H. L. Plum, RCRA Program Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Response to Proposed Construction Design Changes to the SWIC Pond A, DP-831, Waste Isolation Pilot Plant

Dear Mr. Plum:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received a letter proposing construction design changes to the Storm Water Infiltration Control Pond A, submitted by the U.S. Department of Energy Waste Isolation Pilot Plant (WIPP) dated July 29, 2005. The letter confirms an approval given by NMED by telephone on July 21, 2005 to realign anchor trenches and seams for the synthetic liner from an east-west to north-south orientation. In addition, four overflow pipes as originally designed will be replaced with a spillway located on the west side of the pond. NMED approves of the design changes as stated in the letter and depicted on the attached drawing. As-built drawings must be submitted after project completion.

If you have any questions, please call Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027.

Sincerely,

Clint Marshall

Clint Marshall, Hydrologist
Mining Environmental Compliance Section
Ground Water Quality Bureau

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

AUG 0 8 2005

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AUG 1 1 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Weekly Status Report on Construction Activities for Storm Water Infiltration Control Pond A, Week Ending August 5, 2005

Dear Mr. Marshall:

The purpose of this letter is to provide a weekly status report on activities related to the dewatering and construction of Storm Water Infiltration Control (SWIC) Pond A. On June 6, 2005, WIPP received a letter dated May 20, 2005, from William C. Olson, Chief of the Ground Water Quality Bureau. The letter authorizes pumping storm water from SWIC Pond A to SWIC Pond 1 and/or 2 as needed to facilitate construction of SWIC Pond A and states that WIPP shall submit weekly reports on: (1) the volume of storm water transferred to SWIC Ponds 1 and 2, (2) the remaining capacity in SWIC Ponds 1 and 2, and (3) the progress of construction activities on SWIC Pond A. The statuses of these three items are as follows:

1.) No storm water has been transferred to SWIC Pond 1 or 2 during this reporting period.

2.) The remaining capacity in SWIC Pond 1 is approximately 5.8 feet or 755,000 gallons. The remaining capacity in SWIC Pond 2 is approximately 2.0 feet or 660,000 gallons.

3.) The installation of the HDPE liner in SWIC Pond A was completed on Saturday July 30, 2005. The anchor trenches were backfilled and final grading around the pond was completed on August 2, 2005. The infiltration controls required to be constructed by the December 23, 2003 DP-831 Modification are substantially complete with the exception of final seeding in areas disturbed by construction activities. Accordingly, this will be the last weekly status report related to the construction of SWIC Pond A.

If you have any questions or require additional information, please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

Lloyd L. Piper
Acting Manager

CBFO:AMO:HJP:KHB:05-1511:UFC5486

cc:
C. Padilla, NMED *ED
J. Kieling, NMED ED
J. Bearzi, NMED ED
W. Olsen, NMED ED
CBFO M & RC
* ED denotes electronic distribution

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUL 2 9 2005

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AUG 01 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Written Follow-Up Confirming a Verbal Discussion on July 21, 2005, Noting Construction Enhancements For The WIPP Salt Pile Infiltration Controls Project, Pond A

Dear Mr. Marshall:

The purpose of this letter is to confirm our discussion on July 21, 2005, regarding two design changes implemented in the construction of Storm Water Infiltration Control (SWIC) Pond A of the WIPP Salt Pile Infiltration Controls Project. These two changes involved relocating the anchor trenches to hold the high density polyethylene liner (HDPE) liner in place and a change in the location and design of the overflow for SWIC Pond A.

The original design drawing illustrated anchor trenches and seams for the liner oriented in the east and west direction of SWIC Pond A. Due to the unusual amount of rainfall received during construction, we have been delayed in continuing this project. This has been noted in several letters submitted to you between March and July 2005.

After considering several alternatives, we have determined that constructability will be improved and the completion of the project expedited by installing the liner with anchor trenches and seams oriented in the north/south direction. In addition, this change will provide greater stability for the liner and reduce uplift by wind.

The other change pertains to overflow options. The original design drawing notes that four overflow pipes exist through the earthen berm. These will be abandoned in place with the ends cut off and covered with soil. The construction change to be implemented is to install an emergency spillway in the berm with the down slope covered by liner and rip-rap or concrete slurry to prevent soil erosion. This spillway will discharge to the roadside drainage adjacent to the Louis Whitlock Road (formerly the WIPP North Access Road), which will divert emergency overflows west from SWIC Pond A along the highway should this be required in the future.

Enclosed is a drawing, for your information only, that depicts the construction plan as described in this letter.

CBFO:AMO:HJP:KJB:05-1503:UFC5486

If you have any questions or require additional information, please contact me at (505) 234-7462.

Sincerely,

H. L. Plum
RCRA Program Manager

Enclosure

cc: w/o enclosure

C. Padilla, NMED	*ED
J. Kieling, NMED	ED
J. Bearzi, NMED	ED
W. Olsen, NMED	ED

CBFO:AMO:HJP:KJB:05-1503:UFC5486

bcc: w/o enclosure

G. Basabilvazo, CBFO	* ED
V. Daub, CBFO	ED
D. Mercer, CBFO	ED
L. Piper, CBFO	ED
S. Anderson, WTS	ED
G. Johnson, WTS	ED
D. Steffen, WTS	ED
S. Youngerman, WTS	ED
D. Bignell, WRES	ED
R. Kehrman, WRES	ED
S. Jones, WRES	ED
B. Roush, WRES	ED
J. Siegel, WRES	ED
CBFO M & RC	

* ED denotes electronic distribution

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State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
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1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
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RON CURRY
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Deputy Secretary

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Sent To Dr. Ines R. Triay,
Street, Apt. No., Waste Isolation P
or PO Box No. US Dept. of Energy
City, State, ZIP+4 P.O. Box B090

August 5, 2005

Dr. Ines R. Triay, Acting Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Request for Additional Information, DP-831, Waste Isolation Pilot Plant

Dear Dr. Triay:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received an application for discharge permit modification (Application) dated March 4, 2005, from the U.S. Department of Energy Waste Isolation Pilot Plant (WIPP). NMED determined that the application was administratively complete on April 26, 2005. WIPP notified NMED on June 27, 2005 that the public notice requirements for the application have been completed. NMED has reviewed the application for discharge permit modification and requests additional information as follows.

1. In Section 6.b, Monitoring Plan, WIPP refers to Tab 1 of the Application titled, "Additional Potential Contamination Sources" for the required information. Information for monitoring is not located in Tab 1. The application should make reference to the approved Discharge Permits dated April 29, 2003, and December 22, 2003 for this information.

2. On Page 3 under Tab 1, Item 5 of the reclamation activities states that the Site Preliminary Design Validation (SPDV) pile was seeded with shallow rooted plants. Please provide the seed mix used in the revegetation activities.

3. On Page 3 under Tab 1, Item 6 of the reclamation activities states that the SPDV pile is regularly inspected, monitored and maintained. Please provide more details on the frequency and type of inspections, monitoring and maintenance conducted at the SPDV pile.

4. On Page 4 under Tab 1, three piezometers are proposed, one each on the east, west and south sides of the SPDV pile. Please provide a map showing the locations of the proposed piezometers.

5. On Page 5 under Tab 2, Section A, the Application refers to language in the December 16, 1996, DP-831 Permit Renewal Application stating, "Closure plans for the sewage facility and evaporation ponds will specifically require that all lagoons and ponds will be pumped or evaporated and that all sludges be sampled to determine if hazardous constituents exist as defined by the Resource Conservation and Recovery Act (RCRA – 40 CFR 261). If hazardous constituents are detected, the sludges will be managed accordingly." DP-831 regulates discharges that are not necessarily defined as hazardous by RCRA. Please provide more details on how liquids and sludges will be disposed of upon closure of the facultative lagoon system and evaporation ponds regardless of whether they are classified as hazardous.

6. On Pages 5-6 under Tab 2, Section B, the Application states that the active salt piles will be closed in accordance with the requirements of the Land Withdrawal Act (LWA), Section 4(b)(4). The LWA makes further reference to Sections 2 and 3 of the Act of July 31, 1947 (30 U.S.C. 602, 603) commonly referred to as the "Materials Act of 1947." NMED recognizes that WIPP is required to dispose of the salt tailings according to federal law, however more specificity is needed regarding the final disposition of the salt piles whether onsite or offsite. Options for onsite disposal should include conceptual descriptions regarding technical components such as covers and storm water diversion structures. Plans for offsite disposal should discuss possible entities to receive the salt product as well as expected uses. WIPP may amend closure plans at a future date to adjust for unforeseen circumstances and federal requirements.

7. On Pages 6-7 under Tab 2, Section C, the Application states that an investigation of the SPDV pile determined that no remedial measures were required according to NMED guidelines. Please specify the guidelines to which the Application is referring.

8. Please provide as-built plans and specifications for the grading and cover of the SPDV pile.

9. On Page 8 of Table 2 under Tab 4, evaporation pond 007b is described as once containing soap, cleaning fluids, oil and brine. Please provide additional information on the current status of this facility, the pond dimensions, descriptions of any liners, and a map showing its location.

Please respond to this letter within 30 days of receipt. If you have any questions, please contact me at 505-827-0027.

Sincerely,

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office
Steve Zappe, NMED-HWB

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUL 29 2005

RECEIVED
AUG 01 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Weekly Status Report on Construction Activities for Storm Water Infiltration Control Pond A, Week Ending July 29, 2005

Dear Mr. Marshall:

The purpose of this letter is to provide a weekly status report on activities related to the dewatering and construction of Storm Water Infiltration Control (SWIC) Pond A. On June 6, 2005, WIPP received a letter dated May 20, 2005, from William C. Olson, Chief of the Ground Water Quality Bureau. The letter authorizes pumping storm water from SWIC Pond A to SWIC Pond 1 and/or 2 as needed to facilitate construction of SWIC Pond A and states that WIPP shall submit weekly reports on: (1) the volume of storm water transferred to SWIC Ponds 1 and 2, (2) the remaining capacity in SWIC Ponds 1 and 2, and (3) the progress of construction activities on SWIC Pond A. The statuses of these three items are as follows:

1.) No storm water has been transferred to SWIC Pond 1 or 2 during this reporting period.

2.) The remaining capacity in SWIC Pond 1 is approximately 5.5 feet or 726,000 gallons. The remaining capacity in SWIC Pond 2 is approximately 2.9 feet or 629,000 gallons.

3.) Liner installation on SWIC Pond A began on Tuesday July 26, 2005, and is approximately 20% complete.

If you have any questions or require additional information, please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

Lloyd L. Piper
Acting Manager

cc:
J. Kieling, NMED *ED
J. Bearzi, NMED ED
W. Olsen, NMED ED
*ED denotes electronic distribution

CBFO:AMO:HJP:KJB:05-1505:UFC5486

bcc:

G. Basabilvazo, CBFO	* ED
D. Mercer, CBFO	ED
D. Bignell, WRES	ED
R. Kehrman, WRES	ED
S. Jones, WRES	ED
H. Plum, CBFO	ED
B. Roush, WRES	ED
J. Siegel, WRES	ED
S. Anderson, WTS	ED
G. Johnson, WTS	ED
D. Steffen, WTS	ED
S. Youngerman, WTS	ED
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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUL 2 5 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

RECEIVED
JUL 2 7 2005

Subject: Weekly Status Report on Construction Activities for Storm Water Infiltration Control Pond A, Week Ending July 22, 2005

Dear Mr. Marshall:

The purpose of this letter is to provide a weekly status report on activities related to the de-watering and construction of Storm Water Infiltration Control (SWIC) Pond A. On June 6, 2005, WIPP received a letter dated May 20, 2005, from William C. Olson, Chief of the Ground Water Quality Bureau. The letter authorizes pumping storm water from SWIC Pond A to SWIC Pond 1 and/or 2 as needed to facilitate construction of SWIC Pond A and states that WIPP shall submit weekly reports on: (1) the volume of storm water transferred to SWIC Ponds 1 and 2, (2) the remaining capacity in SWIC Ponds 1 and 2, and (3) the progress of construction activities on SWIC Pond A. The status of these three items is as follows:

1.) No storm water has been transferred to SWIC Pond 1 or 2 during this reporting period.

2.) The remaining capacity in SWIC Pond 1 is approximately 5.7 feet or 745,000 gallons. The remaining capacity in SWIC Pond 2 is approximately 1.8 feet or 598,000 gallons.

3.) Earthwork for SWIC Pond A resumed on July 19, 2005, preparing the subgrade of SWIC Pond A for installation of the synthetic liner.

If you have any questions or require additional information, please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

Lloyd L. Piper
Acting Manager

cc:
J. Kieling, NMED *ED
J. Bearzi, NMED ED
W. Olsen, NMED ED
*ED denotes electronic distribution

CBFO:AMO:HLP:LR:05-1500:UFC:5486

Clint

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUL 1 3 2005

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JUL 1 8 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Weekly Status Report on Construction Activities for Storm Water Infiltration Control Pond A, Week Ending July 8, 2005

Dear Mr. Marshall:

The purpose of this letter is to provide a weekly status report on activities related to the dewatering and construction of Storm Water Infiltration Control (SWIC) Pond A. On June 6, 2005, WIPP received a letter dated May 20, 2005, from William C. Olson, Chief of the Ground Water Quality Bureau. The letter authorizes pumping storm water from SWIC Pond A to SWIC Pond 1 and/or 2 as needed to facilitate construction of SWIC Pond A and states that WIPP shall submit weekly reports on: (1) the volume of storm water transferred to SWIC Ponds 1 and 2, (2) the remaining capacity in SWIC Ponds 1 and 2, and (3) the progress of construction activities on SWIC Pond A. The status of these three items is as follows:

1.) No storm water has been transferred to SWIC Pond 1 or 2 during this reporting period.

2.) The remaining capacity in SWIC Pond 1 is approximately 5.4 feet or 716,400 gallons. The remaining capacity in SWIC Pond 2 is approximately 1.4 feet or 471,200 gallons.

3.) In accordance with the authorization granted in a letter from the Ground Water Quality Bureau dated June 21, 2005, the berm on SWIC Pond A was breached on Friday June 24, 2005. Additional water remained that was pumped to the same drainage as water released by breaching the berm. The soil in Pond A was saturated but continues to dry. Construction will resume as soon as equipment can reenter this area to grade the soil, allowing for the instillation of the liner.

If you have any questions or require additional information, please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

Ines Triay

Dr. Ines R. Triay,
Acting Manager

CBFO:AMO:HLP:KJB:05-0297:UFC5486

cc:
J. Kieling, NMED *ED
J. Bearzi, NMED ED
W. Olsen, NMED ED
*ED denotes electronic distribution

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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUL 06 2005

JUL 01 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Weekly Status Report on Construction Activities for Storm Water Infiltration Control Pond A, Week Ending July 1, 2005

Dear Mr. Marshall:

The purpose of this letter is to provide a weekly status report on activities related to the dewatering and construction of Storm Water Infiltration Control (SWIC) Pond A. On June 6, 2005, WIPP received a letter dated May 20, 2005, from William C. Olson, Chief of the Ground Water Quality Bureau. The letter authorizes pumping storm water from SWIC Pond A to SWIC Pond 1 and/or 2 as needed to facilitate construction of SWIC Pond A and states that WIPP shall submit weekly reports on: (1) the volume of storm water transferred to SWIC Ponds 1and 2, (2) the remaining capacity in SWIC Ponds 1 and 2, and (3) the progress of construction activities on SWIC Pond A. The status of these three items is as follows:

1.) No storm water has been transferred to SWIC Pond 1 or 2 during this reporting period.

2.) The remaining capacity in SWIC Pond 1 is approximately 5.15 feet or 696,000 gallons. The remaining capacity in SWIC Pond 2 is approximately 1.2 feet or 406,549 gallons.

3.) In accordance with the authorization granted in a letter from the Ground Water Quality Bureau dated June 21, 2005, the berm on SWIC Pond A was actually breached late on Friday, June 24, 2005. The water remaining will be pumped mechanically from SWIC Pond A to the environment. Arrangements to resume construction will be made once the pond has adequately dried.

If you have any questions or require additional information, please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

Dr. Ines R. Triay
Acting Manager

*ED Denotes Electronic Distribution
CBFO:AMO:HJP:KJB:05-0294:UFC5486

cc:

J. Kieling, NMED	*ED
J. Bearzi, NMED	ED
W. Olsen, NMED	ED
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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
JUN 2 7 2005

JUN 3 0 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Weekly Status Report on Construction Activities For Storm Water Infiltration Control Pond A

Dear Mr. Marshall:

The purpose of this letter is to provide a weekly status report on activities related to the dewatering and construction of Storm Water Infiltration Control (SWIC) Pond A. On June 6, 2005, WIPP received a letter dated May 20, 2005, from William C. Olson, Chief of the Ground Water Quality Bureau. The letter authorizes pumping storm water from SWIC Pond A to SWIC Pond 1 and/or 2 as needed to facilitate construction of SWIC Pond A and states that WIPP shall submit weekly reports on: (1) the volume of storm water transferred to SWIC Ponds 1 and 2, (2) the remaining capacity in SWIC Ponds 1 and 2, and (3) the progress of construction activities on SWIC Pond A.

Following a 1.7 inch rain event on May 27 through May 28, 2005 approximately 1.7 million gallons of water had accumulated in SWIC Pond A. To date, we have taken no action regarding the removal of this water from the pond. A letter from the Ground Water Quality Bureau dated June 21, 2005, granted WIPP permission to breach the berm on SWIC Pond A permitting the water to be discharged to the environment. The berm of SWIC Pond A was breached on Saturday, June 25, 2005. Arrangements will then be made with the construction contractor to resume construction, once the pond has adequately dried.

If you have any questions or require additional information, please contact Jody Plum of my staff at (505) 234-7462.

Sincerely,

Ines R. Triay
Acting Manager

cc:

J. Kieling, NMED	*ED
J. Bearzi, NMED	ED
W. Olsen, NMED	ED

*ED Denotes Electronic Distribution

CBFO:AMO:HJP:KJB:05-0289:UFC5486

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
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(505) 827-2965 fax

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Secretary

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US Dept. of Energy
P.O. Box 3090

PS Form 3800, June 200

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June 21, 2005

Dr. Ines R. Triay, Acting Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Response to Notices of Intent and Continuance to Discharge Storm Water from SWIC Pond A to the Ground, DP-831, Waste Isolation Pilot Plant

Dear Dr. Triay:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received the Notice of Intent (NOI), submitted by the U.S. Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) dated June 21, 2005. The NOI request the discharge of 1.7 million gallons of storm water from the unlined Storm Water Infiltration Control (SWIC) Pond A to the ground. Excessive precipitation in the area in late May has caused further delay in lining SWIC Pond A and the discharge of storm water to the environment is necessary to complete construction.

Based on a telephone conversation with Jody Plum of the DOE on June 21, 2005, WIPP proposes to release the storm water by breaching a berm in the SWIC Pond A to empty the pond more rapidly.

Based on the presently available information in your letter and telephone discussion, a discharge permit is not being required for the discharge described above. A discharge permit is not being required because the discharge meets the New Mexico Water Quality Control Commision (WQCC) standards as listed in Section 20.6.2.3103 NMAC.

If at some time in the future WIPP intends to change the amount, the character, or location of the discharges so that they will not be as described, or if observation or monitoring shows that the discharges are threatening ground water quality, you must file a new NOI with the NMED.

If you have any questions, please call Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027.

Sincerely,

William C. Olson, Chief
Ground Water Quality Bureau

WCO/CLM

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUN 24 2005

JUN 21 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Completion of Public Notice Requirements for the March 4, 2005, Discharge Plan Modification

Dear Mr. Marshall:

The purpose of this letter is to provide proof of the completion of the public notice requirements Option #2 for the March 4, 2005, Discharge Plan (DP-831) modification in accordance with your letter dated April 26, 2005, and the public notice requirements of 20.6.2.3108 NMAC. Public Notice Option #2 requires that within 15 days of the completion of the public notice requirements, the Permitee must submit proof of notice to the New Mexico Environment Department containing:

1. A signed affidavit of sign posting a synopsis of the public notice
2. A copy of the published display ad indicating the newspaper and date of publication.
3. The list of discharge site owners' names and addresses and copies of certified mail return receipts for owners, if different from the applicant.

Enclosed are a copy of the public notice that was published in the Carlsbad Current Argus newspaper on May 5, 2005, a signed affidavit, check number 009681 and a photograph of the synopsis of the public notice that was posted in a prominent location in front of the facility where it would be visible to the public passing by the site. To address Item 3, the discharge site owner is the same as the applicant, the U.S. Department of Energy, Acting Manager, Dr. Inés R. Triay.

If you have any questions or need additional information regarding this information, please contact Mr. H. L. Plum of my staff at (505) 234-7462.

Sincerely,

for

Ines R. Triay
Acting Manager

Enclosures

CBFO:AMO:JP:KJB:05-0286:UFC5486
*ED Denotes Electronic Distribution

JUN 2 4 2005

AFFIDAVIT OF SIGN POSTING, DP- *831*

I certify, under penalty of law, that I fulfilled the ground water Discharge Permit public notice requirements of Section 20.6.2.3108.A.1 NMAC. I prominently posted a synopsis of the public notice (prepared by NMED), in English and in Spanish, at a conspicuous public location, approved by NMED, at or near the proposed facility for 30 days. I am aware that there are significant penalties for false certification including the possibility of fines. I have included a payment of $15.00 for the poster (If public notice option 1 or 2 was selected).

____
Signature of Applicant

6/21/05
Date

cm

UN 2 4 2005

PUBLIC NOTICE
NOTICIA PUBLICA

Discharge Permit Modification / Aplicación para Modificación del Permiso de Descarga: For up to 3,231,360 gallons per day of storm water and up to 33,000 gallons per day of domestic and industrial wastewater to evaporation ponds / Hasta 3,231,360 galones por día de agua de lluvia y hasta 33,000 galones por día de aguas residuales domésticas y industriales a las charcas de evaporación

Applicant & Discharge Location / Solicitante & Sitio de Descarga: Waste Isolation Pilot Plant, US Dept. of Energy, 26 miles southeast of Carlsbad

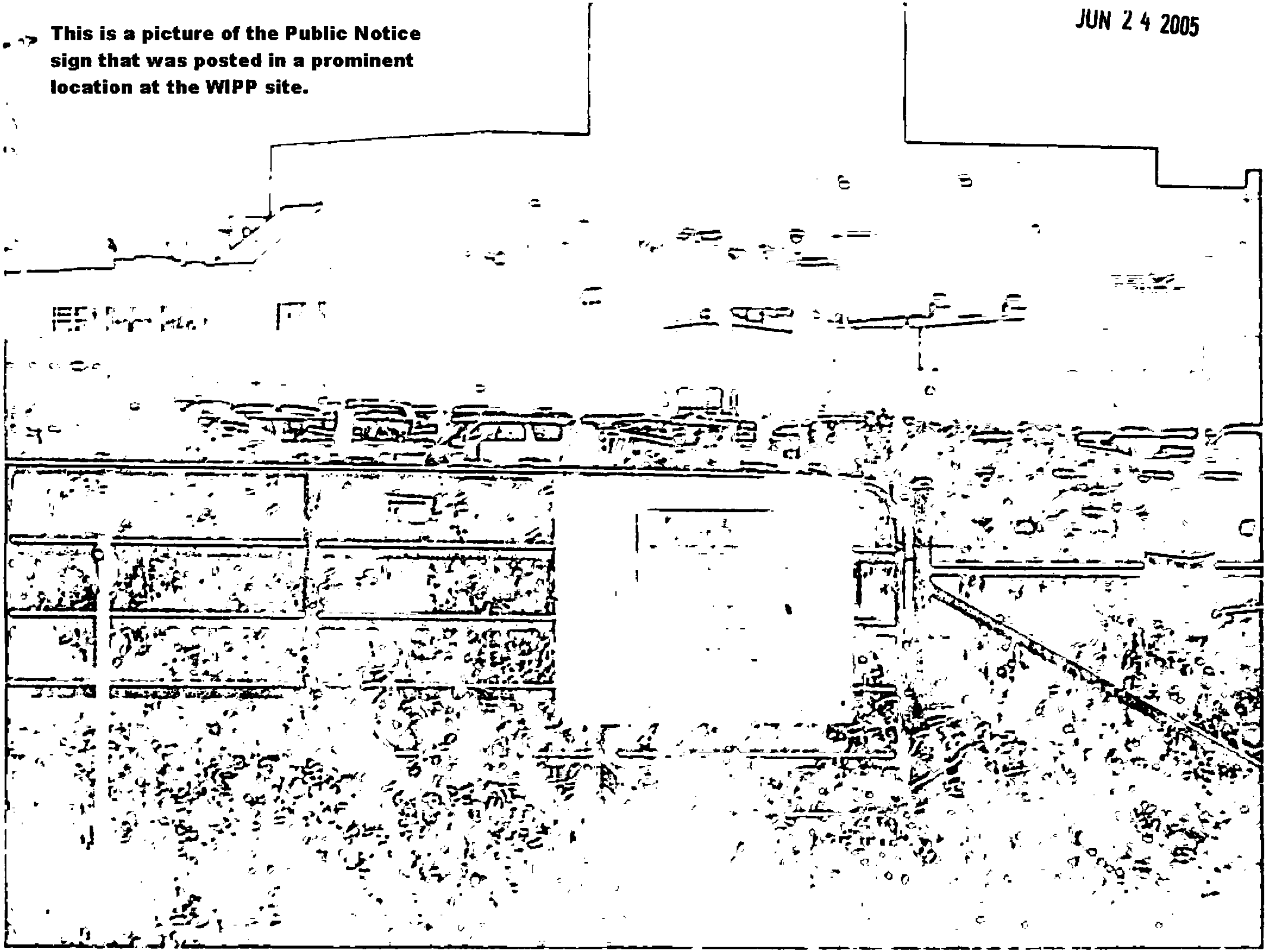
For More Information / Para Más Información (DP-831): Ground Water Quality Bureau / Sección de Agua Subterránea NM Environment Department / Departamento del Medio Ambiente

(505) 827-2900

www.nmenv.state.nm.us (public notices)

This is a picture of the Public Notice sign that was posted in a prominent location at the WIPP site.

JUN 24 2005



Copy of the Public Notice posted in the Carlsbad Current-Argus on May 5, 2005.

Home projects sought

CARLSBAD — First United Methodist Church, Epworth Methodist Church, First Presbyterian Church, First Assembly of God, Carlsbad Family Fellowship and First Baptist Church are planning a home repair mission June 6-10. Eligible projects may include porch construction, exterior and interior painting, weatherization, step repair, wheelchair ramps, drywall repair, carpentry, mobile home underpinning and roof coating, and roll roofing. Labor and materials will be free to qualifying homes.

Applicants will be carefully reviewed to determine qualifications. Applications can be picked up at the Southeast New Mexico Community Action Corporation, 1915 San Jose Blvd. Applications must be submitted by 4 p.m. Friday. The project is funded by PNM Foundation and co-sponsored by SNMCAC. For more information, call Kitty Huber at 887-3939.

Scholarships available

CARLSBAD — Class Act and Washington TRU Solutions plans to award four $1,000 scholarships at the Class Act party May 23. Scholarship applications will be available for pickup by homeschool students at First United Methodist Church (ask for Judi Waters). Applications are due Friday. Carlsbad High School, Phoenix, Victory and Faith students will receive applications at their respective schools.

CAAA. Entry packets are available at The Artist Gallery, 120 S. Canyon St. For more information, call Josie Tabor at 885-3317 or Loretta Forbes at 885-3583.

ness with a pharmacy that will even put over-the- counter medications into bubble packs.

Buren, a.k.a. Jeanne Phillips, and is distributed by Universal Press Syndicate.

PUBLIC NOTICE

NOTICIA PUBLICA

Discharge Permit Modification / Aplicación para Modificación del Permiso de Descarga: For up to 3,231,360 gallons per day of storm water and up to 33,000 gallons per day of domestic and industrial wastewater to evaporation ponds / Hasta 3,231,360 galones por dia de agua de lluvia y hasta 33,000 galones por dia de aguas residuales domésticas y industriales a las charcas de evaporación

Applicant & Discharge Location / Solicitante & Sitio de Descarga: Waste Isolation Pilot Plant, US Dept. of Energy, 26 miles southeast of Carlsbad

For More Information / Para Más Información (DP-831): Ground Water Quality Bureau / Sección de Agua Subterránea NM Environment Department / Departamento del Medio Ambiente

(505) 827-2900

www.nmenv.state.nm.us (public notices)

New Mexico Environmental Department
Ground Water Quality Bureau

Acknowledgement of Receipt

Acknowledgement of Receipt of Check/Cash

I hereby acknowledge receipt of Check No. #009681 Dated. 6/10/05
or cash, received in the amount of $ 15.00 from Washington Tru Solutions
for Waste Isolation Pilot Plant DP-831 318

(Facility Name) (DP No.) (AI ID)

Copy Made for Check Processing ______ Date ______

For Central File Activity ______

Submitted to ASD by: ______ Date: ______

Received in ASD by: ______ Date: ______

Filing Fee ☐ New Facility ☐ Renewal ☐

Modification ☐ Other ☒ (Explain) Posterfee

Organization Code ______ Application FY ______

To be Deposited in the Ground Water Section Discharge Plan Fees.

Full Payment ☐ or Annual Increment ☐

WASHINGTON TRU SOLUTIONS LLC
P.O. Box 2078
Carlsbad, NM 88221

CARLSBAD NATIONAL BANK
PO Box 1359
Carlsbad, NM 88220

009681

VOID

Date Jun/10/2005 Pay Amount 15.00***

Pay ****FIFTEEN AND XX / 100 DOLLAR****

To The Order Of
NEW MEXICO ENVIRONMENT DEPARTMENT
Harold Runnels Bld.
1190 St. Francis Dr.
PO Box 26110
Sante Fe, NM 87502

Authorized Signature

DP-831

⑈009681⑈ ⑆112201797⑆ 51225⑈

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUN 2 1 2005

RECEIVED
JUN 28 2005

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Harold Runnels Building, Room N2250
1190 St. Francis Drive
Santa Fe, NM 87501

Subject: Notice of Intent to Discharge

Dear Mr. Marshall:

The purpose of this letter is to provide you with the information you requested during phone conversations the week of May 30 through June 3, 2005, to accommodate our request to discharge approximately 1.7 million gallons of water from Storm Water Infiltration Control Pond A to the environment. Following a rainfall event of 1.7 inches May 27 through 28, 2005, this request is to facilitate drying the pond so that construction may resume.

The Department of Energy is providing the information below to the New Mexico Environment Department as required pursuant to 20.6.2.1201 NMAC.

(1) Name of the person making the discharge;
Dr. Inés Triay, Acting Manager

(2) The address of the person making the discharge;
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
4021 National Parks Highway
Carlsbad, NM 88221
(505) 234-7303

(3) The location of the discharge;

Name	County	Township	Range	Section	Latitude	Longitude
Pond A	Eddy	22S	31E	SE 1/4 of the SW 1/4 of the SE 1/4 of section 20	N32°, 22 Minutes, 19.9 Seconds	W103°, 47 Minutes, 51.9 Seconds

CBFO:AMO:HJP:KJB:05-0288:UC5486

(4) An estimate of the concentration of water contaminates in the discharge (based upon sample collected on June 6, 2005);

Parameter	Result	20.6.2.3103 NMAC Standard
Chloride (mg/l)	73.7	250
Nitrate (NO_3) (mg/l)	1.68	10
Nitrite (NO_2) (mg/l)	0.0146	NA
pH mg/l (s.u.)	8.41	6 - 9
Sulfate(mg/l)	12.8	600.0
Total dissolved solids (mg/l)	269	1,000.0
Total suspended solids (mg/l)	7.00	NA
Total silver (mg/l)	<0.003	0.05
Total arsenic (mg/l)	<0.010	0.1
Total barium (mg/l)	0.109	1.0
Total cadmium (mg/l)	<0.001	0.01
Total chromium (mg/l)	0.009	0.05
Total mercury (mg/l)	<0.0002	0.002
Total lead (mg/l)	<0.005	0.05
Total selenium (mg/l)	<0.010	0.05

(5) The quantity of the discharge;

Approximately 1.7 million gallons of storm water may be discharged from Storm Water Infiltration Control Pond A to the environment.

If you have any questions regarding this notification, please contact Mr. Jody Plum at (505) 234-7462.

Sincerely,

Dr. Ines R. Triay
Acting Manager

CBFO:AMO:HJP:KJB:05-0288:UC5486

cc:

C. Padilla, NMED	*ED
J. Bearzi, NMED	ED
T. Klein, NMED-AIP	ED
D. Pepe, NMED-AIP	ED
S. Zappe, NMED	ED
CBFO M&RC	

*ED denotes Electronic Distribution

CBFO:AMO:HJP:KJB:05-0288:UC5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

RECEIVED
JUN 0 2 2005

MAY 3 1 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Transfer of Water from Pond A to Pond 1 And or 2 and Weekly Status Report for the WIPP Storm water Infiltration Controls Project Pond A

Dear Mr. Marshall:

The purpose of this letter is to confirm the telephone discussion between you, Jody Plum of the U.S. Department of Energy, and Dale Bignell of Washington TRU Solutions on Monday, May 16, 2005. During this phone conversation, it was requested and you authorized a continuance of the verbal authorization you provided on May 10, 2005, to pump an estimated 130,000 gallons of water from Storm Water Infiltration Control (SWIC) Pond A to SWIC Pond 1 and/or 2. A Notice of Intent (NOI) documenting your May 10, 2005, authorization was documented in a letter mailed on May 16, 2005.

Based on your May 10, 2005, verbal authorization for the NOI letter mailed on May 16, 2005, the estimated 130,000 gallons of water was transferred to SWIC Pond 1. Over the weekend, May 14 and 15, 2005, the Waste Isolation Pilot Plant (WIPP) site received an additional 0.48 inches of rain resulting in collection of an equal volume of water and continued need to pump from SWIC Pond A to SWIC Pond 1 and or 2.

The removal of this water from Pond A is necessary to facilitate resuming construction in SWIC Pond A. Pond A is estimated to contain less than 130,000 gallons of water. The construction contractor is scheduled to resume earthwork during the week of May 23, 2005, if the pond is adequately dried and no additional rainfall is received.

Due to continued precipitation events and submittal of several NOIs, DOE would like to request that it be allowed to submit a weekly status report of the pumping activities and associated construction progress on Pond A. In this manner, you will be informed of our progress and conditions at hand and have a subsequent reduction in administrative action. If you have no objections to this proposal, we will provide you the first report on the date you request by letter or e-mail as directed by your office.

Thank you for your assistance and if you have any questions or need additional information please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

Ines Triay

Ines R. Triay
Acting Manager

cc:
J. Kieling, NMED *ED
J. Bearzi, NMED ED

*ED denotes electronic distribution
CBFO:AMO:HLP:GS:05-0278:UFC 5487.00

bcc:

G. Basabilvazo, CBFO	*ED
H. Plum, CBFO	ED
M. Rose, CBFO	ED
D. Mercer, CBFO	ED
D. Bignell, WRES	ED
R. Kehrman, WRES	ED
S. Kouba, WRES	ED
R. Chavez, WRES	ED
S. Jone, WRES	ED
R. Reeves, WRES	ED
B. Roush, WRES	ED
J. Siegel, WRES	ED
S. Anderson, WTS	ED
G. Johnson, WTS	ED
S. Youngerman, WTS	ED

*ED denotes electronic distribution
CBFO:AMO:HLP:GS:05-0278:UFC 5487.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAY 31 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Notification of the Freeboard Levels in the Sewage Lagoons and the H-19 Evaporation Pond and Monthly Construction/Dewatering Progress Report for Stormwater Infiltration Control Pond A

Dear Mr. Marshall:

The purpose of this letter is to report the Freeboard Levels remaining in the Waste Isolation Pilot Plant (WIPP) Sewage Lagoons and the H-19 Evaporation Pond.

Your letter dated December 28, 2004, approved the corrective actions proposed by Department of Energy (DOE) for required DOE provide notification to New Mexico Environment Department (NMED) by the last day of each month. As requested, the freeboard levels for May 2005 are listed below.

Location	**Remaining Freeboard on May 16, 2005**
Settling Pond 1A	33 inches
Polishing Pond 1B	30 inches
Settling Pond 2A	30 inches
Settling Pond 2B	32 inches
Evaporation Pond A	27 inches
Evaporation Pond B	26 inches
Evaporation Pond C	26 inches
H-19 Evaporation Pond	30 inches

A minimum of two feet of freeboard has been re-established in all seven ponds in the sewage lagoon system and the H-19 Evaporation Pond. For this reason, the corrective actions approved in your December 28, 2004, letter have been completed and this will be the last monthly status report on the freeboard levels in these ponds. The WIPP project will return to the normal inspection schedule and discontinue daily inspections of the sewage system ponds and the H-19 Evaporation Pond.

A Notice of Intent dated March 4, 2005, from DOE to you, references your request for WIPP to provide NMED with a monthly report of the status of activities for the construction of Storm Water Infiltration Control Pond A. Correspondence dated May 6,

CBFO:AMO:HLP:LR:05-0279:UFC:5486

May 16 and May 19, 2005, documents efforts taken to transfer water from Pond A to Ponds 1 and/or 2 to facilitate drying Pond A so that construction may be continued. All water has been removed from Pond A; however, the dirt is not dry enough to permit the use of heavy equipment at this time. We are currently attempting to schedule the liner and construction contractor to complete the earthwork and liner installation in Pond A in early June 2005.

If you have any questions or require additional information, please contact me at (505) 234-7462.

Sincerely,

Ines Triay

Ines R. Triay
Acting Manager

cc:

J. Kieling, NMED	* ED
J. Bearzi, NMED	ED
CBFO M&RC	

*ED denotes electronic distribution

CBFO:AMO:HLP:LR:05-0279:UFC:5486

bcc:

G. Basabilvazo, CBFO	ED
H. Plum, CBFO	ED
D. Mercer, CBFO	ED
L. Piper, CBFO	ED
C. Zvonar, CBFO	ED
R. Steger, CBFO	ED
S. Anderson, WTS	ED
G. Johnson, WTS	ED
D. Steffen, WTS	ED
S. Youngerman, WTS	ED
D. Bignell, WRES	ED
R. Chavez, WRES	ED
S. Jones, WRES	ED
R. Kehrman, WRES	ED
S. Kouba, WRES	ED
R. Reeves, WRES	ED
B. Roush, WRES	ED
J. Siegel, WRES	ED

CBFO:AMO:HLP:LR:05-0279:UFC:5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAY 24 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

RECEIVED
MAY 26 2005

Subject: Sewage Lagoon Liner Integrity Inspection Plan

Dear Mr. Marshall:

The purpose of this letter is notify you that we anticipate having a subcontractor on site during the week of June 6, 2005, to conduct leak testing on the synthetic liners in each of the seven ponds that constitute the Waste Isolation Pilot Plant (WIPP) sewage treatment system.

During your last inspection of the WIPP Site on August 11, 2004, you requested that WIPP develop and submit to you an inspection plan for the liners of the sewage lagoon system. On March 10, 2005, we provided you with a letter notifying the Ground Water Quality Bureau of our intent to establish a contract with a company that provides professional services for locating leaks in geomembrane-lined facilities using electrical leak detection methods and laboratory testing to evaluate the condition of the liners.

You and other representatives of the New Mexico Environment Department are welcome, as always, to observe the testing procedures during the week of June 6, 2005. To coordinate the specific dates and times that the testing will be conducted or if you have any questions or need any additional information relative to this inspection plan, please contact me at (505) 234-7462.

Sincerely,

H. L. Plum
RCRA Program Manager

cc:

J. Kieling, NMED	*ED
J. Bearzi, NMED	ED
T. Klein, NMED-AIP	ED

CBFO:AMO:HLP:LR:05-0277:UFC:5486

BILL RICHARDSON
Governor

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

RON CURRY
Secretary

7002 2410 0004 2506 1499

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Total Postage & Fees	$

Sent To Dr. Ines R. Triay,
Waste Isolation Pi
Street, Apt. No.; or PO Box No. U.S. Dept. of Energy
P.O. Box 3090
City, State, ZIP+4 Carlsbad, New Mexi
PS Form 3800, June 2002

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

May 20, 2005

Dr. Ines R. Triay, Acting Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Response to Notices of Intent and Continuance to Transfer Storm Water from SWIC Pond A to SWIC Ponds 1, 2, DP-831, Waste Isolation Pilot Plant

Dear Dr. Triay:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received three Notices of Intent (NOI), submitted by the U.S. Department of Energy Waste Isolation Pilot Plant (WIPP) dated April 29, May 13, and May 19, 2005. The NOIs request the transfer of storm water from the unlined Storm Water Infiltration Control (SWIC) Pond A to the lined SWIC Ponds 1 and 2. Excessive precipitation in the area has caused further delay in lining SWIC Pond A and transfer of storm water to SWIC Ponds 1and 2 is necessary to complete construction.

Due to repeated storm events triggering several NOI requests, WIPP has also submitted a request, dated May 19, 2005, to continue to transfer storm water from SWIC Pond A to SWIC Ponds 1 and 2 as needed to facilitate construction activities. WIPP proposes to submit weekly status reports on storm water transfer activities and construction progress on Pond A.

Based on the presently available information in your letters, a discharge permit is not being required for the discharges described above. A discharge permit is not being required because the storm water discharges are to synthetically lined impoundments designed to contain storm water and therefore no releases to the ground are expected. NMED approves your request to continue the transfer of storm water on an as-needed basis until the construction of SWIC Pond A is complete. WIPP shall submit weekly reports on the volume of storm water transferred to Ponds 1 and 2, the remaining capacity in

Ponds 1and 2, and the progress of construction activities on SWIC Pond A.

If at some time in the future WIPP intends to change the amount, the character, or location of the discharges so that they will not be as described, or if observation or monitoring shows that the discharges are threatening ground water quality, you must file a new NOI with the NMED.

If you have any questions, please call Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027.

Sincerely,

William C. Olson, Chief
Ground Water Quality Bureau

WCO/CLM

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAY 1 9 2005

RECEIVED
MAY 2 0 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Transfer of Water from Pond A to Pond 1 and/or 2 and Weekly Status Report for the WIPP Stormwater Infiltration Controls Project Pond A

Dear Mr. Marshall:

The purpose of this letter is to confirm the telephone discussion between you, Jody Plum of the U.S. Department of Energy, and Dale Bignell of Washington TRU Solutions on Monday, May 16, 2005. During this phone conversation, we requested and you authorized a continuance of the verbal authorization you provided on May 10, 2005, to pump an estimated 130,000 gallons of water from Storm Water Infiltration Control (SWIC) Pond A to SWIC Pond 1 and/or 2. A Notice of Intent (NOI) documenting your May 10, 2005, authorization was documented in a letter mailed on May 16, 2005.

Based on your May 10, 2005, verbal authorization for the NOI letter mailed on May 16, 2005, the estimated 130,000 gallons of water was transferred to SWIC Pond 1. Over the weekend, May 14 and 15, 2005, the WIPP site received an additional 0.48 inches of rain resulting in collection of an additional, estimated 130,000 gallons of water and continued need to pump water from SWIC Pond A to SWIC Pond 1 and or 2.

The removal of this estimated 130,000 gallons of water from Pond A is necessary to facilitate resuming construction in SWIC Pond A. The construction contractor is scheduled to resume earthwork during the week of May 23, 2005, if the pond is adequately dried and no additional rainfall is received.

Due to continued precipitation events which have led to submittal of several NOIs, DOE would like to request that it be allowed to submit a weekly status report of the pumping activities and associated construction progress on Pond A. In this manner, you will be informed of our progress and conditions at hand and have a subsequent reduction in administrative action. If you have no objections to this proposal, we will provide you the first report on the date you request by letter or e-mail as directed by your office.

Thank you for your assistance and if you have any questions or need additional information please contact Mr. Jody Plum of my staff at (505) 234-7462.

Sincerely,

George T. Basabilvazo for

Ines R. Triay
Acting Manager

CBFO:AMO:HJ:LR:05-0274:UFC:5487

cc:

J. Kieling, NMED	* ED
J. Bearzi, NMED	ED
CBFO M&RC	

CBFO:AMO:HJ:LR:05-0274:UFC:5487

bcc:

G. Basabilvazo, CBFO	*ED
H. Plum, CBFO	ED
M. Rose, CBFO	ED
D. Mercer, CBFO	ED
S. Anderson, WTS	ED
G. Johnson, WTS	ED
S. Youngerman, WTS	ED
D. Bignell, WRES	ED
R. Kehrman, WRES	ED
S. Kouba, WRES	ED
R. Chavez, WRES	ED
S. Jones, WRES	ED
R. Reeves, WRES	ED
B. Roush, WRES	ED
J. Siegel, WRES	ED

*ED denotes Electronic Distribution

CBFO:AMO:HJ:LR:05-0274:UFC:5487

MAY 19 2005

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Harold Runnels Building, Room N2250
1190 St. Francis Drive
Santa Fe, NM 87501

Subject: Notice of Intent to Discharge

Dear Mr. Marshall:

The purpose of this letter is to document your verbal authorization on May 10, 2005, to discharge approximately 130,000 gallons of water from Storm Water Infiltration Control (SWIC) Pond A to Storm Water Infiltration Control Ponds 1 and/or 2.

As the result of a storm event on May 6, 2005, additional water has accumulated in SWIC Pond A. In order to facilitate resuming earth work and the installation of the synthetic liner in SWIC Pond A as required by the Discharge Permit Modification issued on December 22, 2003, the DOE requests authorization to discharge the water from SWIC Pond A to SWIC Pond 1 and/or 2.

It is estimated that there is approximately 130,000 gallons in SWIC Pond A. The SWIC Ponds 1 and 2 are lined with a 60-mil high-density polyethylene liner so the discharge will not infiltrate to the subsurface or impact groundwater. The transfer of this water will present no threat to human health or the environment.

The DOE is providing the information below to the NMED as required pursuant to 20.6.2.1201 NMAC.

(1) Name of the person making the discharge;
Dr. Inés Triay, Acting Manager

(2) The address of the person making the discharge;
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
4021 National Parks Highway
Carlsbad, NM 88221
(505) 234-7303

CBFO:AMO:HLP:GS:05-0271:UFC 5487.00

MAY 19 2005

(3) The location of the discharge:

Name	County	Township	Range	Section	Latitude	Longitude
Pond 1	Eddy	22S	31E	SW ¼ of the SE 1/4 of the SE 1/4 of Section 20	N32°, 22 Minutes, 13.6 Seconds	W103°, 47 Minutes, 39.4 Seconds
Pond 2	Eddy	22S	31E	SE ¼ of the SE 1/4 of the SE 1/4 of section 20	N32°, 22 Minutes, 13.7 Seconds	W103°, 47 Minutes, 34.3 Seconds
Pond A	Eddy	22S	31E	SE 1/4 of the SW 1/4 of the SE 1/4 of section 20	N32°, 22 Minutes, 19.9 Seconds	W103°, 47 Minutes, 51.9 Seconds

(4) An estimate of the concentration of water contaminates in the discharge (based upon April 21, 2005, results):

Parameter	Pond A Results	Pond A Results (Duplicate)
pH	8.00	7.98
Specific Gravity @ 21° C	1.003	1.003
Specific Conductance @ 25° C	1,073	1082
Bicarbonate of Alkalinity HCO_3	112	110
Chloride (mg/l)	253	250
Divalent Cations mq/l	<1.0	<1.0
Fe (total)	0.01	0.01
Calcium (mg/l)	12.0	NA
Sulfide (mg/l)	23.0	NA
Potassium (mg/l)	2.5	NA

(5) The quantity of the discharge:

Approximately 130,000 gallons of storm water is to be discharged from SWIC Pond A to SWIC Ponds 1 and/or 2.

If you have any questions regarding this notification, please contact Mr. Jody Plum at (505) 234-7462.

Sincerely,

Ines R. Triay
Acting Manager

cc:

M. Leavitt, NMED	*ED
J. Bearzi, NMED	ED
S. Zappe, NMED	ED
T. Klein, NMED-AIP	ED
D. Peppe, NMED-AIP	ED
CBFO M&RC	

*ED denotes Electronic Distribution
CBFO:AMO:HLP:GS:05-0271:UFC 5487.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAY 0 6 2005

RECEIVED
MAY 0 9 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Notification of the Freeboard Levels in the Sewage Lagoons and the H-19 Evaporation Pond and Construction Progress Report for Storm Water Infiltration Control Pond A

Dear Mr. Marshall:

The purpose of this letter is to provide you the requested information as noted in your letter dated December 28, 2004, approving the corrective actions proposed by WIPP for the restoration of freeboard in the sewage lagoon system and the H-19 evaporation pond. Your December 28, 2004 letter requires us to notify you of the freeboard levels in each pond by the last day of each month. As requested, the freeboard levels for April 2005 are listed below.

Location	Remaining Freeboard on April 15, 2005
Settling Pond 1A	30 inches
Polishing Pond 1B	26 inches
Settling Pond 2A	29 inches
Settling Pond 2B	29 inches
Evaporation Pond A	14 inches
Evaporation Pond B	23 inches
Evaporation Pond C	23 inches
H-19 Evaporation Pond	30 inches

As discussed with you and documented in a letter dated March 4, 2005 the status of the activities for the construction of Storm Water Infiltration Control (SWIC) Pond A is as follows:

- An additional 0.38 inches of rain fell April 17, 2005 impacting efforts to install the liner.
- Earthwork has not been resumed pending scheduling of the liner contractor.

CBFO:AMO:HLP:GS:05-0267:UFC 5486.00

- Efforts are being taken to schedule the contractor to install the lienr at their first availability when Pond A dries out.

If you have any questions or require additional information, please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

Inés Triay

Ines R. Triay
Acting Manager

cc:

J. Kieling, NMED	*ED
J. Bearzi, NMED	ED
N. Levitt, NMED	ED
T. Klein, AIP	ED

*ED denotes electronic distribution
CBFO:AMO:HLP:GS:05-0267:UFC 5486.00

bcc:

H. L. Plum, CBFO	*ED
D. Mercer, CBFO	ED
M. Rose, CBFO	ED
G. Basabilvazo, CBFO	ED
S. D. Anderson, WTS	ED
D. T. Bignell, WRES	ED
R. R. Chavez, WRES	ED
S. B. Jones, WRES	ED
S. C. Kouba, WRES	ED
R. F. Kehrman, WRES	ED
R. D. Reeves, WRES	ED
B. P. Roush, WRES	ED
J. Siegel, WRES	ED
G. L. Valett, WRES	ED

*ED denotes electronic distribution
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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAY 04 2005

APR 29 2005

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Harold Runnels Building, Room N2250
1190 St. Francis Drive
Santa Fe, NM 87501

Subject: Notice of Intent to Discharge

Dear Mr. Marshall:

The purpose of this letter is to document your verbal authorization on April 27, 2005, to discharge approximately 130,000 gallons of water from Storm Water Infiltration Control (SWIC) Pond A to SWIC Pond 1 and/or 2. A March 4, 2005, Notice of Intent (NOI) to discharge approximately 200,000 gallons from SWIC Pond A to SWIC Pond 1 and 2 or to the ground was approved without requiring a permit on March 7, 2005. Analytical results indicated the water discharged pursuant to the March 4, 2005, NOI conformed to the numerical standards outlined in 20.6.2.3103 NMAC and did not contain any toxic pollutants as defined in 20.6.2.1101.TT NMAC. Therefore, the discharge was exempt from requiring a permit pursuant to 20.6.2.3105.A. NMAC.

As the result of a storm event on April 17, 2005, additional water has accumulated in SWIC Pond A. In order to facilitate resuming earth work and the installation of the synthetic liner in SWIC Pond A, as required by the Discharge Permit Modification issued on December 22, 2003, the DOE requests authorization to discharge the water from SWIC Pond A to SWIC Pond 1 and/or 2. We estimate that there is less than 130,000 gallons of water in SWIC Pond A. The analytical results below indicate that the water that has collected in Pond A and sampled on April 21, 2005, exceeds the regulatory threshold of 250 mg/l of chloride listed in 20.6.2.3103 NMAC. The SWIC Ponds 1 and 2 are lined with a 60-mil high-density polyethylene liner so the discharge will not infiltrate to the subsurface or impact groundwater. The transfer of this water to SWIC Pond 1 and/or 2 will present no threat to human health or the environment.

The DOE is providing the information below to the New Mexico Environment Department as required pursuant to 20.6.2.1201 NMAC.

(1) Name of the person making the discharge;
Dr. Inés Triay, Acting Manager

CBFO:AMO:HLP:GS:05-0264:UFC 5487.00

(2) The address of the person making the discharge;

U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
4021 National Parks Highway
Carlsbad, NM 88221
(505) 234-7303

(3) The location of the discharge;

Name	County	Township	Range	Section	Latitude	Longitude
Pond 1	Eddy	22S	31E	SW ¼ of the SE ¼ of the SE ¼ of Section 20	N32°, 22 Minutes, 13.6 Seconds	W103°, 47 Minutes, 39.4 Seconds
Pond 2	Eddy	22S	31E	SE ¼ of the SE ¼ of the SE ¼ of section 20	N32°, 22 Minutes, 13.7 Seconds	W103°, 47 Minutes, 34.3 Seconds
Pond A	Eddy	22S	31E	SE ¼ of the SW ¼ of the SE ¼ of section 20	N32°, 22 Minutes, 19.9 Seconds	W103°, 47 Minutes, 51.9 Seconds

(4) An estimate of the concentration of water contaminates in the discharge;

Parameter	Pond A Results	Pond A Results (Duplicate)
Ph	8.00	7.98
Specific Gravity @ 21o C	1.003	1.003
Specific Conductance @ 25o C	1,073	1082
Bicarbonate of Alkalinity HCO3	112	110
Chloride (mg/l)	253	250
Divalent Cations mq/l	<1.0	<1.0
Fe (total)	0.01	0.01
Calcium (mg/l)	12.0	NA
Sulfide (mg/l)	23.0	NA
Potassium (mg/l)	2.5	NA

(5) The quantity of the discharge.
Approximately 130,000 gallons of storm water may be discharged from SWIC Pond A to SWIC Ponds 1 and/or 2.

If you have any questions regarding this notification, please contact Mr. Jody Plum at (505) 234-7462.

Sincerely,

Ines Triay

Dr. Ines R. Triay
Acting Manager

cc:

M. Leavitt, NMED	*ED
J. Bearzi, NMED	ED
S. Zappe, NMED	ED
T. Klein, NMED-AIP	ED
D. Peppe, NMED-AIP	ED
CBFO M&RC	

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State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2918
Fax (505) 827-2965

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

April 26, 2005

RE: Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant (REVISED).

Dear Discharge Permit Applicant:

The New Mexico Environment Department (NMED) received a Ground Water Discharge Permit Application from you on March 8, 2005. Pursuant to Section 20.6.2.3106 NMAC of the New Mexico Water Quality Control Commission Regulations (2016.2 NMAC), NMED determined on March 10, 2005 that your application is administratively complete.

Within 30 days of the submission of an administratively complete Discharge Permit Application, you must provide public notice using one of the 3 options listed in Section 20.6.2.3108 NMAC. You selected public notice option # 2. The instructions and materials needed to complete this option are enclosed.

If you have any questions, please call the Ground Water Quality Bureau at (505) 827-2900.

Sincerely,

Megan Nelson
for
William C. Olson, Chief
Ground Water Quality Bureau

Attachments: Public Notice 1 (mail to property owner)
Public Notice Synopsis (for newspaper display ad)
Instructions for Option #2
Affidavit (return to NMED)
~~Invoice ($15 fee for poster – please submit payment to NMED)~~
Poster

Public Notice 1
DP-831

The U.S. Department of Energy's Waste Isolation Pilot Plant, Ines Triay, Acting Manager, proposes to modify the Discharge Permit (DP-831) for the discharge and treatment of up to 33,000 gallons per day of domestic and industrial wastewater and up to 3,231,360 gallons per day of storm water runoff from general facility grounds, parking lots, and synthetically lined and/or capped salt storage piles. This permit modification addresses additional potential contamination sources at the WIPP facility and incorporates all potential sources into a comprehensive closure plan. The sources addressed in the closure plan include three salt storage piles that are the result of constructing underground access drifts and rooms for the disposal of transuranic radioactive waste and transuranic radioactive mixed waste. Potential contaminants from these types of discharges include total dissolved solids, chloride and nitrogen compounds.

The facility is located 26 miles southeast of Carlsbad, in Sections 20, 21, 28 and 29, T22S, R31E, Eddy County, New Mexico. Ground water that could potentially be affected by the discharges ranges from the Culebra Member of the Rustler Formation at a depth of approximately 608 feet with a total dissolved solids concentration of approximately 234,000 mg/l to water in the Dewey Lake Formation south of the site at a depth of 225 feet with a total dissolved solids concentration of approximately 3,920 mg/l.

Information in this public notice was provided by the applicant and will be verified by the New Mexico Environment Department during the permit application process. NMED will accept comments and statements of interest regarding the application and will create a facility specific mailing list for persons who wish to receive future notices. Comments and statements of interest should be sent to Clint Marshall, DP-831, Ground Water Quality Bureau, PO Box 26110, Santa Fe, NM 87502. For additional information please call (505) 827-2900.

Applicant:
Ines Triay, Acting Manager
U.S. Department of Energy
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

Public Notice Synopsis, DP-831
(for sign & newspaper display ad)

Newspaper display ad must be at least 2 inches by 3 inches in size and must be published for at least one day in a section other than the classifieds or legals.

PUBLIC NOTICE
NOTICIA PUBLICA

Discharge Permit Modification / Aplicación para Modificación del Permiso de Descarga: For up to 3,231,360 gallons per day of stormwater and up to 33,000 gallons per day of domestic and industrial wastewater to evaporation ponds / Hásta 3,231,360 galones por día de agua de lluvia y hasta 33,000 galones por día de aguas residuales domésticas y industriales a las charcas de evaporación

Applicant & Discharge Location / Solicitante & Sitio de Descarga: Waste Isolation Pilot Plant, US Dept of Energy, 26 miles southeast of Carlsbad

For More Information / Para Más Información (DP-831):
Ground Water Quality Bureau / Sección de Agua Subterranea
NM Environment Department / Departamento del Medio Ambiente
(505) 827-2900 www.nmenv.state.nm.us (public notices)

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

BILL RICHARDSON
Governor

RON CURRY
Secretary

DERRITH WATCHMAN-MOOR
Deputy Secretary

7002 2410 0004 2506 0861

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Postage	$
Certified Fee	
Return Reciept Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Dr. Ines R. Triay
Waste Isolation Pil
US Dept of Energy
P.O. Box 3090
Carlsbad, New Mexic

PS Form 3800, June 2002

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

April 7, 2005

Dr. Ines R. Triay, Acting Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Approval of Inspection Plan for Sewage Lagoon System, DP-831, Waste Isolation Pilot Plant

Dear Dr. Triay:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received a plan to inspect the sewage lagoon system submitted by the U.S. Department of Energy Waste Isolation Pilot Plant (WIPP) dated March 10, 2005. The proposal was submitted based on a request from NMED personnel during a site inspection conducted on August 11, 2004. The purpose of the proposed plan is to evaluate the integrity of the existing synthetic liners in the sewage lagoon system and to determine if leaks exist below the waterline. NMED hereby approves the proposed inspection plan.

The proposed inspection plan and leak detection method is briefly described as follows:

A contractor will be employed by WIPP to provide professional engineering services using an electronic leak detection method to locate leaks in the existing synthetic liners. Electrodes will be placed in each lagoon and the adjacent ground and a voltage applied. The lagoon liner acts as an insulator, therefore leaks in the liner produce detectable localized anomalies of high current density. In addition to applying this technique, samples of the liner material will be collected from each of the lagoons above the waterline and subjected to laboratory testing to further determine the condition of the liners. A final report will be submitted to NMED within 90 days of the contractor's report.

If you have any questions regarding this approval, please call me at 505-827-0027.

Sincerely,

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau

xc: Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 24 2005

RECEIVED
MAR 28 2005

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Notification of the Freeboard Levels in the Sewage Lagoons and the H-19 Evaporation Pond and Construction Progress Report for Storm Water Infiltration Control Pond A

Dear Mr. Marshall:

Your letter dated December 28, 2004, approving the corrective actions proposed by WIPP for the loss of freeboard in the sewage lagoons and the H-19 evaporation pond requires us to notify you of the freeboard levels in each pond by the last day of each month. As requested, the freeboard levels for March 2005 are listed below.

Location	Remaining Freeboard on March 15, 2005
Settling Pond 1A	20 inches
Polishing Pond 1B	18 inches
Settling Pond 2A	19 inches
Settling Pond 2B	18 inches
Evaporation Pond A	16 inches
Evaporation Pond B	18 inches
Evaporation Pond C	18 inches
H-19 Evaporation Pond	25 inches

Two feet of freeboard has been restored in the H-19 Evaporation Pond as required by DP-831.

As discussed with you and documented in a letter dated March 4, 2005, the following summarizes activities related to the construction of the Storm Water Infiltration Control (SWIC) Pond A.

- In order to provide additional capacity in the SWIC Pond 1, approximately 110,000 gallons of water was pumped to the SWIC Pond 2 for evaporation.

- Water was pumped from the SWIC Pond A to the environment until the pump would not keep suction. Small isolated areas of pond water remain on the west end of the SWIC Pond A.

- The culvert that directs storm water run-off from the parking lot to the SWIC Pond A was plugged to prevent run-off from the parking lot entering the SWIC Pond A. Much of the precipitation that may fall on the parking lot is diverted to the environment.

- A temporary dam has been constructed in the drainage ditch which conveys storm water run-off from the plant site to the SWIC Pond A. All run-off collected at this location is pumped to the SWIC Pond 1 as necessary.

Efforts to remove and prevent storm water accumulation are proving effective; however, the SWIC Pond A is still too wet for construction to resume at this time.

If you have any questions or require additional information, please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

Ines R. Triay
Acting Manager

cc:

J. Kieling, NMED	*ED
J. Bearzi, NMED	ED
N. Levitt, NMED	ED
T. Klein, AIP	ED

*ED denotes electronic distribution
CBFO:AMO:HLP:GS:05-0238:UFC 5486.00

bcc:

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D. T. Bignell, WRES	ED
R. R. Chavez, WRES	ED
S. B. Jones, WRES	ED
S. C. Kouba, WRES	ED
R. F. Kehrman, WRES	ED
R. D. Reeves, WRES	ED
B. P. Roush, WRES	ED
J. Siegel, WRES	ED
G. L. Valett, WRES	ED

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State of New Mexico
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Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
Telephone (505) 827-2918
Fax (505) 827-2965

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

March 23, 2005

RE: Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant

Dear Discharge Permit Applicant:

The New Mexico Environment Department (NMED) received a Ground Water Discharge Permit Application from you on March 8, 2005. Pursuant to Section 20.6.2.3106 NMAC of the New Mexico Water Quality Control Commission Regulations (2016.2 NMAC), NMED determined on March 10, 2005 that your application is administratively complete.

Within 30 days of the submission of an administratively complete Discharge Permit Application, you must provide public notice using one of the 3 options listed in Section 20.6.2.3108 NMAC. You selected public notice option # 2. The instructions and materials needed to complete this option are enclosed.

If you have any questions, please call the Ground Water Quality Bureau at (505) 827-2900.

Sincerely,

Megan Nelson

for William C. Olson, Chief
Ground Water Quality Bureau

Attachments: Public Notice 1 (mail to property owner)
Public Notice Synopsis (for newspaper display ad)
Instructions for Option #2
Affidavit (return to NMED)
Invoice ($15 fee for poster – please submit payment to NMED)
Poster

Public Notice 1
DP-831

DP-831, Waste Isolation Pilot Plant, Inez Triay, Acting Manager, proposes to modify the Discharge Permit for the discharge of up to 3,231,360 gallons per day of domestic and industrial wastewater, and storm water runoff from mine tailings from a federal nuclear waste storage facility to a treatment and disposal system. Potential contaminants from this type of discharge include dissolved solids, chloride and nitrogen compounds. The facility is located 26 miles southeast of Carlsbad, in Section 20, T22S, R31E, Eddy County. Ground water beneath the site is at a depth of approximately 608 feet and has a total dissolved solids concentration of approximately 3,920 milligrams per liter.

Information in this public notice was provided by the applicant and will be verified by the New Mexico Environment Department during the permit application review process. NMED will accept comments and statements of interest regarding the application and will create a facility specific mailing list for persons who wish to receive future notices. Comments and statements of interest should be sent to Clint Marshall, DP-831, Ground Water Quality Bureau, PO Box 26110, Santa Fe, NM 87502. For additional information, please call (505) 827-2900.

Applicant:
Inez Triay, Acting Manager
US Dept of Energy
PO Box 3090
Carlsbad, NM 88221

Public Notice Synopsis, DP-831
(for sign & newspaper display ad)

Newspaper display ad must be at least 2 inches by 3 inches in size and must be published for at least one day in a section other than the classifieds or legals.

PUBLIC NOTICE
NOTICIA PUBLICA

Discharge Permit Modification / Aplicación para Modificación del Permiso de Descarga: For 3,231,360 gallons per day of domestic, industrial and mining wastewater to a treatment and disposal system / Por 3,231,360 galones por día de aguas residuales domésticas, industriales y mineros a un sistema de tratamiento y disposición

Applicant & Discharge Location / Solicitante & Sitio de Descarga: Waste Isolation Pilot Plant, US Dept of Energy, 26 miles southeast of Carlsbad

For More Information / Para Más Información (DP-831):
Ground Water Quality Bureau / Sección de Agua Subterranea
NM Environment Department / Departamento del Medio Ambiente
(505) 827-2900
www.nmenv.state.nm.us (public notices)

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
March 10, 2005

RECEIVED
MAR 1 8 2005

Mr. Steve Zappe, WIPP Project Leader
Hazardous Waste Permits Program
Hazardous Waste Bureau
New Mexico Environment Department
2905 E. Rodeo Park Dr., Bldg. 1
Santa Fe, New Mexico 87505-6303

Subject: Stained Soils Found in the Parking Area During Excavation for the TRUPACT Sun Shade Structure

Dear Mr. Zappe:

The purpose of this letter is to provide follow-up information concerning the stained soils noted during construction of the TRUPACT Sun Shade Structure (Enclosure 1). On February 14, 2005, the Department of Energy (DOE) and Washington TRU Solutions (WTS) notified you that stained soil had been found in two of the 15 footing excavations. These excavations are located within the Parking Area Unit (PAU) as described in the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP) that is paved over the area of Solid Waste Management Unit (SWMU) 005a (Enclosure 2). This SWMU was a concrete batch plant operated during the construction of several buildings at the WIPP facility. SWMU 005a is characterized in Revision 3 of the WIPP RCRA Permit Application as follows:

> "The only releases at these sites consist of spillage that occurred during filling of the trucks and stockpiling materials. The material released was water mixed with concrete, sand, and gravel and is considered non-hazardous. In addition, trace amounts of non-RCRA regulated motor oil, grease, and diesel may have leaked from trucks during handling."

During the notification call, it was stated that an investigation of the stained soil, including sampling, would be conducted to determine if there were constituents of concern present. The soil and a small amount of liquid were sampled on February 15, 2005. The excavations were deepened and a geologic soil description was made on February 18, 2005. The following enclosures provide details of the investigative activities:

Enclosure 1	Engineering Figure of the TRUPACT Sun Shade Shelter Noting the Location of the Structure and Footings
Enclosure 2	Aerial Photograph Noting the Location of Solid Waste Management Unit 005a
Enclosure 3	Analytical Results for the Investigation
Enclosure 4	Analytical Discussion
Enclosure 5	Summary Description of Additional Excavated Soil

The sample analyses have indicated the contaminant is diesel fuel (Enclosure 3). Excavations indicate only a small area was contaminated (see Enclosure 4). The levels of diesel fuel are slightly elevated (see Enclosure 4) above the clean soil levels described in the Solid Waste Regulations NMED 20.9.1.708. Data and observations indicate the stained soil is stable. The information developed during the investigation shows the stained soil is not migrating (Enclosure 5). The diesel found was bound to the soils and obvious signs of degradation indicate the microbes in the soil and oxidation of the fuels were taking place. The natural attenuation process is expected to continue to reduce the diesel levels in the soil. Inspection of the excavations on subsequent days after the excavations showed the stained soil to be dramatically lighter in color and no odor was present.

No impact is expected to human health or the environment, due to the depth of the contamination and the fact that it is covered with a minimum of 6 inches of concrete and 4 inches of asphalt under the concrete. The footings measuring approximately 4 feet wide by 4 feet long by 4 feet deep will be filled with compacted gravel and concrete. There is no apparent migration of the contaminants and no receptors under the concrete and asphalt.

The location has been identified using the Global Positioning Satellite System and SWMU 005a has been noted in the HWFP. Solid Waste Management Unit 005a will be thoroughly evaluated at the decommissioning of the WIPP facility and closed per the HWFP Attachment I. Since this is a previously identified SWMU with non hazardous constituents and no human health or environmental receptors, no further actions are planned until site closure.

Per DOE's phone conversation with you on March 4, 2005, construction of the TRUPACT sun shade structure will resume.

If you have any questions, please contact me at (505) 234-7300.

Sincerely,

Inés Triay

Inés R. Triay
Acting Manager

Enclosures

cc: w/enclosures
J. Bearzi, NMED
T. Klein, NMED-AIP
M. Leavitt, NMED
C. Marshall, NMED
D. Pepe, ???

CBFO:AMO:HLP:GS:05-0228:UFC 5486.00

Enclosure 1

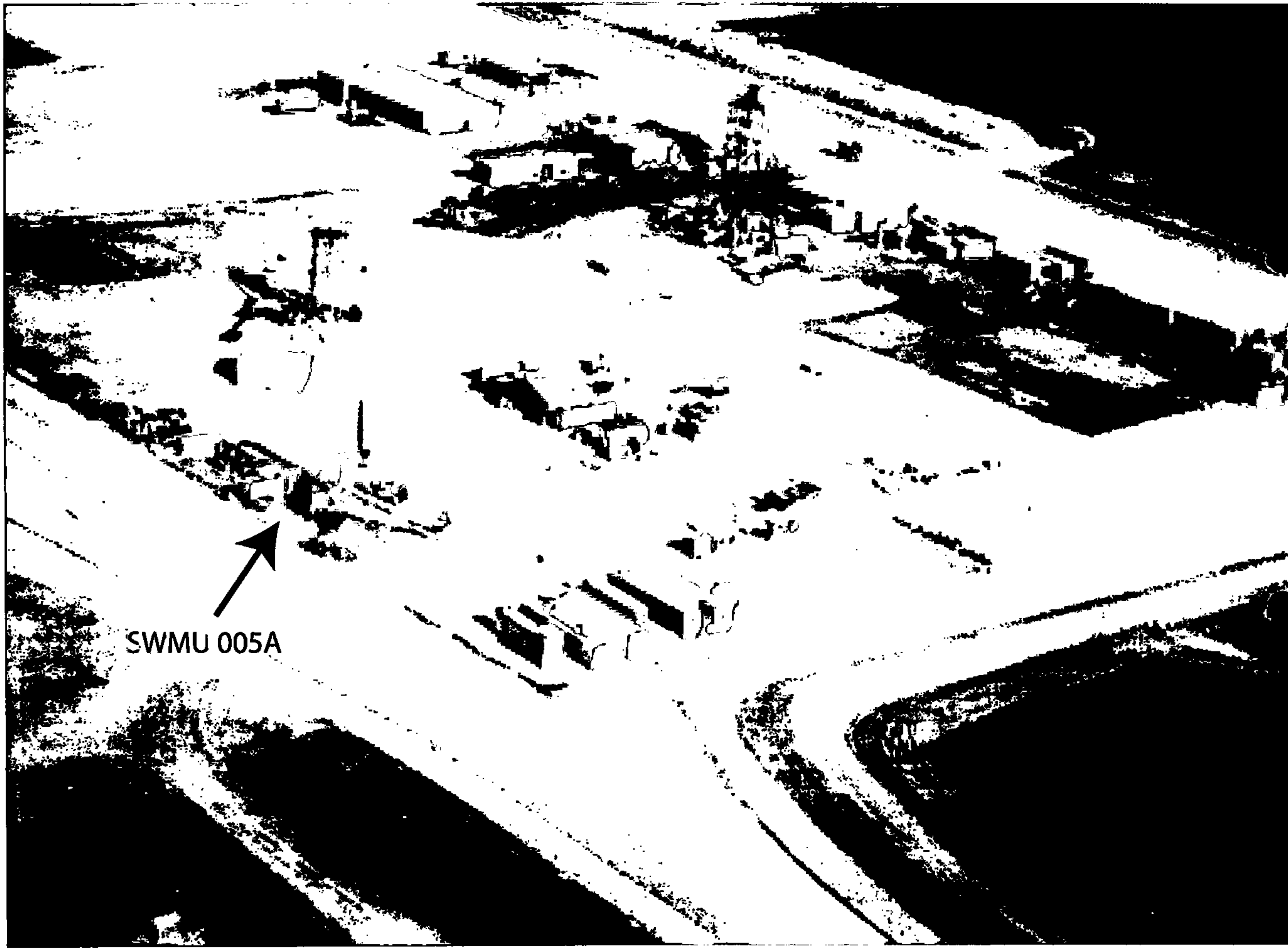
Engineering Figure of the TRUPACT Sun Shade Shelter Noting the Location of the Structure and Footings.

Enclosure 2

Aerial Photograph Noting the Location Of Solid Waste Management Unit 005a

CBFO:AMO:HLP:GS:05-0228:UFC 5486.00

Attachment 2



Enclosure 3

Analytical Results for the Investigation

TRACEANALYSIS, INC.
6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail lab@traceanalysis.com

Analytical and Quality Control Report

Koreen Guillermo
WRES
P.O.Box 2078
Carlsbad, NM 88221-2078

Report Date: February 24, 2005

Work Order: 5021614

Project Number: PO #402560

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
54725	WST-05-008	water	2005-02-15	08:16	2005-02-16
54726	WST-05-009	water	2005-02-15	08:16	2005-02-16
54727	WST-05-010	water	2005-02-15	08:18	2005-02-16
54728	WST-05-012	soil	2005-02-15	08:39	2005-02-16
54729	WST-05-013	soil	2005-02-15	08:39	2005-02-16
54730	WST-05-014	soil	2005-02-15	08:46	2005-02-16
54731	WST-05-015	soil	2005-02-15	08:46	2005-02-16
54732	WST-05-016	soil	2005-02-15	09:30	2005-02-16
54733	WST-05-017	soil	2005-02-15	09:36	2005-02-16
54734	WST-05-018	soil	2005-02-15	09:56	2005-02-16
54735	WST-05-019	soil	2005-02-15	09:58	2005-02-16
54736	WST-05-020	soil	2005-02-15	10:14	2005-02-16
54737	WST-05-021	soil	2005-02-15	10:16	2005-02-16
54738	WST-05-022	soil	2005-02-15	10:30	2005-02-16
54739	WST-05-023	soil	2005-02-15	10:32	2005-02-16
54740	WST-05-024	soil	2005-02-15	10:49	2005-02-16
54741	WST-05-025	soil	2005-02-15	10:52	2005-02-16
54742	WST-05-026	water	2005-02-15	10:51	2005-02-16
54743	WST-05-027	water	2005-02-15	10:58	2005-02-16

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 37 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Analytical Report

Sample: 54725 - WST-05-008

Analysis:	Volatiles	Analytical Method:	S 8260B	Prep Method:	S 5030B
QC Batch:	16033	Date Analyzed:	2005-02-20	Analyzed By:	JG
Prep Batch:	14150	Date Prepared:	2005-02-20	Prepared By:	JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane		<1.00	μg/L	1	1.00
Dichlorodifluoromethane		<1.00	μg/L	1	1.00
Chloromethane (methyl chloride)		<1.00	μg/L	1	1.00
Vinyl Chloride		<1.00	μg/L	1	1.00
Bromomethane (methyl bromide)		<1.00	μg/L	1	1.00
Chloroethane		<1.00	μg/L	1	1.00
Trichlorofluoromethane		<1.00	μg/L	1	1.00
Acetone		20.3	μg/L	1	10.0
Iodomethane (methyl iodide)		<5.00	μg/L	1	5.00
Carbon Disulfide		<1.00	μg/L	1	1.00
Acrylonitrile		<1.00	μg/L	1	1.00
2-Butanone (MEK)		<5.00	μg/L	1	5.00
4-Methyl-2-pentanone (MIBK)		<5.00	μg/L	1	5.00
2-Hexanone		<1.00	μg/L	1	1.00
trans 1,4-Dichloro-2-butene		<10.0	μg/L	1	10.0
1,1-Dichloroethene		<1.00	μg/L	1	1.00
Methylene chloride		<5.00	μg/L	1	5.00
MTBE		<1.00	μg/L	1	1.00
trans-1,2-Dichloroethene		<1.00	μg/L	1	1.00
1,1-Dichloroethane		<1.00	μg/L	1	1.00
cis-1,2-Dichloroethene		<1.00	μg/L	1	1.00
2,2-Dichloropropane		<1.00	μg/L	1	1.00
1,2-Dichloroethane (EDC)		<1.00	μg/L	1	1.00
Chloroform		<1.00	μg/L	1	1.00
1,1,1-Trichloroethane		<1.00	μg/L	1	1.00
1,1-Dichloropropene		<1.00	μg/L	1	1.00
Benzene		<1.00	μg/L	1	1.00
Carbon Tetrachloride		<1.00	μg/L	1	1.00
1,2-Dichloropropane		<1.00	μg/L	1	1.00
Trichloroethene (TCE)		<1.00	μg/L	1	1.00
Dibromomethane (methylene bromide)		<1.00	μg/L	1	1.00
Bromodichloromethane		<1.00	μg/L	1	1.00
2-Chloroethyl vinyl ether		<5.00	μg/L	1	5.00
cis-1,3-Dichloropropene		<1.00	μg/L	1	1.00
trans-1,3-Dichloropropene		<1.00	μg/L	1	1.00
Toluene		<1.00	μg/L	1	1.00
1,1,2-Trichloroethane		<1.00	μg/L	1	1.00
1,3-Dichloropropane		<1.00	μg/L	1	1.00
Dibromochloromethane		<1.00	μg/L	1	1.00
1,2-Dibromoethane (EDB)		<1.00	μg/L	1	1.00
Tetrachloroethene (PCE)		<1.00	μg/L	1	1.00
Chlorobenzene		<1.00	μg/L	1	1.00
1,1,1,2-Tetrachloroethane		<1.00	μg/L	1	1.00
Ethylbenzene		<1.00	μg/L	1	1.00
m,p-Xylene		<1.00	μg/L	1	1.00

continued ...

sample 54725 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Bromoform		<1.00	μg/L	1	1.00
Styrene		<1.00	μg/L	1	1.00
o-Xylene		<1.00	μg/L	1	1.00
1,1,2,2-Tetrachloroethane		<1.00	μg/L	1	1.00
2-Chlorotoluene		<1.00	μg/L	1	1.00
1,2,3-Trichloropropane		<1.00	μg/L	1	1.00
Isopropylbenzene		<1.00	μg/L	1	1.00
Bromobenzene		<1.00	μg/L	1	1.00
n-Propylbenzene		<1.00	μg/L	1	1.00
1,3,5-Trimethylbenzene		<1.00	μg/L	1	1.00
tert-Butylbenzene		<1.00	μg/L	1	1.00
1,2,4-Trimethylbenzene		<1.00	μg/L	1	1.00
1,4-Dichlorobenzene (para)		<1.00	μg/L	1	1.00
sec-Butylbenzene		<1.00	μg/L	1	1.00
1,3-Dichlorobenzene (meta)		<1.00	μg/L	1	1.00
p-Isopropyltoluene		<1.00	μg/L	1	1.00
4-Chlorotoluene		<1.00	μg/L	1	1.00
1,2-Dichlorobenzene (ortho)		<1.00	μg/L	1	1.00
n-Butylbenzene		<1.00	μg/L	1	1.00
1,2-Dibromo-3-chloropropane		<5.00	μg/L	1	5.00
1,2,3-Trichlorobenzene		5.13	μg/L	1	5.00
1,2,4-Trichlorobenzene		<5.00	μg/L	1	5.00
Naphthalene		<5.00	μg/L	1	5.00
Hexachlorobutadiene		<5.00	μg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		51.7	μg/L	1	50.0	103	70 - 130
Toluene-d8		49.9	μg/L	1	50.0	100	70 - 130
4-Bromofluorobenzene (4-BFB)		48.1	μg/L	1	50.0	96	70 - 130

Sample: 54726 - WST-05-009

Analysis:	Volatiles	Analytical Method:	S 8260B	Prep Method:	S 5030B
QC Batch:	16033	Date Analyzed:	2005-02-20	Analyzed By:	JG
Prep Batch:	14150	Date Prepared:	2005-02-20	Prepared By:	JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane		<1.00	μg/L	1	1.00
Dichlorodifluoromethane		<1.00	μg/L	1	1.00
Chloromethane (methyl chloride)		<1.00	μg/L	1	1.00
Vinyl Chloride		<1.00	μg/L	1	1.00
Bromomethane (methyl bromide)		<1.00	μg/L	1	1.00
Chloroethane		<1.00	μg/L	1	1.00
Trichlorofluoromethane		<1.00	μg/L	1	1.00
Acetone		18.0	μg/L	1	10.0
Iodomethane (methyl iodide)		<5.00	μg/L	1	5.00
Carbon Disulfide		<1.00	μg/L	1	1.00

continued ...

sample 54726 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Acrylonitrile		<1.00	µg/L	1	1.00
2-Butanone (MEK)		<5.00	µg/L	1	5.00
4-Methyl-2-pentanone (MIBK)		<5.00	µg/L	1	5.00
2-Hexanone		<1.00	µg/L	1	1.00
trans 1,4-Dichloro-2-butene		<10.0	µg/L	1	10.0
1,1-Dichloroethene		<1.00	µg/L	1	1.00
Methylene chloride		<5.00	µg/L	1	5.00
MTBE		<1.00	µg/L	1	1.00
trans-1,2-Dichloroethene		<1.00	µg/L	1	1.00
1,1-Dichloroethane		<1.00	µg/L	1	1.00
cis-1,2-Dichloroethene		<1.00	µg/L	1	1.00
2,2-Dichloropropane		<1.00	µg/L	1	1.00
1,2-Dichloroethane (EDC)		<1.00	µg/L	1	1.00
Chloroform		<1.00	µg/L	1	1.00
1,1,1-Trichloroethane		<1.00	µg/L	1	1.00
1,1-Dichloropropene		<1.00	µg/L	1	1.00
Benzene		<1.00	µg/L	1	1.00
Carbon Tetrachloride		<1.00	µg/L	1	1.00
1,2-Dichloropropane		<1.00	µg/L	1	1.00
Trichloroethene (TCE)		<1.00	µg/L	1	1.00
Dibromomethane (methylene bromide)		<1.00	µg/L	1	1.00
Bromodichloromethane		<1.00	µg/L	1	1.00
2-Chloroethyl vinyl ether		<5.00	µg/L	1	5.00
cis-1,3-Dichloropropene		<1.00	µg/L	1	1.00
trans-1,3-Dichloropropene		<1.00	µg/L	1	1.00
Toluene		<1.00	µg/L	1	1.00
1,1,2-Trichloroethane		<1.00	µg/L	1	1.00
1,3-Dichloropropane		<1.00	µg/L	1	1.00
Dibromochloromethane		<1.00	µg/L	1	1.00
1,2-Dibromoethane (EDB)		<1.00	µg/L	1	1.00
Tetrachloroethene (PCE)		<1.00	µg/L	1	1.00
Chlorobenzene		<1.00	µg/L	1	1.00
1,1,1,2-Tetrachloroethane		<1.00	µg/L	1	1.00
Ethylbenzene		<1.00	µg/L	1	1.00
m,p-Xylene		<1.00	µg/L	1	1.00
Bromoform		<1.00	µg/L	1	1.00
Styrene		<1.00	µg/L	1	1.00
o-Xylene		<1.00	µg/L	1	1.00
1,1,2,2-Tetrachloroethane		<1.00	µg/L	1	1.00
2-Chlorotoluene		<1.00	µg/L	1	1.00
1,2,3-Trichloropropane		<1.00	µg/L	1	1.00
Isopropylbenzene		<1.00	µg/L	1	1.00
Bromobenzene		<1.00	µg/L	1	1.00
n-Propylbenzene		<1.00	µg/L	1	1.00
1,3,5-Trimethylbenzene		<1.00	µg/L	1	1.00
tert-Butylbenzene		<1.00	µg/L	1	1.00
1,2,4-Trimethylbenzene		<1.00	µg/L	1	1.00
1,4-Dichlorobenzene (para)		<1.00	µg/L	1	1.00
sec-Butylbenzene		<1.00	µg/L	1	1.00
1,3-Dichlorobenzene (meta)		<1.00	µg/L	1	1.00
p-Isopropyltoluene		<1.00	µg/L	1	1.00

continued ...

sample 54726 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
4-Chlorotoluene		<1.00	μg/L	1	1.00
1,2-Dichlorobenzene (ortho)		<1.00	μg/L	1	1.00
n-Butylbenzene		<1.00	μg/L	1	1.00
1,2-Dibromo-3-chloropropane		<5.00	μg/L	1	5.00
1,2,3-Trichlorobenzene		<5.00	μg/L	1	5.00
1,2,4-Trichlorobenzene		<5.00	μg/L	1	5.00
Naphthalene		<5.00	μg/L	1	5.00
Hexachlorobutadiene		<5.00	μg/L	1	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		51.0	μg/L	1	50.0	102	70 - 130
Toluene-d8		49.9	μg/L	1	50.0	100	70 - 130
4-Bromofluorobenzene (4-BFB)		49.5	μg/L	1	50.0	99	70 - 130

Sample: 54727 - WST-05-010

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	16027	Date Analyzed:	2005-02-19	Analyzed By:	BP
Prep Batch:	14144	Date Prepared:	2005-02-17	Prepared By:	DS

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	0.1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		17.1	mg/L	0.1	150	114	70 - 130

Sample: 54727 - WST-05-010

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5030B
QC Batch:	15959	Date Analyzed:	2005-02-16	Analyzed By:	MS
Prep Batch:	14077	Date Prepared:	2005-02-16	Prepared By:	MS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<0.500	mg/L	5	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.507	mg/L	5	0.100	101	80.5 - 113
4-Bromofluorobenzene (4-BFB)		0.355	mg/L	5	0.100	71	64.8 - 123

Sample: 54728 - WST-05-012

Analysis:	Volatiles	Analytical Method:	S 8260B	Prep Method:	S 5030B
QC Batch:	16034	Date Analyzed:	2005-02-20	Analyzed By:	JG
Prep Batch:	14152	Date Prepared:	2005-02-20	Prepared By:	JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane	1	<50.0	µg/Kg	50	1.00
Dichlorodifluoromethane		<50.0	µg/Kg	50	1.00
Chloromethane (methyl chloride)		<50.0	µg/Kg	50	1.00
Vinyl Chloride		<50.0	µg/Kg	50	1.00
Bromomethane (methyl bromide)		<250	µg/Kg	50	5.00
Chloroethane		<50.0	µg/Kg	50	1.00
Trichlorofluoromethane		<50.0	µg/Kg	50	1.00
Acetone		<500	µg/Kg	50	10.0
Iodomethane (methyl iodide)		<250	µg/Kg	50	5.00
Carbon Disulfide		<50.0	µg/Kg	50	1.00
Acrylonitrile		<50.0	µg/Kg	50	1.00
2-Butanone (MEK)		<250	µg/Kg	50	5.00
4-Methyl-2-pentanone (MIBK)		<250	µg/Kg	50	5.00
2-Hexanone		<250	µg/Kg	50	5.00
trans 1,4-Dichloro-2-butene		<500	µg/Kg	50	10.0
1,1-Dichloroethene		<50.0	µg/Kg	50	1.00
Methylene chloride		<250	µg/Kg	50	5.00
MTBE		<50.0	µg/Kg	50	1.00
trans-1,2-Dichloroethene		<50.0	µg/Kg	50	1.00
1,1-Dichloroethane		<50.0	µg/Kg	50	1.00
cis-1,2-Dichloroethene		<50.0	µg/Kg	50	1.00
2,2-Dichloropropane		<50.0	µg/Kg	50	1.00
1,2-Dichloroethane (EDC)		<50.0	µg/Kg	50	1.00
Chloroform		<50.0	µg/Kg	50	1.00
1,1,1-Trichloroethane		<50.0	µg/Kg	50	1.00
1,1-Dichloropropene		<50.0	µg/Kg	50	1.00
Benzene		<50.0	µg/Kg	50	1.00
Carbon Tetrachloride		<50.0	µg/Kg	50	1.00
1,2-Dichloropropane		<50.0	µg/Kg	50	1.00
Trichloroethene (TCE)		<50.0	µg/Kg	50	1.00
Dibromomethane (methylene bromide)		<50.0	µg/Kg	50	1.00
Bromodichloromethane		<50.0	µg/Kg	50	1.00
2-Chloroethyl vinyl ether		<250	µg/Kg	50	5.00
cis-1,3-Dichloropropene		<50.0	µg/Kg	50	1.00
trans-1,3-Dichloropropene		<50.0	µg/Kg	50	1.00
Toluene		<50.0	µg/Kg	50	1.00
1,1,2-Trichloroethane		<50.0	µg/Kg	50	1.00
1,3-Dichloropropane		<50.0	µg/Kg	50	1.00
Dibromochloromethane		<50.0	µg/Kg	50	1.00
1,2-Dibromoethane (EDB)		<50.0	µg/Kg	50	1.00
Tetrachloroethene (PCE)		<50.0	µg/Kg	50	1.00
Chlorobenzene		<50.0	µg/Kg	50	1.00
1,1,1,2-Tetrachloroethane		<50.0	µg/Kg	50	1.00
Ethylbenzene		<50.0	µg/Kg	50	1.00
m,p-Xylene		<50.0	µg/Kg	50	1.00
Bromoform		<50.0	µg/Kg	50	1.00

continued ...

[1] elevated reporting limits due to surfactants.

sample 54728 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Styrene		<50.0	μg/Kg	50	1.00
o-Xylene		<50.0	μg/Kg	50	1.00
1,1,2,2-Tetrachloroethane		<50.0	μg/Kg	50	1.00
2-Chlorotoluene		<50.0	μg/Kg	50	1.00
1,2,3-Trichloropropane		<50.0	μg/Kg	50	1.00
Isopropylbenzene		<50.0	μg/Kg	50	1.00
Bromobenzene		<50.0	μg/Kg	50	1.00
n-Propylbenzene		<50.0	μg/Kg	50	1.00
1,3,5-Trimethylbenzene		<50.0	μg/Kg	50	1.00
tert-Butylbenzene		<50.0	μg/Kg	50	1.00
1,2,4-Trimethylbenzene		<50.0	μg/Kg	50	1.00
1,4-Dichlorobenzene (para)		<50.0	μg/Kg	50	1.00
sec-Butylbenzene		<50.0	μg/Kg	50	1.00
1,3-Dichlorobenzene (meta)		<50.0	μg/Kg	50	1.00
p-Isopropyltoluene		<50.0	μg/Kg	50	1.00
4-Chlorotoluene		<50.0	μg/Kg	50	1.00
1,2-Dichlorobenzene (ortho)		<50.0	μg/Kg	50	1.00
n-Butylbenzene		<50.0	μg/Kg	50	1.00
1,2-Dibromo-3-chloropropane		<250	μg/Kg	50	5.00
1,2,3-Trichlorobenzene		<250	μg/Kg	50	5.00
1,2,4-Trichlorobenzene		<250	μg/Kg	50	5.00
Naphthalene		<250	μg/Kg	50	5.00
Hexachlorobutadiene		<250	μg/Kg	50	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		2380	μg/Kg	50	50.0	95	70 - 130
Toluene-d8		2430	μg/Kg	50	50.0	97	70 - 130
4-Bromofluorobenzene (4-BFB)		2440	μg/Kg	50	50.0	98	70 - 130

Sample: 54729 - WST-05-013

Analysis:	Volatiles	Analytical Method:	S 8260B	Prep Method:	S 5030B
QC Batch:	16034	Date Analyzed:	2005-02-20	Analyzed By:	JG
Prep Batch:	14152	Date Prepared:	2005-02-20	Prepared By:	JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane	2	<50.0	μg/Kg	50	1.00
Dichlorodifluoromethane		<50.0	μg/Kg	50	1.00
Chloromethane (methyl chloride)		<50.0	μg/Kg	50	1.00
Vinyl Chloride		<50.0	μg/Kg	50	1.00
Bromomethane (methyl bromide)		<250	μg/Kg	50	5.00
Chloroethane		<50.0	μg/Kg	50	1.00
Trichlorofluoromethane		<50.0	μg/Kg	50	1.00
Acetone		<500	μg/Kg	50	10.0
Iodomethane (methyl iodide)		<250	μg/Kg	50	5.00
Carbon Disulfide		<50.0	μg/Kg	50	1.00

continued . . .

[2]elevated reporting limits due to surfactants.

sample 54729 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Acrylonitrile		<50.0	µg/Kg	50	1.00
2-Butanone (MEK)		<250	µg/Kg	50	5.00
4-Methyl-2-pentanone (MIBK)		<250	µg/Kg	50	5.00
2-Hexanone		<250	µg/Kg	50	5.00
trans 1,4-Dichloro-2-butene		<500	µg/Kg	50	10.0
1,1-Dichloroethene		<50.0	µg/Kg	50	1.00
Methylene chloride		<250	µg/Kg	50	5.00
MTBE		<50.0	µg/Kg	50	1.00
trans-1,2-Dichloroethene		<50.0	µg/Kg	50	1.00
1,1-Dichloroethane		<50.0	µg/Kg	50	1.00
cis-1,2-Dichloroethene		<50.0	µg/Kg	50	1.00
2,2-Dichloropropane		<50.0	µg/Kg	50	1.00
1,2-Dichloroethane (EDC)		<50.0	µg/Kg	50	1.00
Chloroform		<50.0	µg/Kg	50	1.00
1,1,1-Trichloroethane		<50.0	µg/Kg	50	1.00
1,1-Dichloropropene		<50.0	µg/Kg	50	1.00
Benzene		<50.0	µg/Kg	50	1.00
Carbon Tetrachloride		<50.0	µg/Kg	50	1.00
1,2-Dichloropropane		<50.0	µg/Kg	50	1.00
Trichloroethene (TCE)		<50.0	µg/Kg	50	1.00
Dibromomethane (methylene bromide)		<50.0	µg/Kg	50	1.00
Bromodichloromethane		<50.0	µg/Kg	50	1.00
2-Chloroethyl vinyl ether		<250	µg/Kg	50	5.00
cis-1,3-Dichloropropene		<50.0	µg/Kg	50	1.00
trans-1,3-Dichloropropene		<50.0	µg/Kg	50	1.00
Toluene		<50.0	µg/Kg	50	1.00
1,1,2-Trichloroethane		<50.0	µg/Kg	50	1.00
1,3-Dichloropropane		<50.0	µg/Kg	50	1.00
Dibromochloromethane		<50.0	µg/Kg	50	1.00
1,2-Dibromoethane (EDB)		<50.0	µg/Kg	50	1.00
Tetrachloroethene (PCE)		<50.0	µg/Kg	50	1.00
Chlorobenzene		<50.0	µg/Kg	50	1.00
1,1,1,2-Tetrachloroethane		<50.0	µg/Kg	50	1.00
Ethylbenzene		<50.0	µg/Kg	50	1.00
m,p-Xylene		<50.0	µg/Kg	50	1.00
Bromoform		<50.0	µg/Kg	50	1.00
Styrene		<50.0	µg/Kg	50	1.00
o-Xylene		<50.0	µg/Kg	50	1.00
1,1,2,2-Tetrachloroethane		<50.0	µg/Kg	50	1.00
2-Chlorotoluene		<50.0	µg/Kg	50	1.00
1,2,3-Trichloropropane		<50.0	µg/Kg	50	1.00
Isopropylbenzene		<50.0	µg/Kg	50	1.00
Bromobenzene		<50.0	µg/Kg	50	1.00
n-Propylbenzene		<50.0	µg/Kg	50	1.00
1,3,5-Trimethylbenzene		<50.0	µg/Kg	50	1.00
tert-Butylbenzene		<50.0	µg/Kg	50	1.00
1,2,4-Trimethylbenzene		<50.0	µg/Kg	50	1.00
1,4-Dichlorobenzene (para)		<50.0	µg/Kg	50	1.00
sec-Butylbenzene		<50.0	µg/Kg	50	1.00
1,3-Dichlorobenzene (meta)		<50.0	µg/Kg	50	1.00
p-Isopropyltoluene		<50.0	µg/Kg	50	1.00

continued . . .

sample 54729 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
4-Chlorotoluene		<50.0	µg/Kg	50	1.00
1,2-Dichlorobenzene (ortho)		<50.0	µg/Kg	50	1.00
n-Butylbenzene		<50.0	µg/Kg	50	1.00
1,2-Dibromo-3-chloropropane		<250	µg/Kg	50	5.00
1,2,3-Trichlorobenzene		<250	µg/Kg	50	5.00
1,2,4-Trichlorobenzene		<250	µg/Kg	50	5.00
Naphthalene		<250	µg/Kg	50	5.00
Hexachlorobutadiene		<250	µg/Kg	50	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		2380	µg/Kg	50	50.0	95	70 - 130
Toluene-d8		2460	µg/Kg	50	50.0	98	70 - 130
4-Bromofluorobenzene (4-BFB)		2510	µg/Kg	50	50.0	100	70 - 130

Sample: 54730 - WST-05-014

Analysis:	TPH DRO	**Analytical Method:**	Mod. 8015B	**Prep Method:**	N/A
QC Batch:	16028	**Date Analyzed:**	2005-02-19	**Analyzed By:**	BP
Prep Batch:	14145	**Date Prepared:**	2005-02-17	**Prepared By:**	DS

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		1130	mg/Kg	5	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	3	540	mg/Kg	5	30.0	360	69.8 - 106.1

Sample: 54730 - WST-05-014

Analysis:	TPH GRO	**Analytical Method:**	S 8015B	**Prep Method:**	S 5035
QC Batch:	15958	**Date Analyzed:**	2005-02-16	**Analyzed By:**	MS
Prep Batch:	14076	**Date Prepared:**	2005-02-16	**Prepared By:**	MS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		1.09	mg/Kg	10	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.09	mg/Kg	10	0.100	109	0 - 160
4-Bromofluorobenzene (4-BFB)		0.964	mg/Kg	10	0.100	96	0 - 174

[3] Surrogate recovery out of control limits due to peak interference. QC show the process within control.

Sample: 54731 - WST-05-015

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	16028	Date Analyzed:	2005-02-19	Analyzed By:	BP
Prep Batch:	14145	Date Prepared:	2005-02-17	Prepared By:	DS

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		1050	mg/Kg	5	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	4	442	mg/Kg	5	30.0	295	69.8 - 106.1

Sample: 54731 - WST-05-015

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
QC Batch:	15958	Date Analyzed:	2005-02-16	Analyzed By:	MS
Prep Batch:	14076	Date Prepared:	2005-02-16	Prepared By:	MS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO	5	<20.0	mg/Kg	200	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.799	mg/Kg	200	0.100	4	0 - 160
4-Bromofluorobenzene (4-BFB)		0.797	mg/Kg	200	0.100	4	0 - 174

Sample: 54732 - WST-05-016

Analysis:	Volatiles	Analytical Method:	S 8260B	Prep Method:	S 5030B
QC Batch:	16034	Date Analyzed:	2005-02-20	Analyzed By:	JG
Prep Batch:	14152	Date Prepared:	2005-02-20	Prepared By:	JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane		<10.0	μg/Kg	10	1.00
Dichlorodifluoromethane		<10.0	μg/Kg	10	1.00
Chloromethane (methyl chloride)		<10.0	μg/Kg	10	1.00
Vinyl Chloride		<10.0	μg/Kg	10	1.00
Bromomethane (methyl bromide)		<50.0	μg/Kg	10	5.00
Chloroethane		<10.0	μg/Kg	10	1.00
Trichlorofluoromethane		<10.0	μg/Kg	10	1.00
Acetone		<100	μg/Kg	10	10.0
Iodomethane (methyl iodide)		<50.0	μg/Kg	10	5.00
Carbon Disulfide		<10.0	μg/Kg	10	1.00
Acrylonitrile		<10.0	μg/Kg	10	1.00
2-Butanone (MEK)		<50.0	μg/Kg	10	5.00
4-Methyl-2-pentanone (MIBK)		<50.0	μg/Kg	10	5.00
2-Hexanone		<50.0	μg/Kg	10	5.00
trans 1,4-Dichloro-2-butene		<100	μg/Kg	10	10.0
1,1-Dichloroethene		<10.0	μg/Kg	10	1.00

[4]Surrogate recovery out of control limits due to peak interference. QC show the process within control.
[5]Sample diluted due to surfactants.

continued ...

sample 54732 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Methylene chloride		<50.0	μg/Kg	10	5.00
MTBE		<10.0	μg/Kg	10	1.00
trans-1,2-Dichloroethene		<10.0	μg/Kg	10	1.00
1,1-Dichloroethane		<10.0	μg/Kg	10	1.00
cis-1,2-Dichloroethene		<10.0	μg/Kg	10	1.00
2,2-Dichloropropane		<10.0	μg/Kg	10	1.00
1,2-Dichloroethane (EDC)		<10.0	μg/Kg	10	1.00
Chloroform		<10.0	μg/Kg	10	1.00
1,1,1-Trichloroethane		<10.0	μg/Kg	10	1.00
1,1-Dichloropropene		<10.0	μg/Kg	10	1.00
Benzene		<10.0	μg/Kg	10	1.00
Carbon Tetrachloride		<10.0	μg/Kg	10	1.00
1,2-Dichloropropane		<10.0	μg/Kg	10	1.00
Trichloroethene (TCE)		<10.0	μg/Kg	10	1.00
Dibromomethane (methylene bromide)		<10.0	μg/Kg	10	1.00
Bromodichloromethane		<10.0	μg/Kg	10	1.00
2-Chloroethyl vinyl ether		<50.0	μg/Kg	10	5.00
cis-1,3-Dichloropropene		<10.0	μg/Kg	10	1.00
trans-1,3-Dichloropropene		<10.0	μg/Kg	10	1.00
Toluene		<10.0	μg/Kg	10	1.00
1,1,2-Trichloroethane		<10.0	μg/Kg	10	1.00
1,3-Dichloropropane		<10.0	μg/Kg	10	1.00
Dibromochloromethane		<10.0	μg/Kg	10	1.00
1,2-Dibromoethane (EDB)		<10.0	μg/Kg	10	1.00
Tetrachloroethene (PCE)		<10.0	μg/Kg	10	1.00
Chlorobenzene		<10.0	μg/Kg	10	1.00
1,1,1,2-Tetrachloroethane		<10.0	μg/Kg	10	1.00
Ethylbenzene		<10.0	μg/Kg	10	1.00
m,p-Xylene		<10.0	μg/Kg	10	1.00
Bromoform		<10.0	μg/Kg	10	1.00
Styrene		<10.0	μg/Kg	10	1.00
o-Xylene		<10.0	μg/Kg	10	1.00
1,1,2,2-Tetrachloroethane		<10.0	μg/Kg	10	1.00
2-Chlorotoluene		<10.0	μg/Kg	10	1.00
1,2,3-Trichloropropane		<10.0	μg/Kg	10	1.00
Isopropylbenzene		<10.0	μg/Kg	10	1.00
Bromobenzene		<10.0	μg/Kg	10	1.00
n-Propylbenzene		<10.0	μg/Kg	10	1.00
1,3,5-Trimethylbenzene		<10.0	μg/Kg	10	1.00
tert-Butylbenzene		<10.0	μg/Kg	10	1.00
1,2,4-Trimethylbenzene		<10.0	μg/Kg	10	1.00
1,4-Dichlorobenzene (para)		<10.0	μg/Kg	10	1.00
sec-Butylbenzene		<10.0	μg/Kg	10	1.00
1,3-Dichlorobenzene (meta)		<10.0	μg/Kg	10	1.00
p-Isopropyltoluene		<10.0	μg/Kg	10	1.00
4-Chlorotoluene		<10.0	μg/Kg	10	1.00
1,2-Dichlorobenzene (ortho)		<10.0	μg/Kg	10	1.00
n-Butylbenzene		<10.0	μg/Kg	10	1.00
1,2-Dibromo-3-chloropropane		<50.0	μg/Kg	10	5.00
1,2,3-Trichlorobenzene		<50.0	μg/Kg	10	5.00
1,2,4-Trichlorobenzene		<50.0	μg/Kg	10	5.00

continued . . .

sample 54732 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Naphthalene		<50.0	μg/Kg	10	5.00
Hexachlorobutadiene		<50.0	μg/Kg	10	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		483	μg/Kg	10	50.0	97	70 - 130
Toluene-d8		486	μg/Kg	10	50.0	97	70 - 130
4-Bromofluorobenzene (4-BFB)		497	μg/Kg	10	50.0	99	70 - 130

Sample: 54733 - WST-05-017

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	16028	Date Analyzed:	2005-02-19	Analyzed By:	BP
Prep Batch:	14145	Date Prepared:	2005-02-17	Prepared By:	DS

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		1710	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	6	652	mg/Kg	1	150	435	69.8 - 106.1

Sample: 54733 - WST-05-017

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
QC Batch:	15958	Date Analyzed:	2005-02-16	Analyzed By:	MS
Prep Batch:	14076	Date Prepared:	2005-02-16	Prepared By:	MS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<1.00	mg/Kg	10	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.837	mg/Kg	10	0.100	84	0 - 160
4-Bromofluorobenzene (4-BFB)		0.876	mg/Kg	10	0.100	88	0 - 174

Sample: 54734 - WST-05-018

Analysis:	Volatiles	Analytical Method:	S 8260B	Prep Method:	S 5030B
QC Batch:	16034	Date Analyzed:	2005-02-20	Analyzed By:	JG
Prep Batch:	14152	Date Prepared:	2005-02-20	Prepared By:	JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane		<10.0	μg/Kg	10	1.00

continued . . .

[6]Surrogate recovery out of control limits due to peak interference. QC show the process within control.

sample 54734 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Dichlorodifluoromethane		<10.0	µg/Kg	10	1.00
Chloromethane (methyl chloride)		<10.0	µg/Kg	10	1.00
Vinyl Chloride		<10.0	µg/Kg	10	1.00
Bromomethane (methyl bromide)		<50.0	µg/Kg	10	5.00
Chloroethane		<10.0	µg/Kg	10	1.00
Trichlorofluoromethane		<10.0	µg/Kg	10	1.00
Acetone		<100	µg/Kg	10	10.0
Iodomethane (methyl iodide)		<50.0	µg/Kg	10	5.00
Carbon Disulfide		<10.0	µg/Kg	10	1.00
Acrylonitrile		<10.0	µg/Kg	10	1.00
2-Butanone (MEK)		<50.0	µg/Kg	10	5.00
4-Methyl-2-pentanone (MIBK)		<50.0	µg/Kg	10	5.00
2-Hexanone		<50.0	µg/Kg	10	5.00
trans 1,4-Dichloro-2-butene		<100	µg/Kg	10	10.0
1,1-Dichloroethene		<10.0	µg/Kg	10	1.00
Methylene chloride		<50.0	µg/Kg	10	5.00
MTBE		<10.0	µg/Kg	10	1.00
trans-1,2-Dichloroethene		<10.0	µg/Kg	10	1.00
1,1-Dichloroethane		<10.0	µg/Kg	10	1.00
cis-1,2-Dichloroethene		<10.0	µg/Kg	10	1.00
2,2-Dichloropropane		<10.0	µg/Kg	10	1.00
1,2-Dichloroethane (EDC)		<10.0	µg/Kg	10	1.00
Chloroform		<10.0	µg/Kg	10	1.00
1,1,1-Trichloroethane		<10.0	µg/Kg	10	1.00
1,1-Dichloropropene		<10.0	µg/Kg	10	1.00
Benzene		<10.0	µg/Kg	10	1.00
Carbon Tetrachloride		<10.0	µg/Kg	10	1.00
1,2-Dichloropropane		<10.0	µg/Kg	10	1.00
Trichloroethene (TCE)		<10.0	µg/Kg	10	1.00
Dibromomethane (methylene bromide)		<10.0	µg/Kg	10	1.00
Bromodichloromethane		<10.0	µg/Kg	10	1.00
2-Chloroethyl vinyl ether		<50.0	µg/Kg	10	5.00
cis-1,3-Dichloropropene		<10.0	µg/Kg	10	1.00
trans-1,3-Dichloropropene		<10.0	µg/Kg	10	1.00
Toluene		<10.0	µg/Kg	10	1.00
1,1,2-Trichloroethane		<10.0	µg/Kg	10	1.00
1,3-Dichloropropane		<10.0	µg/Kg	10	1.00
Dibromochloromethane		<10.0	µg/Kg	10	1.00
1,2-Dibromoethane (EDB)		<10.0	µg/Kg	10	1.00
Tetrachloroethene (PCE)		<10.0	µg/Kg	10	1.00
Chlorobenzene		<10.0	µg/Kg	10	1.00
1,1,1,2-Tetrachloroethane		<10.0	µg/Kg	10	1.00
Ethylbenzene		<10.0	µg/Kg	10	1.00
m,p-Xylene		<10.0	µg/Kg	10	1.00
Bromoform		<10.0	µg/Kg	10	1.00
Styrene		<10.0	µg/Kg	10	1.00
o-Xylene		<10.0	µg/Kg	10	1.00
1,1,2,2-Tetrachloroethane		<10.0	µg/Kg	10	1.00
2-Chlorotoluene		<10.0	µg/Kg	10	1.00
1,2,3-Trichloropropane		<10.0	µg/Kg	10	1.00
Isopropylbenzene		<10.0	µg/Kg	10	1.00

continued ...

sample 54734 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Bromobenzene		<10.0	μg/Kg	10	1.00
n-Propylbenzene		<10.0	μg/Kg	10	1.00
1,3,5-Trimethylbenzene		<10.0	μg/Kg	10	1.00
tert-Butylbenzene		<10.0	μg/Kg	10	1.00
1,2,4-Trimethylbenzene		<10.0	μg/Kg	10	1.00
1,4-Dichlorobenzene (para)		<10.0	μg/Kg	10	1.00
sec-Butylbenzene		<10.0	μg/Kg	10	1.00
1,3-Dichlorobenzene (meta)		<10.0	μg/Kg	10	1.00
p-Isopropyltoluene		<10.0	μg/Kg	10	1.00
4-Chlorotoluene		<10.0	μg/Kg	10	1.00
1,2-Dichlorobenzene (ortho)		<10.0	μg/Kg	10	1.00
n-Butylbenzene		<10.0	μg/Kg	10	1.00
1,2-Dibromo-3-chloropropane		<50.0	μg/Kg	10	5.00
1,2,3-Trichlorobenzene		<50.0	μg/Kg	10	5.00
1,2,4-Trichlorobenzene		<50.0	μg/Kg	10	5.00
Naphthalene		<50.0	μg/Kg	10	5.00
Hexachlorobutadiene		<50.0	μg/Kg	10	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		472	μg/Kg	10	50.0	94	70 - 130
Toluene-d8		487	μg/Kg	10	50.0	97	70 - 130
4-Bromofluorobenzene (4-BFB)		492	μg/Kg	10	50.0	98	70 - 130

Sample: 54735 - WST-05-019

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	16028	Date Analyzed:	2005-02-19	Analyzed By:	BP
Prep Batch:	14145	Date Prepared:	2005-02-17	Prepared By:	DS

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		154	mg/Kg	1	150	103	69.8 - 106.1

Sample: 54735 - WST-05-019

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
QC Batch:	15958	Date Analyzed:	2005-02-16	Analyzed By:	MS
Prep Batch:	14076	Date Prepared:	2005-02-16	Prepared By:	MS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<1.00	mg/Kg	10	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.862	mg/Kg	10	0.100	86	0 - 160
4-Bromofluorobenzene (4-BFB)		0.927	mg/Kg	10	0.100	93	0 - 174

Sample: 54736 - WST-05-020

Analysis:	Volatiles	Analytical Method:	S 8260B	Prep Method:	S 5030B
QC Batch:	16034	Date Analyzed:	2005-02-20	Analyzed By:	JG
Prep Batch:	14152	Date Prepared:	2005-02-20	Prepared By:	JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane		<10.0	μg/Kg	10	1.00
Dichlorodifluoromethane		<10.0	μg/Kg	10	1.00
Chloromethane (methyl chloride)		<10.0	μg/Kg	10	1.00
Vinyl Chloride		<10.0	μg/Kg	10	1.00
Bromomethane (methyl bromide)		<50.0	μg/Kg	10	5.00
Chloroethane		<10.0	μg/Kg	10	1.00
Trichlorofluoromethane		<10.0	μg/Kg	10	1.00
Acetone		<100	μg/Kg	10	10.0
Iodomethane (methyl iodide)		<50.0	μg/Kg	10	5.00
Carbon Disulfide		<10.0	μg/Kg	10	1.00
Acrylonitrile		<10.0	μg/Kg	10	1.00
2-Butanone (MEK)		<50.0	μg/Kg	10	5.00
4-Methyl-2-pentanone (MIBK)		<50.0	μg/Kg	10	5.00
2-Hexanone		<50.0	μg/Kg	10	5.00
trans 1,4-Dichloro-2-butene		<100	μg/Kg	10	10.0
1,1-Dichloroethene		<10.0	μg/Kg	10	1.00
Methylene chloride		<50.0	μg/Kg	10	5.00
MTBE		<10.0	μg/Kg	10	1.00
trans-1,2-Dichloroethene		<10.0	μg/Kg	10	1.00
1,1-Dichloroethane		<10.0	μg/Kg	10	1.00
cis-1,2-Dichloroethene		<10.0	μg/Kg	10	1.00
2,2-Dichloropropane		<10.0	μg/Kg	10	1.00
1,2-Dichloroethane (EDC)		<10.0	μg/Kg	10	1.00
Chloroform		<10.0	μg/Kg	10	1.00
1,1,1-Trichloroethane		<10.0	μg/Kg	10	1.00
1,1-Dichloropropene		<10.0	μg/Kg	10	1.00
Benzene		<10.0	μg/Kg	10	1.00
Carbon Tetrachloride		<10.0	μg/Kg	10	1.00
1,2-Dichloropropane		<10.0	μg/Kg	10	1.00
Trichloroethene (TCE)		<10.0	μg/Kg	10	1.00
Dibromomethane (methylene bromide)		<10.0	μg/Kg	10	1.00
Bromodichloromethane		<10.0	μg/Kg	10	1.00
2-Chloroethyl vinyl ether		<50.0	μg/Kg	10	5.00
cis-1,3-Dichloropropene		<10.0	μg/Kg	10	1.00
trans-1,3-Dichloropropene		<10.0	μg/Kg	10	1.00
Toluene		<10.0	μg/Kg	10	1.00
1,1,2-Trichloroethane		<10.0	μg/Kg	10	1.00
1,3-Dichloropropane		<10.0	μg/Kg	10	1.00
Dibromochloromethane		<10.0	μg/Kg	10	1.00
1,2-Dibromoethane (EDB)		<10.0	μg/Kg	10	1.00

continued ...

sample 54736 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Tetrachloroethene (PCE)		<10.0	μg/Kg	10	1.00
Chlorobenzene		<10.0	μg/Kg	10	1.00
1,1,1,2-Tetrachloroethane		<10.0	μg/Kg	10	1.00
Ethylbenzene		<10.0	μg/Kg	10	1.00
m,p-Xylene		<10.0	μg/Kg	10	1.00
Bromoform		<10.0	μg/Kg	10	1.00
Styrene		<10.0	μg/Kg	10	1.00
o-Xylene		<10.0	μg/Kg	10	1.00
1,1,2,2-Tetrachloroethane		<10.0	μg/Kg	10	1.00
2-Chlorotoluene		<10.0	μg/Kg	10	1.00
1,2,3-Trichloropropane		<10.0	μg/Kg	10	1.00
Isopropylbenzene		<10.0	μg/Kg	10	1.00
Bromobenzene		<10.0	μg/Kg	10	1.00
n-Propylbenzene		<10.0	μg/Kg	10	1.00
1,3,5-Trimethylbenzene		<10.0	μg/Kg	10	1.00
tert-Butylbenzene		<10.0	μg/Kg	10	1.00
1,2,4-Trimethylbenzene		<10.0	μg/Kg	10	1.00
1,4-Dichlorobenzene (para)		<10.0	μg/Kg	10	1.00
sec-Butylbenzene		<10.0	μg/Kg	10	1.00
1,3-Dichlorobenzene (meta)		<10.0	μg/Kg	10	1.00
p-Isopropyltoluene		<10.0	μg/Kg	10	1.00
4-Chlorotoluene		<10.0	μg/Kg	10	1.00
1,2-Dichlorobenzene (ortho)		<10.0	μg/Kg	10	1.00
n-Butylbenzene		<10.0	μg/Kg	10	1.00
1,2-Dibromo-3-chloropropane		<50.0	μg/Kg	10	5.00
1,2,3-Trichlorobenzene		<50.0	μg/Kg	10	5.00
1,2,4-Trichlorobenzene		<50.0	μg/Kg	10	5.00
Naphthalene		<50.0	μg/Kg	10	5.00
Hexachlorobutadiene		<50.0	μg/Kg	10	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		471	μg/Kg	10	50.0	94	70 - 130
Toluene-d8		485	μg/Kg	10	50.0	97	70 - 130
4-Bromofluorobenzene (4-BFB)		484	μg/Kg	10	50.0	97	70 - 130

Sample: 54737 - WST-05-021

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	16028	Date Analyzed:	2005-02-19	Analyzed By:	BP
Prep Batch:	14145	Date Prepared:	2005-02-17	Prepared By:	DS

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

continued ...

sample continued ...

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	7	185	mg/Kg	1	150	123	69.8 - 106.1

Sample: 54737 - WST-05-021

Analysis: TPH GRO
QC Batch: 15958
Prep Batch: 14076

Analytical Method: S 8015B
Date Analyzed: 2005-02-16
Date Prepared: 2005-02-16

Prep Method: S 5035
Analyzed By: MS
Prepared By: MS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<1.00	mg/Kg	10	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.987	mg/Kg	10	0.100	99	0 - 160
4-Bromofluorobenzene (4-BFB)		0.954	mg/Kg	10	0.100	95	0 - 174

Sample: 54738 - WST-05-022

Analysis: Volatiles
QC Batch: 16034
Prep Batch: 14152

Analytical Method: S 8260B
Date Analyzed: 2005-02-20
Date Prepared: 2005-02-20

Prep Method: S 5030B
Analyzed By: JG
Prepared By: JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane		<10.0	μg/Kg	10	1.00
Dichlorodifluoromethane		<10.0	μg/Kg	10	1.00
Chloromethane (methyl chloride)		<10.0	μg/Kg	10	1.00
Vinyl Chloride		<10.0	μg/Kg	10	1.00
Bromomethane (methyl bromide)		<50.0	μg/Kg	10	5.00
Chloroethane		<10.0	μg/Kg	10	1.00
Trichlorofluoromethane		<10.0	μg/Kg	10	1.00
Acetone		<100	μg/Kg	10	10.0
Iodomethane (methyl iodide)		<50.0	μg/Kg	10	5.00
Carbon Disulfide		<10.0	μg/Kg	10	1.00
Acrylonitrile		<10.0	μg/Kg	10	1.00
2-Butanone (MEK)		<50.0	μg/Kg	10	5.00
4-Methyl-2-pentanone (MIBK)		<50.0	μg/Kg	10	5.00
2-Hexanone		<50.0	μg/Kg	10	5.00
trans 1,4-Dichloro-2-butene		<100	μg/Kg	10	10.0
1,1-Dichloroethene		<10.0	μg/Kg	10	1.00
Methylene chloride		<50.0	μg/Kg	10	5.00
MTBE		<10.0	μg/Kg	10	1.00
trans-1,2-Dichloroethene		<10.0	μg/Kg	10	1.00
1,1-Dichloroethane		<10.0	μg/Kg	10	1.00
cis-1,2-Dichloroethene		<10.0	μg/Kg	10	1.00
2,2-Dichloropropane		<10.0	μg/Kg	10	1.00

continued ...

[7]Surrogate recovery out of control limits. New control chart pending. QC show the process within control.

sample 54738 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
1,2-Dichloroethane (EDC)		<10.0	μg/Kg	10	1.00
Chloroform		<10.0	μg/Kg	10	1.00
1,1,1-Trichloroethane		<10.0	μg/Kg	10	1.00
1,1-Dichloropropene		<10.0	μg/Kg	10	1.00
Benzene		<10.0	μg/Kg	10	1.00
Carbon Tetrachloride		<10.0	μg/Kg	10	1.00
1,2-Dichloropropane		<10.0	μg/Kg	10	1.00
Trichloroethene (TCE)		<10.0	μg/Kg	10	1.00
Dibromomethane (methylene bromide)		<10.0	μg/Kg	10	1.00
Bromodichloromethane		<10.0	μg/Kg	10	1.00
2-Chloroethyl vinyl ether		<50.0	μg/Kg	10	5.00
cis-1,3-Dichloropropene		<10.0	μg/Kg	10	1.00
trans-1,3-Dichloropropene		<10.0	μg/Kg	10	1.00
Toluene		<10.0	μg/Kg	10	1.00
1,1,2-Trichloroethane		<10.0	μg/Kg	10	1.00
1,3-Dichloropropane		<10.0	μg/Kg	10	1.00
Dibromochloromethane		<10.0	μg/Kg	10	1.00
1,2-Dibromoethane (EDB)		<10.0	μg/Kg	10	1.00
Tetrachloroethene (PCE)		<10.0	μg/Kg	10	1.00
Chlorobenzene		<10.0	μg/Kg	10	1.00
1,1,1,2-Tetrachloroethane		<10.0	μg/Kg	10	1.00
Ethylbenzene		<10.0	μg/Kg	10	1.00
m,p-Xylene		<10.0	μg/Kg	10	1.00
Bromoform		<10.0	μg/Kg	10	1.00
Styrene		<10.0	μg/Kg	10	1.00
o-Xylene		<10.0	μg/Kg	10	1.00
1,1,2,2-Tetrachloroethane		<10.0	μg/Kg	10	1.00
2-Chlorotoluene		<10.0	μg/Kg	10	1.00
1,2,3-Trichloropropane		<10.0	μg/Kg	10	1.00
Isopropylbenzene		<10.0	μg/Kg	10	1.00
Bromobenzene		<10.0	μg/Kg	10	1.00
n-Propylbenzene		<10.0	μg/Kg	10	1.00
1,3,5-Trimethylbenzene		<10.0	μg/Kg	10	1.00
tert-Butylbenzene		<10.0	μg/Kg	10	1.00
1,2,4-Trimethylbenzene		<10.0	μg/Kg	10	1.00
1,4-Dichlorobenzene (para)		<10.0	μg/Kg	10	1.00
sec-Butylbenzene		<10.0	μg/Kg	10	1.00
1,3-Dichlorobenzene (meta)		<10.0	μg/Kg	10	1.00
p-Isopropyltoluene		<10.0	μg/Kg	10	1.00
4-Chlorotoluene		<10.0	μg/Kg	10	1.00
1,2-Dichlorobenzene (ortho)		<10.0	μg/Kg	10	1.00
n-Butylbenzene		<10.0	μg/Kg	10	1.00
1,2-Dibromo-3-chloropropane		<50.0	μg/Kg	10	5.00
1,2,3-Trichlorobenzene		<50.0	μg/Kg	10	5.00
1,2,4-Trichlorobenzene		<50.0	μg/Kg	10	5.00
Naphthalene		<50.0	μg/Kg	10	5.00
Hexachlorobutadiene		<50.0	μg/Kg	10	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		449	μg/Kg	10	50.0	90	70 - 130

continued . . .

sample continued ...

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Toluene-d8		480	µg/Kg	10	50.0	96	70 - 130
4-Bromofluorobenzene (4-BFB)		477	µg/Kg	10	50.0	95	70 - 130

Sample: 54739 - WST-05-023

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	16028	Date Analyzed:	2005-02-19	Analyzed By:	BP
Prep Batch:	14145	Date Prepared:	2005-02-17	Prepared By:	DS

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	8	192	mg/Kg	1	150	128	69.8 - 106.1

Sample: 54739 - WST-05-023

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
QC Batch:	15958	Date Analyzed:	2005-02-16	Analyzed By:	MS
Prep Batch:	14076	Date Prepared:	2005-02-16	Prepared By:	MS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<1.00	mg/Kg	10	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.891	mg/Kg	10	0.100	89	0 - 160
4-Bromofluorobenzene (4-BFB)		0.939	mg/Kg	10	0.100	94	0 - 174

Sample: 54740 - WST-05-024

Analysis:	Volatiles	Analytical Method:	S 8260B	Prep Method:	S 5030B
QC Batch:	16034	Date Analyzed:	2005-02-20	Analyzed By:	JG
Prep Batch:	14152	Date Prepared:	2005-02-20	Prepared By:	JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane		<10.0	µg/Kg	10	1.00
Dichlorodifluoromethane		<10.0	µg/Kg	10	1.00
Chloromethane (methyl chloride)		<10.0	µg/Kg	10	1.00
Vinyl Chloride		<10.0	µg/Kg	10	1.00
Bromomethane (methyl bromide)		<50.0	µg/Kg	10	5.00
Chloroethane		<10.0	µg/Kg	10	1.00
Trichlorofluoromethane		<10.0	µg/Kg	10	1.00
Acetone		<100	µg/Kg	10	10.0

continued ...

[8]Surrogate recovery out of control limits. New control chart pending. QC show the process within control.

sample 54740 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Iodomethane (methyl iodide)		<50.0	μg/Kg	10	5.00
Carbon Disulfide		<10.0	μg/Kg	10	1.00
Acrylonitrile		<10.0	μg/Kg	10	1.00
2-Butanone (MEK)		<50.0	μg/Kg	10	5.00
4-Methyl-2-pentanone (MIBK)		<50.0	μg/Kg	10	5.00
2-Hexanone		<50.0	μg/Kg	10	5.00
trans 1,4-Dichloro-2-butene		<100	μg/Kg	10	10.0
1,1-Dichloroethene		<10.0	μg/Kg	10	1.00
Methylene chloride		<50.0	μg/Kg	10	5.00
MTBE		<10.0	μg/Kg	10	1.00
trans-1,2-Dichloroethene		<10.0	μg/Kg	10	1.00
1,1-Dichloroethane		<10.0	μg/Kg	10	1.00
cis-1,2-Dichloroethene		<10.0	μg/Kg	10	1.00
2,2-Dichloropropane		<10.0	μg/Kg	10	1.00
1,2-Dichloroethane (EDC)		<10.0	μg/Kg	10	1.00
Chloroform		<10.0	μg/Kg	10	1.00
1,1,1-Trichloroethane		<10.0	μg/Kg	10	1.00
1,1-Dichloropropene		<10.0	μg/Kg	10	1.00
Benzene		<10.0	μg/Kg	10	1.00
Carbon Tetrachloride		<10.0	μg/Kg	10	1.00
1,2-Dichloropropane		<10.0	μg/Kg	10	1.00
Trichloroethene (TCE)		<10.0	μg/Kg	10	1.00
Dibromomethane (methylene bromide)		<10.0	μg/Kg	10	1.00
Bromodichloromethane		<10.0	μg/Kg	10	1.00
2-Chloroethyl vinyl ether		<50.0	μg/Kg	10	5.00
cis-1,3-Dichloropropene		<10.0	μg/Kg	10	1.00
trans-1,3-Dichloropropene		<10.0	μg/Kg	10	1.00
Toluene		<10.0	μg/Kg	10	1.00
1,1,2-Trichloroethane		<10.0	μg/Kg	10	1.00
1,3-Dichloropropane		<10.0	μg/Kg	10	1.00
Dibromochloromethane		<10.0	μg/Kg	10	1.00
1,2-Dibromoethane (EDB)		<10.0	μg/Kg	10	1.00
Tetrachloroethene (PCE)		<10.0	μg/Kg	10	1.00
Chlorobenzene		<10.0	μg/Kg	10	1.00
1,1,1,2-Tetrachloroethane		<10.0	μg/Kg	10	1.00
Ethylbenzene		<10.0	μg/Kg	10	1.00
m,p-Xylene		<10.0	μg/Kg	10	1.00
Bromoform		<10.0	μg/Kg	10	1.00
Styrene		<10.0	μg/Kg	10	1.00
o-Xylene		<10.0	μg/Kg	10	1.00
1,1,2,2-Tetrachloroethane		<10.0	μg/Kg	10	1.00
2-Chlorotoluene		<10.0	μg/Kg	10	1.00
1,2,3-Trichloropropane		<10.0	μg/Kg	10	1.00
Isopropylbenzene		<10.0	μg/Kg	10	1.00
Bromobenzene		<10.0	μg/Kg	10	1.00
n-Propylbenzene		<10.0	μg/Kg	10	1.00
1,3,5-Trimethylbenzene		<10.0	μg/Kg	10	1.00
tert-Butylbenzene		<10.0	μg/Kg	10	1.00
1,2,4-Trimethylbenzene		<10.0	μg/Kg	10	1.00
1,4-Dichlorobenzene (para)		<10.0	μg/Kg	10	1.00
sec-Butylbenzene		<10.0	μg/Kg	10	1.00

continued . . .

sample 54740 continued...

Parameter	Flag	RL Result	Units	Dilution	RL
1,3-Dichlorobenzene (meta)		<10.0	μg/Kg	10	1.00
p-Isopropyltoluene		<10.0	μg/Kg	10	1.00
4-Chlorotoluene		<10.0	μg/Kg	10	1.00
1,2-Dichlorobenzene (ortho)		<10.0	μg/Kg	10	1.00
n-Butylbenzene		<10.0	μg/Kg	10	1.00
1,2-Dibromo-3-chloropropane		<50.0	μg/Kg	10	5.00
1,2,3-Trichlorobenzene		<50.0	μg/Kg	10	5.00
1,2,4-Trichlorobenzene		<50.0	μg/Kg	10	5.00
Naphthalene		<50.0	μg/Kg	10	5.00
Hexachlorobutadiene		<50.0	μg/Kg	10	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		448	μg/Kg	10	50.0	90	70 - 130
Toluene-d8		488	μg/Kg	10	50.0	98	70 - 130
4-Bromofluorobenzene (4-BFB)		483	μg/Kg	10	50.0	97	70 - 130

Sample: 54741 - WST-05-025

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	16028	Date Analyzed:	2005-02-19	Analyzed By:	BP
Prep Batch:	14145	Date Prepared:	2005-02-17	Prepared By:	DS

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<50.0	mg/Kg	1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	9	172	mg/Kg	1	150	115	69.8 - 106.1

Sample: 54741 - WST-05-025

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5035
QC Batch:	15958	Date Analyzed:	2005-02-16	Analyzed By:	MS
Prep Batch:	14076	Date Prepared:	2005-02-16	Prepared By:	MS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO		<1.00	mg/Kg	10	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.892	mg/Kg	10	0.100	89	0 - 160
4-Bromofluorobenzene (4-BFB)		0.876	mg/Kg	10	0.100	88	0 - 174

[9] Surrogate recovery out of control limits. New control chart pending. QC show the process within control.

Sample: 54742 - WST-05-026

Analysis:	Volatiles	Analytical Method:	S 8260B	Prep Method:	S 5030B
QC Batch:	16033	Date Analyzed:	2005-02-20	Analyzed By:	JG
Prep Batch:	14150	Date Prepared:	2005-02-20	Prepared By:	JG

Parameter	Flag	RL Result	Units	Dilution	RL
Bromochloromethane	10	<50.0	μg/L	50	1.00
Dichlorodifluoromethane		<50.0	μg/L	50	1.00
Chloromethane (methyl chloride)		<50.0	μg/L	50	1.00
Vinyl Chloride		<50.0	μg/L	50	1.00
Bromomethane (methyl bromide)		<50.0	μg/L	50	1.00
Chloroethane		<50.0	μg/L	50	1.00
Trichlorofluoromethane		<50.0	μg/L	50	1.00
Acetone		<500	μg/L	50	10.0
Iodomethane (methyl iodide)		<250	μg/L	50	5.00
Carbon Disulfide		<50.0	μg/L	50	1.00
Acrylonitrile		<50.0	μg/L	50	1.00
2-Butanone (MEK)		<250	μg/L	50	5.00
4-Methyl-2-pentanone (MIBK)		<250	μg/L	50	5.00
2-Hexanone		<50.0	μg/L	50	1.00
trans 1,4-Dichloro-2-butene		<500	μg/L	50	10.0
1,1-Dichloroethene		<50.0	μg/L	50	1.00
Methylene chloride		<250	μg/L	50	5.00
MTBE		<50.0	μg/L	50	1.00
trans-1,2-Dichloroethene		<50.0	μg/L	50	1.00
1,1-Dichloroethane		<50.0	μg/L	50	1.00
cis-1,2-Dichloroethene		<50.0	μg/L	50	1.00
2,2-Dichloropropane		<50.0	μg/L	50	1.00
1,2-Dichloroethane (EDC)		<50.0	μg/L	50	1.00
Chloroform		<50.0	μg/L	50	1.00
1,1,1-Trichloroethane		<50.0	μg/L	50	1.00
1,1-Dichloropropene		<50.0	μg/L	50	1.00
Benzene		<50.0	μg/L	50	1.00
Carbon Tetrachloride		<50.0	μg/L	50	1.00
1,2-Dichloropropane		<50.0	μg/L	50	1.00
Trichloroethene (TCE)		<50.0	μg/L	50	1.00
Dibromomethane (methylene bromide)		<50.0	μg/L	50	1.00
Bromodichloromethane		<50.0	μg/L	50	1.00
2-Chloroethyl vinyl ether		<250	μg/L	50	5.00
cis-1,3-Dichloropropene		<50.0	μg/L	50	1.00
trans-1,3-Dichloropropene		<50.0	μg/L	50	1.00
Toluene		<50.0	μg/L	50	1.00
1,1,2-Trichloroethane		<50.0	μg/L	50	1.00
1,3-Dichloropropane		<50.0	μg/L	50	1.00
Dibromochloromethane		<50.0	μg/L	50	1.00
1,2-Dibromoethane (EDB)		<50.0	μg/L	50	1.00
Tetrachloroethene (PCE)		<50.0	μg/L	50	1.00
Chlorobenzene		<50.0	μg/L	50	1.00
1,1,1,2-Tetrachloroethane		<50.0	μg/L	50	1.00
Ethylbenzene		<50.0	μg/L	50	1.00
m,p-Xylene		<50.0	μg/L	50	1.00
Bromoform		<50.0	μg/L	50	1.00

continued ...

[10] elevated reporting limits due to surfactants.

sample 54742 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Styrene		<50.0	µg/L	50	1.00
o-Xylene		<50.0	µg/L	50	1.00
1,1,2,2-Tetrachloroethane		<50.0	µg/L	50	1.00
2-Chlorotoluene		<50.0	µg/L	50	1.00
1,2,3-Trichloropropane		<50.0	µg/L	50	1.00
Isopropylbenzene		<50.0	µg/L	50	1.00
Bromobenzene		<50.0	µg/L	50	1.00
n-Propylbenzene		<50.0	µg/L	50	1.00
1,3,5-Trimethylbenzene		<50.0	µg/L	50	1.00
tert-Butylbenzene		<50.0	µg/L	50	1.00
1,2,4-Trimethylbenzene		<50.0	µg/L	50	1.00
1,4-Dichlorobenzene (para)		<50.0	µg/L	50	1.00
sec-Butylbenzene		<50.0	µg/L	50	1.00
1,3-Dichlorobenzene (meta)		<50.0	µg/L	50	1.00
p-Isopropyltoluene		<50.0	µg/L	50	1.00
4-Chlorotoluene		<50.0	µg/L	50	1.00
1,2-Dichlorobenzene (ortho)		<50.0	µg/L	50	1.00
n-Butylbenzene		<50.0	µg/L	50	1.00
1,2-Dibromo-3-chloropropane		<250	µg/L	50	5.00
1,2,3-Trichlorobenzene		<250	µg/L	50	5.00
1,2,4-Trichlorobenzene		<250	µg/L	50	5.00
Naphthalene		<250	µg/L	50	5.00
Hexachlorobutadiene		<250	µg/L	50	5.00

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		50.8	µg/L	1	50.0	102	70 - 130
Toluene-d8		49.2	µg/L	1	50.0	98	70 - 130
4-Bromofluorobenzene (4-BFB)		48.8	µg/L	1	50.0	98	70 - 130

Sample: 54743 - WST-05-027

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	Prep Method:	N/A
QC Batch:	16027	Date Analyzed:	2005-02-19	Analyzed By:	BP
Prep Batch:	14144	Date Prepared:	2005-02-17	Prepared By:	DS

Parameter	Flag	RL Result	Units	Dilution	RL
DRO		<5.00	mg/L	0.1	50.0

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		19.2	mg/L	0.1	150	128	70 - 130

Sample: 54743 - WST-05-027

Analysis:	TPH GRO	Analytical Method:	S 8015B	Prep Method:	S 5030B
QC Batch:	15959	Date Analyzed:	2005-02-16	Analyzed By:	MS
Prep Batch:	14077	Date Prepared:	2005-02-16	Prepared By:	MS

Parameter	Flag	RL Result	Units	Dilution	RL
GRO	[1]	<5.00	mg/L	50	0.100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		5.02	mg/L	50	0.100	100	80.5 - 113
4-Bromofluorobenzene (4-BFB)		3.69	mg/L	50	0.100	74	64.8 - 123

Method Blank (1) QC Batch: 15958

Parameter	Flag	MDL Result	Units	RL
GRO		1.71	mg/Kg	0.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.958	mg/Kg	10	0.100	96	81.8 - 109
4-Bromofluorobenzene (4-BFB)		0.591	mg/Kg	10	0.100	59	50.7 - 113

Method Blank (1) QC Batch: 15959

Parameter	Flag	MDL Result	Units	RL
GRO		<0.0261	mg/L	0.1

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.100	mg/L	1	0.100	100	77.63 - 111
4-Bromofluorobenzene (4-BFB)		0.0758	mg/L	1	0.100	76	32.2 - 122

Method Blank (1) QC Batch: 16027

Parameter	Flag	MDL Result	Units	RL
DRO		0.620	mg/L	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		17.3	mg/L	0.1	150	115	70 - 130

Method Blank (1) QC Batch: 16028

Parameter	Flag	MDL Result	Units	RL
DRO		<12.0	mg/Kg	50

[1] Sample diluted due to surfactant content.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane	12	184	mg/Kg	1	150	123	69.8 - 106.1

Method Blank (1) QC Batch: 16033

Parameter	Flag	MDL Result	Units	RL
Bromochloromethane		<0.177	μg/L	1
Dichlorodifluoromethane		<0.208	μg/L	1
Chloromethane (methyl chloride)		0.400	μg/L	1
Vinyl Chloride		<0.135	μg/L	1
Bromomethane (methyl bromide)		<1.23	μg/L	5
Chloroethane		<0.182	μg/L	1
Trichlorofluoromethane		<0.0610	μg/L	1
Acetone		<5.50	μg/L	10
Iodomethane (methyl iodide)		<0.107	μg/L	5
Carbon Disulfide		<0.0360	μg/L	1
Acrylonitrile		<0.0970	μg/L	1
2-Butanone (MEK)		<0.531	μg/L	5
4-Methyl-2-pentanone (MIBK)		<0.421	μg/L	5
2-Hexanone		<0.168	μg/L	5
trans 1,4-Dichloro-2-butene		<0.517	μg/L	10
1,1-Dichloroethene		<0.136	μg/L	1
Methylene chloride		1.25	μg/L	5
MTBE		<0.123	μg/L	1
trans-1,2-Dichloroethene		<0.126	μg/L	1
1,1-Dichloroethane		<0.0600	μg/L	1
cis-1,2-Dichloroethene		<0.151	μg/L	1
2,2-Dichloropropane		<0.180	μg/L	1
1,2-Dichloroethane (EDC)		<0.113	μg/L	1
Chloroform		<0.141	μg/L	1
1,1,1-Trichloroethane		<0.116	μg/L	1
1,1-Dichloropropene		<0.0540	μg/L	1
Benzene		0.170	μg/L	1
Carbon Tetrachloride		<0.0790	μg/L	1
1,2-Dichloropropane		<0.111	μg/L	1
Trichloroethene (TCE)		0.220	μg/L	1
Dibromomethane (methylene bromide)		<0.140	μg/L	1
Bromodichloromethane		<0.161	μg/L	1
2-Chloroethyl vinyl ether		<0.388	μg/L	5
cis-1,3-Dichloropropene		<0.0890	μg/L	1
trans-1,3-Dichloropropene		<0.0760	μg/L	1
Toluene		0.280	μg/L	1
1,1,2-Trichloroethane		<0.135	μg/L	1
1,3-Dichloropropane		<0.0990	μg/L	1
Dibromochloromethane		<0.0900	μg/L	1
1,2-Dibromoethane (EDB)		<0.0700	μg/L	1
Tetrachloroethene (PCE)		<0.270	μg/L	1
Chlorobenzene		<0.0540	μg/L	1
1,1,1,2-Tetrachloroethane		<0.0990	μg/L	1

continued ...

[12] Surrogate recovery out of control limits. New control chart pending. QC show the process within control.

method blank continued ...

Parameter	Flag	MDL Result	Units	RL
Ethylbenzene		0.0600	µg/L	1
m,p-Xylene		0.140	µg/L	1
Bromoform		<0.0570	µg/L	1
Styrene		<0.0910	µg/L	1
o-Xylene		<0.0960	µg/L	1
1,1,2,2-Tetrachloroethane		<0.125	µg/L	1
2-Chlorotoluene		0.0600	µg/L	1
1,2,3-Trichloropropane		<0.458	µg/L	1
Isopropylbenzene		<0.0850	µg/L	1
Bromobenzene		<0.106	µg/L	1
n-Propylbenzene		0.0800	µg/L	1
1,3,5-Trimethylbenzene		0.0500	µg/L	1
tert-Butylbenzene		<0.107	µg/L	1
1,2,4-Trimethylbenzene		<0.0990	µg/L	1
1,4-Dichlorobenzene (para)		<0.217	µg/L	1
sec-Butylbenzene		0.110	µg/L	1
1,3-Dichlorobenzene (meta)		0.100	µg/L	1
p-Isopropyltoluene		<0.106	µg/L	1
4-Chlorotoluene		<0.0940	µg/L	1
1,2-Dichlorobenzene (ortho)		<0.100	µg/L	1
n-Butylbenzene		0.170	µg/L	1
1,2-Dibromo-3-chloropropane		<0.690	µg/L	5
1,2,3-Trichlorobenzene		7.58	µg/L	5
1,2,4-Trichlorobenzene		1.49	µg/L	5
Naphthalene		3.60	µg/L	5
Hexachlorobutadiene		0.840	µg/L	5

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		50.6	µg/L	1	50.0	101	70 - 130
Toluene-d8		49.3	µg/L	1	50.0	99	70 - 130
4-Bromofluorobenzene (4-BFB)		49.0	µg/L	1	50.0	98	70 - 130

Method Blank (1) **QC Batch: 16034**

Parameter	Flag	MDL Result	Units	RL
Bromochloromethane		<1.53	µg/Kg	1
Dichlorodifluoromethane		<1.31	µg/Kg	1
Chloromethane (methyl chloride)		<3.35	µg/Kg	1
Vinyl Chloride		<1.79	µg/Kg	1
Bromomethane (methyl bromide)		<8.81	µg/Kg	5
Chloroethane		<2.86	µg/Kg	1
Trichlorofluoromethane		<1.75	µg/Kg	1
Acetone		<30.6	µg/Kg	10
Iodomethane (methyl iodide)		34.2	µg/Kg	5
Carbon Disulfide		<1.83	µg/Kg	1
Acrylonitrile		<5.67	µg/Kg	1
2-Butanone (MEK)		<9.85	µg/Kg	5
4-Methyl-2-pentanone (MIBK)		<15.9	µg/Kg	5

continued ...

method blank continued ...

Parameter	Flag	MDL Result	Units	RL
2-Hexanone		<24.9	μg/Kg	5
trans 1,4-Dichloro-2-butene		<11.2	μg/Kg	10
1,1-Dichloroethene		<2.44	μg/Kg	1
Methylene chloride		21.1	μg/Kg	5
MTBE		<3.35	μg/Kg	1
trans-1,2-Dichloroethene		<1.19	μg/Kg	1
1,1-Dichloroethane		<2.53	μg/Kg	1
cis-1,2-Dichloroethene		<1.74	μg/Kg	1
2,2-Dichloropropane		<1.92	μg/Kg	1
1,2-Dichloroethane (EDC)		<1.57	μg/Kg	1
Chloroform		<1.69	μg/Kg	1
1,1,1-Trichloroethane		<1.61	μg/Kg	1
1,1-Dichloropropene		<1.20	μg/Kg	1
Benzene		<1.84	μg/Kg	1
Carbon Tetrachloride		<1.61	μg/Kg	1
1,2-Dichloropropane		<2.23	μg/Kg	1
Trichloroethene (TCE)		<7.08	μg/Kg	1
Dibromomethane (methylene bromide)		<2.01	μg/Kg	1
Bromodichloromethane		<1.73	μg/Kg	1
2-Chloroethyl vinyl ether		<2.32	μg/Kg	5
cis-1,3-Dichloropropene		<1.81	μg/Kg	1
trans-1,3-Dichloropropene		<1.96	μg/Kg	1
Toluene		3.00	μg/Kg	1
1,1,2-Trichloroethane		<1.69	μg/Kg	1
1,3-Dichloropropane		<1.40	μg/Kg	1
Dibromochloromethane		<1.77	μg/Kg	1
1,2-Dibromoethane (EDB)		<2.20	μg/Kg	1
Tetrachloroethene (PCE)		<1.23	μg/Kg	1
Chlorobenzene		<1.45	μg/Kg	1
1,1,1,2-Tetrachloroethane		<1.84	μg/Kg	1
Ethylbenzene		<2.03	μg/Kg	1
m,p-Xylene		<5.03	μg/Kg	1
Bromoform		<1.68	μg/Kg	1
Styrene		<2.13	μg/Kg	1
o-Xylene		<2.03	μg/Kg	1
1,1,2,2-Tetrachloroethane		<1.59	μg/Kg	1
2-Chlorotoluene		<2.13	μg/Kg	1
1,2,3-Trichloropropane		<2.71	μg/Kg	1
Isopropylbenzene		<2.06	μg/Kg	1
Bromobenzene		<2.13	μg/Kg	1
n-Propylbenzene		<2.43	μg/Kg	1
1,3,5-Trimethylbenzene		<2.68	μg/Kg	1
tert-Butylbenzene		<1.90	μg/Kg	1
1,2,4-Trimethylbenzene		<2.30	μg/Kg	1
1,4-Dichlorobenzene (para)		<1.81	μg/Kg	1
sec-Butylbenzene		<2.87	μg/Kg	1
1,3-Dichlorobenzene (meta)		<1.52	μg/Kg	1
p-Isopropyltoluene		<2.19	μg/Kg	1
4-Chlorotoluene		<2.19	μg/Kg	1
1,2-Dichlorobenzene (ortho)		<1.69	μg/Kg	1
n-Butylbenzene		<3.12	μg/Kg	1
1,2-Dibromo-3-chloropropane		<7.07	μg/Kg	5

continued ...

method blank continued ...

Parameter	Flag	MDL Result	Units	RL
1,2,3-Trichlorobenzene		10.2	μg/Kg	5
1,2,4-Trichlorobenzene		<3.81	μg/Kg	5
Naphthalene		7.80	μg/Kg	5
Hexachlorobutadiene		2.60	μg/Kg	5

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		483	μg/Kg	10	50.0	97	70 - 130
Toluene-d8		490	μg/Kg	10	50.0	98	70 - 130
4-Bromofluorobenzene (4-BFB)		488	μg/Kg	10	50.0	98	70 - 130

Laboratory Control Spike (LCS-1) QC Batch: 15958

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
GRO	8.58	8.21	mg/Kg	10	1.00	<0.381	86	4	72 - 124	21

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.946	0.958	mg/Kg	10	0.100	95	96	80.4 - 113
4-Bromofluorobenzene (4-BFB)	0.852	0.772	mg/Kg	10	0.100	85	77	72.2 - 119

Laboratory Control Spike (LCS-1) QC Batch: 15959

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
GRO	0.875	0.942	mg/L	1	1.00	<0.0261	88	7	69.7 - 131	24

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0988	0.103	mg/L	1	0.100	99	103	80.5 - 113
4-Bromofluorobenzene (4-BFB)	0.0961	0.0935	mg/L	1	0.100	96	94	64.8 - 123

Laboratory Control Spike (LCS-1) QC Batch: 16027

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
DRO	25.4	26.4	mg/L	0.1	250	<0.538	102	4	75.3 - 117.1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Triacontane	16.3	16.6	mg/L	0.1	150	109	111	70 - 130

Laboratory Control Spike (LCS-1) QC Batch: 16028

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
DRO	289	284	mg/Kg	1	250	<12.0	116	2	78.7 - 117.6	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
n-Triacontane [13,14]	207	202	mg/Kg	1	150	138	135	69.8 - 106.1

Laboratory Control Spike (LCS-1) QC Batch: 16033

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
1,1-Dichloroethene	85.2	87.4	μg/L	1	100	<0.136	85	2	70 - 130	20
Benzene	96.5	99.0	μg/L	1	100	<0.146	96	2	70 - 130	20
Trichloroethene (TCE)	91.3	92.2	μg/L	1	100	<0.117	91	1	70 - 130	20
Toluene	93.5	95.8	μg/L	1	100	<0.0600	94	2	70 - 130	20
Chlorobenzene	95.0	97.2	μg/L	1	100	<0.0540	95	2	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Dibromofluoromethane	50.8	50.9	μg/L	1	50.0	102	102	70 - 130
Toluene-d8	49.6	50.4	μg/L	1	50.0	99	101	70 - 130
4-Bromofluorobenzene (4-BFB)	49.2	50.1	μg/L	1	50.0	98	100	70 - 130

Laboratory Control Spike (LCS-1) QC Batch: 16034

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
1,1-Dichloroethene	873	901	μg/Kg	10	100	<2.44	87	3	70 - 130	20
Benzene	972	986	μg/Kg	10	100	<1.84	97	1	70 - 130	20
Trichloroethene (TCE)	911	915	μg/Kg	10	100	<7.08	91	0	70 - 130	20
Toluene	949	958	μg/Kg	10	100	3	95	1	70 - 130	20
Chlorobenzene	956	975	μg/Kg	10	100	<1.45	96	2	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Dibromofluoromethane	514	519	μg/Kg	10	50.0	103	104	70 - 130
Toluene-d8	493	496	μg/Kg	10	50.0	99	99	70 - 130
4-Bromofluorobenzene (4-BFB)	495	494	μg/Kg	10	50.0	99	99	70 - 130

Matrix Spike (MS-1) QC Batch: 15958 Spiked Sample: 54739

[13]Surrogate recovery out of control limits. New control chart pending. QC show the process within control.
[14]Surrogate recovery out of control limits. New control chart pending. QC show the process within control.a comment.

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
GRO	7.99	8.54	mg/Kg	10	1.00	<0.381	80	7	0 - 182	19.6

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.797	0.754	mg/Kg	10	0.1	80	75	0 - 160
4-Bromofluorobenzene (4-BFB)	0.963	0.911	mg/Kg	10	0.1	96	91	0 - 174

Matrix Spike (MS-1) QC Batch: 16028 Spiked Sample: 54739

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
DRO	267	256	mg/Kg	1	250	<12.0	107	4	67.7 - 110.5	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
n-Triacontane [15] [16]	180	174	mg/Kg	1	150	120	116	69.8 - 106.1

Matrix Spike (MS-1) QC Batch: 16034 Spiked Sample: 54738

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
1,1-Dichloroethene	866	881	μg/Kg	10	100	<2.44	87	2	70 - 130	20
Benzene	965	980	μg/Kg	10	100	<1.84	96	2	70 - 130	20
Trichloroethene (TCE)	901	911	μg/Kg	10	100	<7.08	90	1	70 - 130	20
Toluene	925	946	μg/Kg	10	100	<1.50	92	2	70 - 130	20
Chlorobenzene	930	957	μg/Kg	10	100	<1.45	93	3	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Dibromofluoromethane	488	490	μg/Kg	10	50	98	98	70 - 130
Toluene-d8	489	497	μg/Kg	10	50	98	99	70 - 130
4-Bromofluorobenzene (4-BFB)	491	496	μg/Kg	10	50	98	99	70 - 130

Standard (ICV-1) QC Batch: 15958

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1.00	0.908	91	85 - 115	2005-02-16

Standard (CCV-1) QC Batch: 15958

[15] Surrogate recovery out of control limits. New control chart pending. QC show the process within control.
[16] Surrogate recovery out of control limits. New control chart pending. QC show the process within control.

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1.00	0.918	92	85 - 115	2005-02-16

Standard (ICV-1) QC Batch: 15959

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1.00	0.918	92	85 - 115	2005-02-16

Standard (CCV-1) QC Batch: 15959

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1.00	0.893	89	85 - 115	2005-02-16

Standard (ICV-1) QC Batch: 16027

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	260	104	75 - 125	2005-02-19

Standard (CCV-1) QC Batch: 16027

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	262	105	75 - 125	2005-02-19

Standard (ICV-1) QC Batch: 16028

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	234	94	75 - 125	2005-02-19

Standard (CCV-1) QC Batch: 16028

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	247	99	75 - 125	2005-02-19

Standard (CCV-2) QC Batch: 16028

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/Kg	250	244	97	75 - 125	2005-02-19

Standard (CCV-1) QC Batch: 16033

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Vinyl Chloride		μg/L	50.0	43.7	87	80 - 120	2005-02-20
1,1-Dichloroethene		μg/L	50.0	46.4	93	80 - 120	2005-02-20
Chloroform		μg/L	50.0	52.2	104	80 - 120	2005-02-20
1,2-Dichloropropane		μg/L	50.0	52.4	105	80 - 120	2005-02-20
Toluene		μg/L	50.0	52.4	105	80 - 120	2005-02-20
Chlorobenzene		μg/L	50.0	51.5	103	80 - 120	2005-02-20
Ethylbenzene		μg/L	50.0	53.5	107	80 - 120	2005-02-20

Standard (CCV-1) QC Batch: 16034

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Vinyl Chloride		μg/Kg	50.0	43.7	87	80 - 120	2005-02-20
1,1-Dichloroethene		μg/Kg	50.0	46.4	93	80 - 120	2005-02-20
Chloroform		μg/Kg	50.0	52.2	104	80 - 120	2005-02-20
1,2-Dichloropropane		μg/Kg	50.0	52.4	105	80 - 120	2005-02-20
Toluene		μg/Kg	50.0	52.4	105	80 - 120	2005-02-20
Chlorobenzene		μg/Kg	50.0	51.5	103	80 - 120	2005-02-20
Ethylbenzene		μg/Kg	50.0	53.5	107	80 - 120	2005-02-20

5021614

REQUEST FOR ANALYSIS

R/A Control / C/C Control No. № 3440

WASTE ISOLATION PILOT PLANT
WESTINGHOUSE ELECTRIC CORP.
P.O. BOX 2078
CARLSBAD, NM 88221-2078

DATE SAMPLES SHIPPED 2/15/05
LAB DESTINATION TRACE
LABORATORY CONTACT MIKE ABLE
SEND LAB REPORT TO WRES/WIPP
P.O. BOX 2078
CARLSBAD, NM 88221

SAMPLING PROGRAM WIPP SAMPLING TEAM
PURCHASE ORDER NO. 402560

DATE REPORT REQUIRED
PROJECT CONTACT MOREEN GUILLERMO
PROJECT CONTACT PHONE NO. 505-234-8755

Sample Number	Sample Type	Sample Quantity	Preservative	Req'l. Testing Program	Special Instructions
WST-05-008	LIQUID 54725	(2) 40mL	4°c	BTEX	
WST-05-009	LIQUID 26	(2) 40mL	4°c	BTEX	
WST-05-010	LIQUID 27	250mL	4°c	TPH, GRO, DRO	
WST-05-011	SOIL ~~28~~	VOID	VOID	VOID	NOT ENOUGH SAMPLE
WST-05-012	SOIL 28	(2) 40mL	4°c	BTEX	
WST-05-013	SOIL 29	(2) 40mL	4°c	BTEX	
WST-05-014	SOIL 30	250mL	4°c	TPH, GRO, DRO	
WST-05-015	SOIL 31	250mL	4°c	TPH, GRO, DRO	
WST-05-016	SOIL 32	(2) 40mL	4°c	BTEX	
WST-05-017	SOIL 33	250mL	4°c	TPH, GRO, DRO	
WST-05-018	SOIL 34	(2) 40mL	4°c	BTEX	
WST-05-019	SOIL 35	250mL	4°c	TPH, GRO, DRO	
WST-05-020	SOIL 36	(2) 40mL	4°c	BTEX	
WST-05-021	SOIL 37	250mL	4°c	TPH, GRO, DRO	
WST-05-022	SOIL 38	(2) 40mL	4°c	BTEX	

TURNAROUND TIME REQUIRED: (Rush must be approved by appropriate Manager) NORMAL ____ RUSH X (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)

NONHAZARD X FLAMMABLE ____ SKIN IRRITANT ____ HIGHLY TOXIC ____ BIOLOGICAL ____ OTHER ____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis.) RETURN TO CLIENT ____ DISPOSAL BY LAB X

FOR LAB USE ONLY

RECEIVED BY Vicki [signature] 2-16-05 10:20 DATE/TIME

WP Form 1177; 11/3/89
Page 1 of 2

1°c TNMHD 903-310-628-0 MA

WHITE - Original, to accompany samples YELLOW - Field Copy PINK - Other

Report Date: February 24, 2005
PO #402560

Work Order: 5021614

CHAIN-OF-CUSTODY RECORD

5021614

WASTE ISOLATION PILOT PLANT
WESTINGHOUSE ELECTRIC CORP.
P.O. BOX 2078
CARLSBAD, NM 88221-2078

C/C Control

R/A Control No. 3440

SAMPLING PROGRAM WIPP SAMPLING TEAM

LAB DESTINATION TRACE

SAMPLE TEAM MEMBERS R STOCKWELL, K.GUILLERMO

CARRIER/WAYBILL NO.

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
WST-05-008	PIT #1 54725	2/15/05 816	LIQUID	(2) 40mL		
WST-05-009	PIT #1 26	2/15/05 816	LIQUID	(2) 40mL		
WST-05-010	PIT #1 27	2/15/05 818	LIQUID	250mL		
WST-05-011	VOID	VOID	VOID	VOID	VOID	VOID
WST-05-012	PIT #1 28	2/15/05 839	SOIL	(2) 40mL		
WST-05-013	PIT #1 29	2/15/05 839	SOIL	(2) 40mL		
WST-05-014	PIT #1 30	2/15/05 846	SOIL	250mL		
WST-05-015	PIT #1 31	2/15/05 846	SOIL	250mL		
WST-05-016	PIT #2 32	2/15/05 930	SOIL	(2) 40mL		
WST-05-017	PIT #2 33	2/15/05 936	SOIL	250mL		
WST-05-018	PIT #3 34	2/15/05 956	SOIL	(2) 40mL		
WST-05-019	PIT #3 35	2/15/05 958	SOIL	250mL		
WST-05-020	PIT #4 36	2/15/05 1014	SOIL	(2) 40mL		
WST-05-021	PIT #4 37	2/15/05 1016	SOIL	250mL		
WST-05-022	PIT #5 38	2/15/05 1030	SOIL	(2) 40mL		

Special Instructions: RETURN COOLER

Possible Sample Hazards: NONE KNOWN

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: R Stockwell WTS 2/15/05
   Received By: [illegible] 2/15/05
2. Relinquished By: [illegible] 2/15/05
   Received By: [illegible] 2.15.05 2:52 pm
3. Relinquished By:
   Received By:
4. Relinquished By:
   Received By: Vicki Hensley 2.16.05 10:20

WP Form 1178; 11/3/89
Page 1 of 2

1°C TNMFO 903-310-628-0 MA

WHITE - To accompany samples
YELLOW - Field copy
PINK - Other

Report Date: February 24, 2005
PO #402560

Work Order: 5021614

5021615

REQUEST FOR ANALYSIS

R/A Control
C/C Control No. № 3439

WASTE ISOLATION PILOT PLANT
WESTINGHOUSE ELECTRIC CORP.
P.O. BOX 2078
CARLSBAD, NM 88221-2078

DATE SAMPLES SHIPPED 2/15/05
LAB DESTINATION TRACE
LABORATORY CONTACT MIKE ABLE
SEND LAB REPORT TO WRES/WIPP CARLSBAD NM P.O. BOX 2078 88221

SAMPLING PROGRAM WIPP SAMPLING TEAM
PURCHASE ORDER NO. 402560

DATE REPORT REQUIRED
PROJECT CONTACT Koreen Guillermo
PROJECT CONTACT PHONE NO. 505-234-8753

Sample Number	Sample Type	Sample Quantity	Preservative	Req'l. Testing Program	Special Instructions
WST-05-023	SOIL	250mL	4°C	TPH, GRO, DRO	54739
WST-05-024	SOIL	(2) 40mL	4°C	BTEX	54740
WST-05-025	SOIL	250mL	4°C	TPH, GRO, DRO	54741
WST-05-026	LIQUID	(2) 40mL	4°C	BTEX	54742
WST-05-027	LIQUID	250mL	4°C	TPH, GRO, DRO	54743

NO FURTHER ENTRIES THIS DATE RLS 2/15/05

TURNAROUND TIME REQUIRED: (Rush must be approved by appropriate Manager) NORMAL____ RUSH X (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)

NONHAZARD X FLAMMABLE____ SKIN IRRITANT____ HIGHLY TOXIC____ BIOLOGICAL____ OTHER____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis.) RETURN TO CLIENT____ DISPOSAL BY LAB X

FOR LAB USE ONLY

RECEIVED BY Vicki Dunn 2-16-05 1020 DATE/TIME

WP Form 1177; 11/3/89
Page 1 of 2

WHITE - Original, to accompany samples YELLOW - Field Copy PINK - Other

5021615

CHAIN-OF-CUSTODY RECORD

WASTE ISOLATION PILOT PLANT
WESTINGHOUSE ELECTRIC CORP.
P.O. BOX 2078
CARLSBAD, NM 88221-2078

C/C Control

R/A Control No. 3439

SAMPLING PROGRAM WIPP SAMPLING TEAM

LAB DESTINATION TRACE

SAMPLE TEAM MEMBERS R STOCKWELL, K. GUILLERMO

CARRIER/WAYBILL NO.

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
WST-05-023	PIT #5	2/15/05 1032	SOIL	250mL	54739	
WST-05-024	PIT #6	2/15/05 1049	SOIL	(2) 40mL	54740	
WST-05-025	PIT #6	2/15/05 1052	SOIL	250mL	54741	
WST-05-026	EQUIP. RINSE	2/15/05 1057	LIQUID	(2) 40mL	54742	
WST-05-027	EQUIP. RINSE	2/15/05 1058	LIQUID	250mL	54743	

NO FURTHER SAMPLES
RLS 2/16/05

Special Instructions: RETURN COOLER

Possible Sample Hazards: NONE KNOWN

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: R STOCKWELL WTS 2/15/05

Received By: [illegible] 2/15/05

2. Relinquished By: [illegible] 2/15/05

Received By: [illegible] 2/15/05 2:52 pm

3. Relinquished By:

Received By:

4. Relinquished By:

Received By: Vicki [illegible] 2.16.05 10:20

WP Form 1178; 11/3/89
Page 1 of 2

1°c TNMHO 903-310-628-0

MA

WHITE - To accompany samples
YELLOW - Field copy
PINK - Other

Report Date: February 24, 2005
PO #402560

Work Order: 5021614

Enclosure 4

Analytical Discussion

Enclosure 4

Analytical Discussion

During excavation of the footings, brownish stains were encountered approximately four feet below the concrete and asphalt cover. Sampling of the soils and liquid occurred within 24 hours of discovery. No hazardous constituents were found in the soils. Samples were analyzed for Volatile Organic Chemicals (VOC), Gasoline Range Organics (GRO) and Diesel Range Organics (DRO). The GRO and DRO are both components of Total Petroleum Hydrocarbons (TPH). The sampling results are in Attachment 4.

All soil analytical results, except those at locations B and C (see Attachment 4 Figure), showed no detection of VOC, GRO, or DRO. Diesel was the only constituent found. In location B, a sample and duplicate were taken. These samples had DRO values of 1050 and 1130 mg/kg, respectively. Soils with TPH concentrations below 1000 mg/kg are considered clean. The analysis of the soil in location C showed the level of DRO constituents as 1710 mg/kg and GRO constituents were not detected. Location B GRO values were non-detect in one sample and a slight detection of 1.09 mg/Kg (detection limit is 1 mg/kg), in the duplicate. Therefore, the TPH concentration in locations B and C are slightly higher than the clean soil designation. It was noted during the excavations that the diesel was not migrating. No staining was found in the soils above or below the stained horizon. No stained soil or odor was found east, west or south of locations B & C. In addition the stained soils excavated were not stained after a short period of exposure to air and sunlight on the surface, and lost their odor within twenty-four hours.

Precipitation prior to sampling and during the additional excavation and soil description was believed to be the source of approximately 300 milliliters of water found in one excavation and sampled during the sampling event. The sampling results indicate that there are no hazardous constituents at levels of concern. With the exception of two samples from one location, Volatile Organic Compound (VOC) analyses were non-detect. The water sample and its duplicate contained acetone below levels of concern (0.02 and 0.018 ppm). This constituent and the associated levels are consistent with the use of acetone in the laboratory glass cleaning process. We are discussing possible sources of contamination in lab process due to the fact no known source of acetone is believed to be present. The analytical results for the water sample showed no detection of GRO and DRO.

Enclosure 5

Summary Description of Additional Excavated Soil

Enclosure 5
Summary Description of Additional Excavated Soil

The excavations were uncovered at 7:45 a.m. on February 18, 2005. Air quality testing by a Flame Ionization Detector (FID) was completed at each of the excavations. Three locations (B, C, and D) had FID detections. Location C had the highest reading at 1 ppm. Location B had a reading of 0.5 ppm, which is also the lower confidence limit for this analytical device in the prevailing conditions. Location D had a reading of 0.2 ppm. These readings were well below the human health risk levels. These locations are shown in the Attachment 4 Figure.

Soil logging, i.e., description of soils types utilizing geologic soil descriptions, commenced upon completion of the air quality tests. The observations began with further excavation (three feet deeper) in all of the locations. The locations were logged from least contaminated to most contaminated. Logging was completed at 9:40 a.m. All excavations were covered with plastic, plywood, and clean soil as logging was completed.

Location A was excavated and logged first. This location had a white caliche layer from 4 feet to 4 feet 4 inches. Then reddish-brown, medium-grained, drift sand occurred from 6 feet 4 inches to 6 feet 6 inches. Tan fine-grained sand was encountered from 6 feet 6 inches to the bottom of the hole at 7 feet. No stained soils or odor were found in location A.

Location G was excavated and logged second. White caliche was encountered from 4 feet 1 inch to 4 feet 4 inches. The brownish-red to reddish, medium-grained sand, as seen in location A, continued to 6 feet 8 inches into the hole. The final 4 inches to 6 inches were clean, tan, and fine-grained sand as seen in location A. No stained soils or odor were found in location G.

Location H was excavated and logged third. A thin caliche layer was found at the 4 foot level. The rest of the excavation found only the brownish-red, medium-grained sand to 7 feet. No stained soils or odor were found in location H.

Location D was excavated and logged fourth. A layer of caliche was found from 4 feet to 4 feet 6 inches. From 4 feet 6 inches to total depth at 7 feet, only the brownish-red, medium-grained sand was found. No stained soils or odor were found in location D.

Location C was excavated and logged fifth. Caliche was encountered between 4 feet 1 inch and 4 feet 8 inches. The caliche was mingled with reddish, medium-grained sand. From 4 feet 8 inches to 5 feet, the reddish sand began to show black staining and an odor was detected. The sand, at this depth, was dry. At 5 feet to 6 feet, the black stained sand, containing a medium strength odor, predominated. The sand remained dry through out the excavation. Between 6 feet and 6 feet 2 inches, the stained soil was mixed with unstained reddish sand. There was a slight odor at this level. From 6 feet 2 inches to a total depth of 7 feet, the reddish sand was not stained and graded to the tan fine-grained sand. This zone was unstained, dry and odor free.

CBFO:AMO:HLP:GS:05-0228:UFC 5486.00

The sixth excavation was location B. From 4 feet 1 inch to 4 feet 8 inches, caliche was encountered along with medium-grained, brown sand with a reddish tint. No stain was seen, but a faint odor was noted. From 4 feet 8 inches to 5 feet, a medium-grained, brown sand was encountered. There was no stain and only a faint petroleum odor. At this depth, the sand was dry. From 5 feet to 6 feet, a brown to gray-brown sand was encountered. It was medium-grained with possibly a slight stain which was not prominent and a faint odor. From 6 feet to 6 feet 6 inches, a light-brown to reddish-brown, medium to fine-grained sand was encountered. The sand at this depth was clean, dry, and had a faint odor. From 6 feet 6 inches to 6 feet 8 inches, the light-brown to reddish-brown sand persisted. It was medium-grained, dry, clean (no stain), and had no discernable odor. From 6 feet 8 inches to a total depth of 7 feet, tan fine-grained sand was encountered. This sand was dry, odor free, and not stained.

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary

JON GOLDSTEIN
Deputy Secretary

October 23, 2008

RE: NOTICE OF APPROVAL AND GENERAL RESPONSE TO COMMENTS; CLASS 3 MODIFICATION FOR NO FURTHER ACTION OF SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN
WIPP HAZARDOUS WASTE FACILITY PERMIT
EPA I.D. NUMBER NM4890139088

Dear Interested Person:

This letter is a notification of the final administrative action by the New Mexico Environment Department (**NMED**) to approve a Class 3 permit modification request (**PMR**) to the Waste Isolation Pilot Plant (**WIPP**) Hazardous Waste Facility Permit. The Department of Energy Carlsbad Field Office and Washington TRU Solutions LLC (**the Permittees**) submitted this PMR to the Hazardous Waste Bureau in the following document:

- Request for Class 3 Permit Modification (NFA), Letter Dated 8/27, Rec'd 9/4/07

In this PMR, the Permittees requested the following:

1. Modify the permit to reflect the determination by NMED that no further action is necessary to investigate fifteen Solid Waste Management Units (SWMUs) and eight Areas of Concern (AOCs) at WIPP.

This Class 3 PMR was evaluated and processed in accordance with the requirements specified in 20.4.1.900 NMAC (incorporating 40 CFR §270.42(c)). It was subject to a 60-day public comment period running from September 1 through October 30, 2007, during which NMED received written comments from one individual and one organization. NMED then issued a draft permit on March 7, 2008, accompanied by a fact sheet and public notice announcing a 60-day public comment period running from March 7 through May 6, 2008 and an opportunity for public hearing. By the conclusion of the public comment period on the draft permit, NMED had received no public comments on the draft permit and no request for a public hearing. NMED's general responses to the comments related to the submitted PMR are summarized in the attachment to this letter.

NMED is approving the draft permit without change to remove the fifteen SWMUs and eight AOCs from Module VII as requiring no further action. The modification will become effective 30 days after the approval of the modification, which makes the effective date of the permit modification November 22, 2008. Further information on this administrative action, including the modified permit and the Permittees' approval notification, may be found on the NMED WIPP Information Page at <http://www.nmenv.state.nm.us/wipp/>. Please contact Steve Zappe at (505) 476-6051 or via e-mail at <steve.zappe@state.nm.us> if you have further questions or need additional information.

Sincerely,

John E. Kieling
Manager
Permits Management Program

Attachment

cc: James Bearzi, HWB
Steve Zappe, HWB
David Moody, DOE/CBFO
Farok Sharif, Washington TRU Solutions LLC

NMED General Response to Comments on Class 3 Permit Modification To WIPP Hazardous Waste Facility Permit (WIPP permit) Submitted August 27, 2007

Item 1. Modify the WIPP Permit to accurately reflect that No Further Action is required for Solid Waste Management Units and Areas of Concern at WIPP

Background: The PMR proposed to modify the WIPP Permit to reflect a determination by NMED on April 20, 2007, which had concluded that no further action was necessary to investigate fifteen Solid Waste Management Units (SWMUs) and eight Areas of Concern (AOCs) listed in several tables in Module VII of the WIPP Permit. NMED had issued this determination based upon evaluation of relevant sampling information for each site, which supported the conclusion that a more formal RCRA Facility Investigation (RFI) was unnecessary because either there had never been a release of hazardous constituents to the environment at a site or, if there had been a release, a release assessment indicated that the concentrations of hazardous constituents were at acceptably low levels to require no further action. Below is a summary of the changes proposed by the PMR:

- Delete Table 2 entitled "SWMUs Requiring an RFI"
- Delete Table 3 entitled "AOCs Included in the Permit"
- Add Table 4 entitled "SWMUs/AOCs Requiring No Further Action"

NMED received two comments during the public comment period for this PMR, which are addressed below. Based upon public comment and the administrative record, NMED issued a draft permit on March 7, 2008, accompanied by a fact sheet and public notice announcing a 60-day public comment period and opportunity for public hearing. By the conclusion of the public comment period on the draft permit, NMED had received no public comments and no request for a public hearing.

Comments: The first commenter submitted a redacted version of the Permittees' fact sheet for the PMR, suggesting that the Permittees had written the fact sheet intentionally to obscure the truth. The second commenter expressed no objection to the approval of the PMR, but noted that the proposed modification did not address a different minor modification to update another table in Module VII of the Permit. This commenter requested that the PMR not be approved until this specific table had been updated and finalized.

Response: The first comment did not provide any technical or regulatory suggestions relevant to the PMR, and no response is necessary.

Regarding the second comment, NMED incorporated the change to Table 2A, "SWMUs Not Requiring an RFI", which addressed the commenter's concern.

The only other changes from the original PMR that NMED incorporated in the draft permit consisted of not deleting Tables 2 and 3 in their entirety, but deleting all entries from each table and indicating that future entries in each table were "Reserved." This change was necessary because Permit Condition VII.J contains requirements associated with newly-identified SWMUs and potential AOCs, which would necessitate their listing on these tables that would otherwise have been deleted.

New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

RECE[illegible]
OCT 24 2008
BY:

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Hasler
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10/23/2008
Mailed From 87505
US POSTAGE

Bill Olson
NMED/GWQB
Bureau Chief
P.O. Box 26110
Santa Fe, NM 87502

87502+0110

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

1190 St. Francis Drive
P.O. Box 26110, Santa Fe, NM 87502
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us
William C. Olson, Bureau Chief

RON CURRY
Secretary
JON GOLDSTEIN
Deputy Secretary

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David C. Moody, Man
Sent To US Dept. of Energy
Carlsbad Field Offi
or PO Box No. P.O. Box 3090
City, State, ZIP+4 Carlsbad, New Mexic
PS Form 3800, August 2006

September 9, 2008

David C. Moody, Manager
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, New Mexico 88221

RE: Discharge Permit Renewal and Modification, DP-831, Waste Isolation Pilot Plant

Dear Mr. Moody:

The New Mexico Environment Department (NMED) issues the enclosed Discharge Permit Renewal and Modification, DP- 831 to the U.S. Department of Energy (DOE) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978§§74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

The Discharge Permit Renewal and Modification contains terms and conditions that shall be complied with by the DOE and are enforceable by NMED pursuant to WQCC 20.6.2.3104, WQA, NMSA 1978 § 74-6-5 and §74-6-10. Issuance of this Discharge Permit Renewal and Modification does not relieve the DOE of its responsibility to comply with the WQA, WQCC Regulations, or any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

Pursuant to 20.6.2.3109.H.4 NMAC, this Discharge Permit Renewal and Modification shall expire on **September 9, 2013**. You must submit an application for renewal at least 120 days before the permit expiration date.

Sincerely,

William C. Olson, Chief
Ground Water Quality Bureau

WCO:clm

Enclosure: Discharge Permit Renewal and Modification DP-831

xc: Mary Ann Menetrey, Program Manager, MECS (Encl)
Steve Zappe, Staff Manager, HWB (Encl)
Gary Beatty, Manager, District IV, Roswell

GROUND WATER DISCHARGE PERMIT RENEWAL AND MODIFICATION
U.S. DEPARTMENT OF ENERGY
WASTE ISOLATION PILOT PLANT, DP-831
September 9, 2008

I. INTRODUCTION

The New Mexico Environment Department (NMED) renews and modifies Discharge Permit, DP-831, to the U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§ 74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit Renewal and Modification, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the WIPP into ground water and surface water, so as to protect ground water and surface water for present and potential future use as domestic and agricultural water supply and other uses; to abate pollution of ground and surface water; and to protect public health. In issuing this Discharge Permit Renewal and Modification, NMED has determined that the requirements of 20.6.2.3109.C NMAC have been met.

Facility Description

The WIPP is a hazardous and radioactive waste disposal facility operated by the U.S. Department of Energy (DOE). The WIPP is constructed in a bedded salt formation 2,150 feet below ground surface. DP-831 covers the discharge of domestic effluent, storm water and miscellaneous process waters to various lined impoundments at the facility.

Domestic wastewater from the facility and industrial wastewaters from two compressed air systems are discharged to seven synthetically lined facultative sewage lagoons (Facultative Lagoon System) that include Evaporation Ponds A, B and C; Polishing Ponds 1B and 2B; and Settling Ponds 1A and 2A. Brine, purge waters and miscellaneous non-hazardous process waters are discharged to the H-19 Evaporation Pond and Evaporation Ponds B and C of the Facultative Lagoon System. Storm water runoff at the facility is collected in the synthetically lined Storm Water Infiltration Control (SWIC) Ponds A, 1 and 2.

Salt and other subsurface materials mined during construction as well as currently mined salt are stored on the surface in three stockpiles. The stockpiles include the Salt Storage Extension (SSE) Cells A and B that are being used to store salt currently, or in the future, as it is mined out from the underground panels at the WIPP. Storm water runoff from the SSE is collected in the synthetically lined Salt Storage Extension Basin (SSEB). The existing Salt Pile that was previously used has been capped with a synthetic and earthen cover. Storm water runoff from the Salt Pile is collected in synthetically lined diversion ditches and diverted to the synthetically lined Salt Pile Evaporation Pond (SPEP). The Site and Preliminary and Design Validation (SPDV) material pile was constructed as the shafts were excavated when construction first began at the WIPP site. The SPDV material pile was closed in the year 2000 with a cover consisting of a geosynthetic liner installed on 6 inches of bedding material and covered with a minimum of three feet of earthen material.

Location of Discharge

The WIPP facility is located approximately 26 miles east of Carlsbad, New Mexico in Sections 20, 21, 28 and 29, T22S, R31E, Eddy County.

Quantity, Quality, and Flow Characteristics of the Discharge

The permitted discharge consists of up to 23,000 gallons per day (gpd) of domestic effluent and industrial wastewaters; up to 150,000 gpd of brine, purge waters and non-hazardous process waters; a designed flow of 4,224,835 gpd of storm water runoff based on a 24-hour, 25-year storm event; and mined salt placed in Salt Storage Extension Cells A and B. The discharged waters contain contaminants or toxic pollutants that may exceed water quality standards set forth in WQCC Regulations 20.6.2.3103 NMAC for nitrate, chloride, sulfate and total dissolved solids. These discharged waters may move directly or indirectly into ground water.

Characteristics of Ground Water

Regional ground water beneath the site exists in the Culebra and Magenta Members of the Rustler Formation at approximate depths of 483 feet and 357 feet below ground level, respectively. Ground water also exists in the Dewey Lake Formation in the southwest portion of the WIPP site at well WQSP-6A, and as discontinuous lenses in the region beneath and surrounding the WIPP Site (16 Sections of the WIPP Land Withdrawal Area). Depth to ground water in the Dewey Lake Formation in well WQSP-6A is approximately 164 feet below ground surface and contains a total dissolved solids concentration of approximately 3,400 mg/L. A zone of shallow anthropogenic subsurface water (SSW) located underneath the WIPP facility at a depth of approximately 60-80 feet below ground surface has a TDS concentration ranging from approximately 1,500 to 165,000 mg/L.

General

The WIPP Discharge Plan Renewal and Modification consists of the materials in the Discharge Plan submitted by the DOE dated December 20, 2007. In addition, the discharge plan includes, in part, information and materials submitted as part of the original discharge plan approved on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998, amended on January 24, 2000, renewed on April 29, 2003, modified on December 22, 2003, and modified again on December 29, 2006. The discharges at this site shall be managed in accordance with the Discharge Permit Renewal and Modification Application dated December 20, 2007 as conditioned by this Discharge Permit Renewal and Modification.

Changes as incorporated in this Discharge Permit Renewal and Modification include the following:

1. The minimum operating freeboard allowed for the Facultative Lagoon System and the H-19 Evaporation Pond is decreased from two feet to one foot.

2. The Facultative Lagoon System is permitted to accept non-hazardous industrial wastewater from two compressed air systems.

3. Up to 50,000 gpd of brine, purge waters, and miscellaneous non-hazardous process waters are permitted to be discharged into Evaporation Pond C of the Facultative Lagoon System up to the capacity of the pond with one foot of freeboard.

4. The maximum daily discharge rate to the H-19 Evaporation Pond is increased from 8,000 to 50,000 gpd up to the capacity of the pond with one foot of freeboard.

5. The maximum daily discharge rate to Evaporation Pond B is increased from 2,000 to 50,000 gpd up to the capacity of the pond with one foot of freeboard.

6. Quarterly monitoring for Pu^{238}, $Pu^{238/240}$, U^{234}, U^{235}, U^{238}, Am^{241} and Sr^{90} in the Facultative Lagoon System and the H-19 Evaporation Pond is no longer required.

7. Quarterly monitoring for selenium, chromium and nitrate in the SSW piezometers and wells, well WQSP-6A, and Storm Water Infiltration Control Ponds A, 1 and 2 is no longer required.

8. Semiannual monitoring for chloride has been added for Evaporation Ponds B and C of the Facultative Lagoon System and the H-19 Evaporation Pond. Semiannual monitoring for Total Kjeldahl Nitrogen (TKN) has been added for well WQSP-6A.

9. The accuracy of water level measurements in the Storm Water Infiltration Control Ponds is changed from a 100th of a foot to a 10th of a foot.

Pursuant to 20.6.2.3109.E NMAC, NMED reserves the right to modify permit requirements in the event NMED determines that the requirements of 20.6.2 NMAC are being, or may be, violated or standards of 20.6.2.3103 NMAC are being, or may be, violated. This may include a determination by NMED that operational practices approved under this Discharge Permit Renewal and Modification are not protective of ground and surface water quality, and that a modification is necessary to protect water quality or abate water pollution. Permit modification may include, but is not limited to, lining or relining impoundments, changing discharge locations, changing waste management practices, expanding monitoring requirements, and implementing abatement of water pollution.

Issuance of this Discharge Permit Renewal and Modification does not relieve the DOE of its responsibility to comply with all conditions or requirements of the WQA, WQCC Regulations, and any other applicable federal, state, and/or local laws and regulations such as zoning requirements and nuisance orders.

II. FINDINGS

In issuing this Discharge Permit Renewal and Modification, NMED finds:

1. The DOE is discharging effluent or impacted water at the WIPP Facility so that such effluent may move directly or indirectly into ground water within the meaning of 20.6.2.3104 NMAC.

2. Ground water (located at well WQSP 6A) in the Southwest portion of the WIPP Land Withdrawal Area has an existing concentration of 10,000 milligrams per liter or less of total dissolved solids within the meaning of 20.6.2.3101.A NMAC.

3. The discharges at the WIPP Facility are not subject to any of the exemptions of 20.6.2.3105 NMAC.

4. The WIPP Facility is located at a place of withdrawal of water for present or reasonable foreseeable future use within the meaning of 20.6.2.3101A NMAC.

III. CONDITIONS FOR APPROVAL

The following conditions shall be complied with by the DOE and are enforceable by NMED. The DOE is permitted to discharge water contaminants subject to the following conditions.

OPERATIONS

1. The DOE shall conduct the operational requirements set forth below, including investigations, in accordance with the WQCC Regulations at sections 20.6.2.3106.C and 3107 NMAC to ensure compliance with 20.6.1 and 20.6.2 NMAC.

Permitted Discharge Flow Rates

2. During the term of this Discharge Permit Renewal and Modification, the DOE shall manage discharges as follows. [20.6.2.3109 NMAC]

   a. The DOE is permitted to discharge no more than 23,000 gallons per day of domestic effluent and non-hazardous industrial wastewater from two compressed air systems to the Facultative Lagoon System (Evaporation Ponds A, B and C; Polishing Ponds 1B and 2B; and Settling Ponds 1A and 2A) for treatment and evaporation.

   b. The DOE is permitted to discharge no more than 50,000 gallons per day of brine, purge waters and miscellaneous non-hazardous wastewaters to the H-19 Evaporation Pond. The pond capacity is 346,085 gallons allowing for one foot of freeboard.

   c. The DOE is permitted to discharge no more than 50,000 gpd of brine, purge waters and miscellaneous non-hazardous wastewaters to Evaporation Pond B up to the capacity of the pond with one foot of freeboard. The pond capacity is 500,000 gallons allowing for two feet of freeboard.

d. The DOE is permitted to discharge no more than 50,000 gpd of brine, purge waters and miscellaneous non-hazardous wastewaters to Evaporation Pond C up to the capacity of the pond with one foot of freeboard. The pond capacity is 500,000 gallons allowing for two feet of freeboard.

e. The DOE is permitted to collect storm water runoff from the Salt Pile to the Salt Pile Evaporation Pond (SPEP) at a designed flow of 1,677,633 gallons per day based on a 25 year/24 hour storm event (3.90 inches). The pond capacity is 5,506,989 gallons not allowing for any freeboard.

f. The DOE is permitted to collect storm water runoff from the Salt Storage Extension to the Salt Storage Extension Basin (SSEB) at a designed flow of 2,547,202 gallons per day based on a 25 year/24 hour storm event (3.90 inches). The pond capacity is 4,170,732 gallons not allowing for any freeboard.

g. The DOE is permitted to place mined salt and associated minerals from the excavated panels, drifts and shafts in the nuclear waste repository into Salt Storage Extension Cells A and B.

Pond Maintenance and Inspections

3. The DOE shall properly operate and maintain all impoundments covered by this permit. The DOE shall maintain the capacity of the H-19 Evaporation Pond, the Facultative Lagoon System, SSEB and SPEP to store and evaporate the maximum daily discharge volume allowed by this discharge permit while maintaining one foot of freeboard at all times. In the event that a minimum of one foot of freeboard can not be maintained at all times, the DOE shall submit a corrective action plan to manage discharge volumes to the NMED for approval. [20.6.2.3109 NMAC]

4. The DOE shall measure the thickness of the sludge blanket in each pond of the Facultative Lagoon System every five years. When sludge accumulation exceeds 1/3 of the total depth of any pond, the DOE shall remove the sludge in a manner, which is protective of the pond liner. Removed sludge shall be contained, transported, and disposed of in accordance with all local, state, and federal (e.g., 40 CFR Part 503) regulations. [20.6.2.3109 NMAC]

5. The DOE shall perform visual inspection of the Facultative Lagoon System, H-19 Pond and surrounding berms on a monthly basis. The water surface of the ponds shall be kept free of floating plants and debris. Berms surrounding the ponds shall be kept free of all deep-rooted plants. Berms shall be inspected for signs of wind or water erosion and damage from burrowing animals. In the event berms show signs of damage, the DOE shall submit to the NMED for approval a plan for protection of the berms, which may include the emplacement of rip rap or other methods for armoring the berms. [20.6.2.3109 NMAC]

6. Within 180 days of the issuance of this Discharge Permit, the DOE shall submit, for NMED approval, a plan for controlling storm water and minimizing erosion of the earthen cover of the Salt Pile. The plan shall assess and potentially incorporate options including, but not limited to 1) rock armoring of the side slopes, 2) recontouring of the top surface, 3) the use of alternate borrow sources for cover material, and 4) revegetation of the top surface and side slopes. [20.6.2.3109 NMAC]

Cover Maintenance and Inspections

7. The DOE shall conduct regular maintenance of the earthen covers on the Salt Pile and the SPDV pile. Inspections shall be conducted monthly and after storm events of 2 inches or greater in a 24-hour period to evaluate potential erosion and vegetation success of the cover. In the event of significant erosion or failure of vegetative success, the DOE shall provide a plan and schedule for repair within 90 days of discovery. General observations and cover repairs shall be reported to NMED pursuant to Condition 14 below. [20.6.2.3109 NMAC]

MONITORING AND REPORTING

8. The DOE shall conduct the following monitoring, reporting, and other requirements listed below in accordance with the WQCC Regulations at 20.6.2.3107 NMAC and the monitoring plan submitted by the DOE dated December 20, 2007. A summary of monitoring requirements is attached to this permit as Table 1. A monitoring schedule is attached as Table 2. [20.6.2.3107 NMAC]

Sampling and Field Measurements

9. Discharge Volumes – The DOE shall measure discharge volumes to all impoundments covered under this discharge Permit Renewal and Modification as follows. [20.6.2.3107 NMAC]

    a. The volume of domestic effluent discharged to the Facultative Lagoon System shall be measured using a totalizing flow meter on the influent to the system or the totalizing meter that measures total domestic water usage. Volumes of other authorized discharges to the facultative lagoon system shall be calculated by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. Monthly meter readings, the units of measurement, monthly discharge volumes and other volumetric calculations for the previous 6-month period shall be submitted to NMED semi-annually in the monitoring reports required in Condition 14 below.

    b. The volume and origin of all wastewater discharged to the H-19 Evaporation Pond that is derived from miscellaneous non-hazardous sources shall be measured and reported to NMED. Discharge volumes to the H-19 Evaporation Pond shall be calculated by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. Monthly discharge volumes and other volumetric calculations for the previous 6-month period shall be submitted to NMED semi-annually in the monitoring reports required in Condition 14 below.

10. Surface Impoundments – The DOE shall measure water levels and analyze for water quality as follows.

    a. The water depth shall be measured monthly to the nearest tenth of a foot (0.1 ft) in the SSEB, SPEP, and SWIC Ponds A, 1 and 2. The approximate volume of storm water shall be calculated and a water quality sample collected in each of the five storm water collection ponds once per year after a selected significant storm event where a sufficient quantity of water has collected in the respective ponds. Water quality sampling shall be conducted as required in Condition 9b.

    b. Confirmation of one foot of freeboard shall be conducted monthly on the H-19 Evaporation Pond and each impoundment in the Facultative Lagoon System.

    c. Samples shall be collected from the influent to the Facultative Lagoon System semi-annually and analyzed for the parameters in Groups 2 and 3 listed in Condition 11 below and Table 1, Monitoring Summary. Samples shall be collected semi-annually from the H-19 Evaporation Pond and analyzed for the parameters in Group 2 listed in Condition 11 below and Table 1, Monitoring Summary. A single sample shall be collected annually after a selected significant storm event from each of the storm water ponds, SSEB, SPEP, and SWIC Ponds A, 1 and 2 and analyzed for the parameters in Group 2 listed in Condition 12 below and Table 1, Monitoring Summary.

Analytical results, water level measurements and freeboard confirmation for surface impoundments shall be reported to NMED as required in Condition 14 below. [20.6.2.3107 NMAC]

11. Ground Water Monitoring Wells – The DOE shall measure water depths and analyze for water quality as follows.

    a. Depth to the water table shall be measured to the nearest hundredth of a foot (0.01 ft) above msl, quarterly in piezometers/monitoring wells PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-6, PZ-7, PZ-8, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, C-2505, C-2506, C-2507, C-2811 and WQSP-6A.

    b. Samples shall be collected from piezometers/monitoring wells PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, C-2507, C-2811 and WQSP-6A semi-annually and analyzed for the parameters in Groups 1 and 2 listed in Condition 12 below.

    c. Samples shall be collected from monitoring well WQSP-6A semi-annually and analyzed for the parameters in Group 3 listed in Condition 12 below.

Analytical results and water level measurements for monitoring wells shall be reported to NMED as required in Condition 14. below. [20.6.2.3107 NMAC]

Analysis

12. The DOE shall analyze samples of ground water and water from surface impoundments for the specific parameters listed below and based on the schedule in the attached Table 1. Samples of ground water from monitoring wells shall be analyzed for the parameters listed in Groups 1, 2 and 3 as noted below. Samples collected from surface impoundments shall be analyzed for the parameters listed in Group 2.

    Group 1: Field parameters (analysis to be performed in the field): water level, temperature, pH and electrical conductivity.

    Group 2: General chemistry parameters: sulfate, chloride and total dissolved solids.

    Group 3: Nitrate-nitrogen and total Kjeldahl nitrogen.

    Copies of signed laboratory analysis sheets shall be maintained at the WIPP facility and made available to NMED staff upon request. [20.6.2.3107 NMAC]

Methodology

13. Unless otherwise approved in writing by NMED, the DOE shall conduct sampling and analysis in accordance with the most recent editions of the following documents. [20.6.2.3107 NMAC]

    a. American Public Health Association, *Standard Methods for Examination of Water and Wastewater.*

    b. U.S. Environmental Protection Agency, *Methods for Chemical Analysis of Water and Waste.*

    c. U.S. Geological Survey, *Techniques for Water Resource Investigations of the U.S. Geological Survey.*

    d. American Society for Testing and Materials, Annual Book of ASTM Standards, Part 31, Water.

    e. U.S. Geological Survey, et al., *National Handbook of Recommended Methods for Water Data Acquisition.*

    f. Surface water monitoring must also be conducted according to test procedures approved under Title 40 CFR Part 136.

g. New Mexico Environment Department, Hazardous Waste Bureau Position Paper, *Use of Low-Flow and Other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring.*

Reporting

14. The DOE shall submit to NMED semi-annual monitoring reports by the last day of January and July of each year. Reports shall include the following information. [20.6.2.3107 NMAC]

    a. A summary of all activities related to permitted discharges during the preceding 6 month period. Activities may include general operations, construction or demolition of structures, erosion features, maintenance and repairs to liners, pipelines, covers, berms and other facility components covered by this Discharge Permit Renewal and Modification, water management, water quality and ground water level trends, and precipitation patterns.

    b. A single table in a paper and electronic format (EXCEL spreadsheet) of water level measurements and water quality data with only those constituents analyzed and water levels measured during a single event shown in columns. Tabulated field measurements to include temperature, pH and electrical conductivity corrected to 25 degrees Celsius. Monitoring sites shall be shown in rows. The second column shall contain the date of the sampling event. Values exceeding standards shall be bolded. Any constituent not analyzed for a particular site shall be shown as "NA", any site not sampled shall be shown as "NS" with an associated reason, and any site not measured for water levels shall be shown as "NM" with an associated reason.

    c. A single table as described in Condition 13b above that includes all available ground water data to date shall be submitted annually. For each monitoring well, the name of the well shall be entered in the far left column in a row by itself. Sampling events, beginning with the earliest event first, shall be entered in subsequent rows with the sampling date in the second column and the corresponding analytical data in columns further to the right. Each new sampling event shall be added as an additional row to the existing spreadsheet with the corresponding date of the sampling event noted in the second column next to the monitoring well name.

    d. Discharge volumes, water depths, and calculated storm water volumes for all permitted impoundments at the facility.

    e. Copies of the signed laboratory analyses sheet shall be kept onsite and made available to NMED upon request.

    f. Hydrographs shall be submitted annually for all monitoring wells and piezometers covered under Condition 11a of this Discharge Permit Renewal and Modification. At a minimum, graphs shall include the previous five years of water level data, or for new wells, all data since the well was installed. Data for several wells may be included on one graph.

g. A potentiometric map for the WIPP facility area shall be submitted annually. The map shall incorporate the most recent water level data for all monitoring wells and piezometers installed in the shallow subsurface water (SSW).

CONTINGENCY MEASURES

15. In the event that monitoring indicates ground water standards as defined in Section 20.6.2.3103 NMAC are exceeded in ground water in wells that previously did not exceed ground water standards, or the extent or magnitude of any existing concentrations of water contaminants is significantly increasing, the DOE shall collect a confirmatory sample from the monitoring well(s) within 15 days to confirm the initial sampling results. Within 30 days of confirmation of ground water contamination, the DOE shall submit an abatement plan to NMED, which includes a site investigation to define the source, nature and extent of contamination; a proposed abatement option; and a schedule for its implementation. The site investigation and selection of an abatement option shall be consistent with the requirements and provisions of 20.6.2.4101, 4103, 4106.C & E, 4107, 4108 and 4112 NMAC. [20.6.2.3107A(10) NMAC]

16. In the event of a pipeline break, pump failure, pond overflow or other system failure at the WIPP Facility, discharged water shall be contained, pumped and transferred to areas of the facility that impose minimal impacts to ground water quality. Failed components shall be repaired or replaced as soon as possible and no later than 72 hours from the time of failure. For good cause shown, the DOE may request NMED approval of an extension of the schedule for the repair or replacement of a failed component. [20.6.2.3107A(10) NMAC]

17. In the event of a spill or release that is not authorized by this Discharge Permit Renewal and Modification, the DOE shall initiate the notification and corrective actions required in 20.6.2.1203 NMAC. The DOE shall take immediate corrective action to contain and remove or mitigate the damage caused by the discharge. Within 24 hours of discovery of the discharge, the DOE shall verbally notify the NMED and provide the information outlined in 20.6.2.1203.A.1 NMAC. Within seven days of discovering the discharge, the DOE shall submit a written report to NMED verifying the oral notification and providing any additional information or changes. The DOE shall submit a corrective action report within 15 days after the discovery of the discharge. [20.6.2.1203 NMAC]

CLOSURE

18. The DOE shall close the facilities covered under this Discharge Permit Renewal and Modification in accordance with the closure plan in the March 4, 2005 discharge permit application, the closure plan in the WIPP Hazardous Waste Facility Permit (HWFP) dated January 30, 2003, and the WIPP Land Management Plan as conditioned by this Discharge Permit Renewal and Modification. [20.6.2.3107A(11) NMAC]

Surface Impoundments

19. Upon cessation of operation, the DOE shall close all impoundments at the facility covered by this Discharge Permit. Remaining liquids in each impoundment shall be removed and/or evaporated. All sludge shall be sampled to determine if hazardous constituents exist and managed and/or disposed of in accordance with applicable regulations. All piping and other ancillary components shall be plugged or removed. Synthetic liners shall be removed or ripped in place. All impoundments shall be backfilled with clean fill materials and graded to create positive drainage. The final regraded surface shall be contoured to surrounding topography and shall be revegetated with natural grasses that include a seed mix approved by NMED. [20.6.2.3107A(11) NMAC]

Salt Piles and Salt Storage Area

20. Upon cessation of operation, all mined salt at the WIPP facility shall be removed from the site. The DOE is permitted to use the mined salt as backfill in shafts and as interior fill material in berms and permanent markers after closure. All mined salt remaining after backfilling and after construction of surface structures shall be removed from the site. The DOE shall submit a plan and schedule for salt tailings removal to NMED for approval within 120 days prior to the facility closure. The WIPP Land Management Plan reflects the Land Withdrawal Act's requirements for disposition of the salt. Section I-1d of the WIPP's Hazardous Waste Facility permit also addresses closure activities that include closure of the salt storage areas in accordance with the provisions of the WIPP Land Management Plan. The salt storage area will be reclaimed in the manner described in these documents. [20.6.2.3107A(11) NMAC]

Post-closure Monitoring

21. The DOE shall continue ground water monitoring in all wells covered under DP-831 as described in Condition 10 of this Permit Renewal and Modification for two years after the closure activities described in Conditions 18 and 19 are completed to confirm the absence of ground water contamination. If monitoring results show that the ground water standards in Section 20.6.2.3103 NMAC are being exceeded, the DOE shall implement the contingency plan described in Condition 15 of this Discharge Permit Renewal and Modification. Following notification from NMED that post-closure monitoring may cease, the DOE shall submit a plan to plug and abandon specified monitoring wells not needed for long-term monitoring. Upon NMED approval, the DOE shall plug and abandon the wells in accordance with *NMED Guidelines for Monitoring Well Construction and Abandonment* (copy enclosed) or alternative methods approved by NMED. When all post-closure requirements have been met, the DOE may request to terminate the discharge permit. [20.6.2.3107A(11) NMAC]

IV. GENERAL TERMS AND CONDITIONS

The DOE shall comply with the following general conditions, which shall be enforceable by NMED.

Record Keeping

22. The DOE shall maintain at its facility a written record (unalterable electronic images maintained electronically and available at the site constitutes a written record) of all data and information on monitoring of ground water, surface water, and seepage pursuant to this Discharge Permit Renewal and Modification including the following. [20.6.2.3107A NMAC]

    a. The date, exact time, and exact location of each sample collection or field measurement;

    b. The name of the person who performed each sample collection or field measurement;

    c. The date of the analysis of each sample;

    d. The name and address of the laboratory and the name of the authorized manager or his designee verifying that the laboratory report is complete and accurate.

    e. The analytical technique or method used to analyze each sample or take each field measurement;

    f. The results of each analysis or field measurement, including the raw data; and,

    g. A description of the quality assurance and quality control procedures used.

23. Such data and information as described in Condition 22, shall also be maintained on all split and duplicate samples, spike and blank samples, and repeat samples. [20.6.2.3107A NMAC]

24. The DOE shall maintain a written record of any spills, seeps, or leaks of effluent, leachate or process fluids not authorized by this Discharge Permit Renewal and Modification. [20.6.2.3107A NMAC]

25. The DOE shall maintain a written record of the operation, maintenance and repair of all facilities/equipment used to treat, store, or dispose of wastewater; to measure flow rates; to monitor water quality; or, to collect other data required by this Discharge Permit Renewal and Modification. This record shall include repair, replacement or calibration of any monitoring equipment and repair or replacement of any fixed equipment used in the conveyance of waters covered by this permit. [20.6.2.3107A NMAC]

26. Notwithstanding any company record retention policy to the contrary, until such time as NMED determines that all closure measures have been completed in accordance with the requirements of this Discharge Permit Renewal and Modification, the DOE shall retain copies of all data, records, reports, and other documents generated pursuant to this Discharge Permit. Such record retention period may be increased by the NMED at any time upon written notice to the DOE. [20.6.2.3107A NMAC]

27. All such data, records, reports, and other documents generated pursuant to this Discharge Permit Renewal and Modification, shall be provided to the NMED upon request. [20.6.2.3107A NMAC]

Inspection and Entry

28. The DOE shall allow the Secretary or an authorized representative of NMED, upon the presentation of credentials, to conduct the following actions. [20.6.2.3107D NMAC] [74-6-9.B & E WQA]

    a. Enter at reasonable times upon or through any property or premises owned or controlled by the DOE or at any other location where records are kept under the conditions of this Discharge or any Federal or WQCC regulation.

    b. Inspect and copy, at reasonable times, records required to be kept under the conditions of this Discharge Permit Renewal and Modification or pursuant to State or Federal water quality regulations.

    c. Inspect any facility, equipment (including monitoring and control equipment for treatment works), practices or operations regulated or required under this Discharge Permit Renewal and Modification or under any Federal or WQCC regulations.

    d. Sample or monitor at reasonable times for the purpose of assuring compliance with this Discharge Permit Renewal and Modification or as otherwise authorized by the New Mexico Water Quality Act, any effluent, water contaminant, or receiving water at any location before or after the discharge.

29. Nothing in this Discharge Permit Renewal and Modification shall be construed as limiting in any way the inspection and entry authority of the NMED under the WQA, the WQCC Regulations, or any other applicable law or regulation. [20.6.2.3107 NMAC]

Duty to Provide Information

30. Within a reasonable time after a request from the NMED, which time may be specified by the NMED, the DOE shall provide the NMED with any relevant information to determine whether cause exists for modifying, terminating, or renewing this Discharge Permit Renewal and Modification, or to determine whether the DOE is in compliance with this Discharge Permit Renewal and Modification. [20.6.2.3107D NMAC][74-6-9.B & E WQA]

31. Nothing in this Discharge Permit Renewal and Modification shall be construed as limiting in any way the information gathering authority of NMED under the WQA, the WQCC Regulations, or any other applicable law or regulation. [20.6.2.3107D NMAC][74-6-9.B & E WQA]

Spills, Leaks and Other Unauthorized Discharges

32. This Discharge Permit Renewal and Modification authorizes only those discharges specified herein. Any discharge not authorized by this Discharge Permit Renewal and Modification is a violation of the WQCC Regulations at 20.6.2.3104 NMAC. The DOE must report any such discharge to the NMED, and take corrective action to contain and remove or mitigate the damage caused by the discharge. [20.6.2.1203 NMAC]

Modifications and Amendments

33. The DOE shall notify the NMED of any changes to its wastewater collection or disposal system, including any changes in the wastewater flow rate or the volume of wastewater storage, or of any other changes to its mining operations or processes that would result in any significant change in the discharge of water contaminants. The DOE shall obtain the NMED approval, as a modification to this Discharge Permit Renewal and Modification pursuant to section 20.6.2.3109.E, F, or G NMAC, prior to any increase in the quantity of a discharge, or any increase in the concentration of water contaminants discharged, above those levels approved in this Discharge Permit Renewal and Modification. [20.6.2.3107C NMAC]

Enforcement

34. Any violation of the requirements and conditions of this Discharge Permit Renewal and Modification, including any failure or refusal to allow the NMED to enter and inspect records or facilities, or any refusal or failure to provide the NMED with records or information, may subject the DOE to an enforcement action. Pursuant to WQA § 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, suspending or terminating the Discharge Permit Renewal and Modification, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to the WQA §§ 74-6-10(C) and 74-6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the WQA § 74-6-5, the WQCC regulations, or this Discharge Permit Renewal and Modification, and civil penalties of up to $10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation standard, or order adopted pursuant to such other provision. For certain violations specified in the WQA § 74-6-10.2, criminal penalties may also apply. In any action to enforce this Discharge Permit Renewal and Modification, the DOE waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit Renewal and Modification. The DOE does not waive any argument as to the weight such evidence should be given. [74-6 WQA]

Compliance with Other Laws

35. Nothing in this Discharge Permit Renewal and Modification shall be construed in any way as relieving the DOE of its obligation to comply with all applicable Federal, State, and local laws, regulations, permits, or orders. The DOE does not waive any rights under such

applicable federal, state and local laws, regulations, permits, or orders except as expressly provided in this Discharge Permit Renewal and Modification. [20.6.2 NMAC]

Liability

36. The approval of this Discharge Permit Renewal and Modification does not relieve the DOE of liability should the operation result in actual pollution of surface or ground water which may be actionable under other laws and/or regulations. [20.6.2.3109 NMAC]

Right to Appeal

37. The DOE may file a petition for a hearing before the WQCC on this Discharge Permit Renewal and Modification. Such petition must be made in writing to the WQCC within thirty (30) days after the DOE receives this Discharge Permit Renewal and Modification. Unless a timely petition for a hearing is made, the decision of NMED shall be final. [74-6-5.N WQA]

Transfer

38. Prior to any transfer of ownership, control, or possession of the WIPP facility or any portion thereof, the DOE shall notify the proposed transferee in writing of the existence of this Discharge Permit Renewal and Modification and include a copy of this Permit Renewal and Modification with the notice. The DOE shall deliver or send by certified mail to the NMED a copy of the notification and proof that such notification has been received by the proposed transferee. [20.6.2.3111 NMAC]

Term

The effective date of this Discharge Permit Renewal and Modification is the date it is issued and signed by the Chief of the Ground Water Quality Bureau. The term of this Discharge Permit Renewal and Modification expires five (5) years from the date it was issued. To renew this Discharge Permit Renewal and Modification, the DOE must submit an application for renewal at least 120 days before the expiration date. [74-6-5.H WQA][20.6.2.3109.H NMAC]

Issued this 9th day of Sept, 2008

William C. Olson, Chief
Ground Water Quality Bureau
New Mexico Environment Department

Under authority delegated by the Secretary of the New Mexico Environmental Department

WASTE ISOLATION PILOT PLANT, DP-831
DISCHARGE PERMIT MODIFICATION
MONITORING SUMMARY

Monitoring Reports are due by: 31-JAN, 31-JUL

Table 1: Monitoring Summary

Annual Sampling Frequency	Annual Reporting Frequency	Number of Sites	Sampling Description
12	2	4	Discharge volumes to Facultative Lagoons, H-19 pond & Evaporation Ponds B & C.
12	2	5	Depth of water in SSEB, SPEP & SWIC Ponds A, 1 & 2.
12	2	8	Freeboard confirmation in H-19 Pond and Facultative Lagoons.
1	1	5	Approximate storm water volume in SSEB, SPEP & SWIC Ponds A, 1 & 2.
2	2	2	SO_4, Cl & TDS semi-annually in Facultative Lagoon Influent, H-19 Pond, and Evaporation Ponds B & C.
1	1	5	SO_4, Cl & TDS annually in SSEB, SPEP & SWIC Ponds A, 1 & 2.
4	2	20	Water levels quarterly in 20 monitoring wells and piezometers (see Table 2).
2	2	12	Field parameters, SO_4, Cl & TDS semi- annually in 12 monitoring wells and piezometers (Table 2).
2	2	2	TKN & NO_3 in Facultative Lagoon Influent and monitoring well WQSP-6A (see Table 2).
1	1	12	Historical monitoring data submitted annually.
		20	Hydrographs submitted annually.
12	2	2	Monthly inspections of all covers.
12	2	13	Monthly inspections of all ponds.
1	1	1	Potentiometric map submitted annually.
2	2	1	Activities report submitted semi-annually

Table 2: Ground Water Monitoring Schedule

Completion	Well	Sampling					
Formation	Number	type	Q1	Q2	Q3	Q4	Notes
[illegible]							
Santa Rosa	PZ-1	pz	W	W,1,2	W	W,1,2	
Santa Rosa	PZ-2	pz	W	W	W	W	
Santa Rosa	PZ-3	pz	W	W	W	W	

Completion	Well	Sampling					
Formation	Number	type	Q1	Q2	Q3	Q4	Notes
Santa Rosa	PZ-4	pz	W	W	W	W	
Santa Rosa	PZ-5	pz	W	W,1,2	W	W,1,2	
Santa Rosa	PZ-6	pz	W	W,1,2	W	W,1,2	
Santa Rosa	PZ-7	pz	W	W,1,2	W	W,1,2	
Santa Rosa	PZ-8	pz	W	W	W	W	
Santa Rosa	PZ-9	pz	W	W,1,2	W	W,1,2	
Santa Rosa	PZ-10	pz	W	W,1,2	W	W,1,2	
Santa Rosa	PZ-11	pz	W	W,1,2	W	W,1,2	
Santa Rosa	PZ-12	pz	W	W,1,2	W	W,1,2	
Santa Rosa	PZ-13	pz	W	W,1,2	W	W,1,2	
Santa Rosa	PZ-14	pz	W	W	W	W	
Gatuna	PZ-15	pz	W	W	W	W	
Santa Rosa	C-2505	mw	W	W	W	W	
Santa Rosa	C-2506	mw	W	W	W	W	
Santa Rosa	C-2507	mw	W	W,1,2	W	W,1,2	
Dewey Lake	C-2811	mw	W	W,1,2	W	W,1,2	
Dewey Lake	WQSP-6A	mw	W	W,1,2,3	W	W,1,2,3	

Explanation to Abbreviations and Symbols

Type: mw = monitoring well pz = piezometer	Sampling Quarter: Q1 = Jan-Mar Q2 = Apr-Jun Q3 = Jul-Sep Q4 = Oct-Dec
Sampling Analytical Suites: 1 = Field parameters: Temp, pH, specific conductance 2 = General chemistry parameters: SO_4, Cl & TDS 3 = TKN & NO_3 W = Depth to water measurement to the nearest 0.1 foot.	

Submit all monitoring reports to: Clint Marshall
Ground Water Quality Bureau
P.O. Box 26110
Santa Fe, New Mexico 87502

Marshall, Clint, NMENV

From: Stone, Marissa, NMENV
Sent: Tuesday, September 09, 2008 2:57 PM
Subject: Environment Department Approves Renewal of WIPP Groundwater Discharge Permit

September 9, 2008 Contact: Marissa Stone, NMED Communications Director
For Immediate Release (505) 827-0314 or (505) 231-0475

Environment Department Approves Renewal of WIPP Groundwater Discharge Permit

(Santa Fe, NM) – The New Mexico Environment Department today approved a five-year groundwater discharge permit renewal and modification for the U.S. Department of Energy's Waste Isolation Pilot Plant east of Carlsbad.

The permit, which will be valid until 2013, allows for the discharge of sewage effluent, impacted storm water and nonhazardous wastewaters from the facility to synthetically lined impoundments.

"The permit renewal reflects the continuing efforts between us, DOE and WIPP to protect the environment," said New Mexico Environment Department Secretary Ron Curry. "We are confident this is a strong permit that will protect residents and the area's natural resources."

The department did not receive requests from citizens for a public hearing on the permit.

The permit will allow for the discharge of up to 23,000 gallons per day (gpd) of sewage effluent, up to 150,000 gpd of brine, purge waters and miscellaneous non-hazardous wastewaters. In addition, it will allow for a designed flow of 4,224,835 gpd of storm water runoff from salt storage areas based on a 24-hour, 25-year storm event. Modifications to the discharge permit primarily include changes in some of the monitoring requirements and increases in allowable discharge volumes to some of the synthetically lined impoundments. The depth to groundwater at the facility is about 164 feet and has a total dissolved solids concentration of approximately 3,400 milligrams per liter.

The Environment Department first approved a groundwater discharge permit for WIPP in January 16, 1992.

The permit imposes New Mexico Water Quality Act and Water Quality Control Commission Regulations to control the discharge of water contaminants from WIPP to protect groundwater and surface water.

WIPP, a hazardous and radioactive waste disposal facility operated by DOE, lies in a bedded salt formation 2,150 feet

Notice is hereby given pursuant to 20.6.2.3108.G NMAC, the following Ground Water Discharge Permit applications have been proposed for approval. To request additional information or to obtain a copy of a draft permit, contact the Ground Water Quality Bureau in Santa Fe at (505) 827-2900. Draft permits may also be viewed on-line at http://www.nmenv.state.nm.us/gwb/New_Pages/public_notice.htm

NOTE – If viewing by WEB - Click on facility name to review a copy of the draft permit.

DP #	Facility/Applicant	Closest City	County	Notice	NMED Permit Contact
1329	Bernalillo County Metropolitan Detention Center Douglas Dailey, Manager Water-Reclamation Division Albuquerque/Bernalillo County Water Utility Authority 4201 2nd St., SW Albuquerque, NM 87105	Albuquerque	Bernalillo	Bernalillo County Metropolitan Detention Center, Douglas Dailey, Water Reclamation Division Manager, proposes to renew the Discharge Permit for the discharge of up to 212,600 gallons per day of domestic wastewater from a correctional facility to an aerated lagoon system managed as a sequence batch reactor (SBR) system. Reclaimed wastewater from the SBR system is discharged to a 23 acre land application area, used for dust control and construction purposes at the Cerro Colorado Landfill, and applied by drip-irrigation to approximately 1 acre of landscaping. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 5800 Shelly Rd SW, Albuquerque, in Sections 17 and 18, T09N, R01E, Bernalillo County. Ground water beneath the site is at a depth of approximately 855 feet and has a total dissolved solids concentration of approximately 850 milligrams per liter.	Naomi Davidson
759	Village of Hatch-Sludge Drying Beds Judd L. Nordyke Mayor Village of Willard P.O. Box 220 Hatch, NM 87937	Hatch	Dona Ana	Village of Hatch-Sludge Drying Beds, Honorable Judd L. Nordyke, Mayor, proposes to renew the Discharge Permit for the discharge of up to 1,000 gallons per day of sludge from the Village of Hatch Wastewater Treatment Facility. Sludge is removed from the wastewater treatment plant and discharged to 6 concrete-lined drying beds. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 1101 East Herrera Road, in Hatch, in Section 10, T19S, R03W, Doña Ana County. Ground water beneath the site is at a depth of approximately 6 feet and has a total dissolved solids concentration of approximately 300 milligrams per liter.	Gerald Knutson
831	U.S. Department of	Carlsbad	Eddy	U.S. Department of Energy, Waste Isolation Pilot Plant,	Clint Marshall

	Energy, Waste Isolation Pilot Plant David C. Moody, Manager U.S. Dept. of Energy Carlsbad Field Office PO Box 3090 Carlsbad, NM 88221			Dave Moody, Manager, proposes to renew and modify the Discharge Permit, which presently allows for the discharge of up to 23,000 gallons per day (gpd) of sewage effluent, up to 150,000 gpd of brine, purge waters and miscellaneous non-hazardous wastewaters, and a designed flow of 4,224,835 gpd of storm water runoff from salt storage areas based on a 24-hour, 25-year storm event (3.90 inches). The facility is located approximately 26 miles east of Carlsbad, New Mexico, in Sections 20, 21, 28 and 29, T22S, R31E, Eddy County. Depth to ground water in the area of the facility is approximately 164 feet and has a total dissolved solids concentration of approximately 3,400 milligrams per liter.	
1056	Cobre Mining Company-Continental Mine James E. Humphrey Manager Cobre Mining Co. P.O. Box 7 Hurley, NM 88043	Hanover	Grant	Cobre Mining Company-Continental Mine, James E. Humphrey, Manager, proposes to renew and modify the discharge permit for the discharge of up to 17,280,000 gallons per day of leach solution to the Fierro and/or Humbolt Leach Stockpiles via a network of pipelines from the raffinate pond at the Continental SX/EW Plant or from the Chino Mine raffinate tank. Other facilities covered under this Discharge Permit include the Hanover Mountain Mine, No. 3 Shaft Stockpile, the North Overburden Stockpile, and pipelines to and from the Chino SX/EW Plant. Copper ore will be placed on synthetically-lined pads and leached with an acidic solution with an approximate pH of 2. The pregnant leach solution (PLS) will be collected at each stockpile in a synthetically double-lined pond with a leak detection system. Up to 12,000 gallons per minute of PLS may be pumped through pipelines to the Continental Mine SX/EW Plant or Chino Mine SX/EW Plant (DP-591). The copper will be removed from the leach solution at the SX/EW plant, and the barren leach solution will be discharged to a synthetically double-lined raffinate pond with a leak detection system. Sulfuric acid will be added to the barren leach solution in the raffinate pond, and the raffinate will be pumped through pipelines to the top of the leach stockpiles. The Fierro and Humbolt Leach Ore Stockpiles will receive ore from the Hanover Mountain Mine and/or the Continental Open Pit. The North Overburden Stockpile and the South Waste Rock Facility (permitted under DP-181) may receive waste rock from the Hanover	Kurt Vollbrecht

				Mountain Mine. The Continental Mine facility is located approximately 1/2 mile west of Fierro, 4 miles north of Hanover in Sections 3, 4, 5, 8, 9, 10, 15, 16, 17, 20, 21, 31, and 32, T17S, R12W in Grant County. The depth to ground water below the site ranges from approximately 1 to 200 feet and has a TDS concentration range of 350 to 1,400 milligrams per liter (mg/L).	
1612	City of Eunice-Wastewater Treatment Facility Johnnie M. White Mayor City of Eunice P.O. Box 147 Eunice, NM 88231	Eunice	Lea	City of Eunice-Wastewater Treatment Facility, Honorable Johnnie M. White, Mayor, proposes to discharge up to 400,000 gallons per day of municipal wastewater. Wastewater is presently treated by an Imhoff Tank and trickling filter. Wastewater will be treated in a newly constructed synthetically lined lagoon treatment system by 2010. Treated wastewater is stored and land applied to 80 acres and/or used for oil well drilling operations. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at approximately 0.7 miles east of the intersection of Highway 8 and Highway 207 in Eunice, in Section 27, T21S, R37E, Lea County. Ground water beneath the site is at a depth of approximately 76 feet and has a total dissolved solids concentration of approximately 1950 milligrams per liter.	Gerald Knutson
431	Sun Foundation Wastewater Treatment Plant Neal Pace, President City of the Sun Foundation PO Box 370 Columbus, NM 88029	Columbus	Luna	Sun Foundation Wastewater Treatment Plant, Neal Pace, President, proposes to renew and modify the Discharge Permit for the discharge of up to 6,000 gallons per day (gpd) of domestic wastewater from an unincorporated community to a clay lined evaporation lagoon. The modification consists of an increase in the discharge volume from 4,000 gpd to 6,000 gpd. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at Hwy 11 at Altura Street, just north of Columbus, in Section 27, T28S, R08W, Luna County. Ground water beneath the site is at a depth of approximately 200 feet and has a total dissolved solids concentration of approximately 300 milligrams per liter.	Naomi Davidson
615	Cyprus Pinos Altos Corporation-Deming Tailing Impoundment	Deming	Luna	Cyprus Pinos Altos Corporation-Deming Tailing Impoundment, James E. Humphrey, Manager, proposes to renew the discharge permit for closure and post-closure	Kurt Vollbrecht

	James E. Humphrey Cyprus Pinos Altos Corp. P.O. Box 7 Hurley, NM 88043			monitoring of the Deming Tailing Impoundment. There is currently no mining, milling or tailings discharge associated with present operation and no tailings discharge is authorized by this Discharge Permit. The Deming Tailing Impoundment is located in Deming in Sections 20 and 21, T23S, R9W, Luna County. The depth to ground water below the site is approximately 100 feet and has a total dissolved solids concentration of approximately 420 milligrams per liter.	
1234	Deming Jigging Plant, American Minerals, Inc., Paul V. Hall, Manager American Minerals, Inc. P.O. Box 37 Andersonville,GA. 31711	Deming	Luna	Deming Jigging Plant, American Minerals, Inc., Paul V. Hall, Manager, proposes to renew and modify the discharge permit for closure and post-closure monitoring and maintenance of the former AMI Deming Jigging Plant Site (AMI Site). The AMI Site was reclaimed in the fall of 2005. There is currently no mining, milling or tailings discharge associated with present operation and no tailings discharge is authorized by the Discharge Permit. The AMI Site is located east of Deming in Section 25, T23N, R9W in Luna County. Ground water below the site is at a depth of 74 feet and has a total dissolved solids concentration of 375 milligrams per liter.	Kurt Vollbrecht
1156	Christ Community Church Jack Brock, Pastor Christ Community Church P.O. Box 2975 Alamogordo, NM 88311	Alamogordo	Otero	Christ Community Church, Jack Brock, Pastor, proposes to renew the Discharge Permit for the discharge of up to 6,000 gallons per day of domestic wastewater. Wastewater from the church is discharged to 2 septic tank systems followed by a leachbed. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 2960 North Scenic Drive in Alamogordo, in Section 5, T16S, R10E, Otero County. Ground water beneath the site is at a depth of approximately 270 feet and has a total dissolved solids concentration of approximately 1,750 milligrams per liter.	Gerald Knutson
1516	Stuckey's #112 Steve Kirkley, Director Store Operations Pecan Shoppe of Tucumcari, Inc. PO Box 4009	Tucumcari	Quay	Stuckey's #112, Steve Kirkley, Director of Store Operations, proposes to modify the Discharge Permit for the discharge of up to 2,150 gallons per day of wastewater from a restaurant and convenience store to an evaporative lagoon system that is preceded by a grease interceptor and two septic tanks in parallel. The modification consists of an increase in the discharge volume from 2,000 gpd to 2,150	Kathie Deal

	Eastman, GA 31023			gpd and the installation of a synthetically lined evaporative lagoon to replace the leachfields to address exceedance of ground water quality standards. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at Exit 321 off of Interstate 40, approximately 8 miles west of Tucumcari in Section 5, T10N, R29E, Quay County. Ground water beneath the site is at a depth of approximately 100 feet and has a total dissolved solids concentration of approximately 540 milligrams per liter	
1359	Rio Arriba Rural Events Center Phillip Morfin Administrator Grants & Contracts Rio Arriba County 1122 Industrial Park Espanola, NM 87532	Abiquiu	Rio Arriba	Rio Arriba Rural Events Center, Phillip Morfin, Grants and Contracts Administrator, Rio Arriba County, proposes to renew the Discharge Permit for the treatment of up to 6,000 gallons per day of wastewater in a treatment system consisting of two septic tanks in series, two BioMicrobics 3.0 Fixed Activated Sludge Treatment (FAST) systems in series, a holding tank and a final effluent tank. The treated wastewater is discharged to a 24,000 ft^2 subsurface irrigation system. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located on SR 554 House 122A, approximately four miles east of Abiquiu, in the Lobato Land Grant, Section 18, Township 23N, Range 07E (projected), Rio Arriba County. Ground water beneath the site is at a depth of approximately 476 feet and has a total dissolved solids concentration of approximately 894 milligrams per liter.	Kathie Deal
419	Chaco Culture National Historical Park Barbara West Superintendent Chaco Culture National Historical Park P.O. Box 220 Nageezi, NM 87037	Chaco Canyon	San Juan	Chaco Culture National Historical Park, Department of Interior, National Park Service, proposes to renew and modify the Discharge Permit for the discharge of up to 19,500 gallons per day of domestic wastewater from various sites located throughout the park and reverse osmosis reject water. Domestic wastewater and reverse osmosis reject water is pumped through three lift stations and discharged to three synthetically lined lagoons, designed in series, for disposal by evaporation. The modifications consist of increasing the volume of wastewater discharged from 17,000 to 19,500 gallons per day, discontinuing the use of two leachfields and adding one additional lift station. Potential contaminants associated with this type of discharge include nitrogen	Melanie Sanchez

				compounds. The facility is located at 1808 West County Road 7950, Chaco Canyon, in Section 21, T21N, R10W, San Juan County. Ground water beneath the site is at a depth of approximately 81 feet and has a total dissolved solids concentration of approximately 1,410 milligrams per liter.	
494	City of Las Vegas-Sludge Disposal Facility John Avila, City Manager City of Las Vegas PO Box 160 Las Vegas, NM 87701	Las Vegas	San Miguel	City of Las Vegas-Sludge Disposal Facility, John Avila, City Manager, proposes to renew the Discharge Permit for the discharge of municipal biosolids (sludge). Up to 15,900 gallons per day of aerobically digested sludge from the City of Las Vegas Wastewater Treatment Facility (WWTF) is disposed to 400 acres of rangeland. Sludge is transported to the City of Las Vegas Sludge Disposal Facility by tanker truck and disposed of by subsurface injection in accordance with 40 CFR Part 503 to 400 acres of rangeland. Potential contaminants associated with this type of discharge include nitrogen compounds, metals and organic compounds. The facility is located approximately 10 miles northeast of Las Vegas, in Section 32, T17N, R17E, San Miguel County. Ground water most likely to be affected is at a depth of approximately 30 feet and has a total dissolved solids concentration of approximately 900 milligrams per liter.	Steven Pedro
399	Bowlin's Flying C Ranch Kit Johnson, Director Travel Center Operations Bowlin Travel Centers, Inc. 150 Louisiana Blvd., NE Albuquerque, NM 87108	Clines Corners	Torrance	Bowlin's Flying C Ranch, Kit Johnson, Director of Travel Center Operations, proposes to renew the Discharge Permit for the discharge of up to 5,000 gallons per day of domestic wastewater to three evaporative lagoons in series for disposal. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located approximately 18 miles east of Clines Corners, in Section 20, T9N, R15E, Torrance County. Ground water beneath the site is at a depth of approximately 810 feet and has a total dissolved solids concentration of approximately 4000 milligrams per liter.	Sara Arthur

Prior to ruling on any proposed Discharge Permit or its modification, the New Mexico Environment Department (NMED) will allow thirty days after the date of publication of this notice to receive written comments and during which a public hearing may be requested by any interested person, including the applicant. Requests for public hearing shall be in writing and shall set forth the reasons why the hearing should be held. A hearing will be held if NMED determines that there is substantial public interest. Comments or requests for hearing should be submitted to the Ground Water Quality Bureau at PO Box 26110, Santa Fe, NM 87502.

To view this and other public notices issued by the Ground Water Quality Bureau on-line, go to:
http://www.nmenv.state.nm.us/gwb/New_Pages/public_notice.htm

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUL 2 1 2008

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

JUL 25 2008

BY:

Subject: Information Requested Concerning Areas Regulated Under the DP-831 Permit

Dear Mr. Bearzi:

The purpose of this letter is to transmit compact disk documents containing the reports discussed with Mr. Clint Marshall on June 12, 2008. Mr. Marshall requested the documents after inspecting the areas regulated under the Discharge Permit 831.

If you have any questions about these documents or require any additional information, please contact me at (575) 234-7462.

Sincerely,

H. L. "Jody" Plum
RCRA Program Manager

Enclosure

cc: w/enclosure

S. Zappe, NMED	*ED
C. Marshall, NMED	ED
T. Kesterson, NMED	ED

cc: w/o enclosure
CBFO M&RC
*ED denotes electronic distribution

CBFO:AMO:HLP:KJB:08-0467:UFC1200

Inspection Report
Ground Water Quality Bureau

Start Date: 06/12/2008 08:30 AM **End Date:** 06/12/2008 12:00 PM

Facility Information
Facility Name: Waste Isolation Pilot Plant, DP-831
Contact: Jody Plum
Type of Operation: Federal Agency
Location: Carlsbad

Inspector(s): Clint Marshall, Kurt Vollbrecht

Inspection Summary
Purpose: Compliance

Activities
Samples Taken: No

Observations and Information Obtained
Surface impoundments and salt piles where inspected prior to the renewal of DP-831.

Storm Water Pond A – Pond is nearly empty. Plants growing in sediment on top of synthetic liner.

Salt Pile Evaporation Pond – Pond is dry, but full of sediment that has eroded from the earthen cover of the salt pile.

Salt Pile – There are numerous rills in the side slopes of the earthen cover. Vegetation is sparse. Wind blown sand has piled up on the east side of the pile. On top is is obvious that storm water runoff is not being properly controlled, causing the rilling and washouts on the side slopes.

Salt Storage Extension Cells A and B – Cell A is completely full. Cell B is partially full. There is a lot of drift sand in Cell B.

Salt Storage Extension Basin – The basin is full of salt water which is obviously evaporating fast enough. This leaves little capacity for additional storm water runoff which will likely occur during summer monsoon rains. There is evidence of wave action erosion of the edge of the salt pile in SSE Cell A.

Storm Water Ponds 1 and 2 – Both ponds appear in good condition with about one foot of water in each.

SPDV Pile – Vegetation is moderately robust with only minimal signs of erosion. The pile has rounded crown and rock armouring is present on the side slopes.

H-19 Pond – Salt crust in bottom. Liner appears to be in good condition.

Facultative (sewage) Lagoons – Settling and polishing ponds have new 60 mil HDPE liners. Evaporation Ponds A, B and C are being evaluated for repair or replacement this year. Only south train is being used at this time.

NMED staff also inspected a water line break on the south side of the facility. The leak occurred due to corrosion in a pipeline leading from the fire water tank to the main building. During the inspection, NMED staff also noticed another, apparently separate area of pooled water at a pipeline junction to the south of the location where the primary pipeline leak occurred. WIPP staff could not clearly account for the second area of pooled water, but assured NMED staff that they would investigate.

Action Required

A new grading plan is needed for the top of the salt pile to divert storm water more efficiently and with less erosion to the side slopes. A plan is needed for maintaining more freeboard in the Salt Storage Extension Basin. The staff gauge needs to be replaced due to salt encrustation.

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

FEB 2 1 2008

FEB 2 6 2008

BY:

Report filed separately

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Subject: Transmittal of Information Requested in a Letter Dated January 18, 2008 (Received January 22, 2008)

Dear Mr. Bearzi:

The purpose of this letter is to transmit to the Hazardous Waste Bureau the documentation requested in the subject letter relative to the discharge of approximately 150 gallons of brine water from the Exhaust Shaft Intercept Borehole Water collection system into the H-19 Evaporation Pond.

The Department of Energy (DOE) and Washington TRU Solutions LLC (WTS) appreciate this opportunity to provide the New Mexico Environment Department the documentation requested and allow your agency to review our in-depth critique of the actions that led to this incident. DOE and WTS promptly reported this issue and implemented corrective measures, including sampling the liquid and sediments from the H-19 Evaporation Pond. These actions were taken to correct brine water disposal operations and to ensure there was no negative impact to human health and the environment.

Compliance with waste management requirements is taken very seriously by DOE and WTS and every effort has and will continue to be expended to ensure the Waste Isolation Pilot Plant Facility remains in compliance in all areas. Extensive corrective measures have been identified and are being tracked through completion.

The attached documentation has been assembled to correspond to the eight sections of requested information, as noted in the request for information letter sent by your office.

If you have further questions or need additional information, please contact Mr. Jody Plum at (575) 234-7462.

Sincerely,

David C. Moody

David C. Moody, Manager
Carlsbad Field Office

M. F. Sharif, General Manager
Washington TRU Solutions LLC

Enclosure

CBFO:AMO:HLP:KJB:08-0424:UFC5486

FEB 2 1 2008

cc: w/enclosure
B. Olson, NMED
C. Marshall, NMED
S. Zappe, NMED
C. Walker, Trinity Engineering

CBFO:AMO:HLP:KJB:08-0424:UFC5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

APR 0 7 2008

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Mining and Environmental Compliance Section
P.O. Box 26110
Santa Fe, NM 87502

RECEIVED
APR 1 0 2008
BY:

Subject: Basic Data Report for Piezometers PZ-13, PZ-14, and PZ-15 and Shallow Subsurface Water

Dear Mr. Marshall:

The purpose of this letter is to transmit to you the Basic Data Report for Piezometers PZ-13, PZ-14, and PZ-15 and Shallow Subsurface Water, in response to the Discharge Permit 831 Modification dated December 29, 2006.

If you have any questions about this report or require any additional information, please contact me at (575) 234-7462

Sincerely,

H. L. "Jody" Plum
RCRA Program Manager

Enclosure

cc: w/o enclosure
J. Bearzi, NMED *ED
J. Kieling, NMED ED
*ED denotes electronic distribution

CBFO:AMO:HLP:KJB:08-0433:UFC5486

Basic Data Report for Piezometers PZ-13, PZ-14, and PZ-15 and Shallow Subsurface Water

U.S. Department of Energy

Revision 1

April 2008

This document supersedes DOE/WIPP-08-3375.

This document has been submitted as required to:

Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831
(865) 576-8401

Additional information about this document may be obtained by calling the WIPP Information Center at 1-800-336-9477. Copies may be obtained by contacting the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22101.

ABSTRACT

The Site and Preliminary Design Validation (SPDV) pile is located in the southwest corner of Section 21, Township 22 South, Range 31 East in Eddy County, New Mexico, adjacent to the Waste Isolation Pilot Plant (WIPP) operational area. During August 2007, piezometers (PZ)-13, PZ-14, and PZ-15 were drilled around the SPDV pile to determine if shallow subsurface water (SSW) existed around the SPDV pile and, if so, provide a means to monitor. These piezometers were drilled with a combination of hollow-stem auger and air-assisted hollow-stem auger drilling. Below the surficial dunes and Berino soil, piezometers PZ-13 and PZ-14 encountered in order, from shallowest to deepest, the Mescalero caliche, Gatuña Formation, Santa Rosa Formation, and Dewey Lake Formation. Piezometer PZ-15 was completed in the Gatuña Formation, having not encountered the lower formations by the time SSW was detected.

Water was encountered in all wells. Piezometers were constructed of 2-inch polyvinyl chloride casing and 15 feet of 0.020-inch slot screen. Water samples were obtained and analyzed for each well. Based on the results of the installation of the piezometers, analysis of water levels, and geological analysis, it is concluded that the water levels identified in PZ-13 and PZ-14 are the result of the SPDV pile runoff or infiltration prior to being lined. Water in PZ-15 is much shallower and chemically different that water in the other two wells, indicating another source, such as recharge and infiltration from the east of the SPDV pile.

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1.0 INTRODUCTION

The Site and Preliminary Design Validation (SPDV) pile is located in the southwest corner of Section 21, Township 22 South, Range 31 East, Eddy County, New Mexico, adjacent to the Waste Isolation Pilot Plant (WIPP) operational area (Figure 1-1). Piezometers PZ-13, PZ-14, and PZ-15 are located around the SPDV pile as indicated in Figure 1-2. These piezometers were drilled to determine if shallow subsurface water (SSW) existed around the SPDV pile and, if so, to provide a means to monitor the water level and quality.

Most drillholes near WIPP have been described after completion to provide an account of the geology, hydrology, or other basic data acquired during drilling and immediate completion of the drillhole. This basic data report provides details and descriptions of the drilling procedures and activities utilized during the installation of PZ-13, PZ-14, and PZ-15 that may be helpful to later interpretations of data or for further work in the drillhole, such as test activities and plugging and abandonment.

1.1 Purpose of WIPP and the SPDV Pile

WIPP is a transuranic mixed waste disposal facility operated by the U.S. Department of Energy (DOE). WIPP waste is disposed in the Salado Formation, a bedded salt deposit, 2,150 feet below ground surface (bgs). Salt and other mined rock materials from the construction of WIPP and currently mined salt are stored on the surface in three stockpiles. The stockpiles include, from oldest to newest, the SPDV pile closed in 2000 with an engineered cover; the salt storage area (SSA), which was used previously for mined salt and materials, but recently covered with a synthetic and earthen liner, and the Salt Storage Extension (SSE) for currently mined salt. The focus of this investigation was the SPDV pile.

The SPDV pile was created during the WIPP design validation phase for placement of construction materials resulting from drilling of two 2,150-foot shafts and the underground excavation of connecting tunnels, exploratory tunnels, and four rooms. The materials in the SPDV pile include mined tailings interspersed with soil, rock, and debris from the construction of the shafts. The SPDV pile encompasses approximately 168,000 cubic yards, which includes an area beneath the pile where soil was excavated prior to tailings placement.

The SPDV pile was characterized in 1995 by Daniel B. Stephens and Associates to determine the chemical nature of wastes within the pile and to support selection of reclamation alternatives (Daniel B. Stephens and Associates, Inc., 1996). The investigation determined that no remedial measures were required according to New Mexico Environment Department (NMED) guidelines. As a result of the study, stabilization and reclamation were recommended in order to prevent off-site transport of salt and brine solutions into the surrounding environment, and to blend the salt pile into the surrounding environment. Based on the evaluation, the SPDV pile was formally closed in 2000 by covering it with geosynthetic clay liner installed on 6 inches of bedded material and covered with a minimum of 3 feet of earthen material. The entire SPDV pile was seeded with shallow rooted plants, which have successfully established.

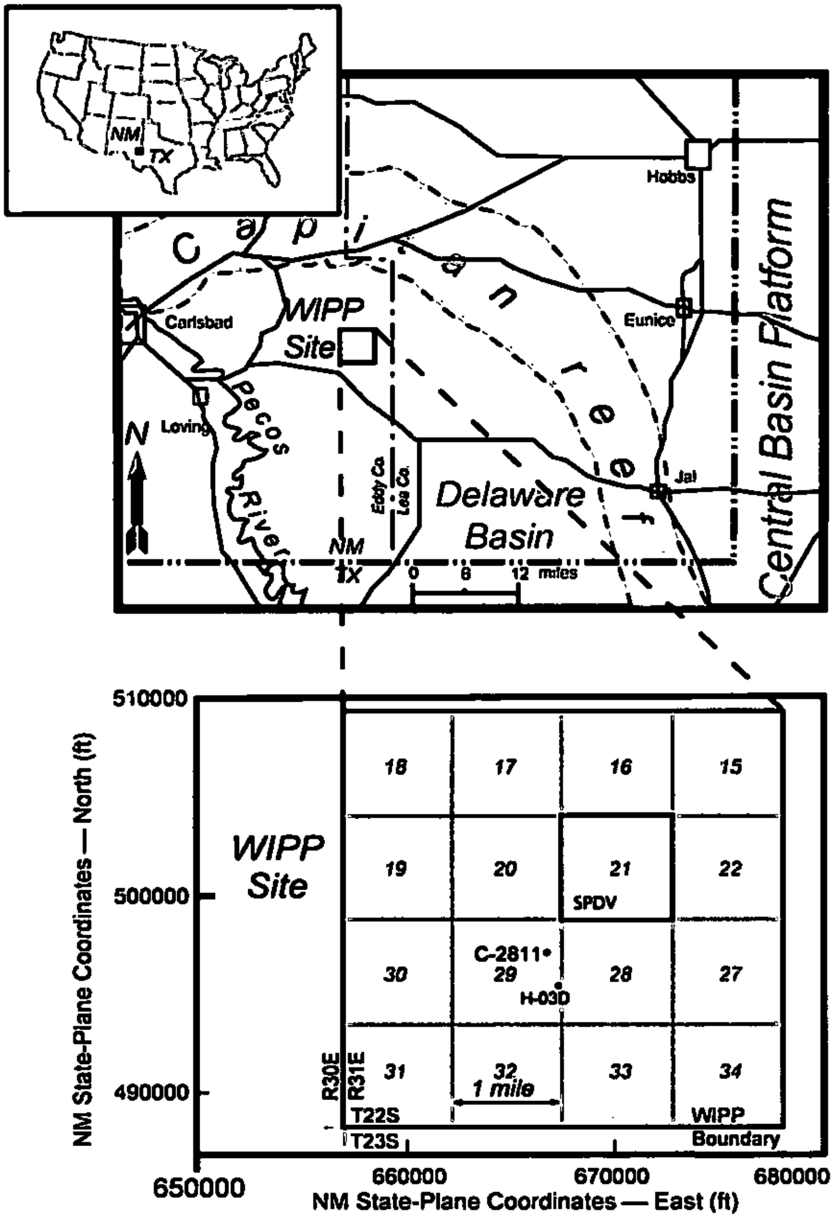

Figure 1-1 - Location Map

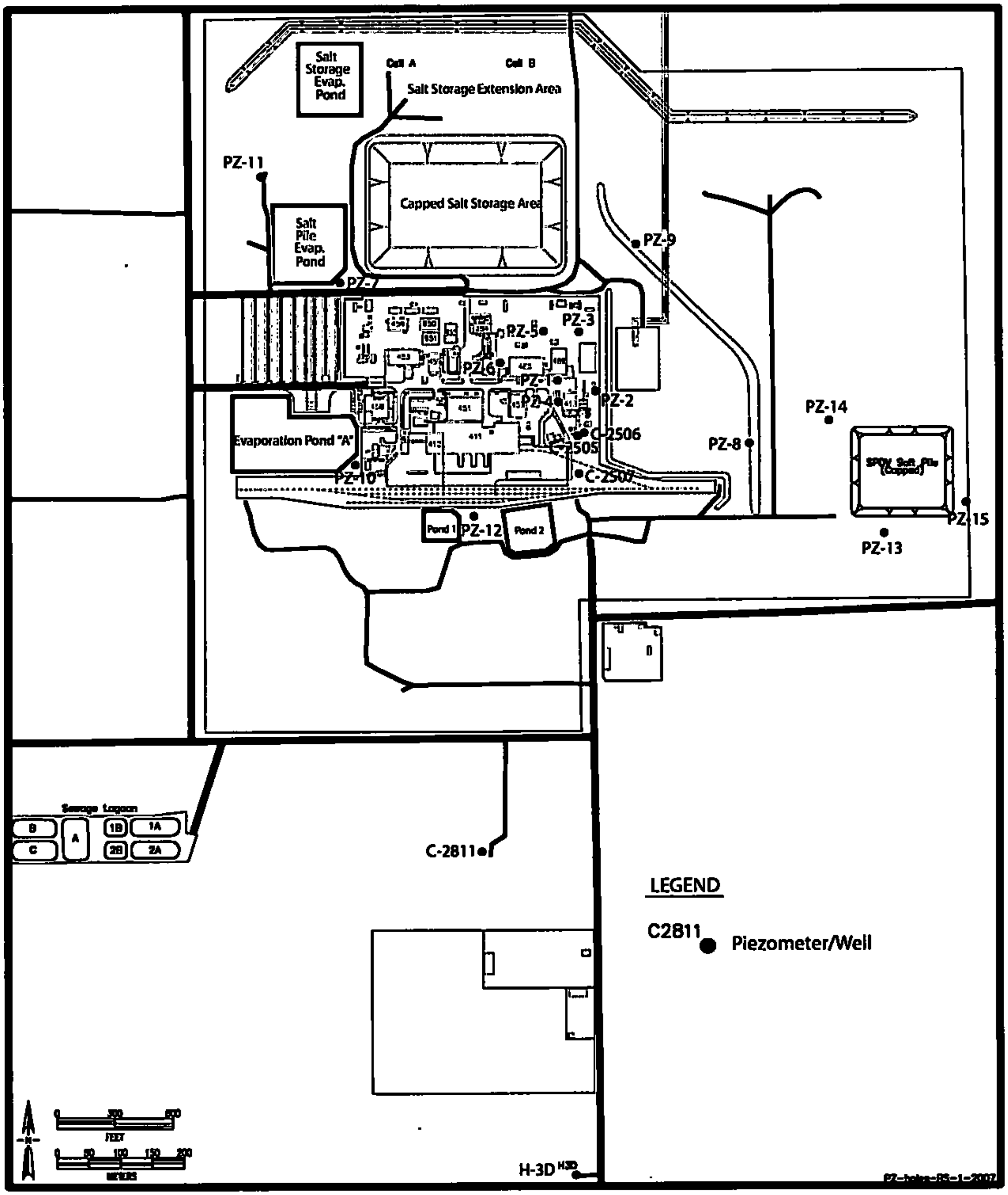

Figure 1-2 - Map of the WIPP Operational Area Showing the Location of Piezometers PZ-13, PZ-14, and PZ-15

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1.2 Purpose of PZ-13, PZ-14, and PZ-15

SSW was first detected in 1995 when a video inspection of the Exhaust Shaft detected seepage from about 50 to 80 feet bgs. After 1995, a series of hydrologic assessments were undertaken to identify the source and nature of the SSW at WIPP. Sixteen wells were installed (Figure 1-2) to assess the SSW. It is important to note that the area of interest to this assessment was the exhaust shaft and surface features such as the old salt pile, salt pile evaporation pond, and Ponds 1 and 2. The assessment excluded the SPDV pile. The SSW is a shallow perched water bearing zone that sits on a permeability change at the formational contact between the Santa Rosa Formation and the upper Dewey Lake Formation. The SSW is anthropogenic in nature, resulting from infiltration of precipitation that was captured by unlined ponds and stockpiles (see discharge permit DP-831 for details).

In December 2003, the NMED Ground Water Quality Bureau (GWQB) issued a modified DP-831 requiring that the unlined ponds and stockpiles be lined with a synthetic liner: SSA and Salt Pile Evaporation Pond (SPEP), Ponds 1 and 2, Pond A. Additionally, a new SSE was to be constructed with a synthetically lined base on which infiltration and surface runoff from this pile would be directed to a new evaporation basin. Also included in this modification was the implementation of a monitoring program of the SSW that included quarterly water level measurements from all the SSW wells and semiannual sampling of selected SSW wells for total dissolved solids (TDS), chloride, sulfate, nitrate, chromium, and selenium. This program was implemented in May 2004 and continues to date.

On December 29, 2006, the NMED GWQB issued another DP-831 modification with a condition that the SPDV pile be investigated as a possible source of shallow groundwater. The modification indicated that WIPP should install three monitoring wells adjacent to the SPDV pile. Piezometers PZ-13, PZ-14, and PZ-15 were drilled during August 2007 around the SPDV pile to investigate the possibility of SSW beneath the subsurface.

Prior to this investigation, the only other drilling in the area was by Daniel B. Stephens and Associates (1996) to characterize the content of the SPDV pile, and Sergent, Hauskins & Beckwith (1979), for geotechnical data collection and analysis. No water was detected in either of these investigations. Prior to drilling the SPDV pile piezometers, it was hypothesized that SSW, if present, would be perched on the contact between the Santa Rosa Formation and the Dewey Lake Formation, as it had at locations west of the SPDV pile. The best estimated depth for piezometers PZ-13, PZ-14, and PZ-15 was 60 feet bgs, based on PZ-8, which is located west of the SPDV pile.

This report summarizes the installation of the piezometers around the SPDV pile and correlates the data to the data for the other SSW piezometers around WIPP via interpretation of hydrology and chemistry.

2.0 GEOLOGICAL DATA

2.1 General Geological Background

The geology and hydrology of formations at the WIPP site and the surrounding area have been investigated since 1975, and the information and interpretations have been reported in numerous documents. The most thorough compilation is the Compliance Certification Application (CCA) submitted in 1996 by the DOE to the U.S. Environmental Agency (U.S. DOE, 1996). Some features of the broader geological history are relevant to understanding the geology and hydrology at the location of the SPDV pile and the piezometers associated with this report (Powers,1997).

The Delaware Basin (Figure 1-1) was a large structural feature that controlled deposition through much of the Paleozoic. By late Permian, the basin was restricted, and evaporite minerals dominated. The basin filled with sediments, and it no longer significantly affected sedimentation. Near the end of the Permian, circulation with the ocean improved, and some of the Rustler Formation was deposited in saline water rather than brine. As the Permian ended and Triassic began, continental environments prevailed and significant redbeds, the Dewey Lake Formation (Figure 2-1), were deposited. Although surrounding areas accumulated variable thicknesses of later Mesozoic and Cenozoic age sediments, the WIPP area appears to have mainly been subjected to erosion during an extended period from mid-Mesozoic to mid-Cenozoic (Figure 2-1). Some basin tilting around mid-Cenozoic exposed the evaporite beds to faster solution and erosion, and weathered material accumulated. The Pecos River drainage became integrated through the region during this period, and late Cenozoic deposits reflect this sedimentary environment and sediment sources outside the local area. Although the region is still subject to evaporite dissolution and erosion, large areas have remained geologically stable for about the last half-million years, resulting in the formation and preservation of pedogenic calcrete (Mescalero caliche) deposits (Powers 1997).

Three sources of information contribute to understanding the geology of PZ-13, PZ-14, and PZ-15: (1) the general near surface geology of this area (Powers 1997), (2) drilling and logging of shallow piezometers in the vicinity, and (3) core samples and cuttings collected during drilling. Formation color was determined using Munsell Soil Color Charts, year 2000 revised edition.

These piezometers were drilled by hollow-stem auger with split spoon sampling and air-assisted hollow-stem auger drilling, depending on the formation and consolidation. Contact depths to each formation were predicted prior to drilling based on those identified in piezometers PZ-8 and PZ-9 (Figure 1-2). Actual contact depths ranged from 11 feet deeper to 11 feet shallower than anticipated for any formation compared to these to piezometers (Table 2-1).

2.2 Geological Data From PZ-13

2.2.1 Permo-Triassic Dewey Lake Formation

The Dewey Lake was encountered in PZ-13 from 75 feet deep to total depth (TD) of the piezometer at 77 feet (Figure 2-2). The Dewey Lake in PZ-13 is dominated by dark reddish brown silty mudstone with mottling of red and gray-olive gray mudstone, with greenish gray reduction spots. The formation was platy, reflecting common thin bedding or laminae of the unit, contained some moisture at the Santa Rosa contact, but dried as the drilling proceeded deeper. This indicated that the upper portion of the Dewey Lake was acting as an aquitard, and drilling was stopped. A well was installed at this location and constructed as depicted in Figure 2-2.

The Dewey Lake at PZ-13 was encountered 11 feet deeper in elevation than it was in PZ-8, indicating possible erosion during deposition of the overlying Santa Rosa Formation during predominantly fluvial environments. The Dewey Lake was 3 feet deeper in elevation in PZ-13 than in PZ-9, another previously installed piezometer in the area. It was about 2 feet deeper in elevation than PZ-14 (Section 2.3).

Table 2-1 - Encountered Contacts of Each New Piezometer Relative to PZ-8, PZ-9, and Each Other

Formation	Well	Encountered Contact Relative to Piezometer Drillholes ("+" indicates deeper)				
		PZ-8	PZ-9	PZ-13	PZ-14	PZ-15
Dewey Lake	PZ-13	+11	+3	NA	+2	Not Encountered
	PZ-14	+9	-0.5		NA	Not Encountered
	PZ-15	Not Encountered	Not Encountered	Not Encountered	Not Encountered	NA
Santa Rosa	PZ-13	0	-2	NA	+2	-7
	PZ-14	+9	+1		NA	
	PZ-15	+7	+5			NA
Gatuña	PZ-13	-3	-2	NA	0	-4
	PZ-14	-3	-2		NA	
	PZ-15	-10	-2			NA

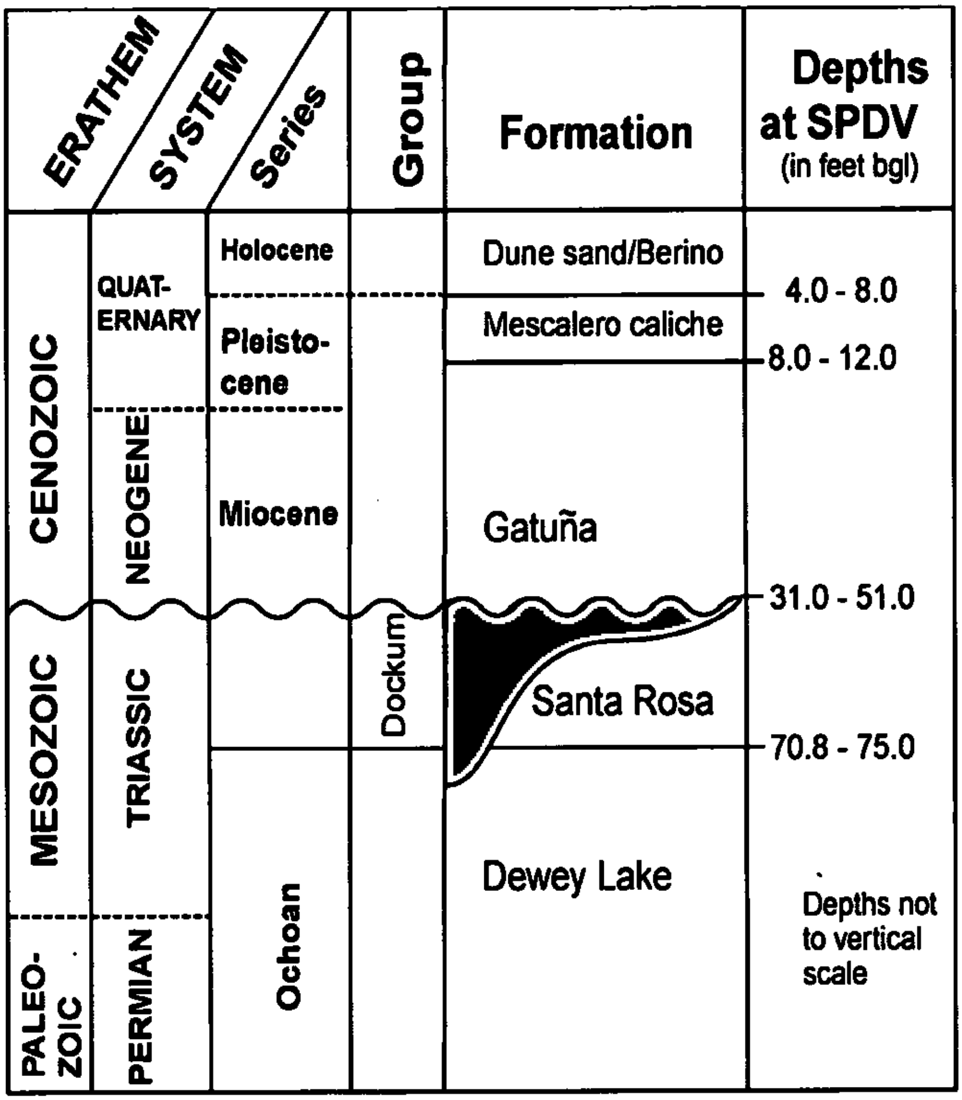


Figure 2-1 - Generalized Stratigraphy Encountered at the SPDV

CORE LOG			Sheet 1 of 2
Hole ID: PZ-13	Location: WIPP Site - SPDV Pile		
Drill Date: 8/13 to 8/21 2007 Drill Crew: Stewart Brothers Drilling Company	Drill Method: Hollow-Stem/Air Rotary Hole Diameter: 9.88 - inch Hole Depth: 77 feet Hole Orient: NA	Drill Make/Model: CME 75 Barrel Specs: 3-inch split spoon Drill Fluid: NA Core Preserv: NA	
Logged by: J. Maly, P.G./R.Salness, P.G.	Date: 8/13 to 8/21 2007	Scale: 1" = 10'	
	Northing	Easting	Elevation
Survey Coordinate: (Ft)			
Comments:			

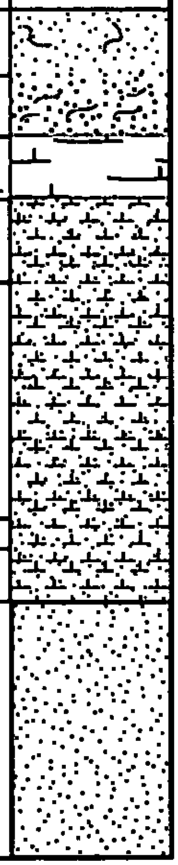
Depth Number	Depth (feet)	% Recovered	Well Construction	Profile (Rock Type)	Description	Lithology
		100	Well Casing	Dune Sand	[5YR 6/4, LT Reddish Brown], sand, fine grained, loose, moist to dry, friable.	
5		80, 100		Berino Soil	[2.5YR 5/8 - 4/8; Red], sandy, 3' - 6' calcareous sand, 6' - 6.5' stiff, indurated, low moisture.	
		80		Mescalero Caliche	[5YR 8/3; Pink], sandy limestone or calcareous sandstone, low moisture, stiff with pebbles and weak laminar structure, at 7.5' to 9', 9'-10' Gatuna inclusions, chert pebbles throughout.	
10, 15		80, 100, 100		Gatuna Sandstone	[5YR 7/4; Pink], Gatuna Sandstone with Mescalero Caliche overprint, dry to slightly moist, loose to very stiff clasts with caliche, altered manganese oxide throughout, more argillaceous and calcareous than above.	
20, 25, 30		100, 100, 100, 100, 100, 100			[2.5YR 5/8; Red], Gatuna Sanstone with argillaceous matrix, chert pebbles throughout, root casts coated in manganese oxide, dry, carlcareous, less argillaceous matrix dominated by sand, increased bedding structure with depth, stiff, platy structures, dry, stiff, moderately indurated.	
		100			[2.5YR 6/6, LT Red], lighter color, more indurated slightly moist.	
		100, 100			[2.5YR 4/8, Red], Carbonate intraclasts incorporated in matrix.	
35, 40, 45, 50		100, 100, <5, 100, 100, 100, 100, 100		Santa Rosa Sandstone	[2.5YR 4/8, Red], [10YR 7/1, LT Gray], interbedded Red and LT Gray sanstone, dessication cracks with carbonate fill, slickensided surfaces (subhorizontal), dry, moderately indurated. Hard at 35' - 39', 39'-39.2' very hard consolidated, well indurated sandstone, dry [2.5YR 4/4; Reddish Brown] 40'-47' Moderately indurated, moist, platy. Changed over to tricone bit on hollow-stem lead auger limiting samples. Steam and condensate apparent when drilling at 55-60' 59.5-59.7 [2.5YR 4/4; Reddish Brown] , moisture content increasing with depth, fine to med sandstone	

Figure 2-2 - Core Log for PZ-13

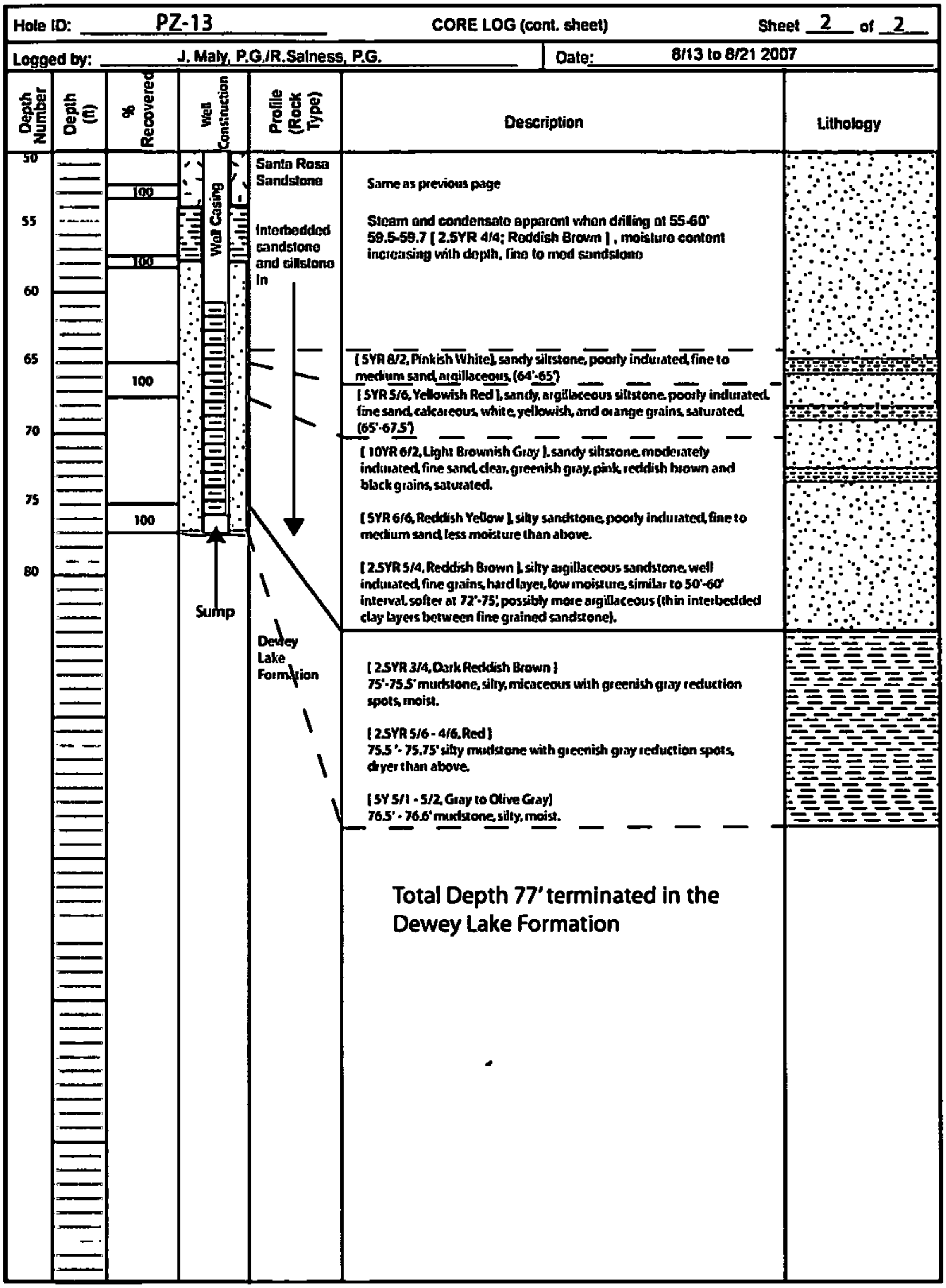


Figure 2-2 - Core Log for PZ-13 (Continued)

2.2.2 Triassic Santa Rosa Formation

The Santa Rosa is 40 feet thick at this location, from 35 feet bgs to 75 feet bgs. The Santa Rosa and Gatuña were differentiated in this drillhole by a mottled red and light gray sandstone with slickensides as opposed to the basal Gatuña Formation lacking these features and being predominantly a red sandstone at the contact. The Santa Rosa in this piezometer consists of interbedded sandstone of variable color, grain size, induration, cementation, and clay content (Figure 2-2). The formation was well indurated and required air assisted drilling from 47 feet to 64 feet, limiting samples to cuttings. It is presumed this may be due to cementation changes from a carbonate base to a silica base.

The interval from 65 feet to 67.5 feet is a sandy argillaceous siltstone that was saturated during drilling. The saturation in the Santa Rosa was identified during drilling to extend down into a harder siltstone of similar characteristic as the overlying lithology (Figure 2-2). The saturation diminished with depth, but showed increasing induration, and clay content. The underlying Dewey Lake was moist.

Comparatively, the Santa Rosa in PZ-13 is 11 feet thicker than in PZ-8 (29 feet) and PZ-9 (29 feet), indicating a thickening trend to the south, south-east of WIPP. This thickening is suggested by Jones (1978) as a consequence of eastward formational dip and eastward rise in surface topography. The Santa Rosa was deposited in dominantly fluvial environments and lies unconformably on the Dewey Lake.

The Santa Rosa was encountered at approximately the same elevation as in PZ-8, but approximately 2 feet shallower in elevation than PZ-9. Compared to PZ-14 and PZ-15, the Santa Rosa in PZ-13 was encountered 2 feet deeper in elevation than PZ-14 and 7 feet shallower in elevation than in PZ-15, indicating possible localized Permo-Triassic erosional features likely due to fluvial activities.

2.2.3 Miocene-Pleistocene Gatuña Formation

The Gatuña Formation is about 25 feet thick at this location. The Gatuña in PZ-13 is pink (Munsell 5YR 7/4) to red (2.5YR 5/8, 6/6, 4/8) sandstone, with generally fine to medium sand grains. The Gatuña contains bluish-black manganese oxide (MnO) stains throughout. The formation at PZ-13 is friable (very loose sand) to moderately well lithified and platy (Figure 2-2). It is very calcareous in the upper part due to overprint (penetration) of pedogenic processes during early stages of the development of overlying Mescalero caliche (Powers, 2003).

The Gatuña generally increases in thickness to the west in the WIPP area, and the depositional edge of the formation is in the same general area where the Santa Rosa pinches out because of erosion that preceded Gatuña deposition (Powers and Holt, 1993). Gatuña thicknesses in nearby piezometers reflect this trend of increasing thickness to the west. The Gatuña thickness in PZ-8, west of PZ-13, is approximately 30 feet. In PZ-9, northwest of PZ-13, the Gatuña is approximately 30 feet.

The Gatuña in PZ-13 was encountered 3 feet shallower in elevation than in PZ-8 and 2 feet shallower in elevation than in PZ-9. Compared to PZ-14 and PZ-15, the Gatuña in PZ-13 was encountered at the same elevation as in PZ-14, but approximately 4 feet shallower in elevation than in PZ-15, following a possible trend of infilling of an erosional feature.

2.2.4 Pleistocene Mescalero Caliche

The Mescalero caliche is 3.5 feet thick at this location; however, the pedogenic processes that developed the Mescalero have penetrated deeper into the Gatuña Formation as defined by the overprint in Section 2.2.3 and in Figure 2-2. The Mescalero in PZ-13 is pink (5YR 7/4) sandy limestone, or calcareous sandstone with pebbles and weak laminar structure. Basal Gatuña inclusions were encountered at this location from 9 to 10 feet (Figure 2-2). Because the Mescalero is a pedogenic process (soil forming), thicknesses will vary from location to location. In the area of PZ-13, compared to other wells, the thickness varies from 2.5 to 4 feet. The Mescalero is an informal soil stratigraphic unit defined by Bachman (1973). It is widespread in southeastern New Mexico, and it is a continuous stratigraphic unit at the WIPP site.

The Mescalero in PZ-13 is approximately 7 feet higher in elevation than in PZ-8 and 5 feet higher in elevation than in PZ-9. Compared to PZ-14 and PZ-15, the Mescalero in PZ-13 was encountered approximately 2 feet higher in elevation than PZ-14 and approximately 5 feet lower in elevation than in PZ-15. This variation is not surprising as the pedogenic process will vary from location to location and generally conforms to underlying topography.

2.2.5 Pleistocene Berino Soil and Surficial Sands

Based on the continuous split spoon sample taken at SNL-13, there is a 4-foot-thick layer of unlithified dune sand and basal argillaceous sand (commonly called the Berino soil, Powers, 2002). The sand is fine grained and calcareous. The Berino soil is not a geologic unit, but defined as a pedogenic unit by local soil scientists (Chugg el al., 1971). The surface sand around WIPP is eolian, with much of it fine to medium grain, moderately well sorted, and poorly indurated. Dunes at the WIPP site are partially stabilized by vegetation (Powers, 2003).

2.3 Geological Data From PZ-14

2.3.1 Permo-Triassic Dewey Lake Formation

The Dewey Lake was encountered in PZ-14 from 70.8 feet to TD at 73 feet (Figure 2-3). In this piezometer interval (70.8 to 73 feet), the Dewey Lake is characterized by a very hard, competent gray and red siltstone, platy, and dry; a red claystone that is unconsolidated with greenish gray reduction spots; and very hard platy red siltstone with greenish gray reduction spots (Figure 2-3). The Dewey Lake in this piezometer was dry at the contact, but damp below. Based on data obtained from the overlying Santa Rosa

Formation (see Section 2.3.2), the TD was based on this depth acting as an aquitard dampening vertical flow of SSW. A well was installed at this location and constructed as depicted in Figure 2-3. The sample obtained from this piezometer did indicate alternating lithologic variations of siltstone and claystone (Figure 2-3).

The Dewey Lake at PZ-14 was encountered 9 feet deeper in elevation than it was in PZ-8, indicating possible erosion during deposition of the overlying Santa Rosa Formation during predominantly fluvial environments. The Dewey Lake was only 0.5 feet shallower in elevation in PZ-14 than in PZ-9, another previously installed piezometer in the area.

2.3.2 Triassic Santa Rosa Formation

The Santa Rosa at this location is 20.8 feet thick, from 50 feet bgs to 70.8 feet bgs, but less than that identified in PZ-13. The Santa Rosa and Gatuña were differentiated in this drill hole, similarly as in PZ-13, by mottled reddish brown and light gray sandstone with slickensides as opposed to the basal Gatuña Formation lacking these features and being predominantly a red sandstone at the contact. Samples for this piezometer were not obtained continuously as the formation was very hard in places and alternative drilling techniques (air assisted) were used. Where samples were not obtained, the geology was assumed to be similar to that identified in PZ-13 where extraordinary effort was made for continuous sampling (Figures 2-2, 2-3).

From the samples obtained for 30 feet bgs to 50 feet bgs the Santa Rosa is identified as interbedded reddish and light gray sandstone to reddish brown very hard siltstone. The sandstone contained carbonate filled dessication cracks, slickensided surfaces, and was poorly to moderately indurated. At 50 feet bgs, the sample indicated a very hard competent siltstone (Figure 2-3). At 50 feet bgs to 70.8 ft bgs, the geology was assumed to be similar to PZ-13 (Figure 2-2).

From 70 to 70.8 feet in PZ-14, the formation was interbedded loose, silty sand and a layer of angular claystone and siltstone fragments. This interval was saturated throughout, but the claystone/siltstone fragments (70.5 to 70.8 feet bgs) appeared to be the primary saturation zone. As discussed in Section 2.3.1, the underlying Dewey Lake was dry, acting as an aquitard.

Comparatively, the Santa Rosa in PZ-14 is thinner than that in PZ-13, PZ-8, and PZ-9. This still correlates with thickening trend to the south-southeast of WIPP as suggested by Jones (1978) as a result of dipping and topography trends. The Santa Rosa in PZ-14 was encountered at approximately nine feet deeper in elevation than PZ-8, and approximately one foot deeper in elevation than PZ-9.

2.3.3 Miocene-Pleistocene Gatuña Formation

The Gatuña is about 23 feet thick at this location. The Gatuña in PZ-14 is pink (5YR 8/4) to red (2.5YR 4/8-5/8) with some light reddish brown (2.5YR 7/4-8/4) interbedded sandstone, with generally fine to medium grains. The Gatuña contains bluish-black MnO stains in the upper and basal portions. Some sections are well lithified and platy. It is very calcareous in the upper portion due to overprinting of the overlying Mescalero caliche. Silica cementation dominates in the basal portion.

Gatuña thickness in this well compared to other nearby piezometers reflects the trend of westward increasing thickness (Powers and Holt, 1993). The Gatuña in PZ-14 is thinner than in PZ-13, PZ-8, and PZ-9. The Gatuña in PZ-14 was encountered 3 feet shallower in elevation than in PZ-8, and 2 feet shallower in elevation than in PZ-9.

2.3.4 Pleistocene Mescalero Caliche

The Mescalero caliche is 4 feet at this location, although, as described in previous sections, the processes that developed the Mescalero have penetrated deeper into the underlying Gatuña Formation. The Mescalero in PZ-14 is pinkish-white to pink (5YR 8/2-8/3) sandy limestone, with low moisture content containing calcareous pebbles with weak laminar structure. At PZ-14 the Mescalero has a very hard surface cap. The Mescalero in PZ-14 is approximately 4 feet higher in elevation as it is in PZ-8 and 3 feet higher in elevation than it is in PZ-9.

2.3.5 Pleistocene Berino Soil and Surficial Sands

Continuous samples were not taken at PZ-14 until the top of the Mescalero caliche was encountered. Until the depth of 5 feet, center bit drilling with a wireline was used. The Berino soil and surficial sands were described based on auger cuttings, and the contact was estimated based on PZ-13 and PZ-15 sampling (Figure 2-3). The surficial dune sand at this location was the same as other, unlithified, calcareous light reddish brown (5YR 6/4) sand. The Berino soil was characterized as a red (2.5YR 5/8-4/8) loose, fine grained sand.

CORE LOG Sheet 1 of 2

Hole ID: PZ-14	Location: WIPP Site - SPDV Pile		
Drill Date: 8/24 to 8/25 2007	Drill Method: Hollow-Stem/Air Rotary	Drill Make/Model: CME 75	
Drill Crew: Stewart Brothers Drilling Company	Hole Diameter: 9.88 - Inch	Barrel Specs: 3-inch split spoon	
	Hole Depth: 77 feet	Drill Fluid: NA	
	Hole Orient: NA	Core Preserv: NA	
Logged by: J. Maly, P.G./R.Salness, P.G.	Date: 8/24 to 8/25 2007	Scale: 1" = 10'	

	Northing	Easting	Elevation
Survey Coordinate: (Ft)			

Comments:

Depth Number	Depth (feet)	% Recovered	Well Construction	Profile (Rock Type)	Description	Lithology
		30	Well Casing	Dune Sand	[5YR 6/4, LT Roddish Brown], sand, fino grained, looso.	
					— ? — — ? — — ? — — ? — — ? —	
				Berino Soil	[2.5YR 5/8 - 4/8; Red], sandy, calcareous sand.	
5		100		Moscalero Caliche	(5YR 8/2-8/3; Pinkish White to Pink) sandy limestone or calcareous sandstone, low moisture, stiff with pebbles, weak laminar structure, hard suface cap	
10		100		Gatuna Sandstone	(5YR 8/4 Pink) Gatuna Sandstone with Mescalero Caliche overprint, dry, gatuna inclusions and chert pebbles throughout, more argillaceous and clacareous than above.	
		100			[2.5YR 4/8-5/8, Red]: Gatuna sandstone with argillaceous calcareous matrix, chert pebbles throughout, root casts coated with manganese oxide.	
15		100			[2.5YR 7/4-8/4; Light Reddish Brown to pink interbedded], platy, moist, Gatuna sandstone sediments, calcareous cementation.	
		100				
20		100			[2.5YR 4/8-5/8, Red], Gatuna sandstone, platy, dry and moist alternating between layers, becomes harder with depth to 25'	
		100				
25		100				
		100			[2.5YR 4/8; Red], Platy Gatuna sandstone, poorly indurated, moist, fine grained, argillaceous, silica cementation, root casts with manganese oxide, chert pebbles, very hard at 30'	
		100				
30		100				
		100		Santa Rosa Sandstone	[2.5YR 7/4-8/4, Pink to Light Roddish Brown], [Gloy 1 8/1; Light Groonish Gray], interbodded Roddish and LT Gray sanstono, desication cracks with carbonato fill, slickensided surfacos (subhorizontal), dry, poorly to modoratoly indurated. Hard at 35.5'-drilled with center bit only to 40 feet; no recovery at 40 foot; drilled with center bit only to 50 foot. [5YR 5/4-4/6; Roddish Brown], Very hard, silt sandstone, argillacoous. (50'-50.5'), pulvorized by samplo barrel Used center bit drilling only instead of wireline to 56 feet. Hit hard, competent Santa Rosa at 56 feet then switched to air rotary until softer Dewey Lake FM. encountered at depth. Center bit at 56 foot is dry. Assume similar geology to that seen in PZ-13	
35						
40		0%				
45						
50						

Figure 2-3 - Core Log for PZ-14

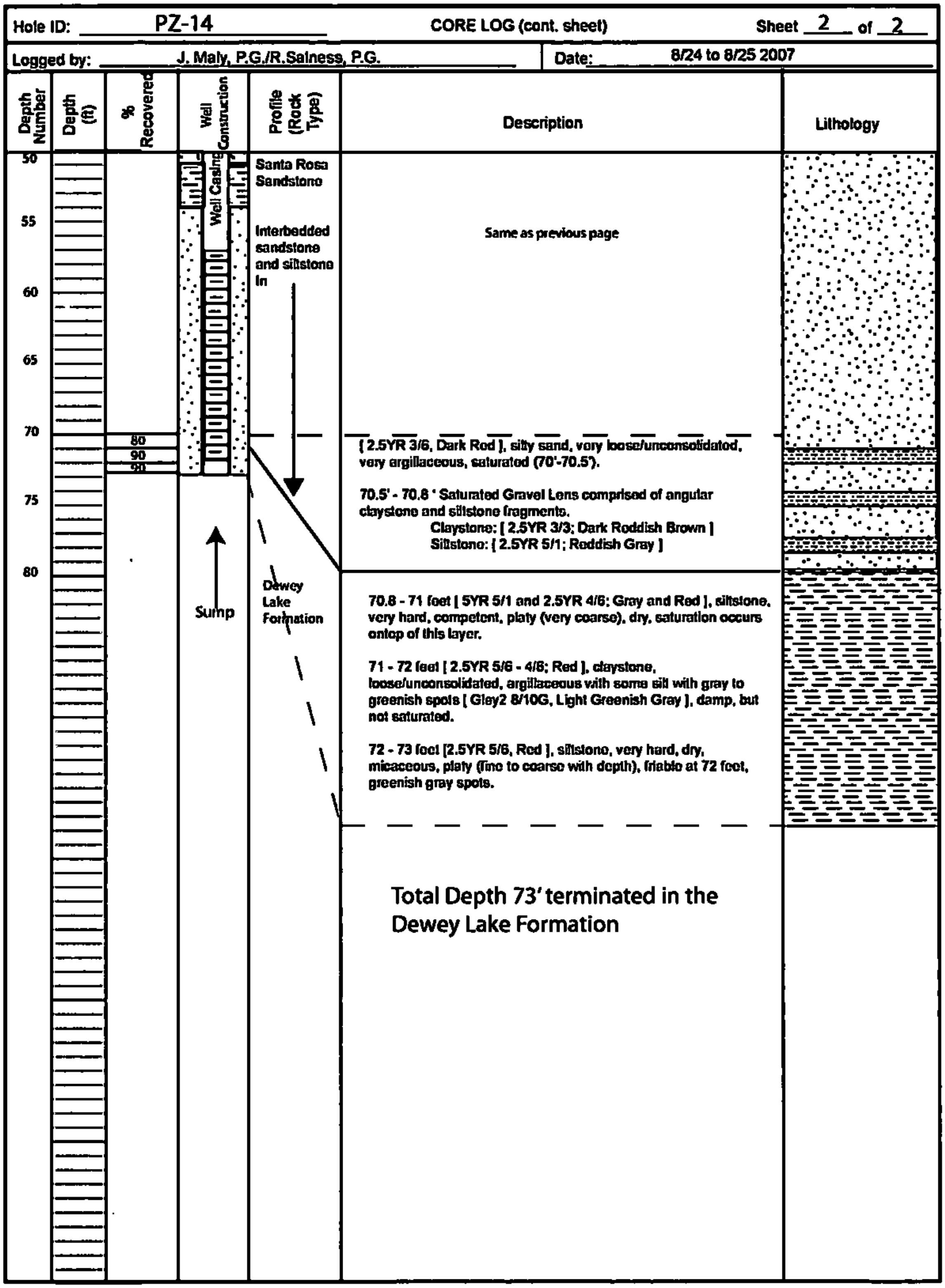


Figure 2-3 - Core Log for PZ-14 (Continued)

2.4 Geological Data from PZ-15

2.4.1 Triassic Santa Rosa Formation

PZ-15 was terminated in the Santa Rosa Formation where saturation was identified. As such, the Dewey Lake Formation was not encountered in this well.

The top of the Santa Rosa in the well was identified at 51 feet bgs. The entire thickness of this formation is unknown as it was not completely drilled through; however, it is assumed to be thinner than in PZ-13 and PZ-14 due to the thickening westward trend of this formation. The top of the Santa Rosa Formation was saturated.

Drilling was terminated at this point as it was apparent that just deeper, the Santa Rosa Formation dried and became very hard, acting as an aquitard. A piezometer was installed at this depth and constructed as depicted in Figure 2-4.

The 5 feet of Santa Rosa Formation penetrated in this well are characterized as two lithologic variations. The upper portion from 51 to 51.5 feet is described as red (2.5YR 4/8) to light gray (10YR 7/1) interbedded sandstone with dessication cracks that are carbonate filled (Figure 2-4) that becomes softer and sandier with depth. This upper portion was saturated at the top and became dry with depth at the lower very hard portion. The lower section sampled (51.5 to 56 feet) is described as a very hard consolidated dry reddish brown (2.5YR 4/4) sandstone.

The Santa Rosa in PZ-15 was encountered at approximately 7 feet deeper in elevation than PZ-8, and approximately 5 feet deeper in elevation than PZ-9.

2.4.2 Miocene-Pleistocene Gatuña Formation

The Gatuña Formation is about 39 feet thick at this location, indicating that it gets thicker to the east around the SPDV pile, which is non-typical of the area around the WIPP site. The Gatuña generally thickens to the west in the area of the WIPP site due to erosion of the Santa Rosa Formation, leading to thicker deposition of Gatuña (Powers and Holt, 1993).

The upper 4 feet of Gatuña at this location is pink (5YR 7/4) sandstone with overprint of pedogenic carbonate soil processes that developed the overlying Mescalero caliche. The upper 4 feet are dry to slightly moist, loose to very stiff, with clasts of caliche and altered MnO throughout (Figure 2-4). The lower portion of the Gatuña is predominantly red sandstone with chert pebbles throughout, MnO stained root casts, dominated by sand (less argillaceous) and increased bedding structure with depth (platy).

The Gatuña in PZ-15 was encountered 10 feet shallower in elevation than in PZ-8 and 2 feet shallower in elevation than in PZ-9.

CORE LOG

Sheet 1 of 1

Hole ID: PZ-15

Location: WIPP Site - SPDV Pile

Drill Date: 8/21 to 8/22 2007

Drill Crew: Stewart Brothers Drilling Company

Drill Method: Hollow-Stem/Air Rotary

Hole Diameter: 9.88 - Inch

Hole Depth: 77 feet

Hole Orient: NA

Drill Make/Model: CME 75

Barrel Specs: 3-Inch split spoon

Drill Fluid: NA

Core Preserv: NA

Logged by: J. Maly, P.G./R.Salness, P.G.

Date: 8/21 to 8/22 2007

Scale: 1" = 10 '

	Northing	Easting	Elevation
Survey Coordinate: (Ft)			

Comments:

Column headings: Depth Number | Depth (feet) | % Recovered | Well Construction | Profile (Rock Type) | Description | Lithology

Depth Number: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55

% Recovered (top to bottom): 100, 100, 80, 80, 100, 100, 100, 100, 100, 100, 50, 80, 80, 90, 100, 100, 100, 100, 100, 100, 90, 100, 100

Well Construction: Well Casing

Profile (Rock Type)	Description
Dune Sand	[5YR 6/4, LT Reddish Brown], sand, fine grained, loose, moist to dry, friable.
Berino Soil	[2.5YR 5/4; Reddish Brown], sandy, 7.8'-8' calcareous sand, indurated, low moisture, small roots, damp. [5YR 8/3 Pink] at 7.5'
Mescalero Caliche	[7.5YR 8/2-8/4; Pink], sandy limestone or calcareous sandstone, low moisture, stiff with chert pebbles and weak laminar structure (friable), moist in friable portions; pedogenic Gatuna interbedded identified by manganese oxide alterations.
Gatuna Sandstone	[5YR 7/4; Pink], Gatuna Sandstone with Mescalero Caliche overprint, dry to slightly moist, loose to very stiff clasts with caliche, altered manganese oxide throughout, less argillaceous/loose matrix, caliche clasts throughout.
	[2.5YR 4/6; Red at 16'] [2.5YR 5/8 at 16.6'], Gatuna Sandstone, chert pebbles throughout, root casts coated in manganes oxide, dry, carlcareous, less argillaceous matrix dominated by sand, increased bedding structure with depth, stiff, platy structures, dry, stiff, moderately indurated. 17.5-20' damp, loose, cabonaceous, more argillaceous 20-22.5' no bedding structure, inc. manganese oxide, damp 22.5' -27.5 platy bedding structure, bcame hard at 24' 26.1'-45' [2.5YR 4/6-4/8; Red], siliceous, friable, more argellacaous matrix interbedded with loose matrix. 45'-50.5' Saturated Gatuna Formation sitting on hard Santa Rosa Formation.
	[2.5YR 4/8, Red]. [10YR 7/1, LT Gray), interbedded Red and LT Gray sandstone, dessication cracks with carbonate fill, slickensided surfaces (subhorizontal), dry, moderately indurated, Wet/saturated at top and dries with depth/perched. 51.3-51.5 soft sandier zone 51.5 Very hard Santa Rosa Sandstone, very hard consolidated, well indurated sandstone, dry [2.5YR 4/4; Reddish Brown].
Santa Rosa Sandstone	Total Depth 55 feet terminated in the Santa Rosa Sandstone

Figure 2-4 - Core Log for PZ-15

2.4.3 Pleistocene Mescalero Caliche

The Mescalero caliche at this location is 4.5 feet thick at this location, although the processes that developed the Mescalero have penetrated deeper into the Gatuña as described in previous sections. The Mescalero in PZ-15 is pink (7.5YR 8/2-8/4) sandy limestone of low moisture content. It has weak laminar structure (friable) with chert pebbles throughout. Some pedogenic Gatuña is interbedded as defined by MnO alterations.

The Mescalero in PZ-14 is approximately 11 feet higher in elevation than it is in PZ-8 and 10 feet higher in elevation than it is in PZ-9.

2.4.4 Pleistocene Berino Soil and Surficial Sands

Based on continuous split spoon samples taken at PZ-15, there is 8 feet of unlithified dune sand and basal argillaceous sand (commonly called Berino soil, Powers, 2002). The sand is fine grained and calcareous. The Berino soil is fined grained, calcareous, and damp with small roots.

2.5 Geologic Significance, Discussion, and Correlation with Other Piezometers

The early SSW piezometers were drilled with air rotary and logged by examination of cuttings from the drill stem. The use of hollow stem augers in PZ-13, PZ-14, and PZ-15 allowed for close examination of the lithology and exactly where saturation occurred. Based on the information from the SPDV pile piezometers, it is clear that no one single lithologic zone can be isolated as being the predominant location for the SSW to reside or flow as the geology is vertically and spatially heterogeneous.

Figure 2-5 presents two cross-section across the site trending west to east (A-A') and northwest to southeast (B-B'). Cross-section A-A' presents a fairly consistent Gatuña thickness that undulates along the top of the Santa Rosa surface, dipping to the west. The Gatuña begins then to noticeably thicken at the point of PZ-15. The Santa Rosa Formation, on the other hand, is variable in thickness, thinning at the location of PZ-12 and thickening east and west of PZ-12, along the deepening Dewey Lake contact. The top of the Dewey Lake appears to have two structural divides; one at PZ-12 and the other at PZ-8, possibly erosional features. The surface dips sharply to the west and east from PZ-12. At Piezometer C-2507 the slope gradually increases approaching PZ-8, where the Dewey Lake surface dips off towards PZ-13, and presumably at the point of PZ-15; however, this well was completed in the Gatuña Formation. The structural divide at PZ-12 is higher in elevation than that in PZ-8, lending to a steeper slope to the east.

Cross-section B-B' also presents a fairly consistent Gatuña thickness that mimics the Santa Rosa depositional surface along this trend. The Gatuña gradually dips to the west and east of the PZ-8/PZ-14 area. The Santa Rosa Formation from roughly north to south is relatively consistent in thickness (± 5 feet), with the thicker portion to the south. Structurally, the Santa Rosa dips to the west and east from the PZ-8/PZ-14 area, similar to the Gatuña, and the thickening trends with the deepening Dewey Lake. The top of the Dewey Lake appears to have a structural divide around PZ-8 where the surface dips gently to the west and sharply to the east, possibly an erosional feature.

Figure 2-6 is a wireframe map showing the upper surface of the Dewey Lake Formation for all SSW piezometers that encountered the Dewey Lake contact. Superimposed on this map are the contours of this surface. This figure shows that the surface of the Dewey Lake in the area of interest is comprised of high areas, valleys, and bowls. Sitting on top of this surface is the Santa Rosa Formation. The Dewey Lake has a lower permeability than overlying formations such that vertical flow is impeded, creating a perched water zone at or near the contact.

These characteristics of the Dewey Lake surface (highs, valleys, ridges, bowls) play an important role in defining geological control of SSW accumulation and movement.

Figure 2-7 depicts the same contours of the Dewey Lake surface superimposed onto a shaded relief map of the Dewey Lake surface. This figure highlights the surficial features identified in previous figures and discussed in the above paragraphs. Low areas (depressions) on the Dewey Lake surface are associated with PZ-7, PZ-4, PZ-14, and C-2507. High points are associated with PZ-12, PZ-8, and C-2505/2506. Between these points are ridges, valleys, and plateaus.

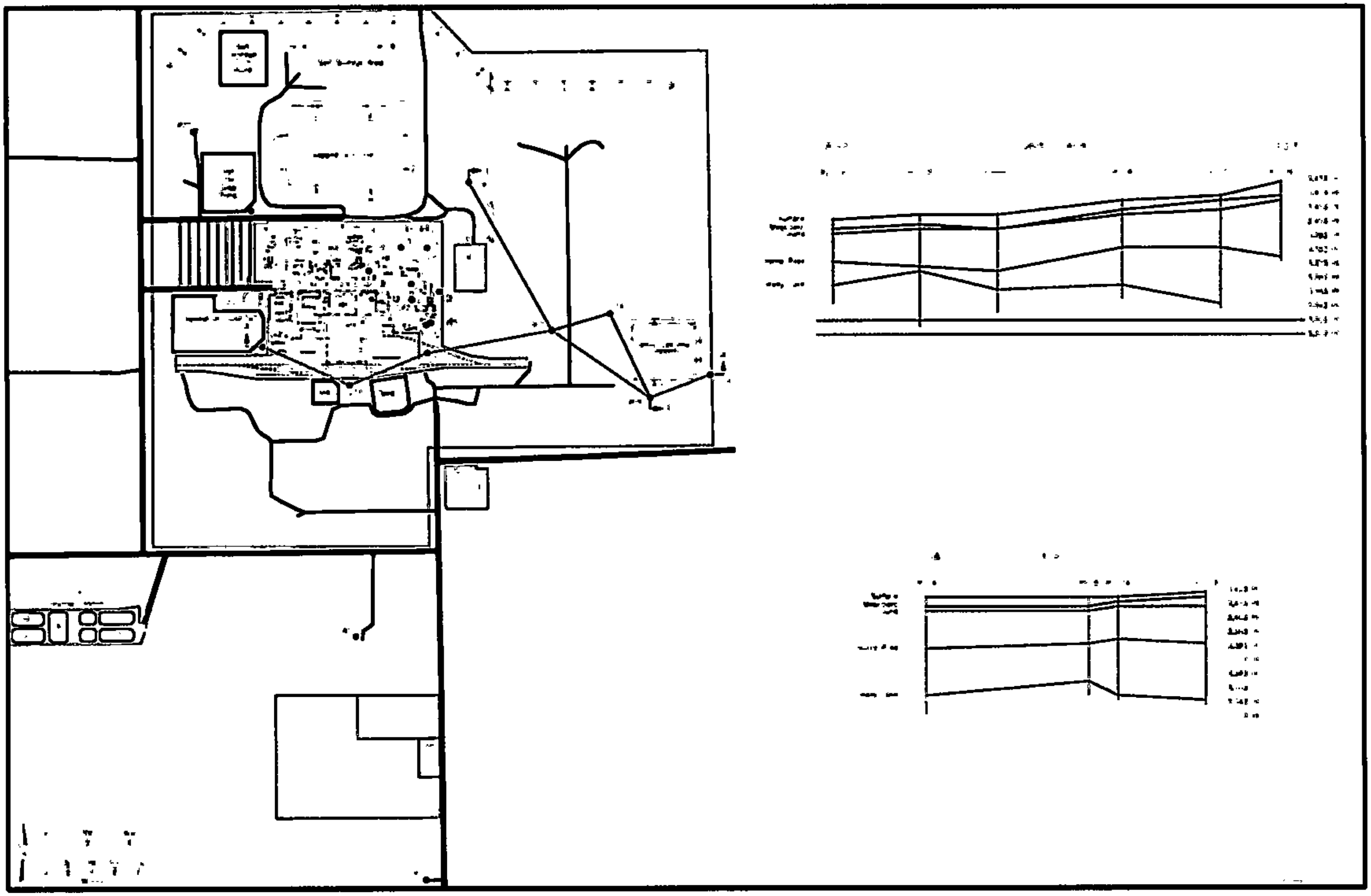


Figure 2-5 - Site Cross-Sections

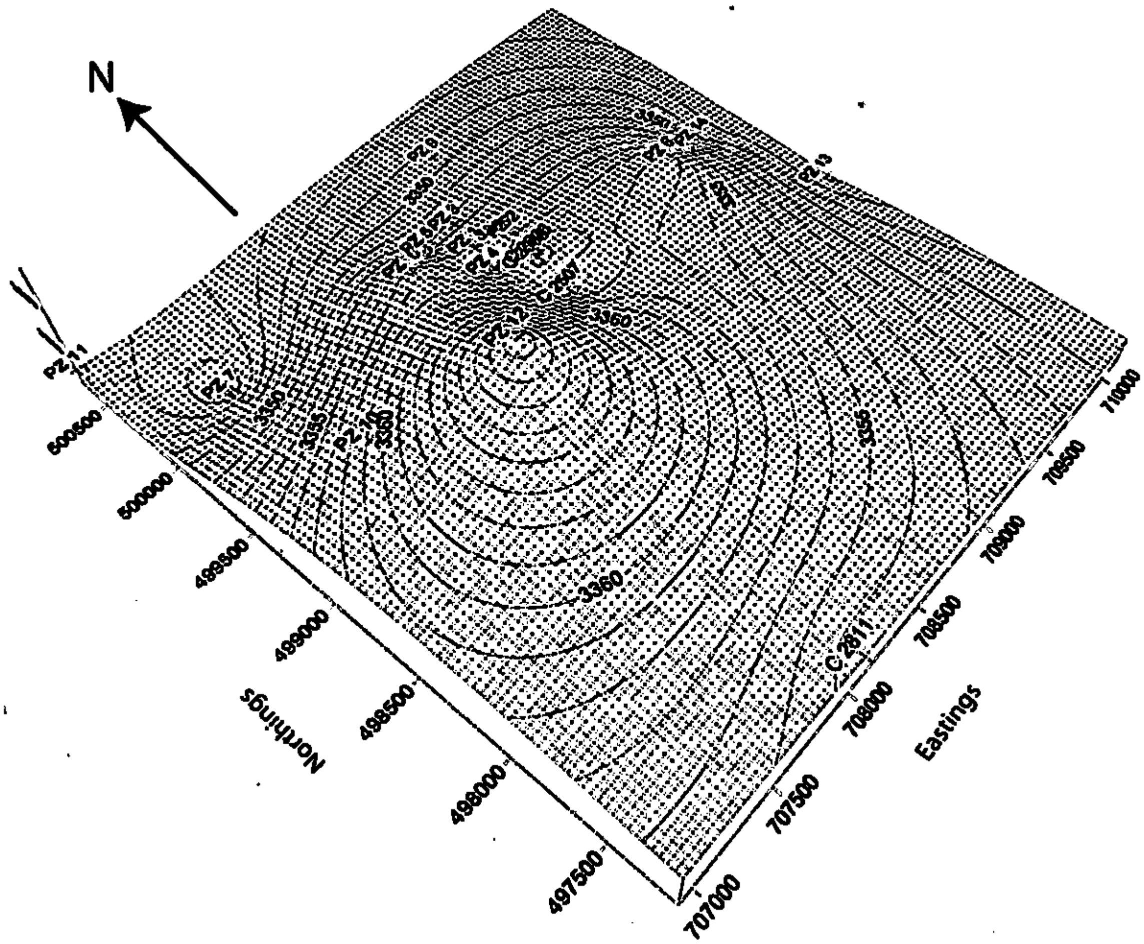


Figure 2-6 - Wireframe Structure Map of Dewey Lake Surface

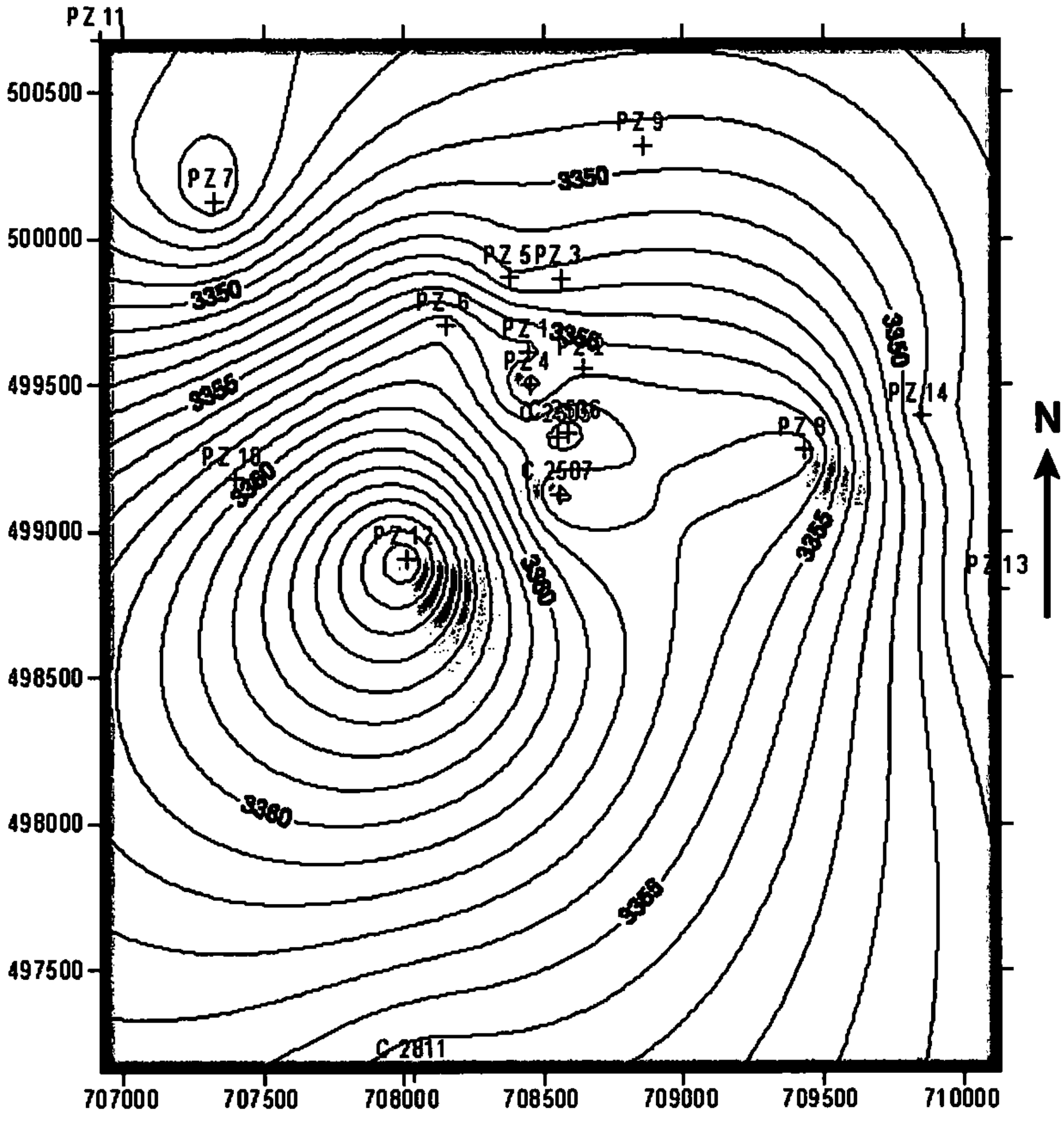


Figure 2-7 - Shaded Relief Structure Map of Dewey Lake Surface

Based of the geologic data obtained from the piezometers around the SPDV pile, there can be some conclusions made at this point:

- The SSW appears to be isolated in different and variable zones around the SPDV pile based on examination of split spoon samples obtained during drilling.
- Structural features of the Santa Rosa/Dewey Lake contact play an important role in accumulation and movement of SSW.
- The stratigraphy overlying the Santa Rosa/Dewey Lake contact is heterogeneous and tortuous.

3.0 HYDROLOGICAL DATA

3.1 Description of Shallow Subsurface Water in the Santa Rosa and Upper Dewey Lake Formations

Shallow Subsurface Water (SSW) was first detected in 1995 when a video inspection of the Exhaust Shaft detected seepage through the shaft liner from approximately 50 to 80 feet bgs. After 1995, a series of hydrologic assessments was undertaken to identify the source and nature of the SSW at WIPP. Sixteen wells were installed around the site to assess the SSW. The SSW was detected in all but one well, PZ-8, which was dry until March 2007. The SSW is a shallow-perched, water-bearing zone that sits on a permeability change at the formational contact between the Santa Rosa Formation and the upper Dewey Lake Formation. The SSW is believed to be entirely anthropogenic in nature, resulting in part from historical natural discharges from locations at WIPP.

In December 2003, the NMED GWQB issued a modified DP-831 indicating that the unlined ponds and stockpiles be lined with a synthetic liner: SSA and SPEP, Ponds 1 and 2, Pond A. Additionally, a new SSE was to be constructed with a synthetically lined base on which infiltration and surface runoff from this pile would be directed to a new evaporation basin. Also included in this modification was a monitoring program that included quarterly water level measurements from all the SSW wells and semiannual sampling of selected SSW wells for TDS, chloride, sulfate, nitrate, chromium, and selenium. This program was implemented in May 2004 and continues to date.

On December 29, 2006, the NMED GWQB issued another DP-831 modification with a condition that the SPDV pile be investigated as a possible source of shallow groundwater. The modification indicated that WIPP should install three monitoring wells adjacent to the SPDV pile. This report has documented the installation of these wells and the data obtained.

Isolated saturated sections were detected in all three piezometer boreholes installed around the SPDV pile, although at differing elevations and lithology. The following sections describe the water levels and chemistry in these wells and a discussion of each as it correlates to the SSW on the WIPP site and the other 16 piezometers.

3.2 Water Levels in Piezometers PZ-13, PZ-14, and PZ-15 and Comparison to WIPP Site Piezometers

In October 2007 a new survey of the piezometer top of casing and ground surface elevation was performed by a New Mexico licensed surveyor to NAD83/NAVD88 datum after the SPDV pile wells were installed. The prior survey performed in the late 1990s was surveyed to a NAD27/NAVD29 datum. All data reported herein are referenced to the 2007 survey. Water level elevations reported prior to this report were to the NAD27/NAVD29 survey.

Water was detected in all three piezometers around the SPDV pile at differing horizons and, in one case, a differing formation. Water saturation in PZ-13 was detected while drilling in the lower Santa Rosa at a depth of 65 feet bgs, an elevation of 3,356 feet above mean sea level (AMSL). Saturation in PZ-13 was confined to a 2.5-foot vertical section of the Santa Rosa characterized by interbedded sandy argillaceous siltstone and sandy siltstone. The water in this boring appeared to be perched upon much harder, consolidated Santa Rosa at the contact with the Dewey Lake Formation. The permeability change of the harder sandstone and underlying Dewey Lake mudstone act as an aquitard perching the water at this elevation. Lithologic intervals above the saturated interval were moist, but not saturated.

Water saturation in PZ-14 was detected while drilling in the lower Santa Rosa at a depth of 70 feet bgs, an elevation of 3,350 feet AMSL. Saturation in this borehole was confined to a thin lense (0.80 foot) of the Santa Rosa, characterized as loose argillaceous sand and a section of interbedded angular claystone and sandstone fragments/pebbles. The saturated lens was sitting upon the contact with the Dewey Lake Formation (mudstone). This permeability contrast allowed the perching of water at this depth as the Dewey Lake acted as an aquitard. Samples were not obtained above this interval as air assisted drilling was employed; however, steam or other indicators of moisture were not apparent.

Water saturation in PZ-15 was detected while drilling in the lower Gatuña Formation at a depth of 45 to 55.5 feet bgs, an elevation of 3,385 feet AMSL. Saturation was in the lower Gatuña, where it became more friable, sitting on the Santa Rosa contact. The upper Santa Rosa Formation in this borehole is very hard at 51.5 feet bgs (3,379 feet AMSL) acting as an aquitard and perching the water at this interval.

Geologically, the underlying formations are very heterogeneous between piezometers (spatially) as well as between formations and within formations (vertically). Heterogeneity in the horizontal and vertical directions is significant as characterized by careful and mostly continuous sampling while drilling. This heterogeneity leads to preferential and tortuous flow paths. The detected saturation, as discussed above, occurred in different horizons of variable thickness and lithologic structure, lending to preferential flow and tortuosity.

The heterogeneity and tortuous flow affects the ability for saturated lenses to develop or connect with one another. An attempt was made to sample piezometers PZ-8, PZ-13, PZ-14, and PZ-15 on October 10, 2007, by low-flow sampling methods using a small diameter submersible pump. Typical sustained flow rates during sampling for the SSW piezometers at WIPP range from 400 milliliters per minute (mpm) to 1,500 mpm while keeping water levels stable and drawdown to a minimum. This could only be achieved for PZ-13, which pumped at an average rate of 1,050 mpm, but was pumped dry as the sample was obtained. Piezometers PZ-8, PZ-14, and PZ-15 could not sustain enough flow to measure before pumping dry. These wells were later sampled using a Teflon™ hand bailer (see Section 2.3). This indicates not only low permeability in the formation but, due to the small saturated lenses, a low volume of SSW in storage around the SPDV pile.

Figure 3-1 is a potentiometric surface map of the SSW at the WIPP site inclusive of the wells at the SPDV pile based on the water levels presented in Table 3-1, and is superimposed on a shaded relief structure map of the Dewey Lake surface. Well H-3d (Figure 1-2) was converted to a shallow monitoring well during the *WIPP Fiscal Year 2005 Plugging, Abandonment, and Well Reconfiguration Program* (DOE/WIPP 05-3326) and is not included in this map. Water levels in Well H-3d are monitored quarterly and to date there has been no SSW impact at this location. Therefore, the southern extent of SSW at the WIPP likely lies between PZ-12 and H-3d. Figure 3-1 does not include PZ-15, as it was completed in the Gatuña Formation.

Based on Figure 3-1, it appears that the surface of the Dewey Lake has an influence on the potentiometric surface and flow system of the SSW. High points in the contact, such as at PC-7, appear to create a radial flow, when water from the SPEP was contributing to infiltration. A ridge aligned with PX-5 and south to C-2507 tends to direct water east and west. Low points in the surface structure are variable depending upon how much water has perched in these areas. The primary flow direction is south.

The water around the SPDV pile is defined by PZ-13, PZ-14, and PZ-15. Water levels for these wells were obtained approximately four months after they were installed. As discussed in previous sections, PZ-15 was completed in a different geologic horizon than PZ-13 and PZ-14, and is reflected in the differing water level elevations (Table 3-1). Hydrographs compiled for the WIPP site piezometers indicate an interconnection by having similar time series responses in water elevation fluctuation. Not enough data have been accumulated to determine connectivity between SPDV pile piezometers or between site piezometers and SPDV pile piezometers. However, based on the small lenses with water identified during drilling, lack of storage identified during sampling and low permeability, vertical and spatial heterogeneity, and tortuous media, the tentative conclusion at this point is that the water identified in PZ-13, PZ-14, and PZ-15 are all isolated from each other. Some of this can be seen with chemical differences (Section 3.3).

Table 3-1 - Measured Water Elevations
December 5, 2007

Well I.D.	Top of Casing Elevation	Water Level	Water Level Elevation
PZ-1	3,414.92	39.98	3,374.94
PZ-2	3,414.99	40.09	3,374.90
PZ-3	3,417.76	41.62	3,376.14
PZ-4	3,413.65	43.24	3,370.41
PZ-5	3,416.88	39.95	3,376.92
PZ-6	3,414.96	40.98	3,373.98
PZ-7	3,415.47	35.3	3,380.17
PZ-8	3,419.83	63.49	3,356.34
PZ-9	3,422.73	56.2	3,366.53
PZ-10	3,407.37	33.51	3,373.86
PZ-11	3,420.41	43.28	3,377.13
PZ-12	3,410.55	48.82	3,361.73
PZ-13	3,423.88	63.95	3,359.93
PZ-14	3,422.22	66.6	3,355.62
PZ-15	3,432.50	45.28	3,387.22
C-2505	3,414.57	42.91	3,371.66
C-2506	3,414.48	42.33	3,372.15
C-2507	3,411.54	42.8	3,368.74
C-2811	3,400.47	51.34	3,349.13

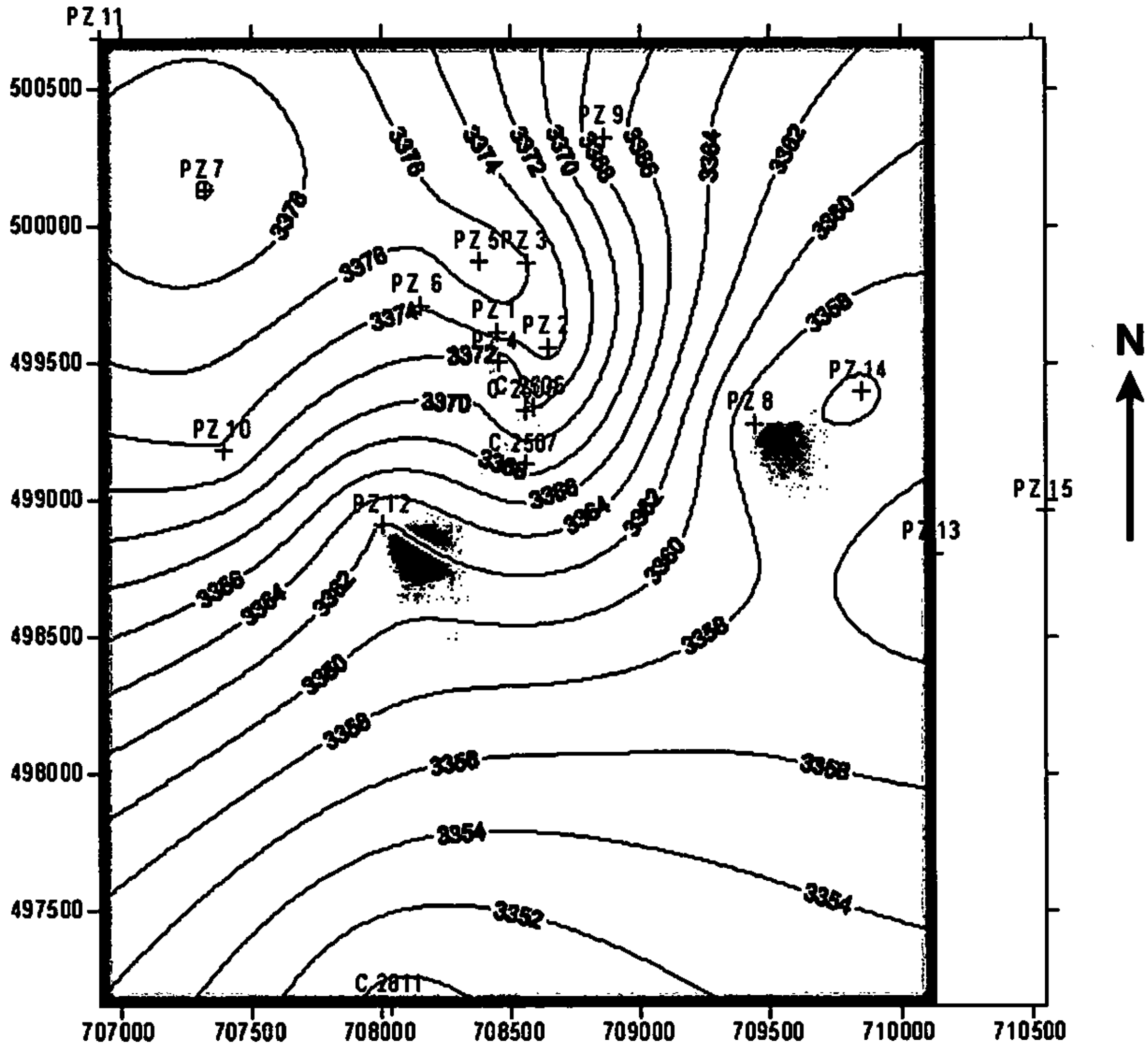


Figure 3-1 - Potentiometric Surface Map Superimposed on Dewey Lake Surface

Overall, the water levels in the WIPP piezometers are rising in all wells, although at differing rates. One well, PZ-9, has been decreasing in elevation since March of 2005. This decreasing water level may be the first sign that lining the salt pile is having an effect on the SSW elevation. The decreasing water levels at PZ-9 began shortly after the conveyance ditches around the Salt Storage Area were lined. This conclusion is preliminary, it is too soon to tell what impact the liner systems at the site have had on water levels in the piezometers.

3.3 Water Quality in Piezometers PZ-13, PZ-14, and PZ-15 and Comparison to WIPP Site Piezometers

SSW samples have been obtained semiannually from the site piezometers as part of DP-831 since 2004. The quarterly sampling event for DP-831 was performed in October 2007, and included the three new piezometers. Since the piezometers around the SPDV pile were new, parameters beyond those required by the permit were analyzed to characterize the water (Table 3-2).

Low-flow sampling techniques are typically employed to sample the piezometers at WIPP. This involves using a small diameter submersible pump with typical sustained flow rates during sampling of 400 mpm to 1500 mpm, while keeping water levels stable and drawdown to a minimum. The water is field analyzed for temperature, conductivity, and pH until these parameters stabilize, then a laboratory sample is obtained. This could only be achieved for PZ-13, which pumped at an average rate of 1,050 mpm, but was pumped dry as the sample was obtained. Piezometers PZ-8, PZ-14, and PZ-15 could not sustain enough flow to measure before pumping dry. Piezometers PZ-8, PZ-14, and PZ-15 were pumped dry on October 10, 2007, and allowed to recover until October 15, 2007, where they were sampled using a Teflon™ hand bailer. PZ-8 was installed in 1997 and remained dry until this year. This was the first time this well was sampled. Results for wells PZ-8, PZ-14, and PZ-15 are presented in Table 3-2. Table 3-3 presents results for the DP-831 required parameters for all the sampled WIPP SSW piezometers.

Table 3-2 presents three different geochemical zones:

1.0 PZ-15, carbonate-based alkalinity. PZ-15 is near is a topographic depression to the east. During heavy rainfall this depression holds water for a period of time; enough such that cattle congregate to drink. The alkalinity in PZ-15 is predominantly carbonate based while the others are bicarbonate based. This is due to the infiltration of rainwater through the upper Mescalero caliche and higher surficial calcium carbonate dissolution.

2.0 PZ-13 and PZ-14, bicarbonate-based alkalinity. These wells may be affected by recharge from the SPDV pile more than rainwater going through caliche at PZ-15. Alkalinity is likely due to the dissolution of sulfates (gypsum and anhydrite) in the SPDV pile. As discussed in Section 1.1, the SPDV pile was used to store mined tailings interspersed with soil, rock, and debris from the construction of the shafts. All formations to the depth of the shafts were mined; therefore, minerals such as gypsum ($CaSO_4 \cdot 2H_20$), anhydrite ($CaSO_4$), halite ($NaCl$), sylvite (KCl), carnallite ($KMgCl_3 \cdot 6H_20$), and soda niter ($NaNO_3$) associated with gypsum and halite were included in the SPDV pile cuttings and explain the chemical differentiation.

Dissolved potassium is significantly higher in PZ-13 and PZ-14 than the other two piezometers, which can likely be attributed to the dissolution of sylvite and carnallite (potash salts). Sulfate concentrations in PZ-13 and PZ-14 are significantly higher and can be attributed to dissolution of anhydrite and gypsum found in formations above the Salado Formation.

3.0 PZ-8, low TDS, low potassium and sulfate, intermediate sodium, and chloride. Dissolved sodium and chloride can be associated with the dissolution of halite, predominantly found in the Salado Formation. While halite is almost exclusive to the salt pile, the SPDV pile also contains halite. Thus, sodium and chloride concentrations are greater in PZ-13 and PZ-14 than in PZ-8, due to SPDV pile proximity. Lacking potassium and sulfate, it is difficult to conclude the source of water in PZ-8 based on a single sample.

To summarize, the document titled *Exhaust Shaft: Phase III Hydraulic Assessment Data Report October 1997 - October 1998* (DOE-WIPP Draft 2302) presents analytical data from piezometers PZ-1 through PZ-12, C-2505, C-2506, and C-2507 for these years. In it the concentration for sulfate range was 404 - 2910 mg/L, nitrate was 4.2 - 46.6 mg/L, sodium 183 - 50,900 mg/L, potassium 3.7 - 356 mg/L, and calcium 270 - 4580 mg/L. Table 3-2 fingerprints SPDV pile PZ-13 and PZ-14 by high potassium concentration, indicating a different source of groundwater than the wells within the operational area.

Table 3-2 - SPDV Piezometer Water Quality

Parameter	ID/Sample Date	PZ-8/ 10-15-07	PZ-13/ 10-10-07	PZ-14/ 10-15-07	PZ-15/ 10-15-07*
Hydroxide Alk. (mg/L)		<1.00	<1.00	<1.00	<1.00
Carbonate Alk. (mg/L)		<1.00	<1.00	<1.00	1100
Bicarbonate Alk. (mg/L)		150	144	146	<4.00
Total Alk. (mg/L)		150	144	146	550
Dissolved Ca (mg/L)		1530	2220	1060	14.2
Dissolved K (mg/L)		17.2	618	649	7.15
Dissolved Mg (mg/L)		1260	1250	696	10.1
Dissolved Na (mg/L)		842	86100	41500	779
Specific Conductance (µMHOs/cm)		18100	366000	184000	3380
Chloride (mg/L)		7440	150000	71500	764
Fluoride (mg/L)		<1.00	22.2	<1.00	9.01
Sulfate (mg/L)		500	2670	2140	169
Nitrate (mg/L)		0.677	12.4	1.41	2.97
pH (s.u.)		7.26	6.09	6.74	8.66

Table 3-3 - Water Quality Results for All WIPP Piezometers

	Water Level Monitoring (Ft AMSL)		Field Parameters October 2007			General Chemistry Parameters					Trace Metals	
Monitoring Site	39343	39420	pH (SU)	Temp. (°C)	Specific Conductivity @25 °C (µS/cm)	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-1	3373.26	3374.94	6.34	22.6	113500	39363	<1.00	2820	83200	99500	<0.100	<0.0250
PZ-2	3372.99	3374.9	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA
PZ-3	3374.29	3376.14	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA
PZ-4	3368.61	3370.41	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA
PZ-5	3375.2	3376.93	6.8	21.2	37500	39363	<1.00	1880	19400	28700	0.071	<0.00500
PZ-6	3372.17	3373.98	6.3	21.4	128000	39363	<1.00	3080	8100	105000	<0.100	<0.0250
PZ-7	3378.47	3380.17	6.44	22.2	78700	39362	<1.00	2660	45600	65000	0.064	<0.00500
PZ-8	3355.59	3356.34	Bailed	Bailed	Bailed	39369	0.677	500	7440	15000	0.039	<0.00500
PZ-9	3364.93	3366.53	6.22	20	155000	39363	<200	4720	116000	144000	<0.0200	<0.00500
PZ-10	3372.29	3373.86	7.08	22.3	1450	39362	<1.00	211	186	968	<0.0200	<0.00500
PZ-11	3375.52	3377.13	6.34	23.4	127100	39362	<1.00	2970	94400	108000	<0.0200	<0.00500
PZ-12	3359.72	3361.73	6.85	20.7	10760	39362	<1.00	958	4310	6200	0.026	<0.00500
PZ-13	3359.91	3359.93	6.09	22.8	>200000	39364	12.4	2670	150000	245500	<0.100	<0.00500
PZ-14	3355.31	3355.62	Bailed	Bailed	Bailed	39369	1.41	2140	71500	106000	<0.0100	<0.00500
PZ-15*	3387.19	3387.22	Bailed	Bailed	Bailed	39369	2.97	169	764	2060	0.022	<0.00500
C-2811	3347.07	3349.13	7.05	20.3	6400	39362	<1.00	635	2980	3860	0.051	<0.00500
C-2505	3369.96	3371.66	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA
C-2506	3370.36	3372.15	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA
C-2507	3367.03	3368.74	6.88	20	9410	39363	<1.00	1220	3500	5540	0.055	0.007

4.0 CONCLUSIONS

Piezometers PZ-13, PZ-14, and PZ-15 indicated saturated sections in all three locations at differing horizons and, in one case, a differing formation. Based on the geologic data obtained the SSW appears to be isolated in different and variable zones around the SPDV pile based on examination of split spoon samples obtained during drilling. Structural features of the Santa Rosa/Dewey Lake contact play an important role in accumulation and movement of SSW and the stratigraphy overlying the Santa Rosa/Dewey Lake contact is heterogeneous and tortuous. The heterogeneity and tortuosity leads to preferential flow and a vertical dampening affect. The heterogeneity, small saturated lenses, and tortuous flow affects the ability for flow to readily occur in the unsaturated zone around the SPDV pile.

Overall the water levels in the WIPP piezometers are rising, although at differing rates. One well, PZ-9, has been decreasing in elevation since March of 2005. The decreasing water levels at PZ-9 began shortly after the conveyance ditches around the Salt Storage Area were lined. It is too soon to consider this a cause and effect, or to tell other impacts of the liner systems at the site on water levels in the piezometers.

Three geochemical zones have been identified based on the data obtained from PZ-13, PZ-14, PZ-15, and PZ-8. One being associated with PZ-15, the second associated with PZ-13 and PZ-14, and the third associated with PZ-8. PZ-13 and PZ-14 are believed to be associated with the SPDV pile. The data are inconclusive with regard to PZ-8. Water detected in PZ-15 is believed to be associated with shallow infiltration from a topographic depression east of the SPDV pile.

5.0 REFERENCES

Bachman, G. O., 1973, *Surficial Features and Late Cenozoic History in Southeastern New Mexico.* U.S. Geological Survey Open-File Report USGS-4339-8.

Chugg, J. C., Anderson, G. W., Kink, D. L., and Jones, L. H., 1971, *Soil Survey of Eddy Area, New Mexico.* U.S. Department of Agriculture.

Daniel B. Stephens & Associates, 1996, *Characterization of the Site Preliminary Design Validation Salt Pile,* UN001325.

Daniel B. Stephens & Associates, 2003, *Water Budget Analysis of Shallow Subsurface Water at the Waste Isolation Pilot Plant*, UN001304.

Jones, C. L., 1978, *Test Drilling for Potash Resources: Waste Isolation Pilot Plant Site, Eddy County, New Mexico.*

Powers, D. W., 1997, *Geology of piezometer holes to investigate shallow water sources under the Waste Isolation Pilot Plant, in Intera, 1997, Exhaust Shaft Hydraulic Assessment Data Report*, DOE/WIPP 97-2219, U.S. Department of Energy, Carlsbad, NM.

Powers, D. W., 2003, *Basic Data Report for Drillhole C-2811 (Waste Isolation Pilot Plant)*, DOE/WIPP 02-3223, U.S. Department of Energy, Carlsbad, NM.

Powers, D. W., and Holt, R. M., 1993, *The Upper Cenozoic Gatuña Formation of Southeastern New Mexico.*

Sergent, Hauskins, & Beckwith, 1979, *Phase III Waste Isolation Pilot Plant Subsurface Exploration & Laboratory Testing.*

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

GROUND WATER

MAR 1 0 2008

BUREAU

MAR 0 6 2008

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Response to the Administrative Completeness Determination and Applicants' Public Notice Requirements for the Renewal and Modification of Discharge Plan 831

Dear Mr. Marshall:

The purpose of this letter is to provide proof of the completion of the public notice requirements for Discharge Permit 831 in accordance with your instructions dated January 23, 2008, received January 28, 2008. NMED's Public Notice Requirements requires that within 15 days of the completion of the public notice requirements, the Permittee must submit proof of notice to NMED containing:

1. Affidavit regarding the sign posting and mailing;
2. List of names and addresses to whom the public notice flyer was mailed;
3. List of name and addresses of owners of discharge sites;
4. Copy of the newspaper ad; and
5. Check number 017630 in the amount of $30.00 for invoice ID 49722, DP-831 Poster Fee.

Therefore, enclosed are the items requested by NMED to document the administrative completeness determination and public notice requirements.

If you have any questions or require additional information, please contact Mr. Jody Plum of my staff at (575) 234-7462.

Sincerely,

David C. Moody

David C. Moody
Manager

Enclosures

cc: w/enclosures
J. Bearzi, NMED *ED
J. Kieling, NMED ED
*ED denotes electronic distribution

CBFO:AMO:HLP:KJB:08-0426:UFC5486

Enclosure 1

The Affidavit

AFFIDAVIT OF PUBLIC NOTICE COMPLETION
New Permit or Permit Modification

DP-831

I certify, under penalty of law, that I have fulfilled the Ground Water Discharge Permit public notice requirements of Section 20.6.2.3108(B) NMAC.

✓ I posted a sign for 30 days displaying a synopsis of the public notice in English and in Spanish at or near the proposed facility in a conspicuous public location (or multiple locations) approved by NMED.

✓ I posted a public notice flyer at a conspicuous off-site location approved by NMED.

✓ I placed a synopsis of the public notice in English and in Spanish in a newspaper approved by NMED. A copy of the newspaper page containing the synopsis is enclosed.

✓ I sent the public notice flyer via 1st class mail to *(check box)*:

☑ owners of all properties within a 1/3 mile of the boundary of the property of the proposed discharge locations – mailing list is enclosed.

☐ owners of all adjacent property (if applicant owns all property within 1/3 mile) – mailing list is enclosed.

☐ owner of the property of the proposed discharge locations (if applicant is not the owner) – mailing address is enclosed.

I am aware that there are significant penalties for false certification including the possibility of fines.

David C Moody
Signature of Applicant

David C. Moody
Printed Name

MANAGER
Title

3-6-08
Date

Enclosure 2

Public Notice Mailing List

Kenneth Smith
267 Smith Ranch Road
Hobbs, NM 88240

Stacey Mills
P.O. Box 1358
Loving, NM 88256

Thaddeus Kostrubala, Environmental Engineer
New Mexico State Land Office
310 Old Santa Fe Trail
P.O. Box 1148
Santa Fe, NM 87504

Jim Stovall, Field Manager
U.S. Department of the Interior
Bureau of Land Management
Carlsbad Field Office
620 E. Greene St.
Carlsbad, NM 88220

Enclosure 3

Owner's Name and Address

Dr. David C. Moody
Carlsbad Field Office
U. S. Department of Energy
P. O. Box 3090
Carlsbad, NM 88221-3090

Enclosure 4

PUBLIC NOTICE
NOTICIA PUBLICA

Discharge Permit Application / Aplicación para Permiso para Descargar: For up to 1,368,000 gallons per day of domestic and process wastewater and up to 4,224,835 gallons per day of stormwater to a treatment and disposal system. / Hasta 1,368,000 de galones por día de aguas residuales domésticas y procesas y hasta 4,224,835 de galones por dia de agua de lluvia a un sistema de tratamiento y disposición.

Applicant & Discharge Location / Solicitante & Sitio de Descarga: Waste Isolation Pilot Plant, 32 miles east of Carlsbad on the Jal Highway

For More Information / Para Más Información (DP-831)
Ground Water Quality Bureau / Sección de Agua Subterránea
NM Environment Department / Departmento del Medio Ambiente
(505) 827-2900
www.nmenv.state.nm.us (public notices)

BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

NEW MEXICO ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

RON CURRY
Secretary

JON GOLDSTEIN
Deputy Secretary

RECEIVED
MAR 07 2008

PUBLIC NOTICE NO. 08-03

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS WASTE BUREAU
SANTA FE, NEW MEXICO
Issued February 28, 2008
Revised March 7, 2008

NOTICE OF PUBLIC COMMENT PERIOD AND INTENT TO APPROVE A MODIFICATION TO THE WASTE ISOLATION PILOT PLANT RCRA PERMIT

Under authority of the New Mexico Hazardous Waste Act (Section 74-4-1 et seq., NMSA 1978, as amended, 1992) and the New Mexico Hazardous Waste Management Regulations (20.4.1 NMAC), the New Mexico Environment Department (**NMED**) can approve or deny hazardous waste permits, closure plans, permit modifications, and amendments. Under this authority, NMED intends to approve, pending public input into this decision, an August 27, 2007 Class 3 permit modification request received from the U.S. Department of Energy and Washington TRU Solutions LLC (**the Permittees**) for the Waste Isolation Pilot Plant (**WIPP**), EPA ID# NM4890139088. NMED issued a Resource Conservation and Recovery Act (**RCRA**) permit, which incorporated corrective action requirements, to the Permittees on October 27, 1999.

WIPP is located in Eddy County in southeastern New Mexico, approximately 26 miles east of Carlsbad. The facility boundary corresponds to a 16-section Federal land area known as the WIPP Land Withdrawal Area, which was created when Congress approved the WIPP Land Withdrawal Act in October 1992. WIPP is an industrial facility that consists of 16 square miles of land surface, surface buildings and structures, an underground network of subsurface excavated openings, and vertical shafts that connect the surface and the subsurface areas. The Permittees have developed a 1,454 acre exclusive use area located in the center of the 16 square miles. Land uses within this area are limited to activities associated with the disposal of transuranic waste.

The Permittees' primary contact for this action is Mr. Jody Plum, US DOE/Carlsbad Field Office, 4021 National Parks Highway, Carlsbad, New Mexico, 88220.

If approved, the proposed modification would grant no further action (**NFA**) status for fifteen Solid Waste Management Units (**SWMUs**) and eight Areas of Concern (**AOCs**) (see list below).

Table 2 (SWMUs Requiring an RFI) and Table 3 (AOCs Included in the Permit) of Module VII of the WIPP Permit identify the SWMUs and AOCs at the facility that are proposed for NFA status. NMED has issued a draft permit to modify Module VII by moving the SWMUs and AOCs from Tables 2 and 3 to a new Table 4 (SWMUs/AOCs Requiring No Further Action).

NMED's approval of the SWMUs/AOCs proposed for NFA by the Permittees is on the basis that they have been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

The following SWMUs and AOCs are the subject of this action:

1. SWMU 001g, H-14/P-1 Mud Pits
2. SWMU 001h, H-15/P-2 Mud Pits
3. SWMU 001j, P-3 Mud Pit
4. SWMU 001k, P-4 Mud Pit
5. SWMU 001L, WIPP-12/P-5 Mud Pits
6. SWMU 001m, P-6 Mud Pit
7. SWMU 001n, P-15 Mud Pit
8. SWMU 001o, Badger Unit Mud Pits
9. SWMU 001p, Cotton Baby Mud Pits
10. SWMU 001q, DOE-1 Mud Pits
11. SWMU 001s, ERDA-9 Mud Pit
12. SWMU 001t, IMC-374 Mud Pit
13. SWMU 001x, WIPP-13 Mud Pit
14. SWMU 004a, Portacamp Storage Yard, West Side
15. SWMU 007b, SW Evaporation Pond
16. AOC 001r, D-123 Mud Pit
17. AOC 001u, IMC-376 Mud Pit
18. AOC 001v, IMC-456 Mud Pit
19. AOC 001w, IMV-457 Mud Pit
20. AOC 001ac, DSP-207 Mud Pit
21. AOC 001ae, IMC-377 Mud Pit
22. AOC 010b, Waste Handling Shaft Sump
23. AOC 010c, Exhaust Shaft Sump

PUBLIC REVIEW OF THE ADMINISTRATIVE RECORD

The Administrative Record for this proposed action consists of the WIPP No Further Action Petition, the Permittees' Class 3 Permit Modification Request, the Fact Sheet / Statement of Basis, this Public Notice, the Draft Permit consisting of revised Tables 2, 3, and new Table 4 of Permit Module VII, and the referenced supporting documentation for each site. The complete Administrative Record may be reviewed at the following location during the public comment period:

NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303
Telephone: (505) 476-6000
Monday-Friday: 8:00 am – 5:00 pm

To obtain a copy of the Administrative Record or a portion thereof, please contact Ms. Pamela Allen at (505) 476-6000, or at the Santa Fe address given above. NMED will provide copies, or portions thereof, of the Administrative Record at a charge to the requestor.

A copy of the Fact Sheet/Statement of Basis, the Public Notice, and the Draft Permit consisting of revised Tables 2, 3, and new Table 4 of Permit Module VII are available electronically on the NMED WIPP Information Page at <www.nmenv.state.nm.us/wipp> or may be reviewed at the following location during the public comment period:

WIPP Information Center
Skeen-Whitlock Building
4021 National Park Highway
Carlsbad, NM 88220
Telephone: (575) 234-7502, (800) 336-9477
Monday-Friday: 7:00 am – 4:30 pm

Any person seeking additional information regarding this notice or the Draft Permit may also contact:

Steve Zappe, WIPP Project Leader
NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East, Bldg 1
Santa Fe, NM 87505-6303
Ref: WIPP No Further Action Petition
E-mail: steve.zappe@state.nm.us
Telephone: (505) 476-6000
Fax: (505) 476-6060

NMED issues this revised public notice on **March 7, 2008** to announce the beginning of a 60-day comment period that will now end at **5:00 pm MDT, May 6, 2008**. Any person who wishes to comment on this action or request a public hearing should submit written or electronic mail (e-mail) comment(s) with the commenter's name and address to Mr. Steve Zappe at the respective address above. Only comments and/or requests received on or before **5:00 pm MDT, May 6, 2008** will be considered.

Written comments must be based on the Administrative Record. Documents in the Administrative Record need not be re-submitted if referenced by the commenter. Requests for a public hearing shall provide: (1) a clear and concise factual statement of the nature and scope of the interest of the person requesting the hearing; (2) the name and address of all persons whom the requestor represents; (3) a statement of any objections to the proposed action, including specific references; and (4) a statement of the issues which such persons propose to raise for consideration at the hearing. Written comment and requests for Public Hearing must be filed with Mr. Steve Zappe on or before **5:00 pm MDT, May 6, 2008**. NMED will provide a thirty (30) day notice of a public hearing, if scheduled.

NMED must ensure that the approved final Permit will be consistent with the New Mexico Hazardous Waste Management Regulations. All written comments submitted on the draft Permit will become part of the administrative record, will be considered in formulating a final decision, and may cause the draft Permit to be modified. NMED will respond in writing to all significant public comment. The response will specify which provisions, if any, of the draft Permit have been changed in the final Permit decision, and the reasons for the change. This response will also be posted on the NMED website in addition to NMED notifying all persons providing written comments.

After consideration of all written public comments received, NMED will issue, or modify and issue, or disapprove the Permit modification. If NMED modifies the Permit, the Permittees shall be provided by mail a copy of the modified Permit and a detailed written statement of reasons for the modifications. The NMED Secretary will make the final Permit decision publicly available and shall notify the Permittees by certified mail. The Secretary's decision shall constitute a final agency decision and may be appealed as provided by the Hazardous Waste Act. All persons on the mailing list, or that provided written comments, or who requested notification in writing, will be notified of the final decision by mail.

The final decision will become effective thirty days after service of the decision to the Permittees, unless a later date is specified or review is requested under the New Mexico Hazardous Waste Management Regulations, 20.4.1 NMAC, Section 901.E, *Hearings*.

ARRANGEMENTS FOR PERSONS WITH DISABILITIES

Any person with a disability requiring assistance or auxiliary aid to participate in this process should contact Judy Bentley by 10 days prior to the end of the public comment period at the following address: New Mexico Environment Department, Room N-4030, P.O. Box 26110, 1190 St. Francis Drive, Santa Fe, New Mexico 87502-6110, (505) 827-9872. TDD or TDY users please access Ms. Bentley's number via the New Mexico Relay Network at 1-800-659-8331.

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary

JON GOLDSTEIN
Deputy Secretary

March 7, 2008

SUBJECT: NOTICE OF PUBLIC COMMENT PERIOD AND INTENT TO APPROVE A CLASS 3 PERMIT MODIFICATION TO THE WASTE ISOLATION PILOT PLANT RCRA PERMIT – CORRECTED

Dear Interested Person:

On February 28, 2008, the New Mexico Environment Department (**NMED**) sent you a letter announcing its intent to approve a Class 3 Permit modification to the Waste Isolation Pilot Plant (**WIPP**) Resource Conservation and Recovery Act (**RCRA**) Permit. However, NMED failed to enclose the Public Notice with the letter, and is therefore re-noticing this action and extending the public comment period.

The enclosed Public Notice provides locations where the administrative record, including the Class 3 permit modification request, Fact Sheet/Statement of Basis, and related documents for this action can be reviewed, and provides procedures for submitting comments and requesting a Public Hearing. Comments and requests for Public Hearing will now be received through **5:00 pm, May 6, 2008.**

Any person seeking additional information regarding this notice or the draft permit may contact:

Mr. Steve Zappe
NMED Hazardous Waste Bureau
2905 Rodeo Park Drive East, Bldg 1
Santa Fe, NM 87505-6303

E-mail: steve.zappe@state.nm.us
Telephone: (505) 476-6000
Fax: (505) 476-6060

Sincerely,

St Zappe for

John E. Kieling
Program Manager
Permits Management Program
Hazardous Waste Bureau

New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

016H26501561
Hasler
$00.41⁰
03/06/2008
Mailed From 87505
US POSTAGE

Bill Olson
NMED/GWQB
P.O. Box 26110
Santa Fe, NM 87502

87502S0110 B900

New Mexico Environmental Department
Ground Water Quality Bureau

Acknowledgement of Receipt

Acknowledgement of Receipt of Check/Cash

I hereby acknowledge receipt of Check No. #017630 Dated. 3/3/08

or cash, received in the amount of $ 130.00 from Washington Tru Solutions

for Waste Isolation Pilot Plant DP-831 318 GROUND WATER

(Facility Name) (DP No.) (AI ID)

MAR 1 0 2008

Copy Made for Check Processing ______ Date ______

For Central File Activity ______ BUREAU

Submitted to ASD by: ______ Date: ______

Received in ASD by: ______ Date: ______

Filing Fee [ ] New Facility [ ] Renewal [ ]

Modification [ ] Other [X] (Explain) Poster Fee

Organization Code ______ Application FY ______

To be Deposited in the Ground Water Section Discharge Plan Fees.

Full Payment [ ] or Annual Increment [ ]

WASHINGTON TRU SOLUTIONS LLC
P.O. Box 2078
Carlsbad, NM 88221

CARLSBAD NATIONAL BANK
PO Box 1359
Carlsbad, NM 88220

017630

Date Mar/03/2008 Pay Amount 30.00***

Pay ****THIRTY AND XX / 100 DOLLAR****

To The Order Of
NEW MEXICO ENVIRONMENT DEPARTMENT
PO BOX 26110
SANTA FE, NM 87502-6110

Authorized Signature

DP-831

⑈017630⑈ ⑆112201797⑆ 51225⑈

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 0 6 2008

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Response to the Administrative Completeness Determination and Applicants' Public Notice Requirements for the Renewal and Modification of Discharge Plan 831

Dear Mr. Marshall:

The purpose of this letter is to provide proof of the completion of the public notice requirements for Discharge Permit 831 in accordance with your instructions dated January 23, 2008, received January 28, 2008. NMED's Public Notice Requirements requires that within 15 days of the completion of the public notice requirements, the Permittee must submit proof of notice to NMED containing:

1. Affidavit regarding the sign posting and mailing;
2. List of names and addresses to whom the public notice flyer was mailed;
3. List of name and addresses of owners of discharge sites;
4. Copy of the newspaper ad; and
5. Check number 017630 in the amount of $30.00 for invoice ID 49722, DP-831 Poster Fee.

Therefore, enclosed are the items requested by NMED to document the administrative completeness determination and public notice requirements.

If you have any questions or require additional information, please contact Mr. Jody Plum of my staff at (575) 234-7462.

Sincerely,

David C. Moody

David C. Moody
Manager

Enclosures

cc: w/enclosures
J. Bearzi, NMED *ED
J. Kieling, NMED ED
*ED denotes electronic distribution

CBFO:AMO:HLP:KJB:08-0426:UFC5486

Enclosure 1

The Affidavit

AFFIDAVIT OF PUBLIC NOTICE COMPLETION
New Permit or Permit Modification

DP-831

I certify, under penalty of law, that I have fulfilled the Ground Water Discharge Permit public notice requirements of Section 20.6.2.3108(B) NMAC.

- ✓ I posted a sign for 30 days displaying a synopsis of the public notice in English and in Spanish at or near the proposed facility in a conspicuous public location (or multiple locations) approved by NMED.
- ✓ I posted a public notice flyer at a conspicuous off-site location approved by NMED.
- ✓ I placed a synopsis of the public notice in English and in Spanish in a newspaper approved by NMED. A copy of the newspaper page containing the synopsis is enclosed.
- ✓ I sent the public notice flyer via 1st class mail to *(check box)*:
  - ☑ owners of all properties within a 1/3 mile of the boundary of the property of the proposed discharge locations – mailing list is enclosed.
  - ☐ owners of all adjacent property (if applicant owns all property within 1/3 mile) – mailing list is enclosed.
  - ☐ owner of the property of the proposed discharge locations (if applicant is not the owner) – mailing address is enclosed.

I am aware that there are significant penalties for false certification including the possibility of fines.

David C. Moody	David C. Moody
Signature of Applicant	*Printed Name*
Manager	3-6-08
Title	*Date*

Enclosure 2

Public Notice Mailing List

Kenneth Smith
267 Smith Ranch Road
Hobbs, NM 88240

Stacey Mills
P.O. Box 1358
Loving, NM 88256

Thaddeus Kostrubala, Environmental Engineer
New Mexico State Land Office
310 Old Santa Fe Trail
P.O. Box 1148
Santa Fe, NM 87504

Jim Stovall, Field Manager
U.S. Department of the Interior
Bureau of Land Management
Carlsbad Field Office
620 E. Greene St.
Carlsbad, NM 88220

Enclosure 3

Owner's Name and Address

Dr. David C. Moody
Carlsbad Field Office
U. S. Department of Energy
P. O. Box 3090
Carlsbad, NM 88221-3090

Enclosure 4

PUBLIC NOTICE
NOTICIA PUBLICA

Discharge Permit Application / Aplicación para Permiso para Descargar: For up to 1,368,000 gallons per day of domestic and process wastewater and up to 4,224,835 gallons per day of stormwater to a treatment and disposal system. / Hasta 1,368,000 de galones por día de aguas residuales domésticas y procesas y hasta 4,224,835 de galones por día de agua de lluvia a un sistema de tratamiento y disposición.

Applicant & Discharge Location / (Solicitante & Sitio de Descarga: Waste Isolation Pilot Plant, 32 miles east of Carlsbad on the Jal Highway

For More Information / Para Más Información (DP-831)
Ground Water Quality Bureau / Sección de Agua Subterránea
NM Environment Department / Departmento del Medio Ambiente
(505) 827-2900
www.nmenv.state.nm.us (public notices)

NEW MEXICO
NVIRONMENT DEPARTMEN

Ground Water Quality Bureau

PUBLIC RECORDS RELEASE FORM

* Please complete a form for each facility requested.

Pre-Review

Reviewers Name: Johnelle Korioth

Facility requested: WIPP **DP#** 831

Number of files given out: C- ______ **M-** ______ **Total-** 1

Number of other doc. given out (maps, designs, etc.): 1

Records Inspection (On-site)

Date: 2/26/08

Time: 3:45 **am/pm**

Name: Johnelle Korioth

Signature: [signature]

Company: PECOS Management Services

Phone #: 505-323-8355

Copy Service (Off-site)

Records Check-Out:

Date: ______

Time: ______ **am/pm**

Name: ______

Signature: ______

Company: ______

Phone #: ______

Estimated date of returned: ______

Records Check-In:

Date: ______________________________

Time: ______________________________ **am/pm**

Name: ______________________________

Signature: ______________________________

Company: ______________________________

Phone #: ______________________________

Post-Review

Files returned to (staff person): ______________________________

Number of files returned: C-_______ M-_________ Total-________

Number of other Documents (maps, designs, etc.): ______________________________

Documents returned in good condition (circle)? ___Yes/No_____________

DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE

Office of the National TRU Program
PO Box 3090
Carlsbad, NM 88221-3090

FACSIMILE TRANSMITTAL ROUTING SHEET
FAX NUMBER (505) 234-7061

GROUND WATER
FEB 0 1 2008
BUREAU

DATE: 02.01.2008

Pages (including cover sheet): 2

To: Clint Marshall **From:** Jody Plum

Location:

Phone: 1-505-827-0027 **Phone:** 1-505-234 7462

Fax: 1-505-827-2965 **Fax:**

☐ **Urgent** ☐ **FYI** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply**

- **Remarks:**

Public Notice, Carlsbad Current Argus, p. 5A

If you have any problems with this fax, please contact Gloria @ (505) 234-7301

02/01/08 14:54 FAX 234 7061 DOE CBFO NAT'L TRU ☑002

GROUND WATER

FEB 01 2008

BUREAU

NATION & WORLD

PUBLIC NOTICE
NOTICIA PUBLICA

Discharge Permit Application / Aplicación para Permiso para Descargar: For up to 1,368,000 gallons per day of domestic and process wastewater and up to 4,224,835 gallons per day of stormwater to a treatment and disposal system. / Hasta 1,368,000 de galones por día de aguas residuales domésticas y procesas y hasta 4,224,835 de galones por día de agua de lluvia a un sistema de tratamiento y disposición.

Applicant & Discharge Location / Solicitante & Sitio de Descarga: Waste Isolation Pilot Plant, 32 miles east of Carlsbad on the Jal Highway

For More Information / Para Más Información (DP-831)
Ground Water Quality Bureau / Seccion de Agua Subterránea
NM Environment Department / Departmento del Medio Ambiente
(505) 827-2900
www.nmenv.state.nm.us (public notices)

Municipal Election
Candidates Invited to Attend
Ward 1 Nick Salcido
Ward 2 Kenny Powel, Lila King
Ward 3 Wesley Carter
Ward 4 Nathan McDonald, Regina Ballard
Municipal Judge David Redford, Mario Salinas, and Jessica Renee Moya
This public forum is cosponsored by the Carlsbad Current-Argus and Carlsbad Radio.
The event will be simulcast on 104.1 FM, 97.7 FM, 740 AM and 1240 AM.

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

FEB 21 2008

FEB 26 2008

BY.............

Report separately bound.

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

Subject: Transmittal of Information Requested in a Letter Dated January 18, 2008 (Received January 22, 2008)

Dear Mr. Bearzi:

The purpose of this letter is to transmit to the Hazardous Waste Bureau the documentation requested in the subject letter relative to the discharge of approximately 150 gallons of brine water from the Exhaust Shaft Intercept Borehole Water collection system into the H-19 Evaporation Pond.

The Department of Energy (DOE) and Washington TRU Solutions LLC (WTS) appreciate this opportunity to provide the New Mexico Environment Department the documentation requested and allow your agency to review our in-depth critique of the actions that led to this incident. DOE and WTS promptly reported this issue and implemented corrective measures, including sampling the liquid and sediments from the H-19 Evaporation Pond. These actions were taken to correct brine water disposal operations and to ensure there was no negative impact to human health and the environment.

Compliance with waste management requirements is taken very seriously by DOE and WTS and every effort has and will continue to be expended to ensure the Waste Isolation Pilot Plant Facility remains in compliance in all areas. Extensive corrective measures have been identified and are being tracked through completion.

The attached documentation has been assembled to correspond to the eight sections of requested information, as noted in the request for information letter sent by your office.

If you have further questions or need additional information, please contact Mr. Jody Plum at (575) 234-7462.

Sincerely,

David C. Moody

David C. Moody, Manager
Carlsbad Field Office

M. F. Sharif, General Manager
Washington TRU Solutions LLC

Enclosure

CBFO:AMO:HLP:KJB:08-0424:UFC5486

FEB 2 1 2008

cc: w/enclosure
B. Olson, NMED
C. Marshall, NMED
S. Zappe, NMED
C. Walker, Trinity Engineering

CBFO:AMO:HLP:KJB:08-0424:UFC5486

New Mexico E onment Department
Ground Wate ality Bureau

DP Processing Form

DP# 831 Reviewer Clint	** Date	Initial
Notice of Intent		
NOI Received		
DP Required Letter Sent		

Discharge Plan Application		
❖ DP Application Received	12-28-07	c ✓
❖ Filing Fee Received	12-28-07	c ✓
❖ Copy Transmitted to District Manager		
Additional Information Requested		
❖ DP application Complete per Completeness Checklist		
❖ Application Information Entered in to TEMPO Database		

Public Notice		
❖ Public Notice Published PNI	1-31-08	ds
Public Notice Corrected		

Plans and Specifications		
❖ Plans and Specifications Received	12-28-07	c ✓
❖ Copy Sent to District Engineer		
❖ Comments Received from District Engineer		

Other Technical Requirements		
❖ Field Inspections		
Hydrogeologic Assessment Reviewed		
❖ Operational Plan Reviewed		
❖ Monitoring Plan Reviewed		
❖ Contingency Plan Reviewed		
❖ Closure Plan Reviewed		
Additional Information Requested		
❖ Technical Review Complete		
❖ Computer Database Updated		
❖ Correspondence Transferred to Discharge Plan and Correspondence Public Drawers		

Public Hearing/Meeting		
Public Meeting Held		
Public Hearing Held		
Public Hearing/Meeting Denied		

Discharge Plan Decision		
❖ Approval/Disapproval Letter Drafted		
❖ Discharge Fee Received		
❖ Approval/Disapproval Letter Sent		
Appeal of Discharge Plan Decision		
WQCC Hearing Schedule		
Appeal Resolved		

❖ Must be Completed
** Date is Date Received, Sent, Published, Approved or Completed.

New Mexico Environmental Department
Ground Water Quality Bureau

Acknowledgement of Receipt

Acknowledgement of Receipt of Check/Cash

I hereby acknowledge receipt of Check No. #017069 Dated 12/17/07
or cash, received in the amount of $ 100.00 from Washington Tru Solutions
for Waste Isolation Pilot Plant DP-831 318
(Facility Name) (DP No.) (AI ID)

GROUND WATER

Copy Made for Check Processing ______ Date ______
For Central File Activity PRO 20080001 (DP-Ren/Mod) DEC 28 2007

Submitted to ASD by: ______ Date: ______ BUREAU

Received in ASD by: ______ Date: ______

Filing Fee [ ] New Facility [ ] Renewal [X]

Modification [X] Other [ ] (Explain) ______

Organization Code ______ Application FY ______

To be Deposited in the Ground Water Section Discharge Plan Fees.

Full Payment [ ] or Annual Increment [ ]

WASHINGTON TRU SOLUTIONS LLC
P.O. Box 2078
Carlsbad, NM 88221

CARLSBAD NATIONAL BANK
PO Box 1359
Carlsbad, NM 88220

017069

Date Dec/17/2007 Pay Amount 100.00***

Pay ***ONE HUNDRED AND XX / 100 DOLLAR****

To The Order Of
NEW MEXICO ENVIRONMENT DEPARTMENT
PO BOX 26110
SANTA FE, NM 87502-6110

Authorized Signature

DP-831

01511

⑈017069⑈ ⑆112201797⑆ 51225⑈

Notice is hereby given pursuant to 20.6.2.3108 NMAC, the following proposed Ground Water Discharge Permit applications have been submitted to the New Mexico Environment Department (NMED) for review.

DP #	Facility/Applicant	Closest City	County	Notice	NMED Permit Contact
1371	Bottomless Lakes State Park Terry Edwards, Operator EMNRD-State Parks Division HC 12 Box 1200 Roswell, NM 88201	Roswell	Chaves	Bottomless Lakes State Park, Terry Edwards, Operator, proposes to renew the Discharge Permit for the discharge of up to 2,125 gallons per day of domestic wastewater to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds. The facility is located at 545A Bottomless Lakes Road, approximately nine miles southeast of Roswell, in Section 34, T11S, R26E, Chaves County. Ground water beneath the site is at a depth of approximately 3 feet and has a total dissolved solids concentration of approximately 10,000 milligrams per liter.	Melanie Sanchez
261	Vermejo Park Ranch Mark Kossler General Manager Vermejo Park Ranch PO Drawer E Raton, NM 87740	Raton	Colfax	Vermejo Park Ranch, Mark Kossler, General Manager, proposes to renew and modify the Discharge Permit for the discharge of up to 21,450 gallons per day of domestic wastewater to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds. The facility is located at Hwy 555 40 miles west of Raton, in Section 26, T31N, R18E, Colfax County. Ground water beneath the site is at a depth of approximately 7 feet and has a total dissolved solids concentration of approximately 700 milligrams per liter.	Kathie Deal
1320	Milagro Dairy Doug & Irene Handley Owners 1461 Curry Road 6 Clovis, NM 88101	Texico	Curry	Milagro Dairy, Doug and Irene Handley, Owners, propose to renew and modify the Discharge Permit for the discharge of up to 124,000 gallons per day of agricultural wastewater to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds. The facility is located at 1201 Highway 202, Texico, in Sections 8, 9, and 10, T01S, R37E, Curry County. Ground water beneath the site is at a depth of approximately 147-195 feet and has a total dissolved solids concentration of approximately 270 milligrams per liter.	Kimberly Kirby
831	U.S Department of Energy Waste Isolation Pilot Plant	Carlsbad	Eddy	U.S Department of Energy Waste Isolation Pilot Plant, David Moody, Manager, proposes to renew and modify the	Clint Marshall

	David Moody, Manager US Department of Energy Carlsbad Field Office PO Box 3090 Carlsbad, NM 88221			Discharge Permit for the discharge of up to 1,368,000 gallons per day of domestic and process wastewater and up to 4,224,835 gallons per day of stormwater to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds, chloride, sulfate, and total dissolved solids. The facility is located 32 miles east of Carlsbad on the Jal Highway, Carlsbad, in Sections 20, 28 and 29, T22S, R31E, Eddy County. Ground water beneath the site is at a depth of approximately 167 feet and has a total dissolved solids concentration of approximately 3,800 milligrams per liter.	
166	Tyrone 2 Leach Dump Richard Mohr, President Tyrone 2 Leach Dump PO Drawer 571 Tyrone, NM 88065	Silver City	Grant	Tyrone 2 Leach Dump, Richard Mohr, President, proposes to modify the Discharge Permit for the discharge of up to 35,000,000 gallons per day of acidic leach solution to a copper ore leach system and solvent extraction / electrowinning plant. Potential contaminants from this type of discharge include sulfate, total dissolved solids, and metals. The facility is located approximately 10 miles south of Silver City, in Sections 15, 21, 22, 23, 27, and 28, T19S, R15W, Grant County. Ground water beneath the site is at a depth of approximately 0-400 feet and has a total dissolved solids concentration of approximately 2-400 milligrams per liter.	Keith Ehlert
1323	Brand West Dairy 2 Frank Brand, Owner Brand West Dairy 2 PO Box 11 Energy, TX 76452	Lovington	Lea	Brand West Dairy 2, Frank Brand, Owner, proposes to renew and modify the Discharge Permit for the discharge of up to 200,000 gallons per day of agricultural wastewater to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds. The facility is located one mile south of NM Hwy 83 on Longview Road, Lovington, in Sections 10, 14, 15, and 23, T16S, R37E, Lea County. Ground water beneath the site is at a depth of approximately 83 feet and has a total dissolved solids concentration of approximately 355 milligrams per liter.	Bill Pearson
1658	NMDOT-Manuelito Rest Area Joseph De Herrera Project Manager NMDOT District VI PO Box 1600	Gallup	McKinley	NMDOT-Manuelito Rest Area, Joseph De Herrera, Project Manager, proposes to discharge up to 12,000 gallons per day of domestic wastewater to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds. The facility is located at mile marker 2 on eastbound I-40, approximately 20 miles west of Gallup, in Section 31, T14N, R20W, McKinley County.	John Rebar

	Gallup, NM 87301			Ground water beneath the site is at a depth of approximately 110 feet and has a total dissolved solids concentration of approximately 1,080 milligrams per liter.	
220	Alamogordo-Wastewater Treatment Plant Brian Cesar Public Works Director City of Alamogordo 1376 E. 9th St. Alamogordo, NM 88310	Alamogordo	Otero	Alamogordo-Wastewater Treatment Plant, Brian Cesar, Public Works Director, proposes to modify the Discharge Permit for the discharge of up to 5,000,000 gallons per day of domestic wastewater from a municipality to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds. The facility is located at 3290 Airport Rd, Alamogordo, in Sections 1, 25, 26, and 35, T16S, R09E; Sections 8, 17, 18, 19, 20, 29, and 31, T16S, R10E; Sections 12, 14, 16, and 23, T17S, R09E; and Section 10, T17S, R10E, Otero County. Ground water beneath the site is at a depth of approximately 20 - 200 feet and has a total dissolved solids concentration of approximately 1,600-20,000 milligrams per liter.	Naomi Davidson
1666	Ute Lake Ranch Water Reclamation Facility Tyler Packard Senior Development Manager Ute Lake Ranch Water Reclamation Facility 188 Inverness Dr. W Suite 150 Englewood, CO 80112	Logan	Quay	Ute Lake Ranch Water Reclamation Facility, Tyler Packard, Senior Development Manager, proposes to discharge up to 330,000 gallons per day of domestic wastewater from a subdivision to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds. The facility is located approximately 3.7 miles north of the intersection of Hwy 54 and Mine Canyon Rd, Logan, in Sections 23, 24, and 25, T13N, R32E, Quay County. Ground water beneath the site is at a depth of approximately 34 feet and has a total dissolved solids concentration of approximately 35,000 milligrams per liter.	Robert George
1667	NMDOT-Glenrio Rest Area Ernest Sanchez Project Manager NMDOT 1120 Cerrillos Rd. Santa Fe, NM 87505	Glenrio	Quay	NMDOT-Glenrio Rest Area, Ernest Sanchez, Project Manager, proposes to discharge up to 12,000 gallons per day of domestic wastewater to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds. The facility is located at I-40 Westbound Lane mile marker 373, Glenrio, in Section 17, T11N, R37E, Quay County. Ground water beneath the site is at a depth of approximately 120 feet and has a total dissolved solids concentration of approximately 1,080 milligrams per liter.	John Rebar

1668	Route 66 Ethanol Derek Brown Managing Member Route 66 Ethanol 4949 SW Meadow Rd. Lake Oswego, OR 97035	Tucumcari	Quay	Route 66 Ethanol, Derek Brown, Managing Member, proposes to discharge up to 43,200 gallons per day of industrial wastewater to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds and total dissolved solids. The facility is located at 1600 North Rock Island Street, Tucumcari, in Section 12, T11N, R30E, Quay County. Ground water beneath the site is at a depth of approximately 19 feet and has a total dissolved solids concentration of approximately 1,113 milligrams per liter.	John Hall
1647	Hernandez Elementary School David Cockerham Superintendent Espanola Public Schools 714 Calle Don Diego Espanola, NM 87532	Hernandez	Rio Arriba	Hernandez Elementary School, David Cockerham, Superintendent, proposes to discharge up to 8,023 gallons per day of domestic wastewater to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds. The facility is located at Rio Arriba County Road 1530 Dr, Hernandez, in Section 17, T21N, R08E, Rio Arriba County. Ground water beneath the site is at a depth of approximately 45 - 55 feet and has a total dissolved solids concentration of approximately 1,100 milligrams per liter.	Robert George
1074	Abengoa Bioenergy Corporation Wes Robinson Plant Manager Abengoa Bioenergy Corp. 1827 Industrial Dr. Portales, NM 88130	Portales	Roosevelt	Abengoa Bioenergy Corporation, Wes Robinson, Plant Manager, proposes to renew and modify the Discharge Permit for the discharge of up to 1,140,000 gallons per day of industrial wastewater from an ethanol plant to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds and total dissolved solids. The facility is located at 1827 Industrial Drive, Portales, in Section 3, T02S, R34E, Roosevelt County. Ground water beneath the site is at a depth of approximately 70 feet and has a total dissolved solids concentration of approximately 1,600 milligrams per liter.	Sandy Spon
1645	Sunland Inc. Jimmie Shearer President Sunland Inc. PO Box 1059 Portales, NM 88130	Portales	Roosevelt	Sunland Inc., Jimmie Shearer, President, proposes to discharge up to 1,750 gallons per day of agricultural and domestic wastewater from a peanut processing plant to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds. The facility is located at 42593 US Highway 70, Portales, in Section 19, T01S, R35E, Roosevelt County. Ground water beneath the site is at a depth of approximately 80 feet and	Sarah McGrath

				has a total dissolved solids concentration of approximately 320 milligrams per liter.	
1644	Santa Fe Animal Shelter and Humane Society Duane Adams Executive Director Santa Fe Animal Shelter & Humane Society 100 Caja del Rio Rd. Santa Fe, NM 87507	Santa Fe	Santa Fe	Santa Fe Animal Shelter and Humane Society, Duane Adams, Executive Director, proposes to discharge up to 6,000 gallons per day of domestic wastewater to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds. The facility is located at 100 Caja del Rio Road, Santa Fe, in Section 35, T17N, R08E, Santa Fe County. Ground water beneath the site is at a depth of approximately 283 feet and has a total dissolved solids concentration of approximately 140 milligrams per liter.	John Hall
1622	UNM Sevilleta Field Station Steve Chavez Project Manager Office of Capital Projects University of NM 1841 Lomas Blvd., NE (MSC 07 4210) Albuquerque, NM 87131	Socorro	Socorro	UNM Sevilleta Field Station, Steve Chavez, Project Manager, proposes to discharge up to 4,425 gallons per day of domestic wastewater from a research facility to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds. The facility is located just west of exit 169 on I-25, approximately 19 miles north of Socorro, in the Sevilleta Land Grant, at latitude 34 degrees, 21 minutes, 12 seconds north and longitude 106 degrees, 53 minutes, 5 seconds west, Socorro County. Ground water most likely to be affected is at a depth of approximately 137 feet and has a total dissolved solids concentration of approximately 1,580 milligrams per liter.	John Rebar

Provided the applicant has met applicable requirements, the New Mexico Environment Department (NMED) will propose for approval a Discharge Permit containing limitations, monitoring requirements, and other conditions intended to protect ground water quality for present and potential future use. Information in this public notice was provided by the applicants and will be verified by NMED during the permit application review process. NMED will accept comments and statements of interest regarding applications and will create facility-specific mailing lists for persons who wish to receive future notices. Questions, comments or statements of interest should be directed to the NMED permit contact at (505) 827-2900 or at the following address: Ground Water Quality Bureau, PO Box 26110, Santa Fe, NM 87502.

To view this and other public notices issued by the Ground Water Quality Bureau on-line, go to:
http://www.nmenv.state.nm.us/gwb/New_Pages/public_notice.htm

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 St. Francis Drive
P.O. Box 26110, Santa Fe, NM 87502
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us

BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary
JON GOLDSTEIN
Deputy Secretary

January 23, 2008

David Moody, Manager
US Department of Energy Carlsbad Field Office
Carlsbad, NM 88221

RE: Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant

Dear Mr. Moody:

The New Mexico Environment Department (NMED) received a Ground Water Discharge Permit Application for the above referenced facility on December 28, 2007. Pursuant to Section 20.6.2.3108 NMAC of the New Mexico Water Quality Control Commission Regulations (20.6.2 NMAC), NMED determined on January 18, 2008 that your application is administratively complete.

Within 30 days of the date your application was deemed administratively complete, you must provide public notice as required by Section 20.6.2.3108 NMAC. Instructions and materials needed to complete the public notice are enclosed.

A technical reviewer will contact you within the next few months if additional information is needed to process your application. If you have a deadline of concern in the interim or any questions, please call the Ground Water Quality Bureau at (505) 827-2900.

Sincerely,

Felicia Vort

for William C. Olson, Chief
Ground Water Quality Bureau

enc: Instructions for Completing Public Notice Requirements
Affidavit
Public Notice Flyer
Text for Newspaper Display Ad
Invoice ($15 fee for sign)
Public Notice Sign

4

INTRUCTIONS FOR COMPLETING PUBLIC NOTICE REQUIREMENTS

Discharge Permit DP- 531 ☐ New ☐ Modification ☒ Renewal & Modification

Within 30 days of the date NMED deemed your Discharge Permit application administratively complete, you must provide public notice as follows:

1. **Post sign(s) at the facility.**
   Enclosed is a sign 2 x 3 feet in size (or multiple signs if required) which must be posted **at or near the facility** in a conspicuous location approved by NMED. An invoice for the sign(s) is enclosed.
   NMED approves the following sign posting location(s): At North and South gate entrances.

2. **Post a public notice flyer off-site.**
   The enclosed public notice flyer which must be posted **off-site** at a location conspicuous to the public and approved by NMED. NMED approves the following flyer posting location: Carlsbad Post Office

3. **Mail a public notice flyer to property owners within 1/3 mile.**
   A copy of the enclosed public notice flyer must be sent by 1st class mail to the owners of record of all properties within 1/3 mile from the boundary of the property where the discharge site is located. If there are no properties within 1/3 mile other than properties owned by the applicant, then the flyer must be mailed to the owners of record of the nearest adjacent properties.

   The names and addresses of property owners can be obtained from the county tax assessor's office. The list of property owners' names and addresses must be submitted to NMED.

4. **Mail a public notice flyer to the owner of the discharge site.**
   A copy of the enclosed flyer must be sent via certified mail, return receipt requested, to the owner(s) of the discharge site(s), if the applicant is not the owner. The list of owners' names and addresses and the certified mail receipts must be submitted to NMED.

5. **Place a display ad in the newspaper.**
   A display ad 3 x 4 inches in size must be published for one day in a newspaper of general circulation in the location of the proposed discharge. The ad may **not** be placed in the classified or legal section. The text for the ad is enclosed. NMED approves publishing the ad in the following newspaper: Current Argus

PROOF OF NOTICE. Within 15 days of completing the above requirements, the applicant must submit the following items as proof of notice to NMED:

- ✓ Affidavit regarding the sign posting and mailing (form enclosed).
- ✓ List of names and addresses to whom the public notice flyer was mailed.
- ✓ List of names and addresses of owners of discharge sites.
- ✓ Certified mail receipts for mailing to discharge site owner(s), if required.
- ✓ Copy of newspaper ad.

Send to NMED Ground Water Quality Bureau, PO Box 26110, Santa Fe, NM 87502.

Reviewer's Initials and Date [signature] 1/9/08

PUBLIC NOTICE
Discharge Permit Application

Waste Isolation Pilot Plant, DP-831

DP-831, U.S Department of Energy Waste Isolation Pilot Plant, David Moody, Manager, proposes to renew and modify the Discharge Permit for the discharge of up to 1,368,000 gallons per day of domestic and process wastewater and up to 4,224,835 gallons per day of stormwater to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds, chloride, sulfate, and total dissolved solids. The facility is located 32 miles east of Carlsbad on the Jal Highway, Carlsbad, in Sections 20, 28 and 29, T22S, R31E, Eddy County. Ground water beneath the site is at a depth of approximately 167 feet and has a total dissolved solids concentration of approximately 3,800 milligrams per liter.

The applicant is seeking a Discharge Permit for the proposed discharge. Provided the applicant has met applicable requirements, the New Mexico Environment Department (NMED) will propose a Discharge Permit containing limitations, monitoring requirements, and other conditions intended to protect ground water quality for present and potential future use. Information in this public notice was provided by the applicant and will be verified by the New Mexico Environment Department during the permit application review process. NMED will accept comments and statements of interest regarding the application and will create a facility specific mailing list for persons who wish to receive future notices.

You may send comments or statements of interest to:

Clint Marshall, DP-831
Ground Water Quality Bureau
PO Box 26110
Santa Fe, NM 87502.

For additional information, please call:
505-827-2900

Applicant
David Moody, Manager
US Department of Energy Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

Public Notice Synopsis, DP-831
(for sign and newspaper display ad)

Newspaper display ad must be at least 3 inches by 4 inches in size and must be published for at least one day in a section other than the classifieds or legals.

PUBLIC NOTICE
NOTICIA PUBLICA

Discharge Permit Application / Aplicación para Permiso para Descargar: For up to 1,368,000 gallons per day of domestic and process wastewater and up to 4,224,835 gallons per day of stormwater to a treatment and disposal system / Hasta 1,368,000 de galones por día de aguas residuales domésticas y procesas y hasta 4,224,835 de galones por día de agua de lluvia a un sistema de tratamiento y disposición

Applicant & Discharge Location / Solicitante & Sitio de Descarga: Waste Isolation Pilot Plant, 32 miles east of Carlsbad on the Jal Highway

For More Information / Para Más Información (DP-831):
Ground Water Quality Bureau / Sección de Agua Subterránea
NM Environment Department / Departamento del Medio Ambiente
(505) 827-2900
www.nmenv.state.nm.us (public notices)

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

DEC 20 2007

GROUND WATER

DEC 28 2007

BUREAU

Ms. Mary Ann Menetrey, Program Manager
Groundwater Quality Bureau, Mining and Environmental Compliance
New Mexico Environment Department
Harold Runnels Building
1190 St. Francis Dr.
Santa Fe, NM 87502

Application in separate bound report

Subject: Discharge Permit 831 Renewal Application

Dear Ms. Menetrey:

Enclosed are three copies of the Discharge Permit 831 (DP-831) Renewal Application and Modification for the Waste Isolation Pilot Plant (WIPP) located in Eddy County, New Mexico and the $100.00 filing fee. Representatives of the Department of Energy (DOE) met with Mr. C. Marshall of your staff on August 23, 2007, to discuss these proposed changes. This application reflects the following modifications to the existing DP-831:

1. The April, 2003, Renewal of DP-831 contained a new requirement to maintain two feet of freeboard in the sewage treatment system ponds and at the H-19 Evaporation Pond. The sewage treatment system design is based on maintaining one foot of freeboard and was operated until 2003 with the design basis of one foot of freeboard with no releases due to wave action. The H-19 Evaporation Pond has four foot horizontal to one foot vertical side slopes. At one foot of freeboard, the water line is four feet from the perimeter of the pond and overflow from wave action is not a concern. For these reasons, we request that the discharge permit be modified to require only one foot of freeboard.

2. The current discharge permit has discharge limits based on average monthly discharge for volumes for the H-19 Evaporation Pond (8,000 gallons per day) and Evaporation Pond B (2,000 gallons per day) at the Sewage Treatment System. This application requests maximum discharge volumes based on the capacity of the evaporation ponds with the condition that one foot freeboard be maintained in the pond. This change will allow the capacity of the evaporation ponds to be utilized and minimize the need for the off-site disposal of water at commercial facilities when special projects (e.g. pump tests on ground water wells or during ground water well development) occur that generate larger than normal volumes of water.

3. The removal of the requirement to monitor for radionuclides (Pu^{238}, $Pu^{239/240}$, U^{234}, U^{235}, U^{238}, Am^{241} and Sr^{90}) in the sewage lagoons and the H-19 Evaporation Pond for the following reasons:

CBFO:AMO:HLP:KJB:07-2232:UFC5486

- The DOE has monitored these radionuclides in accordance with DP-831 for 12 years with concentrations at background levels or below counting limits.

- Annual environmental monitoring at WIPP, reported in the Annual Site Environmental Report, includes monitoring for these radionuclides in surface water, soil and biota.

4. Total and dissolved selenium and chromium in all the infiltration control ponds (Pond 1, 2 and A) have been non-detect since pond installation. Nitrate has typically been below detection limits also during that time. The DOE would like to remove the monitoring for nitrate, selenium and chromium in surface water from the infiltration control ponds.

5. Request to remove the requirement for monitoring infiltration control pond levels to 100th of a foot. The DOE recommends the nearest tenth of a foot, rough order of magnitude as measured with a graduated staff gauge.

If you have any questions regarding this transmittal, please contact Mr. Jody Plum at (505) 234-7462.

Sincerely,

David C. Moody

David C. Moody
Manager

Enclosures

cc: w/o enclosures

J. Bearzi, NMED	* ED
J. Kieling, NMED	ED
C. Marshall, NMED	ED
S. Zappe, NMED	ED

*ED denotes electronic distribution

CBFO:AMO:HLP:KJB:07-2232:UFC5486

Check Date: Dec/17/2007 Vendor Number: 0000002027 Check No. 017069

Invoice Number	Invoice Date	Voucher ID	PO Number	Gross Amount	Discount Taken	Late Charge	Paid Amount
DP-831 EXPIRATION DATE:4-29-08	Dec/17/2007	00032944		100.00	0.00	0.00	100.00

DP-831

For Inquiries: please call 1-888-234-3181

Check Number	Date	Total Gross Amount	Total Discounts	Total Late Charges	Total Paid Amount
017069	Dec/17/2007	100.00	0.00	0.00	100.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
November 30, 2007

Mr. Bill Olson, Chief
Ground Water Quality Bureau
Harold Runnels Building Room N2250
1190 St. Francis Drive
Santa Fe, NM 87502

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
P.O. Box 26110
Santa Fe, NM 87505-6303

Subject: Discharge into the H-19 Evaporation Pond of Approximately 150 Gallons of Brine Containing Approximately 6.83 mg/L of Lead

Dear Sirs:

The purpose of this letter is to provide you with our written report, as required by 20.6.2.1203.A.(6) NMAC, concerning the subject occurrence. On November 20, 2007, Department of Energy (DOE) submitted our Notification of Discharge-Removal in accordance with 20.6.2.1203.A.(1) NMAC informing the Ground Water Quality Bureau (GWQB) of an unintended discharge into the H-19 Evaporation Pond. Such discharges are regulated by conditions found in Discharge Permit DP-831, issued to the DOE for operations at its Waste Isolation Pilot Plant (WIPP). This letter is intended to provide a description of events that caused this condition to occur and the corrective actions taken in response to this discharge as required by 20.6.2.1203.A.(6) NMAC. A sample of brine examined exhibited a lead concentration of approximately 6.83 milligrams per liter (mg/L), which exceeds the 20.4.1.200 NMAC (adopting 40 CFR 261.24) regulatory threshold limit of 5.0 mg/L for the characteristic of toxicity for lead.

On Friday, November 9, 2007, at approximately 10:00 a.m., 560 gallons of brine from the Exhaust Shaft Interception Borehole System was transported from a staging area near the WIPP Waste Handling Building to the H-19 Evaporation Pond. Approximately 150 gallons of brine was discharged by gravity feed into the H-19 Evaporation Pond. During the transfer of brine, an employee involved in this work questioned if the required paperwork had been completed and signatory approvals obtained, as required by WIPP Procedure WP 02-EM1016, *Request to Discharge to Evaporation Ponds*. The employee stopped work and evaluated the situation. It was then discovered that documentation (Request for Disposal, Attachment 1 of WP 02-EM1016 and the analytical results) authorizing the disposal of this brine in the H-19 Evaporation Pond was not complete. It was also discovered that the initial analytical results for the brine sample collected from the portable 1,000-gallon container from the Exhaust Shaft Interception Borehole System indicated that the sample contained greater than 5mg/L of lead.

The remaining 410 gallons of brine have been transferred to eight 55-gallon drums. These drums have been labeled, are being managed, and will be disposed of off-site.

Representative samples were collected of the sediment and brine in the H-19 Evaporation Pond on Tuesday, November 20, 2007. Four representative sediment samples were collected from each quadrant of the pond using a scoop, and were composited into one

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sample for analyses. One grab sample was also collected from the northwest corner of the pond near where the discharge occurred. A grab sample of brine was also collected from each quadrant of the pond. The analytical results are summarized in the following table.

Section of H-19 Sampled	Lead Concentration	
	Total	TCLP
Northwest Corner grab (Point of Discharge) Sediment	11.6 mg/kg	<0.100 mg/kg
Quadrant I Brine	<0.05 mg/l	<0.100 mg/l
Quadrant I Sediment	11.4 mg/kg	<0.100 mg/kg
Quadrant II Brine	<0.05 mg/l	<0.100 mg/l
Quadrant II Sediment	3.80 mg/kg	0.221 mg/kg
Quadrant III Brine	<0.05 mg/l	<0.100 mg/l
Quadrant III Sediment	3.32 mg/kg	0.221 mg/kg
Quadrant IV Brine	<0.05 mg/l	<0.100 mg/l
Quadrant IV Sediment	2.52 mg/kg	0.203 mg/kg

The average concentration of lead throughout the H-19 Evaporation Pond is 6.5 mg/kg (range of 2.52 mg/kg to 11.6 mg/kg) in the sediment. Lead concentrations suspended in the brine solution in the pond are below the detection limit. The WIPP *No Further Action Proposal for Solid Waste Management Units and Areas of Concern* (DOE/WIPP 02-3221, September 2002), established background lead concentrations in soil at 2.2 mg/kg (maximum of 5.4 mg/kg, minimum 1.2 mg/kg) using 55 data points. The New Mexico Environment Department's *Technical Background Document for Development of Soil Screening Levels*, Rev. 4.0 (June 2006) establishes a risk-based residential standard for lead in soil at 400 mg/kg. Therefore, the H-19 analytical results clearly indicate that no threat to human health, the environment, or property on or off-site has occurred.

Other corrective actions that have been taken to ensure that site procedures are followed include the following:

- WIPP Form WF08-011 was issued to ensure that a complete evaluation of the cause of the incident and corrective actions to prevent recurrence are put in place.

- A sign was placed on the gate at the H-19 Evaporation Pond to require approval from the Site Environmental Compliance Group prior to any disposal.

- A review of files for previous brine disposal was conducted to ensure no other unauthorized discharges had occurred. No other discharges unauthorized by DP-83 have occurred.

- Staff were directed to maintain in their possession copies of the completed waste water disposal packages (Request for Disposal, Attachment 1 of WP 02-EM1016, and the analytical results) when disposing of water.

- Staff performing any procedural functions associated with brine disposal in H-19 have been directed to have the procedure with them and to verify that all procedural steps are followed. If updates are needed to clarify or strengthen a procedure, corrections are to be noted to ensure timely revision of the procedure.

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- The analytical laboratory was immediately requested to rerun the analyses and review their laboratory processes to determine if there could have been an error in sample processing (e.g., dilution factors). Results were received on November 15th verifying that the concentration of lead was 6.83 mg/L.

A thorough review of waste water disposal procedures to determine any improvements to prevent the recurrence of this condition remains to be completed. If you have any questions or need additional information, please contact Mr. H.L. Plum at (505) 234-7462.

Sincerely,

David C. Moody

David C. Moody, Manager
Carlsbad Field Office

Farok Sharif

M. Farok Sharif, General Manager
Washington TRU Solutions, LLC

cc:

R. Curry, NMED	*ED
J. Goldstein, NMED	ED
C. Marshall, NMED	ED
S. Zappe, NMED	ED
N. Stone, EPA	ED
V. Daub, CBFO	ED
G. Basabilvazo, CBFO	ED
J. Plum, CBFO	ED
P. Yocum, WTS	ED
W. Wierzbicki, WRES	ED
P. Roush, WRES	ED
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CBFO M&RC	

*ED denotes electronic distribution

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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
NOV 2 0 2007

Mr. Bill Olson, Chief
Ground Water Bureau
Harold Runnels Building Room N2250
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

GROUND WATER
NOV 2 6 2007
BUREAU

Subject: Notification of Discharge

The purpose of this letter is to confirm the U. S. Department of Energy's (DOE), Carlsbad Field Office (CBFO) verbal report to you at approximately 4:40 p.m., Friday, November 16, 2007. This report was made to Mr. C. Marshall by Mr. H. L. Plum, DOE/CBFO. This information is being provided to you in accordance with 20.6.2 NMAC, 20.6.2.1203 NOTIFICATION OF DISCHARGE-REMOVAL:

(a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility:

Persons in charge of the facility:	David C. Moody, Manager 4021 National Parks Highway Carlsbad, New Mexico, 88220 (505) 234-7300
Owner of the facility:	U. S. Department of Energy
Operator of the facility:	Washington TRU Solutions LLC

(b) Name and address of the facility:

U. S. Department of Energy
Waste Isolation Pilot Plant
30 miles east of Carlsbad, New Mexico off of State Highway 128
Carlsbad, NM 88220

(c) The date, time, location, and duration of the discharge:

Date: November 9, 2007
Time: 10:00 a.m.
Location: WIPP Site H-19 Evaporation Pond
Latitude: 32 21.532, Longitude 103 46.975
Duration: 15 minutes

CBFO:AMO:HLP:KJB:07-2224:UFC5486

(d) The source and cause of the discharge:

Source: Exhaust Shaft Intercept Borehole brine collection system.

Cause of discharge:

Approximately 560 gallons of brine from the Exhaust Shaft Intercept Borehole collection system was transported to the H-19 Evaporation Pond for disposal. During the brine disposal, the employee questioned if the procedurally required documentation for water disposal had been completed. The employee stopped work after transferring approximately 150 gallons of brine into the H-19 Evaporation Pond. Later, it was determined that documentation authorizing the disposal of this water into the H-19 Evaporation Pond was not complete.

(e) A description of the discharge, including chemical composition:

This brine was removed from the underground Exhaust Shaft Intercept Borehole collection system. It was sampled to determine its waste characteristics. This batch of water contained lead in the sample and sample duplicate with analytical results of 6.75 and 6.83 mg/L. The 150 gallons of brine were placed in the H-19 Evaporation Pond, which is a lined basin permitted for disposal under the existing Discharge Permit Number 831.

(f) The estimated volume of the discharge:

150 gallons

(g) Any actions taken to mitigate immediate damage from this discharge:

The following actions were taken:

- Upon noting that the brine had been transferred into H-19 without following the procedure, all brine disposal in H-19 was immediately stopped.
- A sign was placed on the gate at the H-19 Evaporation Pond to require additional approval prior to any disposal.
- Staff was directed to maintain, in their possession, a copy of the completed waste water disposal package (Request for Disposal, Attachment 1 of WP 02-EM1016, and the analytical results) when disposing of water.
- A WIPP Form WF08-011 (Corrective Action Report) was issued to tracking and completion of corrective measures.

Staff performing any procedural functions was directed to have the procedure with them and verify that applicable procedural steps are followed.

Notification of Discharge-Removal in 20.6.2.1203(6) NMAC requires the facility owner/operator to submit a report describing any corrective actions taken or to be taken relative to the discharge. As was requested in the November 16th telephone notification, water and sediment samples from the H-19 Evaporation Pond were collected. At the earliest, the analytical results will be available November 29, 2007. State statute 20.6.2.1203(6) NMAC requires that written corrective actions deemed necessary be submitted within 15 days after the discharger learns of the discharge. In order to accommodate the use of the data from the samples, the Permittees will make every effort to submit this report to the New Mexico Environment Department Ground Water Bureau by November 30, 2007.

At this time we believe the discharge poses no threat to human health, the environment or property. If you have any further questions regarding this matter or the proposed date to submit the follow-up report, please contact Mr. H. L. Plum at (505) 234-7462.

Sincerely,

David C. Moody

David C. Moody, Manager
Carlsbad Field Office

cc:

J. Bearzi, NMED	*ED
C. Marshall, NMED	ED
S. Zappe, NMED	ED

*ED denotes Electronic Distribution

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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

OCT 1 1 2007

Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Subject: Transmittal of the Waste Isolation Pilot Plant Groundwater Level Measurements for September 2007

Dear Mr. Bearzi:

The purpose of this letter is to submit the Waste Isolation Pilot Plant groundwater level data for the month of September 2007, as required by Module V.J.2.b of the Hazardous Waste Facility Permit No. NM4890139088—TSDF.

We certify under penalty of law that this document and all enclosures were prepared under our direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

Please feel free to contact Mr. Jody Plum at (505) 234-7462 if you have any questions regarding this data transmittal.

Sincerely,

David C. Moody, Manager
Carlsbad Field Office

M. R. Sharif, General Manager
Washington TRU Solutions LLC

Enclosures

cc: w/enclosures

S. Zappe, NMED	*ED
C. Marshall, NMED	ED
C. Walker, Trinity Engineering	ED

cc: w/o enclosures

J. Kieling, NMED	ED

*ED denotes Electronic Distribution

CBFO:AMO:HLP:KJB:07-2208:UFC5486

SUMMARY COMMENTS FOR THE WATER LEVEL MEASUREMENTS FOR THE MONTH OF SEPTEMBER 2007

1. The WIPP Hazardous Waste Facility Permit (HWFP), Attachment L, Section L-4c (1) requires cumulative fluctuations noted in the Detection Monitoring Program wells of more than two feet in the course of one year which are not attributable to site tests and subsequent stabilization to be reported. Section 6.2.5 of the Calendar Year 2006 Annual Site Environmental Report, submitted to the New Mexico Environment Department in compliance with HWFP Module V.J.2.C, reports regional and DMP water level rises greater than two feet and offers possible causes.

2. Groundwater level measurements were not taken at wells SNL-14 and WIPP-25 due to Sandia National Laboratories (SNL) testing and instrumentation activities. Water level measurements will resume when the instrumentation is removed. These activities are expected to be completed by the end of 2007.

3. Water levels at H-15 do not reflect natural conditions. The packer was inflated with fresh water in December 2006 leaving residual water in the tubing, thus affecting the density. Equilibration will occur with time after mixing.

4. Groundwater levels in SNL-15 were affected during this round of measurements due to discrete water quality sampling performed at this location by SNL in April 2007.

5. The water density for SNL-6 has not been measured; therefore, the equivalent freshwater head has not been calculated. The fluid density for SNL-6 will be determined in the 2007-pressure density survey.

6. SNL-16 was repaired on 07/18/07. The top of casing (TOC) elevation is the pre-damaged elevation. This well will be resurveyed when new wells are drilled and surveyed. By the nature of the damage and repair, there was no significant change to the TOC elevation.

7. Adjusted freshwater heads are based on published fluid density data and pressure density surveys. Density values may be adjusted when a well experiences a significant event such as well maintenance, sampling, development, or pumping activities if the wellbore fluid density is altered.

Waterlevel Measurements
For
September 2007

WELL NUMBER	ZONE	CASING ELEVATION ft amsl (1)	DATE	TIME (MST)	DEPTH TO WATER ft	ADJUST TO TOC ft	ADJUSTED DEPTH TOC ft	ADJUSTED DEPTH METERS	WATER LEVEL ELEVATION ft amsl	ELEVATION IN METERS amsl	ADJUSTED FRESHWATER HEAD ft amsl
AEC-7	CUL	3656.99	09/18/07	07:17	387.50	0.00	387.50	118.11	3269.49	996.54	3312.77
C-2737 (PIP)	CUL	3401.74	09/19/07	10:53	381.90	0.98	380.92	116.10	3020.82	920.75	3023.93
ERDA-9	CUL	3409.92	09/19/07	08:00	397.10	0.50	396.60	120.88	3013.32	918.46	3034.76
H-02b2	CUL	3378.36	09/18/07	14:00	332.19	0.00	332.19	101.25	3046.17	928.47	3050.10
H-03b2	CUL	3389.91	09/19/07	07:42	388.00	0.00	388.00	118.26	3001.91	914.98	3012.77
H-04b	CUL	3333.58	09/18/07	13:22	329.19	0.00	329.19	100.34	3004.39	915.74	3006.30
H-05b	CUL	3506.78	09/18/07	07:39	467.42	0.00	467.42	142.47	3039.36	926.40	3083.17
H-06b	CUL	3347.69	09/17/07	11:00	287.25	0.00	287.25	87.55	3060.44	932.82	3073.90
H-07b1	CUL	3163.72	09/17/07	09:00	163.22	0.00	163.22	49.75	3000.50	914.55	3000.68
H-09c (PIP)	CUL	3407.12	09/18/07	10:15	411.58	0.07	411.51	125.43	2995.61	913.06	2996.87
H-10c	CUL	3688.40	09/18/07	09:18	663.11	0.00	663.11	202.12	3025.29	922.11	3031.70
H-11b4	CUL	3410.79	09/18/07	12:45	421.20	0.00	421.20	128.38	2989.59	911.23	3009.70
H-12	CUL	3427.33	09/18/07	08:35	457.19	0.00	457.19	139.35	2970.14	905.30	3001.73
H-15 (PIP)	CUL	3482.19	09/19/07	11:41	484.92	1.30	483.62	147.41	2998.57	913.96	3036.30
H-17	CUL	3385.24	09/18/07	12:20	418.56	0.00	418.56	127.58	2966.68	904.24	3007.65
H-19b0	CUL	3418.33	09/19/07	07:15	425.43	0.00	425.43	129.67	2992.90	912.24	3014.86
H-19b2	CUL	3418.93	09/19/07	07:00	426.77	0.00	426.77	130.08	2992.16	912.01	3014.19
H-19b3	CUL	3419.02	09/19/07	07:30	427.00	0.00	427.00	130.15	2992.02	911.97	3013.94
H-19b4	CUL	3418.98	09/19/07	07:20	426.26	0.00	426.26	129.92	2992.72	912.18	3014.54
H-19b5	CUL	3418.58	09/19/07	07:10	426.25	0.00	426.25	129.92	2992.33	912.06	3014.06
H-19b6	CUL	3419.02	09/19/07	07:25	426.91	0.00	426.91	130.12	2992.11	912.00	3013.97
H-19b7	CUL	3418.94	09/19/07	07:06	426.96	0.00	426.96	130.14	2991.98	911.96	3013.88
I-461	CUL	3283.61	09/17/07	08:28	236.13	0.00	236.13	71.97	3047.48	928.87	3048.02
SNL-01	CUL	3512.84	09/17/07	13:21	427.18	0.00	427.18	130.20	3085.66	940.51	3090.86
SNL-02	CUL	3323.06	09/17/07	07:38	248.00	0.00	248.00	75.59	3075.06	937.28	3077.29
SNL-03	CUL	3488.95	09/17/07	13:45	413.85	0.00	413.85	126.14	3075.10	937.29	3087.41
SNL-05	CUL	3379.98	09/17/07	07:20	302.70	0.00	302.70	92.26	3077.28	937.95	3081.06
SNL-08	CUL	3555.73	09/18/07	08:00	536.95	0.00	536.95	163.66	3018.78	920.12	3042.97
SNL-09	CUL	3360.96	09/17/07	10:36	308.13	0.00	308.13	93.92	3052.83	930.50	3058.47
SNL-10	CUL	3377.59	09/17/07	10:12	323.72	0.00	323.72	98.67	3053.87	930.82	3054.16
SNL-12	CUL	3339.46	09/18/07	09:52	337.05	0.00	337.05	102.73	3002.41	915.13	3003.34
SNL-13	CUL	3294.22	09/18/07	11:51	284.70	0.00	284.70	86.78	3009.52	917.30	3015.89
SNL-15	CUL	3479.93	09/18/07	08:15	673.54	0.00	673.54	205.29	2806.39	855.39	2862.55
SNL-16	CUL	3133.00	09/17/07	09:07	121.50	0.00	121.50	37.03	3011.50	917.91	3012.71
SNL-17	CUL	3238.06	09/18/07	11:36	230.71	0.00	230.71	70.32	3007.35	916.64	3007.46
SNL-18	CUL	3375.44	09/17/07	12:56	297.58	0.00	297.58	90.70	3077.86	938.13	3081.65
SNL-19	CUL	3222.65	09/17/07	07:51	146.13	0.00	146.13	44.54	3076.52	937.72	3077.98
WIPP-11	CUL	3427.78	09/17/07	12:00	359.29	0.00	359.29	109.51	3068.49	935.28	3087.41
WIPP-13	CUL	3405.67	09/17/07	11:27	340.90	0.00	340.90	103.91	3064.77	934.14	3083.37
WIPP-19	CUL	3435.11	09/19/07	08:48	387.79	0.00	387.79	118.20	3047.32	928.82	3070.22
WIPP-30 (PIP)	CUL	3429.23	09/17/07	12:25	346.80	0.99	345.81	105.40	3083.42	939.83	3090.87
WQSP-1	CUL	3419.43	09/19/07	09:25	356.02	0.18	355.84	108.46	3063.59	933.78	3077.89
WQSP-2	CUL	3464.07	09/19/07	09:00	395.50	0.20	395.30	120.49	3068.77	935.36	3085.94
WQSP-3	CUL	3480.33	09/19/07	08:21	461.19	0.19	461.00	140.51	3019.33	920.29	3075.17
WQSP-4	CUL	3433.27	09/19/07	06:50	442.89	0.18	442.71	134.94	2990.56	911.52	3010.71
WQSP-5	CUL	3384.58	09/19/07	06:40	378.68	0.20	378.48	115.36	3006.10	916.26	3011.81
WQSP-6	CUL	3364.91	09/19/07	06:15	343.53	0.19	343.34	104.65	3021.57	920.97	3024.11
C-2737 (ANNULUS)	MAG	3400.76	09/16/07	10:56	255.11	0.00	255.11	77.76	3145.65	958.79	*
H-02b1	MAG	3378.49	09/18/07	13:54	235.56	0.00	235.56	71.80	3142.93	957.97	*
H-03b1	MAG	3390.72	09/19/07	07:50	243.90	0.00	243.90	74.34	3146.82	959.15	*
H-04c	MAG	3334.28	09/18/07	13:26	187.57	0.00	187.57	57.17	3146.71	959.12	*
H-06c	MAG	3348.69	09/17/07	10:55	279.36	0.00	279.36	85.15	3069.33	935.53	*
H-08a	MAG	3433.28	09/18/07	11:00	405.87	0.00	405.87	123.71	3027.41	922.75	*
H-09c (ANNULUS)	MAG	3407.05	09/18/07	10:20	270.31	0.00	270.31	82.39	3136.74	956.08	*
H-10a	MAG	3688.45	09/18/07	09:14	465.15	0.00	465.15	141.78	3223.30	982.46	*
H-11b2	MAG	3411.86	09/18/07	12:51	273.00	0.00	273.00	83.21	3138.86	956.72	*
H-14	MAG	3347.08	09/18/07	12:13	208.99	0.00	208.99	63.70	3138.09	956.49	*
H-15	MAG	3480.89	09/19/07	11:49	357.27	0.00	357.27	108.90	3123.62	952.08	*
H-18	MAG	3414.21	09/17/07	11:15	268.31	0.00	268.31	81.78	3145.90	958.87	*

Waterlevel Measurements
For
September 2007

WELL NUMBER	ZONE	CASING ELEVATION ft amsl (1)	DATE	TIME (MST)	DEPTH TO WATER ft	ADJUST TO TOC ft	ADJUSTED DEPTH TOC ft	ADJUSTED DEPTH METERS	WATER LEVEL ELEVATION ft amsl	ELEVATION IN METERS amsl	ADJUSTED FRESHWATER HEAD ft amsl
WIPP-18	MAG	3457.57	09/19/07	08:55	308.00	0.00	308.00	93.88	3149.57	959.99	*
WIPP-30 (ANNULUS)	MAG	3430.22	09/17/07	12:26	306.15	0.00	306.15	93.31	3124.07	952.22	*

Waterlevel Measurements
For
September 2007

WELL NUMBER	ZONE	CASING ELEVATION ft amsl (1)	DATE	TIME (MST)	DEPTH TO WATER ft	ADJUST TO TOC ft	ADJUSTED DEPTH TOC ft	ADJUSTED DEPTH METERS	WATER LEVEL ELEVATION ft amsl	ELEVATION IN METERS amsl	ADJUSTED FRESHWATER HEAD ft amsl
WQSP-6a	DL	3364.06	09/19/07	06:25	167.19	0.26	166.93	50.88	3197.13	974.49	*
CB-1 (PIP)	B/C	3328.80	09/18/07	12:08	597.27	0.00	597.27	182.05	2731.53	832.57	*
DOE-2	B/C	3419.64	09/17/07	11:46	726.28	0.00	726.28	221.37	2693.36	820.94	*
C-2505	SR/D	3413.05	09/19/07	14:27	43.09	0.00	43.09	13.13	3369.96	1027.16	*
C-2506	SR/D	3412.87	09/19/07	14:25	42.51	0.00	42.51	12.96	3370.36	1027.29	*
C-2507	SR/D	3410.01	09/19/07	14:32	42.98	0.00	42.98	13.10	3367.03	1026.27	*
C-2811	SR/D	3399.10	09/19/07	10:51	52.03	0.00	52.03	15.86	3347.07	1020.19	*
PZ-01	SR/D	3413.41	09/19/07	14:35	40.15	0.00	40.15	12.24	3373.26	1028.17	*
PZ-02	SR/D	3413.42	09/19/07	14:23	40.43	0.00	40.43	12.32	3372.99	1028.09	*
PZ-03	SR/D	3416.15	09/19/07	14:20	41.86	0.00	41.86	12.76	3374.29	1028.48	*
PZ-04	SR/D	3412.10	09/19/07	14:40	43.49	0.00	43.49	13.26	3368.61	1026.75	*
PZ-05	SR/D	3415.31	09/19/07	14:14	40.11	0.00	40.11	12.23	3375.20	1028.76	*
PZ-06	SR/D	3413.49	09/19/07	14:08	41.32	0.00	41.32	12.59	3372.17	1027.84	*
PZ-07	SR/D	3413.99	09/19/07	10:00	35.52	0.00	35.52	10.83	3378.47	1029.76	*
PZ-08	SR/D	3418.27	09/19/07	10:25	62.68	0.00	62.68	19.10	3355.59	1022.78	*
PZ-09	SR/D	3421.21	09/19/07	10:09	56.28	0.00	56.28	17.15	3364.93	1025.63	*
PZ-10	SR/D	3405.80	09/19/07	10:45	33.51	0.00	33.51	10.21	3372.29	1027.87	*
PZ-11	SR/D	3418.95	09/19/07	09:42	43.43	0.00	43.43	13.24	3375.52	1028.86	*
PZ-12	SR/D	3408.99	09/19/07	10:37	49.27	0.00	49.27	15.02	3359.72	1024.04	*
SNL-06	CUL	3646.11	09/18/07	06:40	898.17	0.00	898.17	273.76	2747.94	837.57	*

(1) Top of casing elevations are from September - November 2006 survey of all network wells by Pyeatt's surveying, Carlsbad, New Mexico.

* Density data not acquired, therefore adjusted freshwater head measurements cannot be calculated for these wells.

New Mexico l ronment Department
Ground Wat _ uality Bureau

Memorandum of Meeting or Phone Conversation

Memorandum of Meeting or Phone Conversation

☒ Telephone ☐ Meeting	Time: 10:45 am	Date: July 10, 2007

Individuals Involved

Jody Plum, Stewart Jones WIPP	☐ called	Clint Marshall
	☐ returned call to	
	☒ teleconference	
	☐ other:	

Subject: Additional Salt to be put in Cell A

Discussion:

Jody and Stewart called as a follow-up to the June 27 letter stating the possible need to put additional salt in Cell A. The current capacity is 330,000 tons. They may have to add an additional 70,000 tons but will not know until September. They are having difficulty finding a contractor to build Cell B. I told them that even though the design is in their DP application, the permit only regulates the amount of runoff going to the collection ponds. Therefore, they do not need to amend or modify the permit.

Conclusions:

WIPP will send us notification if they have to put additional salt in Cell A.

Distribution: File DP-831

Initialed CM

01535

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUN 2 7 2007

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Dr.
Santa Fe, NM 87502

RECEIVED
JUL 03 2007
BY:

Subject: Request for an Increase of Salt Storage Capacity in Cell A of the Salt Storage Extension, Discharge Permit 831

Dear Mr. Marshall:

The purpose of this letter is to notify the NMED of the need to increase the total capacity of Cell A of the Salt Storage Extension. Because the capacity of Cell A is listed in our Discharge Permit Application, your authorization is required before we can implement this increase. Specifically, in the *Waste Isolation Pilot Plant Conceptual Design For Infiltration Controls*, Attachment A, Table A.2 of the Discharge Permit Modification Application dated April 24, 2003, the capacity of Cell A of the Salt Storage Extension was noted as 330,000 tons and the capacity of Cell B was noted as 450,000 tons. The 330,000 ton capacity for Cell A was estimated at the convenience of the Permittees based on the height of the new salt storage extension area being slightly higher than the capped Salt Storage Area. The capacity of Cell A, as designated in the Discharge Permit Application, was not based on regulatory, safety or other technical requirements. Authorizing the Department of Energy to add additional salt in Cell A will have no impact on the maintenance and safe operation of the Salt Storage Extension or the volume of storm-water managed in the Salt Storage Extension Evaporation Pond.

The reason for this request to add additional salt to Cell A is due to difficulties in obtaining a contractor to complete the construction of Cell B. Contracting efforts began last February when the first request for proposals was issued. In May, a second request for proposal was sent out to a broader group of prospective bidders due to the lack of adequate response to the first solicitation. A proposal has been received and we intend to award a contract and mobilize the contractor; however, we need authorization to add an approximate 70,000 tons of additional salt to Cell A to support WIPP mining operations for approximately 20 weeks.

If you have any questions, concerns or would like to discuss this subject, please contact me at (505) 234-7462. Your concurrence in this matter would be appreciated.

Sincerely,

Harold Johnson for

H. L. "Jody" Plum
RCRA Program Manager

cc:
S. Zappe, NMED
J. Keiling, NMED

CBFO:AMO:JP:KJB:07-0480:UFC5486

State of New Mexico
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
(505) 827-2918 phone
(505) 827-2965 fax

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Waste Isolation Pil
US Dept. of Energy
P.O. Box 3090
New Mexico

7004 0750 0001 3214 6983

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

May 14, 2007

Mr. H. L. Plum, RCRA Program Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Approval of SPDV Pile Shallow Groundwater Investigation Work Plan, Waste Isolation Pilot Plant, DP-831,U.S. Department of Energy

Dear Mr. Plum:

The Ground Water Quality Bureau of theNew Mexico Environment Department (NMED) has reviewed the report titled, *SPDV Pile Shallow Groundwater Investigation Work Plan (Revision 2)*, submitted on May 7, 2007. The report includes a response to NMED comments provided to DOE dated March 28, 2007. NMED finds the response acceptable and hereby approves the revised work plan.

If you have any questions, please contact me at 505-827-0027.

Sincerely,

Clint Marshall

Clint Marshall, Hydrogeologist
Mining Environmental Compliance Section
Ground Water Quality Bureau

cc: Mary Ann Menetrey, Program Manager, MECS (encl)
Carlos Romero, District Manager, NMED District 4, Roswell (encl)
James Smith, HPM, Carlsbad Field Office (encl)

GROUND WATER

MAY 10 2007

BUREAU

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAY 07 2007

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Transmittal of Work Plan for Installation of Three Piezometers around the Site and Preliminary Design Validation Salt Tailings Disposal Pile

Dear Mr. Marshall:

This letter transmits to you, our responses to your comments in a letter dated March 28, 2007. In addition, is the updated work plan and schedule for the investigation to detect shallow groundwater, if present, at the Waste Isolation Pilot Plant Salt and Preliminary Design Validation for your approval.

Please provide approval at your earliest convenience so we can begin the subcontractor procurement process.

If you have any questions, you may contact me at 505-234-7462.

Sincerely,

H. L. Plum
RCRA Program Manager

Enclosure

cc: w/enclosure
S. Zappe, NMED *ED
D. Foster, NMED OS ED

cc: w/o enclosure
J. Bearzi, NMED ED
J. Kieling, NMED ED
W. Olsen, NMED ED
*ED denotes electronic distribution

CBFO:AMO:HLP:KJB:07-0460:UFC5486

Response to NMED GWQB Comments
Dated March 28, 2007

1) **NMED GWQB Comment #1:** Upon reviewing potentiometric data for the shallow subsurface water (SSW) at the WIPP site, NMED requires that the location of the piezometers be adjusted. The latest monitoring data suggests that the piezometric surface for the SSW dips eastward or slightly southeastward. Therefore, the piezometer located on the west side of the SPDV Pile should be moved northward toward the northwest corner. The piezometer on the east side of the pile should be moved southward toward the southeast corner. This configuration will be better suited for upgradient and downgradient monitoring of the SSW with respect to the SPDV Pile.

   Answer: The piezometers were moved as previously discussed with Mr. Marshall on or about March 29, 2007. Figure 2 shows the revised locations.

2) **NMED GWQB Comment #2:** Please provide more detail of the screening of a wet zone if it is not found at the Santa Rosa/Dewey Lake (SR/DL) contact. Please provide additional discussion as to whether the well will be advanced to the contact if a wet zone is found above the contact.

   Answer: This comment suggests that SSW might be detected above the SR/DL. If so, a decision will have to be made as how to place well screen across this perched water. The text now shows three options for screening the well: (a) If a wet zone suspected of being SSW is detected and is not associated with the SR/DL contact, the well screen will be placed in this interval and the borehole (which will have been drilled to the SR/DL contact) will be backfilled with cement to the bottom of the PVC sump (b) If a moist or wet zone had been identified above the contact, the well screen length will be increased from the bottom up to intercept this water, to a maximum of 30 feet. (c) If a moist zone of shallow groundwater is not identified, the well screen will be placed across the sulfate cementation zone or SR/DL contact where shallow groundwater should be perched.

3) **NMED GWQB Comment #3:** An appropriate sand pack must be used to accommodate the larger screen slot size proposed in the well design.

   Answer: The 10/20 grade sand pack/filter is appropriately sized for the screen size and the formation. The Santa Rosa Formation and Dewey Lake are medium grained. Medium to coarse grained sand is about 0.02 to 0.04 inches. A 10/20 filter pack is gradational between sieve sizes 0.065" (#10), 0.046"(#14), 0.033"(#20). The goal is to have 70% of the fines retained by the filter pack and 90% of the filter pack retained by the screen (general rule). The filter pack should all be retained by the screen as the sieve sizes are all larger than the screen. Based on the Santa Rosa and Dewey Lake we should be able to retain 70% of the finer sediment, but this is qualitative as there are no available sieve analyses.

4) **NMED GWQB Comment #4:** Section 2.1.1 states the wells will be advanced five feet below the SR/DL contact. However, Section 2.1.2 and Figure 5 indicate a one-foot sump below the screen. Please provide clarification on this discrepancy.

   Answer: Whereas five feet of this contact layer will have been penetrated to verify it, a partial cement backfill of the perching layer with cement will protect its integrity. The one foot PVC sump will leave room for approximately four feet of cement.

5) **NMED GWQB Comment #5:** NMED is concerned that backfilling the sump with bentonite without interfering with the base of the screen will be difficult. Please provide additional information on how this will be accomplished.

   Answer: The work plan has been changed to use (pre-measured) cement placed by tremmie pipe.

6) **NMED GWQB Comment #6:** Section 2.1.4 states that piezometers that do not produce water within six months will be considered for plugging and abandonment. NMED requires that the piezometers stay open for a minimum of two years. The DOE must obtain NMED approval prior to well abandonment.

   Answer: The text has been revised to state: Each well in which water is found will then be incorporated into the quarterly water level monitoring program and semiannual sampling program as defined by DP-831. If water is not detected, the wells will be incorporated into the quarterly water-level monitoring program only. If no water is detected within two years after installation, discussions will be held with the NMED GWQB to determine if the well can be plugged and abandoned.

SPDV Pile Shallow Groundwater Investigation Work Plan

U.S. Department of Energy

Revision 2

May 2007

This document supersedes DOE/WIPP 06-3340, Rev. 1.

Processing and final preparation of this document was performed by Washington TRU Solutions LLC, the Waste Isolation Pilot Plant (WIPP) management and operating (M&O) contractor under U.S. Department of Energy contract number DE-AC29-01AL66444.

This document has been submitted as required to:

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Additional information about this document may be obtained by calling (800) 336-9477.
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ABBREVIATIONS AND ACRONYMS

BDR	Basic Data Report
bgs	below ground surface
DOE	U.S. Department of Energy
DP-831	Discharge Permit 831
GWQB	Ground Water Quality Board
M&O	Management and operating (contractor)
NMED	New Mexico Environment Department
NMOSE	New Mexico Office of the State Engineer
pH	Measure of acidity or alkalinity
PVC	polyvinyl chloride
SPDV	Site and Preliminary Design Validation
SPEP	Salt Pile Evaporation Pond
SSA	Salt Storage Area
SSE	Salt Storage Extension
SSW	Shallow Subsurface Water
WIPP	Waste Isolation Pilot Plant

1.0 BACKGROUND

The Waste Isolation Pilot Plant (WIPP), located 26 miles east of Carlsbad, New Mexico (Figure 1), is a transuranic waste disposal facility operated by the U.S. Department of Energy (DOE). Transuranic waste is disposed in the Salado Formation, a bedded salt deposit, 2,150 feet below ground surface. Salt and other mined rock materials from the construction of WIPP and currently mined salt are stored on the surface in three stockpiles. The stockpiles include, from oldest to newest, the Site and Preliminary Design Validation (SPDV) pile closed in 2000 with an engineered cover, the Salt Storage Area (SSA), previously used for mined salt and materials, but recently covered with a synthetic and earthen liner, and the Salt Storage Extension (SSE) for currently mined salt. Storm water from these stockpiles discharges to five synthetically lined impoundments (Salt Pile Evaporation Pond [SPEP], Pond A, Salt Storage Extension Evaporation Basin, Pond 1, and Pond 2 [Figure 2]) are included in the Discharge Permit 831 (DP-831) as discharge locations.

Shallow Subsurface Water (SSW) was first detected in 1995 when a video inspection of the Exhaust Shaft detected seepage through the shaft liner from about 50 to 80 feet below ground surface (bgs). After 1995, a series of hydrologic assessments was undertaken to identify the source and nature of the SSW at WIPP. Sixteen wells were installed around the site (Figure 2) to assess the SSW. The SSW was detected in all but one well, PZ-8, which was dry until March 2007. The SSW is a shallow-perched, water-bearing zone that sits on a cementation change at the formational contact between the Santa Rosa Formation and the upper Dewey Lake Formation. The SSW is believed to be entirely anthropogenic in nature, resulting in part from historical natural discharges from locations identified in the above paragraph and DP-831.

In December 2003 the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) issued a modified DP-831 indicating that the unlined ponds and stockpiles be lined with a synthetic liner: SSA and SPEP, Ponds 1 and 2, Pond A. Additionally, a new SSE was to be constructed with a synthetically lined base on which infiltration and surface run off from this pile would be directed to a new evaporation basin. Also included in this modification was to implement a monitoring program of the SSW that included quarterly water level measurements from all the SSW wells and semiannual sampling of selected SSW wells for total dissolved solids, chloride, sulfate, nitrate, chromium, and selenium. This program was implemented in May 2004 and continues to date.

On December 29, 2006, the NMED GWQB issued another DP-831 modification with a condition that the SPDV be investigated as a possible source of shallow groundwater. The modification indicated the WIPP should install three monitoring wells adjacent to the SPDV. These wells are then to be incorporated into the SSW monitoring and sampling program.

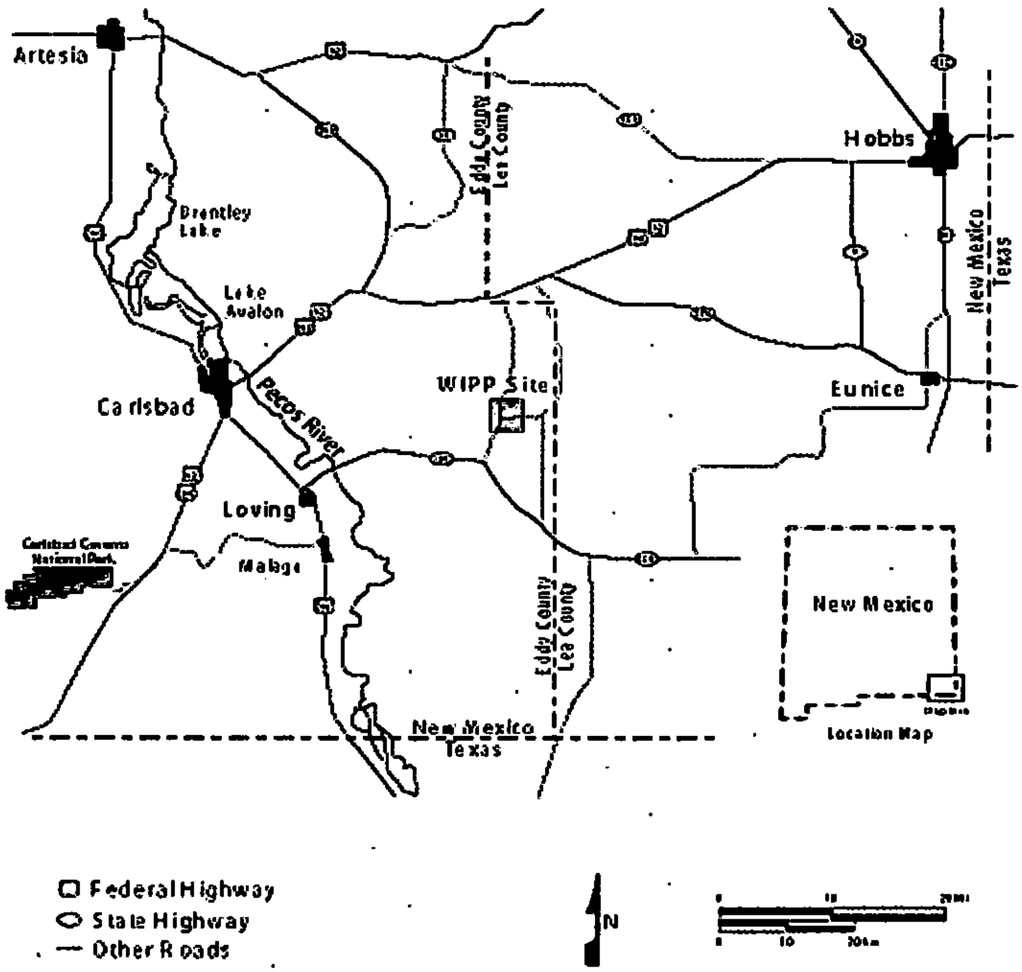

Figure 1 - Carlsbad-WIPP Area Map

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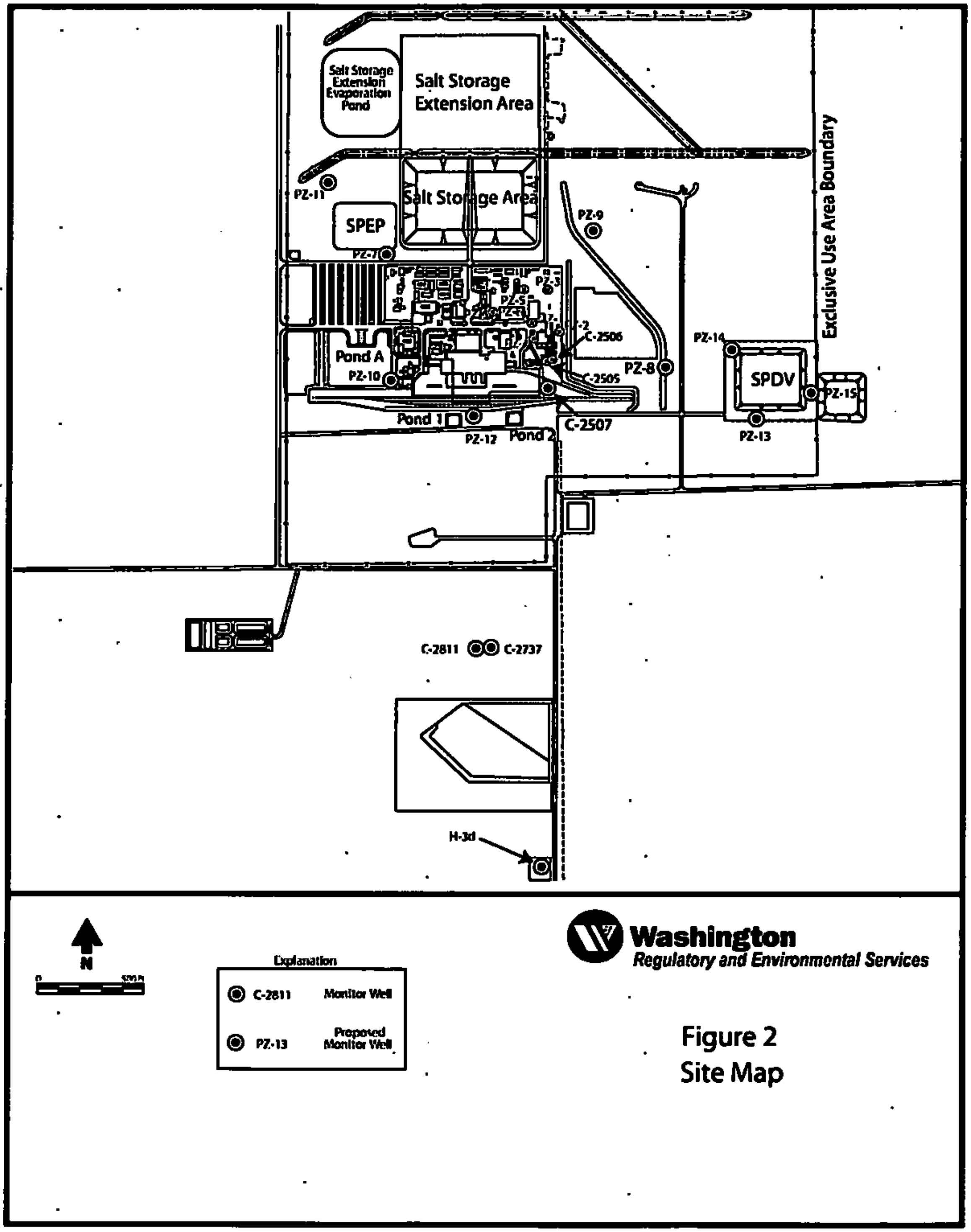


Washington
Regulatory and Environmental Services

Figure 2
Site Map

2.0 SCOPE AND PURPOSE

The purpose of this Work Plan is to describe the proposed locations of three small-diameter monitoring wells, the logging of the boreholes, and the planned methodology of installing these wells. The SPDV (Figure 2) is a closed salt pile that stored the materials drilled from the site preliminary design activities at WIPP. The pile includes salt from the Salado Formation and substrata from overlying formations: Rustler Formation, Dewey Lake Formation, Santa Rosa Formation and Gatuna Formation.

The SPDV was closed in 2000 by covering it with geosynthetic liner installed on six inches of bedded material and covered with a minimum of three feet of earthen material. The plan is to install three 2-inch-diameter wells around the SPDV outside the liner footing as indicated in Figure 3 (PZ-13, PZ-14, PZ-15). The purpose is to identify the presence, if any, of shallow groundwater around the SPDV, and if present, the quality of the water. This work plan has some areas in which the installation of the piezometers deviate from the NMED guidance entitled *"NMED Guidelines for Monitoring Well Construction and Abandonment"*. Where there is a deviation it is called out in this plan requesting approval. By approving this work plan the NMED approves these deviations; therefore there will not be additional approval processes necessary.

2.1 Methodology

2.1.1 Drilling and Lithologic Sampling

Drilling the boreholes will be performed using dry drilling techniques in order to identify the cementation change and if there is a discernable "wet zone" consisting of shallow groundwater from the SPDV or other area. Hollow-stem auger drilling will be the preferred method to drill using continuous sampling of the formations. If auger refusal should occur, then air rotary drilling will be used. Under no circumstances will water, mist, or other drilling fluids be used while drilling these wells, as it is imperative that a wet zone be discernable if present. Continuous sample tubes will be used to obtain lithologic data on the formations. Where sample tubes cannot be used, drill cuttings will be used to define formations. Lithology will be described for each well borehole to assist in well design. A core log will be kept (Figure 4) at five-foot intervals or formation changes, whichever is more frequent, and the following will be recorded:

- Lithology, establishing mineralogy/composition of rock
- Texture: grain shape and roundness, sorting, fabric and color
- Structure, if any
- Moisture
- Consolidation

Each borehole will be drilled such that the outer diameter of the borehole is at least 6 inches in diameter (four inches larger than the well screen and casing). The depth is uncertain, but is expected to be no greater than 100 feet bgs. Each borehole will extend approximately 5 feet below the Santa Rosa/Dewey Lake contact where the sulfate cementation change occurs, to verify the contact, or to 100 feet, whichever is greater.

Based on other SSW wells and associated lithologic descriptions, the contact is expected to be between 65 and 70 feet bgs (Figure 5).

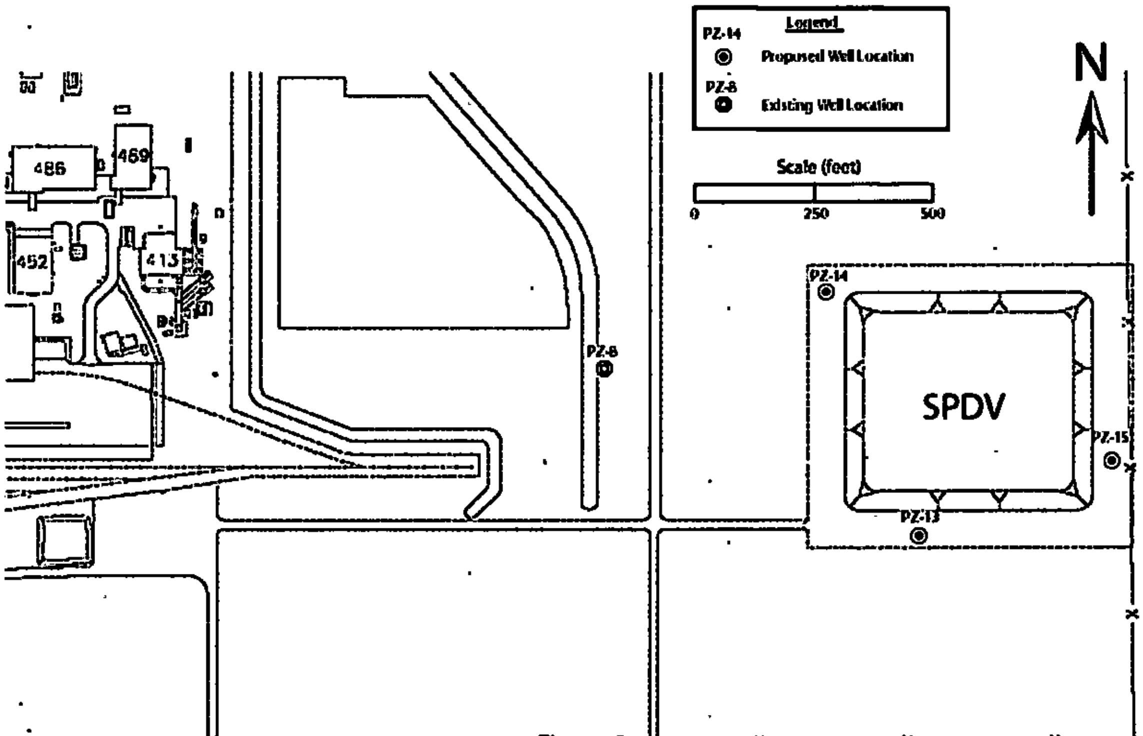


Figure 3
Site Preliminary Design Validation (SPDV) Pile With Identified Proposed Piezometer Locations

CORE LOG			Sheet 1 of ____
Hole ID:	Location:		
Drill Date: Drill Crew:	Drill Method: Hole Diameter: Hole Depth: Hole Orient:	Drill Make/Model: Barrel Specs: Drill Fluid: Core Preserv:	
Logged by:	Date:	Scale:	
	Northing	Easting	Elevation
Survey Coordinate: (Ft)			
Comments:			

Run Number	Depth ( )	% Recovered	RQD	Profile (Rock Type)	Description	Remarks

Figure 4 - Core Log

2.1.2 Well Construction

The wells will be constructed of two-inch, schedule 40 polyvinyl chloride (PVC) extending approximately two feet above ground surface. The span of the screened interval will be dependent upon the identification of the wet zone.

If a wet zone or SSW is identified that is not associated with a cementation change at the Santa Rosa/Dewey Lake contact, or if this contact has not been found within 100 feet of ground surface, the bottom of the screen will be placed at the base of the moist or wet zone with a one-foot PVC sump, 15 feet of screen above this location, and casing to the surface. This construction would include backfilling the borehole with cement to the bottom elevation of the sump.

If a moist or wet zone is identified above the Santa Rosa/Dewey Lake contact, the bottom of the screen will be placed at the base of the Santa Rosa/Dewey Lake contact and the screen length will be increased from the bottom up, to intercept that water, to a maximum of 30 feet. This will apply whether or not moisture was detected at the Santa Rosa/Dewey Lake contact.

If a moist zone of shallow groundwater is not identified, the base of the well screen will be placed across the sulfate cementation or Santa Rosa/Dewey Lake contact where shallow groundwater should be perched.

The well screen will be constructed of two-inch, schedule 40, slotted PVC to 0.020-inch. The well will be completed with sand annulus, bentonite pellets, and cement based on the screen placement. Figure 5 represents typical construction for the SPDV wells.

In all cases above, the bottom of the well screen will have a one-foot sump. If the Santa Rosa/Dewey Lake contact, or some other feature impeding downward flow, is the reason for perched water, it is important not to perforate this apparent barrier. Therefore, the bottom of the borehole will be cemented back with tremmie pipe to the bottom of the one-foot PVC sump. The cement interval will be minimal if the screen is at the Santa Rosa Dewey Lake contact, but will be greater if the SSW is not associated with the cementation change and the well screen is to be placed higher. With this type of completion, there will be one foot of sand below the bottom of the slotted liner as compared to two feet described in the NMED guideline. Also, the well screen for the piezometers will be slotted at 0.020-inch screen versus 0.010-inch as defined in the guidance. This is based on knowledge of the sediments being a medium-grained sand.

2.1.3 Well Development

Each well will be allowed to rest for at least 24 hours to allow shallow groundwater to accumulate if present. Following this period of recharge the wells will be evacuated using air lifting and surge block techniques. The wells will be developed until the existing water reaches equilibrium through measurement of field parameters (pH, temperature, conductivity) or the removal of three well volumes has occurred. If no water accumulates, development will not occur, but the well will remain for future water level monitoring.

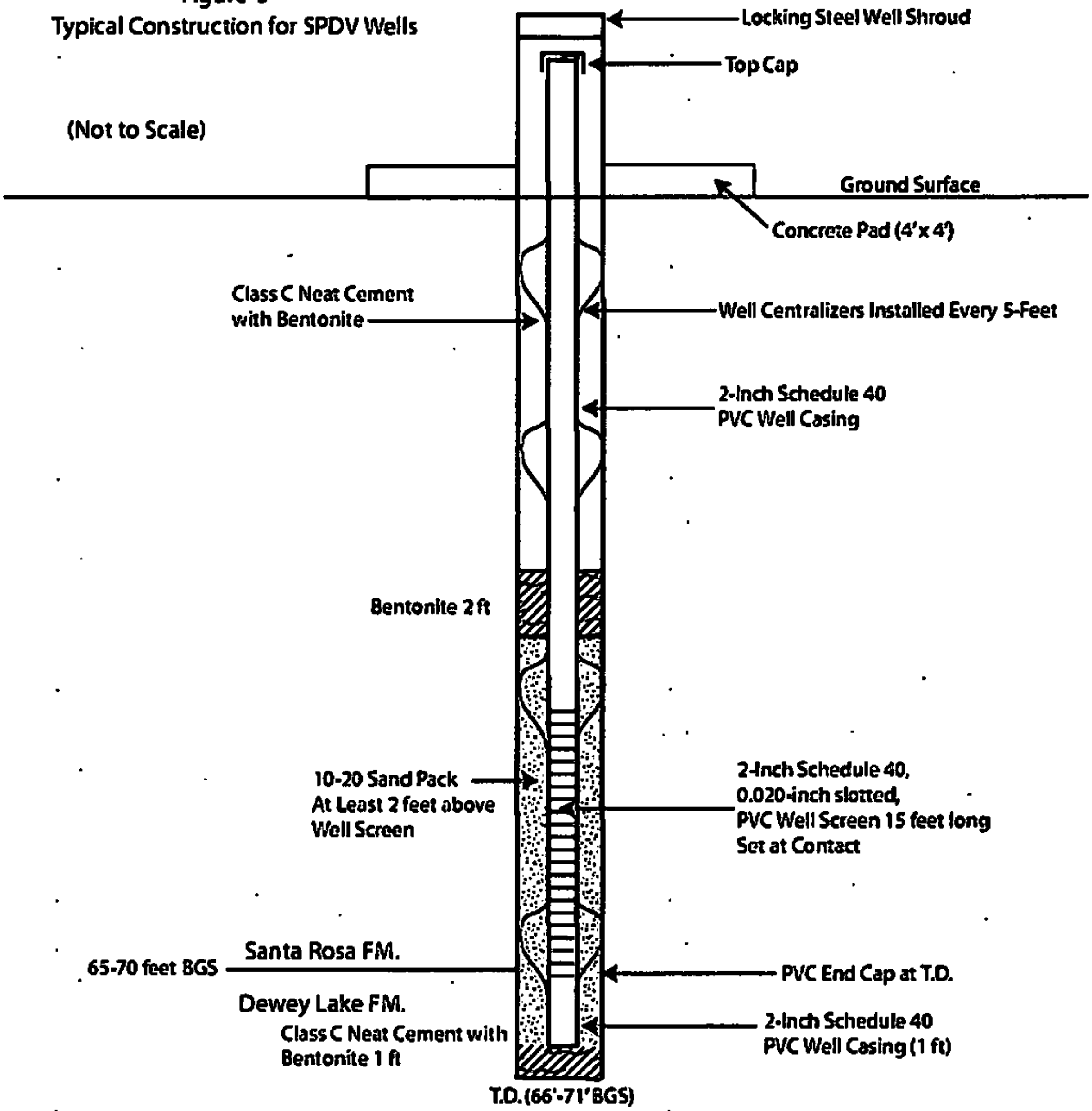
2.1.4 Well Sampling

If water is detected in the wells, sampling will occur following development. Low-flow sampling techniques will be used to purge the well. Continuous monitoring of purge water will occur using a flow through cell. Field parameters will consist of pH, temperature, and conductivity. A sample will be obtained after three consecutive readings for each parameter fall within the sampling criteria: ± 0.5 pH units, ± 10% temperature, and ± 10% conductivity. The samples will be laboratory analyzed for total dissolved solids, chloride, sulfate, nitrate, chromium, and selenium as defined in DP-831.

Each well in which water is found will then be incorporated into the quarterly water level monitoring program and semiannual sampling program as defined by DP-831. If water is not detected, the wells will be incorporated into the quarterly water-level monitoring program only. If no water is detected within two years after installation, discussions will be held with the NMED GWQB to determine a path forward.

Figure 5
Typical Construction for SPDV Wells

(Not to Scale)



3.0 REPORTING

A basic data report (BDR) will be developed for each well following the installation, receipt of any laboratory analyses, and survey of the well locations and top of casing elevations to a common benchmark. The BDR will summarize the geology, hydrology, well installations and construction. A discussion of encountered water in relation to SSW on-site, if any, will be included. Laboratory reports will be included in the BDR with a discussion of the relationship to SSW, if any. Well reports filed with the New Mexico Office of the State Engineer (NMOSE) will be included in the BDR as well as well construction diagrams and lithologic logs. An updated site map with the SPDV wells will be provided with an updated potentiometric surface map.

3.1 Reporting in Accordance with DP-831 Permit Condition IV.10

After the piezometers are installed they will be incorporated into the quarterly water level monitoring program and semiannual sampling program. The DOE will submit the information gathered in semiannual monitoring reports due by the last day of January and July of each year as required in Condition 10 of the December 29, 2006, Discharge Permit Modification.

4.0 SCHEDULE

The following schedule estimates the dates that the wells will be installed and provides the necessary steps in the process.

Activity	Date of Activity
WIPP Receives Permit	December 29, 2006
Submit Work Plan and Schedule to NMED GWQB	March 29, 2007
Submit Applications to drill to the NMOSE	March 1, 2007
Receive Approval to drill from NMOSE	April 1, 2007
Coordination with the U.S. Bureau of Land Management	April 1, 2007
Procurement of Drilling Contractor	February 1, 2007
Receive Approval of Plan from NMED GWQB	April 29, 2007
Drilling Contractor Mobilization	June 1, 2007
Drill and Develop Wells	June 2-15, 2007
Sample Wells	June 22, 2007
Survey Wells/Get Data (Top of Casing)	June 16, 2007
Develop BDR	June 15 - September 15, 2007
Submit BDR to NMED GWQB	September 15, 2007

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State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
(505) 827-2918 phone
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US Dept. of Energy
PO Box 3090
Carlsbad, NM 882
PS Form 3800, June 2002

7004 0750 0001 3222 0935

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

March 28, 2007

Mr. H. L. Plum, RCRA Program Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Comments on the SPDV Pile Shallow Groundwater Investigation Work Plan, DP-831, Waste Isolation Pilot Plant

Dear Mr. Plum:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received the submittal titled, *SPDV Pile Shallow Groundwater Investigation Work Plan* (Work Plan) submitted March 28, 2007 from the U.S. Department of Energy (DOE). The Work Plan is required under Condition 4 of the December 29, 2006 Discharge Permit Modification, DP-831. NMED has reviewed the Work Plan and provides the following comments.

1. Upon reviewing potentiometric data for the shallow subsurface water (SSW) at the WIPP site, NMED requires that the location of the piezometers be adjusted. The latest monitoring data suggests that the piezometric surface for the SSW dips eastward or slightly southeastward. Therefore, the piezometer located on the west side of the SPDV Pile should be moved northward toward the northwest corner. The piezometer on the east side of the pile should be moved southward toward the southeast corner. This configuration will be better suited for upgradient and downgradient monitoring of the SSW with respect to the SPDV Pile.

2. Please provide more detail of the screening of a wet zone if it is not found at the Santa Rosa/Dewey Lake contact. Please provide additional discussion as to whether the well will be advanced to the contact if a wet zone is found above the contact.

3. An appropriate sand pack must be used to accommodate the larger screen slot size proposed

in the well design.

4. Section 2.1.1 states the wells will be advanced five feet below the Santa Rosa/Dewey Lake contact. However, Section 2.1.2 and Figure 5 indicate a one-foot sump below the screen. Please provide clarification on this discrepancy.

5. NMED is concerned that backfilling the sump with bentonite without interfering with the base of the screen will be difficult. Please provide additional information on how this will be accomplished.

6. Section 2.1.4 states that piezometers that do not produce water within six months will be considered for plugging and abandonment. NMED requires that the piezometers stay open for a minimum of two years. The DOE must obtain NMED approval prior to well abandonment.

Please respond to these comments within 30 days of receipt of this letter. If you have any questions regarding this approval, please call me at 505-827-0027.

Sincerely,

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau

xc: Steve Zappe, HWB
Carlos Romero, District Manager, NMED District 4, Roswell
James Smith, HPM, Carlsbad Field Office

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 2 8 2007

MAR 3 0 2007

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Transmittal of Work Plan for Installation of Three Piezometers around the Site and Preliminary Design Validation Salt Tailings Disposal Pile

Dear Mr. Marshall:

The purpose of this letter is to transmit a work plan, with schedule included, for an investigation to detect shallow groundwater, if present, at WIPP Site and Preliminary Design Validation Salt Tailings Disposal pile. According to DP-831, this plan requires your approval before we can proceed. This work plan has some areas in which the installation of the piezometers deviate from the NMED guidance entitled "*NMED Guidelines for Monitoring Well Construction and Abandonment*". Where there is a deviation it is called out in this plan requesting approval. Please provide any comments and/or your approval to me at your earliest convenience. We would like to initiate this work on May 2, 2007.

Please contact me at (505) 234-7462, if you have any questions or require additional information.

Sincerely,

H. L. Plum
RCRA Program Manager

Enclosure

cc:

J. Bearzi, NMED	*ED
J. Kieling, NMED	ED
W. Olsen, NMED	ED
S. Zappe, NMED	ED

*ED denotes electronic distribution

CBFO:AMO:HLP:KJB:07-0443:UFC5487

DOE/WIPP 06-3340

SPDV Pile Shallow Groundwater Investigation Work Plan

U.S. Department of Energy

Revision 1

March 2007

This document supersedes DOE/WIPP 06-3340, Rev. 0.

Processing and final preparation of this document was performed by Washington TRU Solutions LLC, the Waste Isolation Pilot Plant (WIPP) management and operating (M&O) contractor under U.S. Department of Energy contract number DE-AC29-01AL66444.

This document has been submitted as required to:

Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831
(865) 576-8401

Additional information about this document may be obtained by calling (800) 336-9477.
Copies may be obtained by contacting the National Technical Information Service,
U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22101.

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1.0 BACKGROUND

The Waste Isolation Pilot Plant (WIPP), located 26 miles east of Carlsbad, New Mexico (Figure 1), is a transuranic waste disposal facility operated by the U.S. Department of Energy. Transuranic waste is disposed in the Salado Formation, a bedded salt deposit, 2,150 feet below ground surface. Salt and other mined rock materials from the construction of WIPP and currently mined salt are stored on the surface in three stockpiles. The stockpiles include, from oldest to newest, the Site and Preliminary Design Validation (SPDV) pile closed in 2000 with an engineered cover, the salt storage area (SSA), previously used for mined salt and materials, but recently covered with a synthetic and earthen liner, and the Salt Storage Extension (SSE) for currently mined salt. Storm water from these stockpiles discharges to five synthetically lined impoundments (Salt Pile Evaporation Pond [SPEP], Pond A, Salt Storage Extension Evaporation Basin, Pond 1, and Pond 2 [Figure 2]) are included in the Discharge Permit 831 (DP-831) as discharge locations.

Shallow Subsurface Water (SSW) was first detected in 1995 when a video inspection of the Exhaust Shaft detected seepage through the shaft liner from about 50 to 80 feet below ground surface (bgs). After 1995, a series of hydrologic assessments was undertaken to identify the source and nature of the SSW at WIPP. Sixteen wells were installed around the site (Figure 2) to assess the SSW. The SSW was detected in all but one well, PZ-8, which continues to be dry to date. The SSW is a shallow-perched, water-bearing zone that sits on a cementation change at the formational contact between the Santa Rosa Formation and the upper Dewey Lake Formation. The SSW is believed to be entirely anthropogenic in nature, resulting in part from historical natural discharges from locations identified in the above paragraph and DP-831.

In December 2003 the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) issued a modified DP-831 indicating that the unlined ponds and stockpiles be lined with a synthetic liner: SSA and SPEP, Ponds 1 and 2, Pond A. Additionally, a new SSE was to be constructed with a synthetically lined base on which infiltration and surface run off from this pile would be directed to a new evaporation basin. Also included in this modification was to implement a monitoring program of the SSW that included quarterly water level measurements from all the SSW wells and semiannual sampling of selected SSW wells for total dissolved solids, chloride, sulfate, nitrate, chromium, and selenium. This program was implemented in May 2004 and continues to date.

On December 29, 2006, the NMED GWQB issued another DP-831 modification with a condition that the SPDV be investigated as a possible source of shallow groundwater. The modification indicated the WIPP should install three monitoring wells adjacent to the SPDV. These wells are then to be incorporated into the SSW monitoring and sampling program.

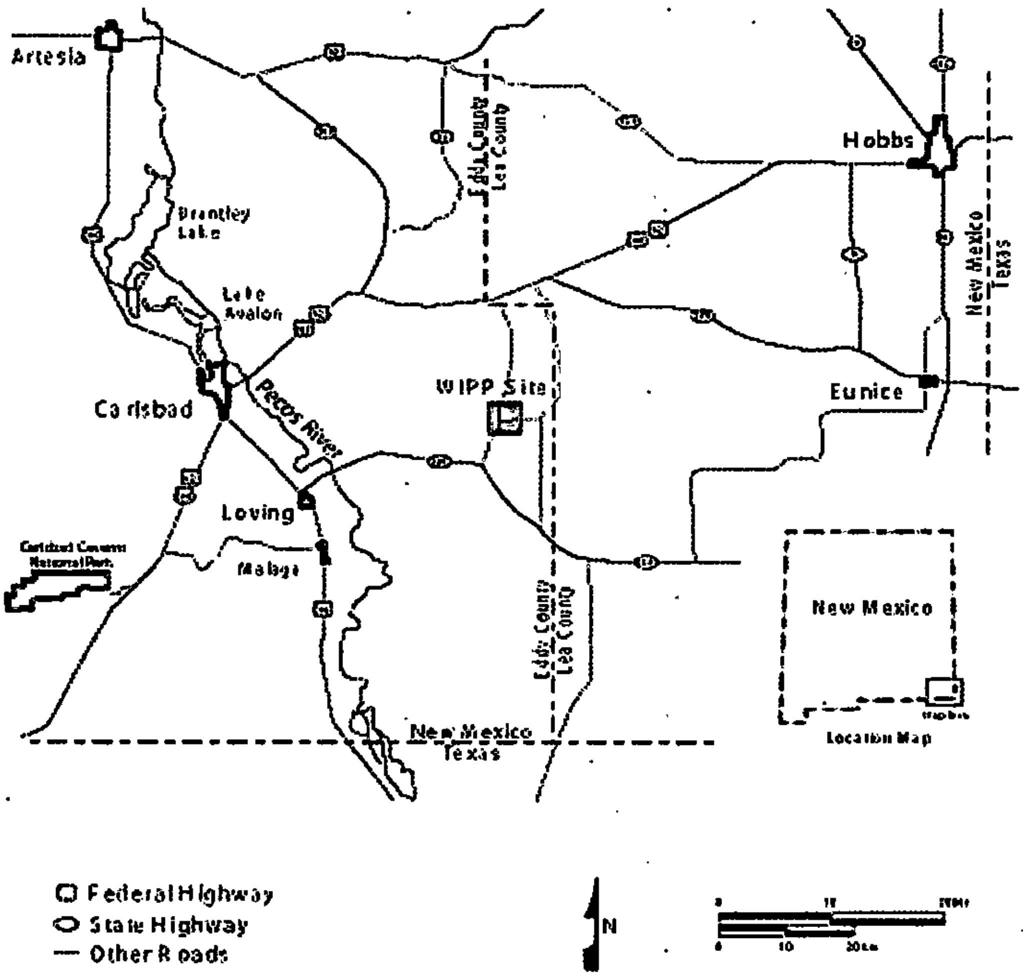
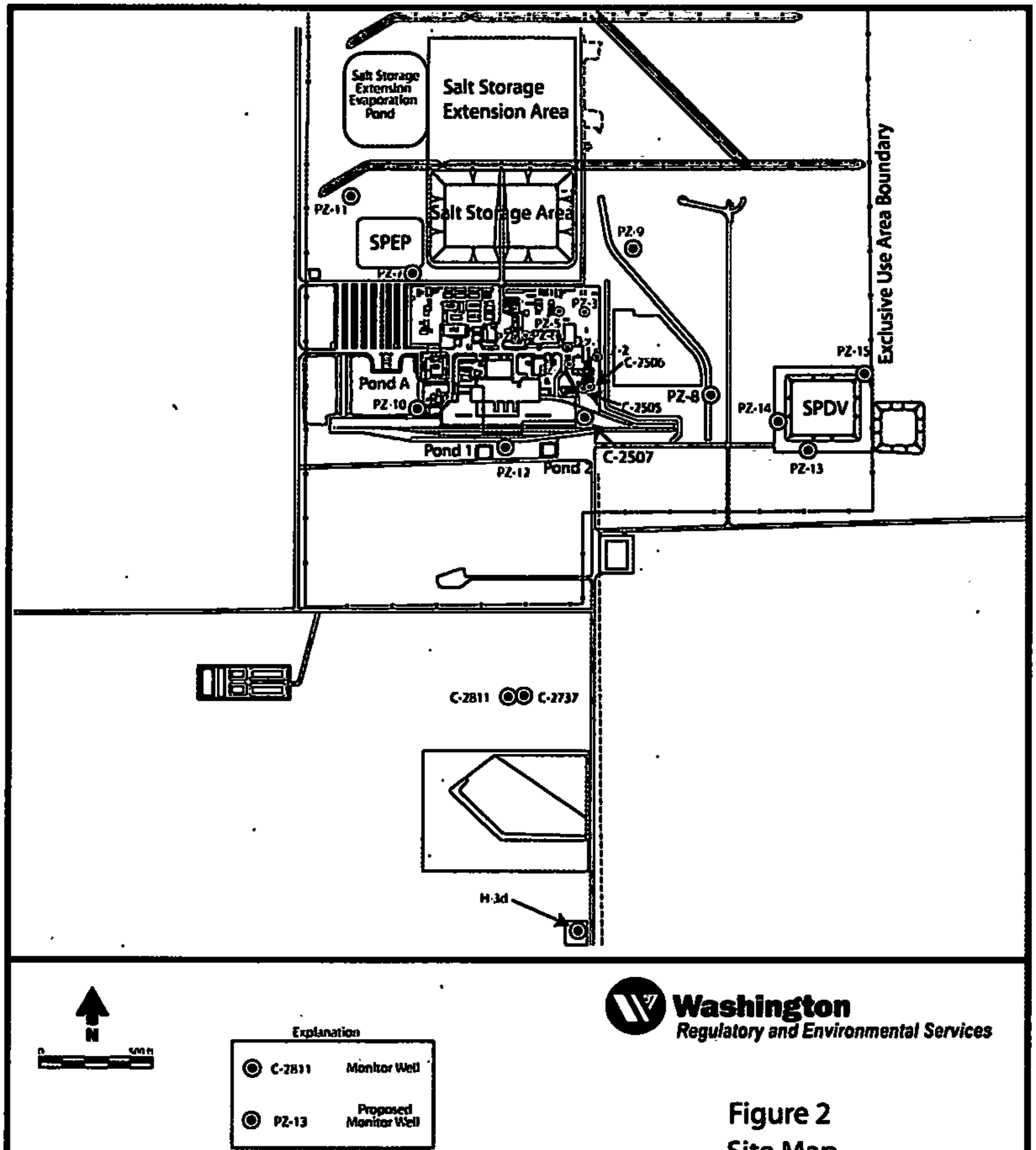


Figure 1 - Carlsbad-WIPP Area Map



Washington
Regulatory and Environmental Services

Figure 2
Site Map

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2.0 SCOPE AND PURPOSE

The purpose of this Work Plan is to describe the proposed locations of three small-diameter monitoring wells, the logging of the boreholes, and the planned methodology of installing these wells. The SPDV (Figure 2) is a closed salt pile that stored the materials drilled from the site preliminary design activities at WIPP. The pile includes salt from the Salado Formation and substrata from overlying formations: Rustler Formation, Dewey Lake Formation, Santa Rosa Formation and Gatuna Formation.

The SPDV was closed in 2000 by covering it with geosynthetic liner installed on six inches of bedded material and covered with a minimum of three feet of earthen material. The plan is to install three 2-inch-diameter wells around the SPDV outside the liner footing as indicated in Figure 3 (PZ-13, PZ-14, PZ-15). The purpose is to identify the presence, if any, of shallow groundwater around the SPDV, and if present, the quality of the water. This work plan has some areas in which the installation of the piezometers deviate from the NMED guidance entitled *"NMED Guidelines for Monitoring Well Construction and Abandonment"*. Where there is a deviation it is called out in this plan requesting approval. By approving this work plan the NMED approves these deviations; therefore there will not be additional approval processes necessary.

2.1 Methodology

2.1.1 Drilling and Lithologic Sampling

Drilling the boreholes will be performed using dry drilling techniques in order to identify the cementation change and if there is a discernable "wet zone" consisting of shallow groundwater from the SPDV or other area. Hollow-stem auger drilling will be the preferred method to drill using continuous sampling of the formations. If auger refusal should occur, then air rotary drilling will be used. Under no circumstances will water, mist, or other drilling fluids be used while drilling these wells, as it is imperative that a wet zone be discernable if present. Continuous sample tubes will be used to obtain lithologic data on the formations. Where sample tubes cannot be used, drill cuttings will be used to define formations. Lithology will be described for each well borehole to assist in well design. A core log will be kept (Figure 4) at five-foot intervals or formation changes, whichever is more frequent, and the following will be recorded:

- Lithology, establishing mineralogy/composition of rock
- Texture: grain shape and roundness, sorting, fabric and color
- Structure, if any
- Moisture
- Consolidation

Each borehole will be drilled such that the outer diameter of the borehole is at least 6-inches in diameter (four inches larger than the well screen and casing). The depth is uncertain, but is expected to be no greater than 100 feet bgs. Each borehole will extend approximately 5 feet below the Santa Rosa/Dewey Lake contact where the sulfate cementation change occurs to verify the contact and to serve as a sump to place the well casing. Based on other SSW wells and associated lithologic descriptions, the contact is expected to be between 65 and 70 feet bgs (Figure 5).

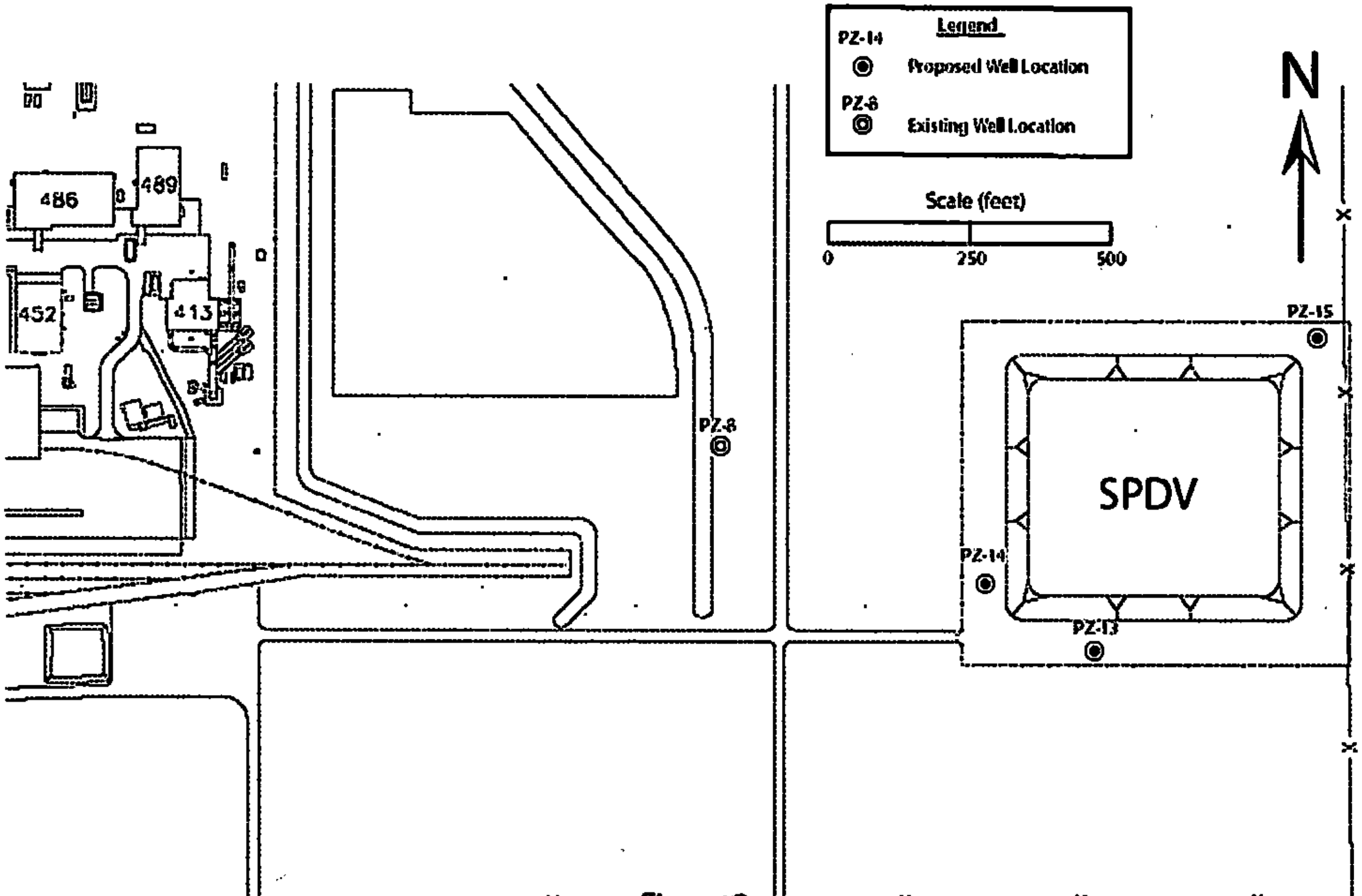


Figure 3
Site Preliminary Design Validation (SPDV) Pile With Identified Proposed Piezometer Locations

CORE LOG					Sheet 1 of ____	
Hole ID:	Location:					
Drill Date: Drill Crew:	Drill Method: Hole Diameter: Hole Depth: Hole Orient:			Drill Make/Model: Barrel Specs: Drill Fluid: Core Preserv.:		
Logged by:			Date:		Scale:	
	Northing		Easting		Elevation	
Survey Coordinate (Ft)						
Comments:						

Run Number	Depth ( )	% Recovered	RQD	Profile (Rock Type)	Description	Remarks

Figure 4 - Core Log

2.1.2 Well Construction

The wells will be constructed of two-inch, schedule 40 PVC extending approximately two feet above ground surface. The span of the screened interval will be dependent upon the identification of the wet zone. If a wet zone or SSW is identified, the screen will be placed at the location of the moist or wet zone with a one foot sump, 15 feet of screen above this location, and casing to the surface (Figure 5). If a moist zone of shallow groundwater is not identified, the well screen will be placed across the sulfate cementation zone where shallow groundwater should be perched. Well screen will be constructed of two-inch, schedule 40, slotted PVC to 0.020-inch. The well will be completed with sand annulus, bentonite pellets, and cement based on the screen placement. Figure 5 represents typical construction for the SPDV wells.

The well screen is planned to be placed at the contact of the cementation change at the Santa Rosa/Dewey Lake contact, with a one-foot sump. It is at this cementation change that shallow perched water resides at other on-site locations. The plan is to not drill much further beyond this change and plug back to the change with bentonite (Figure 5). With this type of completion there will not be 2 feet of sand below the bottom of the slotted liner as described in the NMED guideline. Also, the well screen for the piezometers will be slotted at 0.020-inch screen versus 0.010-inch as defined in the guidance. This is based on historical knowledge of the sediments and will assure adequate entrance velocity into the well from the formation and borehole.

2.1.3 Well Development

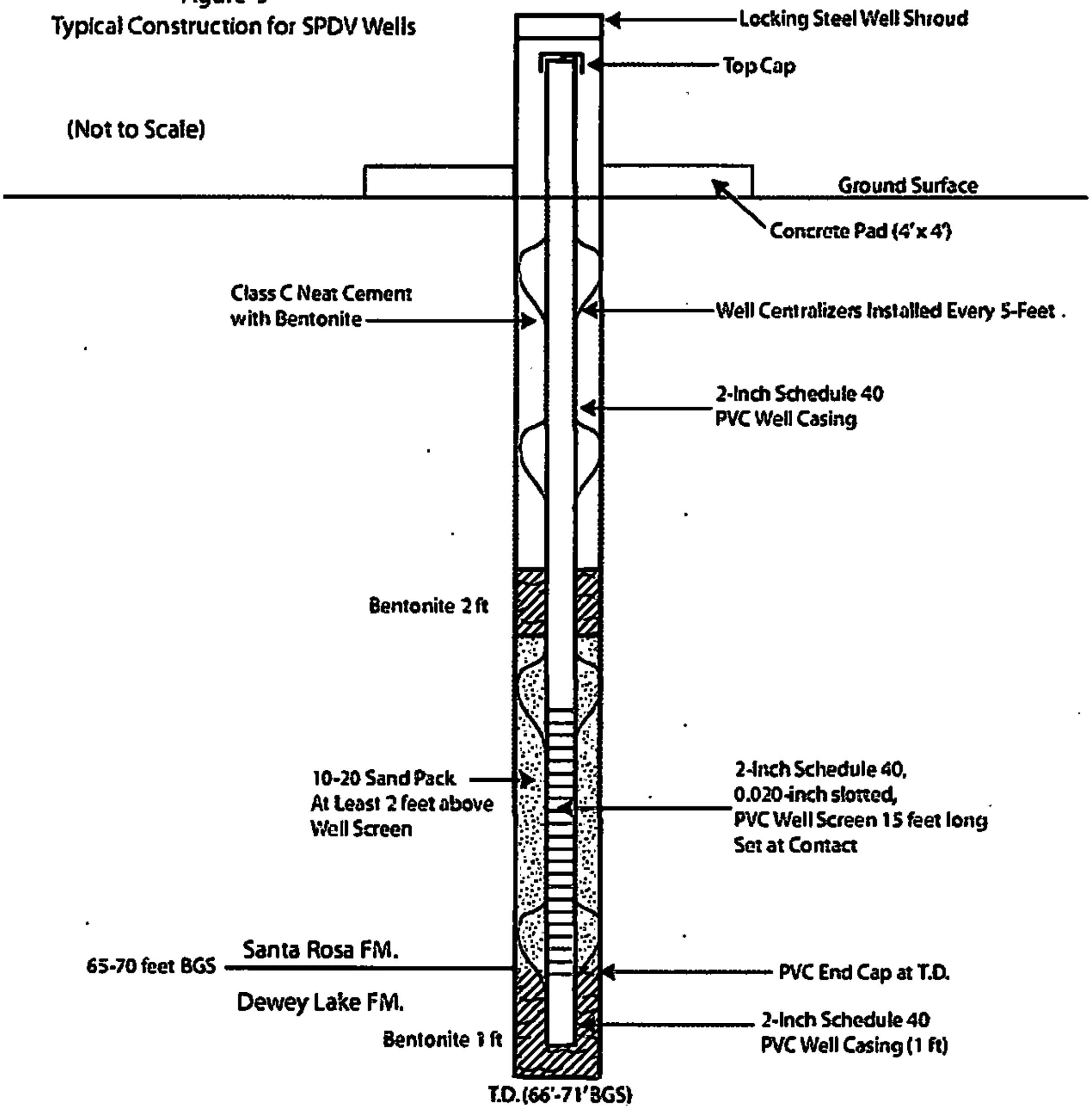
Each well will be allowed to rest for at least 24 hours to allow shallow groundwater to accumulate if present. Following this period of recharge the wells will be evacuated using air lifting and surge block techniques. The wells will be developed until the existing water reaches equilibrium through measurement of field parameters (pH, temperature, conductivity) or the removal of three well volumes has occurred. If no water accumulates, development will not occur, but the well will remain for future water level monitoring.

2.1.4 Well Sampling

If water is detected in the wells, sampling will occur following development. Low-flow sampling techniques will be used to purge the well. Continuous monitoring of purge water will occur using a flow through cell. Field parameters will consist of pH, temperature, and conductivity. A sample will be obtained after three consecutive readings for each parameter fall within the sampling criteria: $\pm$ 0.5 pH units, $\pm$ 10% temperature, and $\pm$ 10% conductivity. The samples will be laboratory analyzed for total dissolved solids, chloride, sulfate, nitrate, chromium, and selenium as defined in DP-831. Each well in which water is found will then be incorporated into the quarterly water level monitoring program and semiannual sampling program as defined by DP-831. If water is not detected, the wells will be incorporated into the quarterly water-level monitoring program. If no water is detected within six months of monitoring, these wells will be considered for plugging and abandonment.

Figure 5
Typical Construction for SPDV Wells

(Not to Scale)



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3.0 REPORTING

A basic data report (BDR) will be developed for each well following the installation, receipt of any laboratory analyses, and survey of the well locations and top of casing elevations to a common benchmark. The BDR will summarize the geology, hydrology, well installations and construction. A discussion of encountered water in relation to SSW on-site, if any, will be included. Laboratory reports will be included in the BDR with a discussion of the relationship to SSW, if any. Well reports filed with the New Mexico Office of the State Engineer (NMOSE) will be included in the BDR as well as well construction diagrams and lithologic logs. An updated site map with the SPDV wells will be provided with an updated potentiometric surface map.

3.1 Reporting in Accordance with DP-831 Permit Condition IV.10

After the piezometers are installed they will be incorporated into the quarterly water level monitoring program and semiannual sampling program. The DOE will submit the information gathered in semiannual monitoring reports due by the last day of January and July of each year as required in Condition 10 of the December 29, 2006, Discharge Permit Modification.

4.0 SCHEDULE

The following schedule estimates the dates that the wells will be installed and provides the necessary steps in the process.

Activity	Date of Activity
WIPP Receives Permit	December 29, 2006
Submit Work Plan and Schedule to NMED GWQB	March 29, 2007
Submit Applications to drill to the NMOSE	March 1, 2007
Receive Approval to drill from NMOSE	April 1, 2007
Coordination with the U.S. Bureau of Land Management	April 1, 2007
Procurement of Drilling Contractor	February 1, 2007
Receive Approval of Plan from NMED GWQB	April 29, 2007
Drilling Contractor Mobilization	May 1, 2007
Drill and Develop Wells	May 2-15, 2007
Sample Wells	May 22, 2007
Survey Wells/Get Data (Top of Casing)	May 16, 2007
Develop BDR	May 15 - August 15, 2007
Submit BDR to NMED GWQB	August 15, 2007

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 0 6 2007

MAR 1 3 2007

BY:

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Use of Clean Stormwater to Assist in Establishment of Vegetation

Dear Mr. Marshall:

The purpose of this letter is to inform the New Mexico Environment Department Ground Quality Bureau of our intent to use the water collected in Stormwater Infiltration Control Ponds 1, 2 and A to irrigate the soil covered portion of the salt pile. The water in the Salt Pile Evaporation Pond will also be used under the condition that it is found to be suitable for agricultural purposes. The use of the water is to assist in establishing and maintaining vegetation.

As we enter into the 2007 growing season, the soil covered portion of the salt pile will be planted with native vegetation. Water will be needed to provide the best opportunity to establish and maintain vegetation on the site. Natural precipitation and the clean stormwater will become the source of this water. Water will be pumped from the pond(s) to an irrigation system. Application will be at a rate to enhance sprouting of seeds and growth of vegetation, but not in a manner that erosion will occur. Further application will be controlled such that during periods of natural precipitation, irrigation will not occur. Any run off from the covered portion of the salt pile will continue to be captured in the Salt Pile Evaporation Pond. Using the stormwater in this manner will allow the project to beneficially use the collected clean stormwater for establishing vegetation on this site, and subsequently reduce volume of water in these ponds. This will provide for future capacity of runoff from naturally occurring precipitation events. Irrigation will begin by the end of March 2007

If you have any questions or wish to discuss any of these comments, please feel free to contact me at (505) 234-7462.

Sincerely,

H. E. Plum
RCRA Program Manager

cc:
J. Kieling, NMED *ED
S. Zappe, NMED ED
*ED denotes electronic distribution

CBFO:AMO:HJP:KJB:07-0438:UFC5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 0 6 2007

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Sixty Day Notice of the Plan for Construction of Salt Storage Area Extension Cell B

Dear Mr. Marshall:

The purpose of this letter is to provide you with sixty days notice that the U.S. Department of Energy Carlsbad Field Office intends to begin the construction of Cell B of the Salt Storage Extension Area.

This notice is in accordance with our September 12, 2005, request to defer construction of Cell B of the Salt Storage Extension Area and your October 20, 2005, letter approving the deferral contingent upon providing a 60 day notice prior to beginning construction. Our Management and Operating Contractor, Washington TRU Solutions, has established target dates of March 9, 2007, to issue the Request for Proposals and May 15, 2007, to begin the actual construction of Cell B.

Please contact me at (505) 234-7462, if you have any questions or require additional information.

Sincerely,

H.L. Plum
RCRA Program Manager

cc:
J. Bearzi, NMED *ED
J. Kieling, NMED ED
*ED denotes electronic distribution

CBFO:AMO:HP:KJB:07-0439:UFC5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 0 6 2007

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Use of Clean Stormwater to Assist in Establishment of Vegetation

Dear Mr. Marshall:

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As we enter into the 2007 growing season, the soil covered portion of the salt pile will be planted with native vegetation. Water will be needed to provide the best opportunity to establish and maintain vegetation on the site. Natural precipitation and the clean stormwater will become the source of this water. Water will be pumped from the pond(s) to an irrigation system. Application will be at a rate to enhance sprouting of seeds and growth of vegetation, but not in a manner that erosion will occur. Further application will be controlled such that during periods of natural precipitation, irrigation will not occur. Any run off from the covered portion of the salt pile will continue to be captured in the Salt Pile Evaporation Pond. Using the stormwater in this manner will allow the project to beneficially use the collected clean stormwater for establishing vegetation on this site, and subsequently reduce volume of water in these ponds. This will provide for future capacity of runoff from naturally occurring precipitation events. Irrigation will begin by the end of March 2007

If you have any questions or wish to discuss any of these comments, please feel free to contact me at (505) 234-7462.

Sincerely,

H. E. Plum
RCRA Program Manager

cc:

J. Kieling, NMED	*ED
S. Zappe, NMED	ED

*ED denotes electronic distribution

CBFO:AMO:HJP:KJB:07-0438:UFC5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

GROUND WATER
FEB 16 2007
BUREAU

FEB 12 2007

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Volumetrics for Water Removal from Exhaust Shaft

Dear Mr. Marshall:

The purpose of this letter is to submit the Monthly Records of water collected from the Waste Isolation Pilot Plant (WIPP) Exhaust Shaft. These records are for the period of January 2006 – January 2007. We will include you on distribution of future reports.

Should you have any questions, please contact me at (505) 481-9034 or Harold Johnson at (505) 234-7349.

Sincerely,

Harold Johnson for
Jody Plum
RCRA Program Manager

Enclosure

cc: w/enclosure
H. Johnson, CBFO *ED
Steve Zappe, NMED ED
CBFO M&RC

*ED denotes electronic distribution

CBFO:AMO:JP:LC:07-0425:UFC:5486

2006 !

0600047	5480	01-09	Johnson/Zvonar/Plum	Bignell	01-09	Volumetrics for water removed from the exhaust shaft catch basin, Waste shaft sump, 700-fan condensate and precipitation data for 12-05
0600368	5486	02-09	Plum/Johnson/Zvonar	Bignell	02-09	Volumetrics for water removed from the exhaust shaft catch basin, waste shaft sump, 700-fan condensate and precipitation data for 01-2006
0600616	5486	03-08	Plum/Johnson/Zvonar	Bignell	03-07	Volumetrics for water removed from the exhaust shaft catch basin, wate shaft sump, 700-fan condensate and precipitation data for feb. 2006
0601043	5486	04-06	Plum/Zvonar/Johnson	Bignell	04-10	Volumetrics for water removed form the exhaust shaft
0602046	5486	06-09	Zvonar/Johnson/Plum	Bignell	06-09	Volumetrics for Water removed from the exhaust shaft borehole intercept, waste shaft sump, 700-fan condensate and precipitation data for may 2006
0602326	5486	07-12	Zvonar/Plum/Johnson	Bignell	07-12	Volumetrics for water removed from the exhaust shaft borehole intercept, waste shaft sump, 700-fan condensate and precipitation data for June 2006
0602614	5486	08-10	Plum	Bignell	08-10	Volumetrics for water removed from the exhaust shaft intercept borehole, waste shaft sump, 700-fan condensate and precipitation data for 7-06
0602867	5486	09-12	Johnson/Plum	Bignell	09-12	Volumetrics for Water Removed from the Exhaust Shaft Intercept Borehole, Waste Shaft Sump, 700-fan condensate and precipitation data for august 2006
0603225	5486	10-04	Johnson/Plum	Bignell	10-03	Volumetrics for water removed from the exhaust shaft intercept borehole, waste shaft sump, 700-fan condensate and precipitation data for 09-06
0603981	5486	11-10	Plum/Johnson	Bignell	11-10	Volumetrics for water removed from the exhaust shaft intercept borehole, waste shaft sump, 700-fan condensate and precipitation data for 10-06
0604257	5486	12-08	Plum/Johnson	Bignell	12-08	Volumetrics for water removed from the exhaust shaft intercept borehole, waste shaft sump, 700-fan condensate and precipitation data for 11-06

What is this number? Gallons?

2007

0700108	5486	01-12	Plum/Johnson	Wierzbicki	01-11	volumetrics for water removed fro the exhaust shaft intercept borehole, waste shaft sump, 700-fan condensate and precipitation data for 12-06

2007

0700108	5486	01-12	Plum/Johnson	Wierzbicki	01-11	volumetrics for water removed fro the exhaust shaft intercept borehole, waste shaft sump, 700-fan condensate and precipitation data for 12-06

BILL RICHARDSON
GOVERNOR

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502-6110
(505) 827-2918 phone
(505) 827-2965 fax

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

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Restricted Delivery Fee (Endorsement Required)	
Total Postage & Fees	$

Mr. David C. Moody
Waste Isolation Pl
US Dept. of Energ
P.O. Box 3090
Carlsbad, New Mexic

PS Form 3800, June 2002

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

December 29, 2006

Mr. David C. Moody, Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Discharge Permit Modification, Waste Isolation Pilot Plant, DP-831, U.S. Department of Energy

Dear Mr. Moody:

The New Mexico Environment Department (NMED) issues the enclosed Discharge Permit Modification, DP-831 for the Waste Isolation Pilot Plant (WIPP) to the U.S. Department of Energy (DOE) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978§§74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

The Discharge Permit Modification contains terms and conditions that shall be complied with by DOE and are enforceable by NMED pursuant to WQCC 20.6.2.3104, WQA, NMSA 1978 § 74-6-5 and §74-6-10. Issuance of this Discharge Permit Modification does not relieve the DOE of its responsibility to comply with the WQA, WQCC Regulations, or any other applicable federal, state and/or local laws and regulations, including zoning requirements and nuisance ordinances.

Pursuant to 20.6.2.3109.H.4 NMAC, this Discharge Permit Modification shall expire on **April 29, 2008**. You must submit an application for renewal at least 120 days before the permit expiration date.

Sincerely,

William C. Olson, Chief
Ground Water Quality Bureau

WCO:clm

Enclosure: Discharge Permit DP-831

cc: Mary Ann Menetrey, Program Manager, MECS (encl)
Carlos Romero, District Manager, NMED District 4, Roswell (encl)
James Smith, HPM, Carlsbad Field Office (encl)
Steve Zappe, HWB (encl)

GROUND WATER DISCHARGE PERMIT MODIFICATION
Waste Isolation Pilot Plant, DP-831
December 29, 2006

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Discharge Permit Modification, DP-831, to the U.S Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit Modification, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the Site Preliminary Design Validation (SPDV) material pile into ground and surface water and to provide an updated closure plan, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses and protect public health. In issuing this Discharge Permit Modification, NMED has determined that the requirements of 20.6.2.3109.C NMAC have been met.

Facility Description

The WIPP is a hazardous and radioactive waste disposal facility operated by the U.S. Department of Energy. The WIPP is constructed in a bedded salt deposit 2150 feet below ground surface. Salt and other subsurface materials mined during construction as well as currently mined salt are stored on the surface in three stockpiles. The stockpiles include the Salt Storage Extension (SSE) that is being used to store salt currently mined at the WIPP. Storm water runoff from the SSE is collected in the synthetically lined Salt Storage Extension Basin (SSEB). The existing Salt Pile that was previously used has been capped with a synthetic and earthen cover. Storm water runoff from the Salt Pile is collected in the synthetically lined Salt Pile Evaporation Pond (SPEP). The Site Preliminary Design Validation (SPDV) material pile was constructed as the shafts were excavated when construction first began at the site. The SPDV material pile was closed in the year 2000 with a cover consisting of a geosynthetic liner installed on 6 inches of bedding material and covered with a minimum of three feet of earthen material. The earthen cover was seeded with shallow-rooted plants. Other discharges covered by DP-831 include domestic waste discharged to seven facultative lagoons, brine and high-TDS discharges to an evaporative lagoon, miscellaneous non-hazardous discharges to an evaporation pond and non-impacted storm water runoff to three synthetically lined impoundments.

Location of Discharge

The facility is located approximately 26 miles east of Carlsbad, New Mexico in Sections 28 and 29, T22S, R31E, Eddy County.

Quantity, Quality, and Flow Characteristics of the Discharge

The permitted discharge consists of up to 23,000 gallons per day (gpd) of sewage effluent, up to 2,000 gpd of non-hazardous high-TDS and brine water, up to 8,000 gpd of non-hazardous miscellaneous water, up to 100 gpd of neutralized acid waste, and a designed flow of 4,224,835 gpd of storm water runoff based on a 24-hour, 25-year storm event. The discharged waters contain contaminants or toxic pollutants that may exceed water quality standards set forth in WQCC Regulations 20.6.2.3103 NMAC for nitrate, chloride, sulfate and total dissolved solids. These discharged waters may move directly or indirectly into ground water.

Characteristics of Ground Water

Regional ground water below the site is at a depth of approximately 225 feet and has a total dissolved solids concentration of approximately 3,920 milligrams per liter. A zone of shallow subsurface water (SSW) below the site is at a depth of approximately 60 – 80 feet. The ground water flow direction for the regional aquifer is to the southeast and the flow direction of the SSW is to the south.

General

The WIPP Discharge Plan Modification consists of the materials submitted by the DOE dated March 5, 2005, September 12, 2005 and May 11, 2006. In addition, the discharge plan includes information and materials submitted as part of the original discharge plan approved on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998, amended on January 24, 2000, renewed on April 29, 2003, and modified on December 22, 2003. The discharge shall be managed in accordance with the discharge plan as conditioned by the Discharge Permit issued April 29, 2003, modified on December 22, 2003, and this Discharge Permit Modification.

The components incorporated into the Discharge Permit through this modification include the following:

1. The inclusion of the Site Preliminary Design Validation (SPDV) material pile into DP-831.

2. The inclusion of a comprehensive closure plan that includes all salt stockpiles at the facility.

Pursuant to 20.6.2.3109.E NMAC, NMED reserves the right to modify permit requirements in the event that NMED determines that the requirements of 20.6.2 NMAC are being, or may be, violated or the standards of 20.6.2.3103 NMAC are being, or may be, violated. This may include a determination by NMED that operational practices approved under this Discharge Permit are not protective of ground and surface water quality, and that a modification is necessary to protect the water quality or abate water pollution. Permit modifications may include, but are not limited to, lining or relining impoundments, changing discharge locations, changing waste management practices, expanding monitoring requirements, and implementing abatement of water pollution.

Issuance of this Discharge Permit does not relieve the DOE of its responsibility to comply with all conditions or requirements of the WQA, WQCC Regulations, and any other applicable Federal, State and local laws and regulations including zoning requirements or nuisance orders.

II. FINDINGS

In issuing this Discharge Permit, NMED finds:

1. The DOE is discharging effluent or leachate from the WIPP facility so that such effluent or leachate may move directly or indirectly into ground water within the meaning of 20.6.2.3104 NMAC.

2. The ground water beneath the WIPP facility has an existing concentration of 10,000 milligrams per liter or less of total dissolved solids within the meaning of 20.6.2.3101.A NMAC.

3. The discharge from the WIPP facility is not subject to any of the exemptions of 20.6.2.3105 NMAC.

III. DEFINITIONS

Whenever any terms defined in the WQA or the WQCC Regulations are used in this Discharge Permit, including any documents incorporated herein by reference, those definitions shall apply. In addition, whenever the terms listed below are used in this Discharge Permit, including any documents incorporated herein by reference, the following definitions shall apply:

"Discharge" means any spilling, leaking, pumping, pouring, emitting, emptying, or dumping into water or in a location and manner where there is a reasonable probability that the discharged substance will directly or indirectly reach surface or subsurface water.

"Discharge Permit" or "DP-831" means, unless otherwise specified, this Discharge Permit DP-831 including any documents incorporated herein by reference.

"NMED" means the New Mexico Environment Department, a department of the executive branch and a constituent agency of the WQCC, and any successor agencies.

"WIPP" means the Waste Isolation Pilot Plant, a facility owned and operated by the U.S. Department of Energy and located in southeast New Mexico.

"WQA" means the New Mexico Water Quality Act, NMSA 1978 §§ 74-6-1 to 74-6-17, as amended.

"WQCC" means the New Mexico Water Quality Control Commission.

"WQCC Regulations" means Title 20, Chapter 6, Parts 2 and 4 NMAC, as amended.

IV. PERMIT CONDITIONS

The following conditions shall be complied with by the DOE and are enforceable by NMED. The DOE is permitted to discharge water contaminants subject to the following conditions.

OPERATIONS

1. The DOE shall conduct the operational requirements set forth below, including investigations, in accordance with the WQCC Regulations at sections 20.6.2.3106.C and 3107 NMAC to ensure compliance with 20.6.1 and 20.6.2 NMAC.

Storm Water Containment

2. The DOE is permitted to capture a designed flow of 4,224,835 gpd of storm water runoff from the existing Salt Pile and the SSE in the impoundments described in Conditions 2a and 2b below. The discharge volumes are based on storm water runoff estimates from a 24-hour, 25-year storm event (3.90 inches).

   a. Salt Pile Evaporation Pond. A designed flow of 1,677,633 gallons per day is permitted to be discharged to the impoundment. The pond capacity is 5,506,989 gallons not allowing for any freeboard.

   b. Salt Storage Extension Basin. A designed flow of 2,547,202 gallons per day is permitted to be discharged to the impoundment. The pond capacity is 4,170,732 gallons not allowing for any freeboard.

SPDV Material Pile

3. The DOE shall conduct regular maintenance of the earthen cover on the SPDV pile. Inspections shall be conducted monthly and after storm events of 2 inches or greater in a 24-hour period to evaluate potential erosion and vegetation success of the cover. In the event of significant erosion, the DOE shall provide a plan and schedule for repair within 90 days of discovery. General observations and cover repairs shall be reported to NMED pursuant to Condition 10 of this Discharge Permit Modification.

4. The DOE shall install three monitoring wells adjacent to the SPDV pile. Within 90 days of the date of this permit, the DOE shall submit for NMED approval a plan and schedule for well installation. The wells shall be installed at the locations indicated in Figure 2 of the September 12, 2005 supplemental information letter. The wells shall be screened in the upper 15 feet of ground water encountered within the Santa Rosa Formation or the Dewey Lake Formation. The wells shall be completed in accordance with NMED *Monitoring Well*

Construction and Abandonment Guidelines (enclosed) or other alternate methods approved by NMED.

MONITORING, REPORTING, AND OTHER REQUIREMENTS

5. In addition to the monitoring requirements in the April 29, 2003 Discharge Permit Renewal and the December 22, 2003 Discharge Permit Modification, the DOE shall conduct the monitoring, reporting, and other requirements listed below.

Sampling and Field Measurements

6. Ground Water Monitoring Wells – If sufficient water is present in any of the monitoring wells installed pursuant to Condition 4 of this permit, the DOE shall sample them as follows.

   a. The depth to the water table shall be measured to the nearest hundredth of a foot (0.01 ft) above mean sea level, quarterly.

   b. Samples shall be collected from each well semi-annually and analyzed for the water parameters listed in Conditions 8a, 8b and 8c below.

7. Seepage Volumes – The DOE shall propose a method to measure or estimate the volume of SSW that seeps into the exhaust shaft of the WIPP facility. The proposed method shall be submitted to NMED within 60 days of the date of this Permit. Upon NMED approval, the DOE shall measure seepage volumes and/or seepage flow rates of the SSW monthly and report the measurements as required in Condition 10 below.

Analysis

8. The DOE shall analyze samples of ground water for the parameters listed below. Samples of ground water from monitoring wells shall be analyzed for dissolved concentrations of the analytes listed below.

   a. Field parameters (analysis to be performed in the field): pH, temperature and specific conductance.

   b. General chemistry parameters: nitrate, sulfate, chloride, and total dissolved solids.

   c. Trace metals: selenium, chromium

   Analytical results and water level measurements shall be reported as required in Condition 10 below.

Methodology

9. Unless otherwise approved in writing by NMED, the DOE shall conduct sampling and analysis in accordance with the most recent edition of following documents:

a. American Public Health Association, *Standard Methods for the Examination of Water and Wastewater.*

b. U.S. Environmental Protection Agency, *Methods for Chemical Analysis of Water and Waste.*

c. U.S. Geological Survey, *Techniques for Water Resource Investigations of the U.S. Geological Survey.*

d. American Society for Testing and Materials, *Annual Book of ASTM Standards*, Part 31. Water.

e. U.S. Geological Survey, et al., *National Handbook of Recommended Methods for Water Data Acquisition.*

f. Surface water monitoring must also be conducted according to test procedures approved under Title 40 Code of Federal Regulations Part 136. [20.6.3107 NMAC]

g. New Mexico Environment Department, Hazardous Waste Bureau Position Paper, *Use of Low-Flow and Other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring.*

Reporting

10. The DOE shall submit the information required in Conditions 3, 6, 7 and 8 in the semi-annual monitoring reports due by the last day of January and July of each year as required in Condition 9 of the December 22, 2003 Discharge Permit Modification.

CONTINGENCY

11. In the event that monitoring indicates ground water standards as defined in Section 20.6.2.3103 NMAC are exceeded in ground water in wells that previously did not show exceedences of ground water standards, or the extent or magnitude of any existing concentrations of water contaminants is significantly increasing, the DOE shall collect a confirmatory sample from the monitoring well(s) within 15 days to confirm the initial sampling results. Within 30 days of confirmation of ground water contamination, the DOE shall submit an abatement plan to NMED, which includes a site investigation to define the source, nature and extent of contamination; a proposed abatement option; and a schedule for its implementation. The site investigation and selection of an abatement option shall be consistent with the requirements and provisions of 20.6.2.4101, 4103, 4106.C & E, 4107, 4108 and 4112 NMAC.

CLOSURE

12. The DOE shall close the facilities covered under this Discharge Permit in accordance with the closure plan in the March 4, 2005 discharge permit application, the closure plan in the WIPP Hazardous Waste Facility Permit (HWFP) dated January 30, 2003, and the WIPP Land Management Plan as conditioned by this Discharge Permit Modification.

Surface Impoundments

13. Upon cessation of operation, the DOE shall close all impoundments at the facility covered by this Discharge Permit. Remaining liquids in each impoundment shall be removed and/or evaporated. All sludge shall be sampled to determine if hazardous constituents exist and managed and/or disposed of in accordance with applicable regulations. All piping and other ancillary components shall be plugged or removed. Synthetic liners shall be removed or ripped in place. All impoundments shall be backfilled with clean fill materials and graded to create positive drainage. The final regarded surface shall be contoured to surrounding topography and shall be revegetated with natural grasses that include a seed mix approved by NMED.

Salt Piles and Salt Storage Area

14. Upon cessation of operation, all mined salt at the WIPP facility shall be removed from the site. The DOE is permitted to use the mined salt as backfill in shafts and as interior fill material in berms and permanent markers after closure. All mined salt remaining after backfilling and after construction of surface structures shall be removed from the site. The DOE shall submit a plan and schedule for salt tailings removal to NMED for approval within 120 days prior to the facility closure. The WIPP Land Management Plan reflects the Land Withdrawal Act's requirements for disposition of the salt. Section I-1d of the WIPP's Hazardous Waste Facility permit also addresses closure activities that include closure of the salt storage areas in accordance with the provisions of the WIPP Land Management Plan. The salt storage area will be reclaimed in the manner described in these documents.

Post-closure Monitoring

15. The DOE shall continue ground water monitoring in all wells covered under DP-831 as described in Condition 5 of this Permit Modification for two years after closure to confirm the absence of ground water contamination. If monitoring results show that the ground water standards in Section 20.6.2.3103 NMAC are being exceeded, the DOE shall implement the contingency plan described in Condition 11 of this Permit Modification. Following notification from NMED that post-closure monitoring may cease, the DOE shall submit a plan to plug and abandon specified monitoring wells not needed for long-term monitoring. Upon NMED approval, the DOE shall plug and abandon the wells in accordance with *NMED Guidelines for Monitoring Well Construction and Abandonment* (copy enclosed) or

alternative methods approved by NMED. When all post-closure requirements have been met, the DOE may request to terminate the discharge permit.

GENERAL TERMS AND CONDITIONS

The DOE shall comply with the following general conditions, which shall be enforceable by NMED.

Record Keeping

16. The DOE shall maintain at its facility a written record of all data and information on monitoring of ground water, surface water, and seepage pursuant to this Discharge Permit including the following:

    a. The date, exact time, and exact location of each sample collection or field measurement;

    b. The name of the person who performed each sample collection or field measurement;

    c. The date of the analysis of each sample;

    d. The name and address of the laboratory and the name of the name of the authorized manager or his designee verifying that the laboratory report is complete and accurate.

    e. The analytical technique or method used to analyze each sample or take each field measurement;

    f. The results of each analysis or field measurement, including the raw data; and,

    g. A description of the quality assurance and quality control procedures used.

17. Such data and information as described in Condition 16, shall also be maintained on all split and duplicate samples, spike and blank samples, and repeat samples.

18. The DOE shall maintain a written record of any spills, seeps, or leaks of effluent, leachate or process fluids not authorized by this Discharge Permit.

19. The DOE shall maintain a written record of the operation, maintenance and repair of all facilities/equipment used to treat, store, or dispose of wastewater; to measure flow rates; to monitor water quality; or, to collect other data required by this Discharge Permit. This record shall include repair, replacement or calibration of any monitoring equipment and repair or replacement of any fixed equipment used in the conveyance of waters covered by this permit.

20. Notwithstanding any company record retention policy to the contrary, until such time as NMED determines that all closure measures have been completed in accordance with the requirements of this Discharge Permit, the DOE shall retain copies of all data, records,

reports, and other documents generated pursuant to this Discharge Permit. Such record retention period may be increased by the NMED at any time upon written notice to the DOE.

21. All such data, records, reports, and other documents generated pursuant to this Discharge Permit, shall be provided to the NMED upon request.

Inspection and Entry

22. The DOE shall allow the Secretary or an authorized representative of NMED, upon the presentation of credentials, to:

    a. Enter at reasonable times upon or through any property or premises owned or controlled by the DOE or at any other location where records are kept under the conditions of this Discharge Permit or any Federal or WQCC regulation.

    b. Inspect and copy, at reasonable times, records required to be kept under the conditions of this Discharge Permit or pursuant to State or Federal water quality regulations.

    c. Inspect any facility, equipment (including monitoring and control equipment for treatment works), practices or operations regulated or required under this Discharge Permit or under any Federal or WQCC regulations.

    d. Sample or monitor at reasonable times for the purpose of assuring compliance with this Discharge Permit or as otherwise authorized by the New Mexico Water Quality Act, any effluent, water contaminant, or receiving water at any location before or after the discharge.

23. Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of the NMED under the WQA, the WQCC Regulations, or any other applicable law or regulation.

Duty to Provide Information

24. Within a reasonable time after a request from the NMED, which time may be specified by the NMED, the DOE shall provide the NMED with any relevant information to determine whether cause exists for modifying, terminating, or renewing this Discharge Permit, or to determine whether the DOE is in compliance with this Discharge Permit.

Spills, Leaks and Other Unauthorized Discharges

25. This Discharge Permit authorizes only those discharges specified herein. Any discharge not authorized by this Discharge Permit is a violation of the WQCC Regulations at 20.6.2.3104 NMAC. The DOE must report any such discharge to the NMED, and it must take corrective action to contain and remove or mitigate the damage caused by the discharge in accordance with section 20.6.2.1203 NMAC.

Modifications and Amendments

26. The DOE shall notify the NMED of any changes to its wastewater collection or disposal system, including any changes in the wastewater flow rate or the volume of wastewater storage, or of any other changes to its mining operations or processes that would result in any significant change in the discharge of water contaminants. The DOE shall obtain the NMED approval, as a modification to this Discharge Permit pursuant to section 20.6.2.3109.E, F, or G NMAC, prior to any increase in the quantity of a discharge, or any increase in the concentration of water contaminants discharged, above those levels approved in this Discharge Permit.

Enforcement

27. Any violation of the requirements and conditions of this Discharge Permit, including any failure or refusal to allow the NMED to enter and inspect records or facilities, or any refusal or failure to provide the NMED with records or information, may subject the DOE to an enforcement action. Pursuant to WQA § 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, suspending or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to the WQA §§ 74-6-10(C) and 74-6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the WQA § 74-6-5, the WQCC regulations, or this Discharge Permit, and civil penalties of up to $10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation standard, or order adopted pursuant to such other provision. For certain violations specified in the WQA § 74-6-10.2, criminal penalties may also apply. In any action to enforce this Discharge Permit, the DOE waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit. The DOE does not waive any argument as to the weight such evidence should be given.

Compliance with Other Laws

28. Nothing in this Discharge Permit shall be construed in any way as relieving the DOE of its obligation to comply with all applicable Federal, State, and local laws, regulations, permits, or orders.

Liability

29. The approval of this Discharge Permit does not relieve the DOE of liability should the operation result in actual pollution of surface or ground water which may be actionable under other laws and/or regulations.

Right to Appeal

30. The DOE may file a petition for a hearing before the WQCC on this Discharge Permit. Such petition must be made in writing to the WQCC within thirty (30) days after the DOE receives this Discharge Permit. Unless a timely petition for a hearing is made, the decision of NMED shall be final.

Transfer

31. Prior to any transfer of ownership, control, or possession of the WIPP facility or any portion thereof, the DOE shall notify the proposed transferee in writing of the existence of this Discharge Permit and include a copy of this Permit with the notice. The DOE shall deliver or send by certified mail to the NMED a copy of the notification and proof that such notification has been received by the proposed transferee.

Term

32. The effective date of this Discharge Permit Modification is the date it is issued and signed by the Chief of the Ground Water Quality Bureau. The term of this Discharge Permit Modification expires on **April 29, 2008** five (5) years from the date the original Discharge Permit Renewal was issued. To renew this Discharge Permit, the DOE must submit an application for renewal at least 120 days before that date.

Issued this 29th day of December 2006

William C. Olson, Chief
Ground Water Quality Bureau
New Mexico Environment Department

Under authority delegated by the Secretary of the New Mexico Environmental Department

BILL RICHARDSON
Governor

State of New Mexico
ENVIRONMENT DEPARTMENT
Ground Water Quality Bureau
Harold Runnels Building
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-2918 phone
(505) 827-2965 fax

RON CURRY
Secretary

DERRITH
WATCHMAN-MOORE
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

December 28, 2006

Mr. David C. Moody, Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Response to Comments and Issuance of Discharge Permit Modification, DP-831, Waste Isolation Pilot Plant, U.S. Department of Energy

Dear Mr. Moody:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has reviewed the comments submitted by the U.S. Department of Energy (DOE) on September 15, 2006 for the Draft Discharge Permit Modification (DP-831) for the Waste Isolation Pilot Plant. The public notice for the Draft Discharge Permit Modification was published on August 16, 2006. The comments from the DOE were the only comments received by NMED concerning this discharge permit modification. NMED's responses to the comments are provided below. The Final Discharge Permit Modification incorporating relevant comments will be issued in a separate letter.

Response to General Comments

A. The conditions in the Discharge Permit Modification that address specific facility components such as the SPDV pile pertain only to those facility components. All general permit language that does not specifically address a specific facility component pertains to all facility components covered under DP-831 including those facilities addressed in the April 29, 2003 Discharge Permit Renewal and the December 22, 2003 Discharge Permit contingency language to more accurately reflect existing conditions at the WIPP site. The DOE is welcome to propose background ground water quality at the WIPP site and propose existing ground water quality conditions in certain monitoring wells.

9. In the last sentence of Condition 13, the word "regarded" has been changed to "regraded."

10. NMED does not agree with some of the changes proposed by DOE to the closure language in Condition 14. NMED has removed portions of the condition that the DOE states in the September 15, 2006 letter are not accurate. NMED retains the requirement that salt tailings be removed from the site as part of facility closure. Please refer to the attached Discharge Permit Modification for NMED's changes.

11. The reference to Condition 9 stated in Condition 15 has been changed to Condition 11.

12. The reference to meteorological data in Condition 16 has been removed.

13. The reference to Condition 15 stated in Condition 17 has been changed to Condition 16.

14. The language in the last sentence of Condition 19 has been changed from "any equipment used in the conveyance of process waters throughout this permit area" to "any fixed equipment used in the conveyance of waters covered by this permit."

15. NMED declines to modify this Condition 20. Retention or records beyond five years may be necessary to evaluate discharge permit compliance.

16. The reference to Condition 33 in Condition 25 has been removed.

If you have any questions, please contact Clint Marshall at 505-827-0027 or Mary Ann Menetrey at 505-827-2944.

Sincerely,

William C. Olson, Chief
Ground Water Quality Bureau

WCO:clm

cc: Mary Ann Menetrey, Program Manager, MECS

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

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GROUND WATER

NOV 0 7 2006

BUREAU

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Record of Communication Relative to Pumping Storm Water from Evaporation Ponds 1 and 2 into Pond A

Dear Mr. Marshall:

The purpose of this letter is to document the telephone conversation between you, Mr. Harold Johnson of the Department of Energy, (DOE) Carlsbad Field Office and Mr. Stewart Jones of Washington Regulatory and Environmental Services on October 24, 2006, regarding the pumping of storm water out of Evaporation Ponds 1 and 2 into Pond A. The reason for this action was to reduce the likelihood of overtopping of Ponds 1 and 2 if the major storm system predicted to impact southeastern New Mexico that week materialized. In the last month the Waste Isolation Pilot Plant (WIPP) has received approximately 1.3 inches of precipitation and Evaporation Ponds 1 and 2 had less than desirable capacity.

To prevent overtopping the ponds DOE suggested to you that storm water in Evaporation Ponds 1 and 2 be pumped into Pond A. It was noted that Ponds 1 and 2 had approximately eight to ten inches of freeboard and that Pond A had about 4 inches of freeboard. With the possibility of considerable precipitation at the WIPP, it was suggested that pumping water into Pond A from Evaporation Ponds 1 and 2 should preclude overtopping in these ponds.

As you know, Pond A has a designed spillway to eliminate erosion to the pond side slopes should it exceed its capacity. You concurred with this action and requested documentation of our telephone call. The DOE therefore pumped sufficient water into Pond A to obtain approximately two feet of free board in Ponds 1 and 2.

If you have any questions or wish to discuss any of these comments, please contact me at (505)234-8172 or (505)234-7452.

Sincerely,

Daryl Mercer
Physical Scientist

cc:
J. Bearzi, NMED *ED
J. Kieling, NMED ED
S. Zappe, NMED ED
*ED denotes electronic distribution

CBFO:AMO:DM:KJB:06-1412:UFC5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
September 15, 2006

GROUND WATER

SEP 1 9 2006

BUREAU

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Comments on the Draft WIPP Discharge Permit, DP-831

Dear Mr. Marshall:

The purpose of this letter is to provide comments on the draft WIPP Discharge Permit Modification (DP-831) placed on notice pursuant to 20.6.2.3108.G NMAC on or before August 16, 2006. We are submitting these comments to facilitate completion of the permit modification process. We are not requesting a public hearing.

General Comments:

A. Because this is a permit modification and not the entire permit, DOE requests clarification on which terms and conditions are specific to the elements of this modification; and which, if any, supersede the conditions of the April 29, 2003 Discharge Permit and the December 22, 2003 Discharge Permit Modification. Two conditions that require clarification are listed below:

   - The record keeping provisions in Item 20 requires all data, records, reports, and other documents generated pursuant to this discharge permit be retained until closure is completed while the April 29, 2003 Discharge Plan Renewal and December 22, 2003 Discharge Plan Modification requires this information be maintained for five years. Does this requirement pertain only to the recordkeeping for the SPDV Pile repairs and monitoring introduced in the permit modification or does it apply to all elements of DP-831 such as the sewage lagoons, other infiltration control features and monitoring of the existing wells and surface water? (This topic is discussed further in our specific comments below.)

   - The Contingency provisions in Item 11 differ from the Contingency requirements in the existing permit. Are these provisions applicable only to the monitoring wells installed at the SPDV Pile pursuant to this modification or all monitoring wells in DP-831? (This topic is discussed further in our specific comments below.)

B. In several locations throughout the permit WIPP is used as an entity to perform an action. In these cases, "WIPP" should be changed to "DOE".

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This occurs at Part II, Item 1; Part II, Item 2; Part IV, first sentence; Part IV, Item 1, Item 2, Item 3 (two occurrences), Item 4, Item 5, Item 7, Item 8, Item 9, Item 10, Item 11 (two occurrences), *Item 13, Item 14, Item 15 (three occurrences), General Terms and Conditions, introductory sentence: Item 16, Item 18, Item 19, Item 20, Item 22, Item 24 (two occurrences), Item 25, Item 26, Item 27 (three occurrences), Item 28, Item 29, Item 30, Item 31 (two occurrences), and Item 32.*

DOE's specific comments follow in the order that the text appears in the draft discharge permit modification:

1. Part I, Quantity, Quality, and Flow Characteristics of the Discharge
   The discharged waters contain contaminants or toxic pollutants that may exceed water quality standards set forth in WQCC Regulations 20.6.2.3103 NMAC for nitrate, chloride, sulfate, selenium, chromium and total dissolved solids.

   Please remove the reference to selenium and chromium as contaminants or pollutants in the DOE's discharges at the WIPP site. Selenium is only detected occasionally in trace quantities in naturally occurring ground water purged from ground water monitoring wells and discharged to the H-19 Evaporation Pond. Chromium is not present in detectable concentrations in any of the waters discharged. The other discharged waters (sewage effluent, salt contact storm water run-off and non contact storm water run-off) do not contain selenium or chromium in detectable concentrations.

2. Part IV. Item 3: *Inspections shall be conducted semi-annually and after storm events of one inch or greater to evaluate potential erosion and vegetation success of the cover.*

   DOE respectfully requests that the requirement to inspect the pile following a storm event of one inch or greater be removed and replaced with a requirement consistent with the existing discharge permit and current inspections of the infiltration control structures. The SPDV Pile is currently inspected monthly and following significant rainfall events. The term "significant rainfall event" has not been defined in the existing DP-831 but is defined in WIPP site procedures as greater than two inches in 12 hours.
   Monthly inspections are frequent enough to identify any significant erosion problems that are caused by lesser rainfalls and schedule repairs in a timely manner.

3. Part IV. Item 3: *General observations and cover repairs shall be reported to NMED pursuant to Condition 8 of this Discharge Permit Modification.*

   The reference to Condition 8, which is entitled, Analysis appears to be incorrect. The correct reference is believed to be Item 10, Reporting.

4. Part IV. Item 6.b.: Recommend that that the reference to Conditions 8A, 8B and 8C reference Conditions 8.a., 8.b. and 8.c. for consistency.

5. Part IV, Item 7: Seepage Volumes – *WIPP shall collect and measure the monthly volume of SSW that seeps into the exhaust shaft of the WIPP facility.*

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DOE requests that this requirement be removed from DP-831. The ground water level data collected in accordance with the December 22, 2003 Discharge Permit Modification provides the GWQB with information regarding the effectiveness of the infiltration controls. Most water that seeps into the Exhaust Shaft evaporates when the ventilation system is operating in normal mode (two Fans operating and airflow of approximately 425,000 cubic feet per minute). The water that is collected in the underground is derived from various natural sources (primarily humidity and condensation on the shaft walls) and the volume of subsurface anthropogenic shallow water that seeps into the Exhaust Shaft cannot be differentiated from other sources of water.

6. Part IV, Item 8: *Analytical results and water level measurements shall be reported as required in Condition 8 below.*

   The reference to Condition 8 appears to be incorrect. Condition 10 would be a more appropriate reference.

7. Part IV, Item 10: *WIPP shall submit the information required in Conditions 2, 5, 6 and 7 in the semi-annual monitoring reports due by the last day of January and July of each year as required in Condition 9 of the December 22, 2003 Discharge Permit Modification.*

   The reference to Conditions 2 and 5 appears to be incorrect. Conditions 3, 6, 7 and 8 appear to be the correct references.

8. Part IV, Item 11: *In the event that monitoring indicates ground water standards as defined in Section 20.6.2.3103 NMAC are exceeded in ground water, WIPP shall collect a confirmatory sample from the monitoring well(s) within 15 days to confirm the initial sampling results. Within 30 days of confirmation of ground water contamination, WIPP shall submit an abatement plan to NMED, which includes a site investigation to define the source, nature and extent of contamination; a proposed abatement option; and a schedule for its implementation.*

   Anthropogenic subsurface shallow ground water and naturally occurring Dewey Lake Formation water at the WIPP site already exceed some of the numerical standards of 20.6.2.3103 NMAC. Permit conditions and procedures, pursuant to the current DP-831 Permit and the WIPP Hazardous Waste Facility Permit (HWFP), Module V, are in place at WIPP recognizing current ground water characteristics and requiring use of sampling methods accepted by the U.S. EPA and NMED. To provide consistency in the application of NMED regulations and existing permits, DOE requests that the following paragraphs be added after the above permit condition:

   For ground water monitoring at WQSP 6a, "contamination" is to be determined pursuant to the conditions in the WIPP Hazardous Waste Facility Permit (HWFP), Module V, which defines "contamination" as a statistically significant increase in the concentration of the monitored parameters (which encompass the parameters established in the DP-

831 permit). Considering temporal and spatial variations in analytical data, "contamination" is indicated when the concentration of the analyte exceeds the 95th upper tolerance limit value for normal or log normal distributions of data or the 95th percentile for non-parametric data. The 15 and 30 day requirements above are inapplicable to ground water monitoring at WQSP6a and the DOE shall, in lieu of submitting an abatement plan, proceed with required actions under the WIPP HWFP.

For the anthropogenic subsurface shallow water, abatement controls have been imposed by NMED in the December 22, 2003 DP-831 Modification. Thus, the 15 and 30 day requirements above are not applicable to the subsurface shallow water. Reports of concentrations of analytes detected in subsurface shallow water wells must continue to be reported in the DOE's semi-annual monitoring reports to the NMED, as required in Condition 9 of the December 22, 2003 Discharge Permit Modification. Pursuant to 20.6.2.3109.E NMAC, NMED reserves the right to modify permit conditions if the infiltration controls approved under this Discharge Permit become ineffective to protect ground and surface water for present and potential future use.

9. Part IV. Condition 13: In the last sentence "regarded" should be changed to "regraded."

10. Part IV. Item 14: There are several subtle inaccuracies in the statements in this Condition. The berms or permanent markers are not specified to be constructed of concrete, there are no plans for backfilling the open drifts or panels in the underground and the Land Withdrawal Act directs the disposition of the salt in accordance with Sections 2 and 3 of the Materials Act of 1947. For simplicity, a mark-up of the condition that is more accurate is provided below:

    Upon cessation of operation, all ~~salt stockpiles~~ residual salt tailings at the WIPP facility shall be ~~removed~~ disposed of ~~from the site~~ as required by Section 4(b)(4) of the Waste Isolation Pilot Plant Land Withdrawal Act. WIPP ~~is permitted~~ has proposed to use stockpiled salt tailings as backfill in shafts~~, tunnels and panels,~~ and as interior fill material ~~on concrete perimeter~~ in berms~~,~~ and permanent markers after closure. ~~monuments and other surface closure structures.~~ All salt tailings remaining after backfilling and after construction of surface structures shall be ~~sold or otherwise~~ disposed of ~~offsite~~ in accordance with the provisions of the Materials Act of 1947. ~~WIPP~~ DOE shall submit a schedule for ~~salt removal~~ the disposition of residual salt tailings within 120 days prior to Facility Closure. ~~the facility ceasing operations.~~ The WIPP Land Management Plan reflects the Land Withdrawal Act's requirements for disposition the salt tailings. ~~and sets forth the plans to reclaim the salt storage area.~~ Section I-1d of the WIPP's Hazardous Waste Facility permit also addresses closure activities that include closure of the salt storage areas in accordance with the provisions of the WIPP Land Management Plan. The salt storage area will be reclaimed in the manner described in these documents.

11. Part IV. Condition 15: The condition references the contingency plan described in Condition 9. The correct reference appears to be Condition 11.

CBFO:AMO:DM:KJB:06-0585:UFC5486

12. Part IV, Item 16: *WIPP shall maintain at its facility a written record of all data and information on monitoring of ground water, surface water, seepage, and meteorological conditions pursuant to this Discharge Permit including the following:*

    No meteorological conditions are required to be monitored pursuant to DP-831. Please remove the reference to maintaining meteorological data.

13. Part IV. Condition 17: *Such data and information as described in Condition 15, shall also be maintained on all split and duplicate samples, spike and blank samples, and repeat samples.*

    It is not clear if the reference to Condition 15 is correct or if the reference should be to Condition 16.

14. Part IV, Item 19: The last sentence in this condition states, "*This record shall include repair, replacement or calibration of any monitoring equipment and repair or replacement of any equipment used in the conveyance of process waters.*"

    Please revise this statement to refer to "fixed equipment " used in the conveyance of waters covered by this permit." The current statement is overly broad such that it could be interpreted to apply to repairs on a truck, trailer or pump used to transfer water to H-19.

15. Part IV, Item 20: *Notwithstanding any company record retention policy to the contrary, until such time as NMED determines that all closure measures have been completed in accordance with the requirements of this Discharge Permit, WIPP shall retain copies of all data, records, reports, and other documents generated pursuant to this Discharge Permit. Such record retention period may be increased by the NMED at any time upon written notice to WIPP.*

    DOE requests that this condition be consistent with the Ground and Surface Water Protection Regulations and existing DP-831 conditions. The current permit (which is consistent with 20.6.2.3107.A.(7)) states under Retention of Records, "the discharger shall maintain all monitoring information, including all calibration and maintenance records, copies of all reports required by this discharge plan, and records of all data used to complete the application for this discharge plan, for a period of at least <u>five</u> years from the date of the sample collection, measurement, report or application."

16. Part IV, Item 25: There is a reference to "Condition 33 of this Discharge Permit." There is no Condition 33 in the draft discharge permit modification.

Thank you for your consideration of these comments. If you have any questions or wish to discuss any of these comments, contact Daryl Mercer at (505) 234-8172 or (505) 234-7452.

Sincerely,

David C. Moody

David C. Moody
Manager

cc:

J. Bearzi, NMED	*ED
J. Kieling, NMED	ED
S. Zappe, NMED	ED

*ED denotes electronic distribution

GROUND WATER

SEP 20 2006

BUREAU

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

SEP 13 2006

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Required Actions Due to Precipitation at WIPP

Dear Mr. Marshall:

The purpose of this letter is to confirm yout telephone conversation with Waste Isolation Pilot Plant personnel on September 5, 2006. We agreed to provide written documentation regarding the impact of significant precipitation received at the WIPP site between September 1 and 4, 2006, and the planned corrective actions.

Between September 1 and September 4, 2006, the WIPP site received 4.38 inches of precipitation over four days. Run off from the Plant and the covered Salt Pile was collected in Evaporation Pond 1, Evaporation Pond 2, Evaporation Pond A, and the Salt Pile Evaporation Pond. These Ponds collect rainfall that does not contain salt. The Salt Storage Extension Evaporation Basin collects runoff that contains salt.

Accumulation of precipitation in Evaporation Pond 2 resulted in this pond exceeding its capacity and overflowing. The overflow from Evaporation Pond 2 occurred through an area approximately 15 feet wide on the west side of the pond. The discharge from this pond is not believed to have consisted of a significant volume of water because of the limited area that contained standing water. There was no erosion of the pond bank caused by the discharge.

On September 5, 2006, remaining evaporation ponds and basins at the WIPP site had the following approximate remaining freeboard:

- Evaporation Pond 1, eight inches
- Evaporation Pond 2, no additional capacity
- Evaporation Pond A, eight inches
- Salt Storage Extension Evaporation Basin, eight inches
- H-19 Evaporation Pond, four feet
- Sewage Lagoons, 40 inches
- Salt Pile Evaporation Pond, four inches

The freeboard for the Salt Pile Evaporation Pond is different from the three foot estimate we provided you on September 5, 2006. A re-evaluation has determined that the collection point where the run-off from the parking lot enters this pond, at the junction of the Salt Pile Run-off Ditch and the Salt Pile Evaporation Pond, is the area of the pond at the lowest elevation and that there is approximately four inches of freeboard at that point.

CBFO:AMO:DM:KJB:06-0583:UFC5486

Following consultation with you, DOE is implementing corrective measures to pump sufficient water out of Evaporation Ponds 1 and 2 into Evaporation Pond A, providing approximately two feet of freeboard in Evaporation Ponds 1 and 2. This will allow for the accumulation of precipitation in Ponds 1 and 2 in the event of additional rainfall. Additionally, if Evaporation Pond A should overflow, the discharge will be through the engineered overflow spillway of Pond A to the roadside drainage ditch adjacent to the WIPP access road that drains to the south. This roadside ditch is not hydrologically connected to any surface waters.

We believe the remaining freeboard available in the Salt Pile Evaporation Basin and Cell A of the salt storage pile is sufficient to accommodate additional rain, however, in the event that an overflow becomes imminent, we will notify your office to discuss options available to manage this water.

Additionally, we informed you that the berms we have constructed on the north and south side of the covered salt pile were effective in diverting water to the armored discharge chutes constructed to limit damage to the soil cover of the original Salt Pile. However, this rainfall event caused erosion in the form of rilling resulting in the deposition of sediment in the Salt Pile Run-off Ditch on the south and east sides of the salt pile. Sediments will be removed from the Salt Pile Run-off ditches and repairs will be made to the soil covering of the salt pile in a timely manner pending the soils drying out enough to allow work with heavy equipment.

If you have any questions pertaining to this matter, please call me at (505) 234-8172.

Sincerely,

Daryl Mercer

Daryl Mercer
Project Scientist

cc:

J. Kieling, NMED	* ED
J. Bearzi, NMED	ED
W. Olsen, NMED	ED

*ED denotes electronic distribution

CBFO:AMO:DM:KJB:06-0583:UFC5486

New Mexico E[illegible]onmental Department
Ground Water Quality Bureau

Acknowled[illegible]nent of Receipt

rec

Acknowledgement of Receipt of Check/Cash

I hereby acknowledge receipt of Check No. 013493 Dated. 9/12/06
or cash, received in the amount of $ 6500.00 from ______
for U.S. DOE ______ 831 ______ 318
(Facility Name) (DP No.) (AI ID)

Copy Made for Check Processing ______ Date ______
For Central File Activity ______

Submitted to ASD by: ______ Date: ______

Received in ASD by: ______ Date: ______

Filing Fee ☐ New Facility ☐ Renewal ☐

Modification ☒ Other ☐ (Explain) ______

Organization Code ______ Application FY ______

To be Deposited in the Ground Water Section Discharge Plan Fees.

Full Payment ☐ or Annual Increment ☐

013493

WASHINGTON TRU SOLUTIONS LLC
P.O. Box 2078
Carlsbad, NM 88221

CARLSBAD NATIONAL BANK
PO Box 1359
Carlsbad, NM 88220

Date Sep/12/2006 Pay Amount 6,500.00***

Pay ****SIX THOUSAND FIVE HUNDRED AND XX / 100 DOLLAR****

To The Order Of
NEW MEXICO ENVIRONMENT DEPARTMENT
PO Box 26110
1190 St. Francis Dr.
Santa Fe, NM 87502

Authorized Signature

DP 341

Washington
TRU Solutions LLC

WRES: 06:602
UFC: 5486.00

GROUND WATER

SEP 15 2006

BUREAU

September 13, 2006

Ground Water Quality Bureau
New Mexico Environment Department
P. O. Box 26110
Santa Fe, New Mexico 87502-6110

Subject: GROUND WATER DISCHARGE PERMIT (DP) 831 FEE - INVOICE 36157

Dear Sir or Madam:

The purpose of this letter is to transmit the required fee of $6500.00 (check #013493) for invoice number 36157 dated August 16, 2006, for Ground Water, PRD20050001, 341- Discharge Permit 831 Fee.

If you have any questions, please call me at (505) 234-7545.

Sincerely,

D. T. Bignell, Manager
Regulatory Compliance

RW:dgy

Enclosures (2)

cc: (without enclosure)
- G. T. Basabilvazo, CBFO
- H. E. Johnson, CBFO
- C. Stroud, LANL
- J. Bearzi, NMED
- J. Kieling, NMED
- S. Zappe, NMED

bcc: <u>WRES Distribution</u>

(Without attachments)

R. R. Chavez	ED
S. B. Jones	ED
R. F. Kehrman	ED
S. C. Kouba	ED
J. Siegel	ED
R. Whiteley	ED

<u>WTS Distribution</u>

(without attachments)

G. J. Johnson	ED
S. Anderson	ED

State of New Mexico Environment Department
Ground Water Quality Bureau
1190 St. Francis Drive
Santa Fe, NM 87505

Telephone:(505) 827-2905 Fax: (505) 827-2965

INVOICE

COPY

Primary Billing Party:
U.S. DOE
PO Box 3090
Carlsbad, NM 88221
DP 831-M

Agency Interest:
318 - Waste Isolation Pilot Plant
26 miles E of Carlsbad
Carlsbad, NM 88221

INVOICE ID: 36157

INVOICE DATE: 08/16/2006
INVOICE DUE DATE: 09/15/2006

ASSESSMENTS
Ground Water. PRD20050001. 341 - Discharge Fee $6,500.00

INVOICED AMOUNT $6,500.00

BALANCE DUE $6,500.00

Cut Here and Include Lower Portion with Payment

Primary Billing Party:
U.S. DOE
PO Box 3090
Carlsbad, NM 88221
DP 831-M

Agency Interest:
318 - Waste Isolation Pilot Plant
26 miles E of Carlsbad
Carlsbad, NM 88221

INVOICE ID: 36157
Invoice Amount: $6,500.00

INVOICE DUE DATE: 09/15/2006
Amount Enclosed # 6,500.00

Please make checks payable to:
Mail payments to:
NMED Federal Tax ID#: 85-6000565

New Mexico Environment Department
Ground Water Quality Bureau
PO Box 26110
Santa Fe, NM 87502-6110
Telephone: (505) 827-2905 **Fax:** (505) 827-2965

Check Date: Sep/12/2006		Vendor Number: 0000000105					Check No. 013493
Invoice Number	**Invoice Date**	**Voucher ID**	**PO Number**	**Gross Amount**	**Discount Taken**	**Late Charge**	**Paid Amount**
36157	Sep/05/2006	00023884		6,500.00	0.00	0.00	6,500.00

GROUND WATER

SEP 15 2006

BUREAU

TROY ® CHECK PAPERS

For Inquiries: please call 1-888-234-3181

Check Number	Date	Total Gross Amount	Total Discounts	Total Late Charges	Total Paid Amount
013493	Sep/12/2006	6,500.00	0.00	0.00	6,500.00

· of New Mexico Environment Departmen

Ground Water Quality Bureau

1190 St. Francis Drive

Santa Fe, NM 87505

Client

Telephone:(505) 827-2905 Fax: (505) 827-2965

INVOICE

Primary Billing Party:
U.S. DOE
PO Box 3090
Carlsbad, NM 88221
DP 831-M

Agency Interest:
318 - Waste Isolation Pilot Plant
26 miles E of Carlsbad
Carlsbad, NM 88221

INVOICE ID: 36157

INVOICE DATE: 08/16/2006
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Ground Water. PRD20050001. 341 - Discharge Fee $6.500.00

INVOICED AMOUNT $6,500.00

BALANCE DUE $6,500.00

Cut Here and Include Lower Portion with Payment

Primary Billing Party:
U.S. DOE
PO Box 3090
Carlsbad, NM 88221
DP-831-M

Agency Interest:
318 - Waste Isolation Pilot Plant
26 miles E of Carlsbad
Carlsbad, NM 88221

INVOICE ID: 36157

Invoice Amount: $6,500.00

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Amount Enclosed________________

Please make checks payable to: New Mexico Environment Department
Mail payments to: Ground Water Quality Bureau
PO Box 26110
Santa Fe, NM 87502-6110
NMED Federal Tax ID#: 85-6000565
Telephone: (505) 827-2905 **Fax:** (505) 827-2965

November 24, 2009

Mr. Marshall, this email is to follow-up on the discussion held via a telephone call on Friday, November 20, 2009.

A call was placed to your office, which you returned to, Stewart Jones of WRES, on this date. The purpose of the call was to inform you that WIPP procurement contracting actions were underway to accomplish the reclamation activities of the covered salt pile, as noted in your approval letter on October 15, 2009.

What we would like to bring to your attention is that after awarding a contract to complete the Salt Storage Evaporation Basin II (SSEB II), the WIPP requests to implement "lessons learned" from this project, into the contract for the covered salt pile. An example is that the bidders were provided 14 days to provide their SSEB II bids. We would like to lengthen this time to allow for more precise bids. Due to this bid preparation time, allowed for the SSEB II, there were required modifications and contract negotiations during construction of the pond. Had more time been provided to the contractors in developing their bids, in all likelihood, elimination of some contract modifications required during the project, could have been eliminated.

Also, as part of our procurement cycle, the anticipated timeframe of your office's approval (≈30 days) was to be applied to the procurement time to award the contract. When the timelines were developed to award the contact, WIPP did not account for a brief approval time by your office. The review time by your office was going to be applied to the contract preparation and award timeframe. Thus, adequate time is needed to complete contracting efforts.

The goal of the project remains unchanged, that is, to Control Storm Water and Minimize Erosion on the Covered Salt Pile before the seasonal rains of late summer. When the Semi-annual DP-831 Report is transmitted to your office by January 31, 2010, additional information related to this project will be provided.

If you have any questions please call Mr. Dan Ferguson at 575.234.8128.

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
October 20, 2009

OCT 23 2009
BY:

Notice to the Waste Isolation Pilot Plant Facility Mailing List

On May 28, 2009, the Waste Isolation Pilot Plant Permittees, the U.S. Department of Energy Carlsbad Field Office and Washington TRU Solutions, submitted the Waste Isolation Pilot Plant Hazardous Waste Facility Permit Renewal Application (Renewal Application) to the New Mexico Environment Department (NMED). The Permittees received extensive comments related to the Renewal Application. To address important comments received on the Renewal Application and expedite the renewal application process, the Permittees requested an extension from NMED to submit an amended Renewal Application on August 19, 2009.

NMED granted the request and set a date of September 25, 2009, to submit an amended Renewal Application. The Permittees met that date and submitted their Amended Renewal Application on September 25, 2009.

The changes requested in the amended Renewal Application are limited to:

- Authorization to dispose of transuranic mixed-waste in Panel 8
- Inclusion of the WIPP Mine Ventilation Rate Monitoring Plan

Additionally, the Permittees provided new and or revised information required of all applications.

The Waste Isolation Pilot Plant Hazardous Waste Facility Permit Amended Renewal Application, September 2009, can be viewed on the Waste Isolation Pilot Plant webpage: http://www.wipp.energy.gov/library/rcrapermit/Final_Renewal_Application_9_09.htm.

CBFO:ORC:GS:09-0328:UFC 5487.00

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

1190 St. Francis Drive
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David C. Moody, Manage
US Dept. of Energy
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 882215

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 15, 2009

David C. Moody, Manager
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, New Mexico 88221

RE: Approval of the Plan and Conceptual Design for Controlling Storm Water and Minimizing Erosion on the Covered Salt Pile, DP-831, DOE Waste Isolation Pilot Plant

Dear Mr. Moody:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has received the letter titled, *Conceptual Design for Controlling Storm Water and Minimizing Erosion on the Covered Salt Pile* (Letter) dated October 14, 2009. In the Letter, the U.S. Department of Energy (DOE) provides a design to construct additional controls to divert storm water off the Salt Pile, which has led to significant erosion of the cover in the past. The October 14, 2009 letter serves as a follow-up to the initial proposal titled, *Plan for Controlling Storm Water and Minimizing Erosion on the Covered Salt Pile* (Plan) submitted by the DOE on March 6, 2009. The Plan provided an evaluation of various alternatives for controlling storm water and minimizing erosion on the Salt Pile, and recommended a basic design for accomplishing the task. The submittal of these documents fulfills the requirements of Condition 6 of the Discharge Permit Renewal and Modification dated September 9, 2008. The WIPP facility is located 26 miles east of Carlsbad in Sections 20, 21, 28 and 29, T22S, R31E, Eddy County.

The proposed Plan and Letter for improvements of the Salt Pile includes 1) the construction of two new run-off chutes, 2) additional berms and top surface regrading to direct storm water to the chutes and off the top of the pile, and 3) the reestablishment of vegetation on the cover.

NMED hereby approves the Plan and Conceptual Design to control storm water and minimize erosion on the Salt Pile described in the letters dated March 6, 2009 and October 14, 2009. Upon completion of the work, the DOE must submit as-built plans of the improvements to NMED. If at any time in the future the DOE intends to make significant changes to the design, the DOE is required to notify NMED prior to implementing the changes.

If you have questions, please contact me at 505-827-0027 or by e-mail at clint.marshall@state.nm.us.

Sincerely,

Clint Marshall, Permit Lead
Mining Environmental Compliance Section
Ground Water Quality Bureau

xc: Mary Ann Menetrey, Program Manager, MECS-GWQB

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

BILL RICHARDSON
Governor
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1190 St. Francis Drive
P.O. Box 5469, Santa Fe, NM 87502
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David C. Moody, Manage
US Dept. of Energy
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 882215
PS Form 3800, August 20
7008 1830 0003 4174 4787

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 15, 2009

David C. Moody, Manager
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, New Mexico 88221

RE: Discharge Permit Amendment Approval, DP-831, Increase in Storage Capacity of the Salt Pile Evaporation Pond, DOE Waste Isolation Pilot Plant

Dear Mr. Moody:

The Ground Water Quality Bureau of the New Mexico Environment Department has received the letter titled, *Corrected DP-831 Amendment Request to Increase the Capacity of the Salt Pile Evaporation Pond* (Letter) dated September 30, 2009. In the Letter, the U.S. Department of Energy (DOE) requests the amendment of the Discharge Permit 831 (DP-831) to increase the capacity of the Salt Pile Evaporation Pond (SPEP) at the Waste Isolation Pilot Plant (WIPP) by redirecting storm water and raising the berm on the pond. The WIPP facility is located 26 miles east of Carlsbad in Sections 20, 21, 28 and 29, T22S, R31E, Eddy County.

The Amendment of DP-831 is described as follows.

The DOE proposes to increase the capacity of the SPEP to fully utilize the total volume of the pond allowing for one foot of freeboard. This will be accomplished by increasing the height the berm encompassing the pond by 2.5 feet. Rather than raise the entire berm elevation, the increase will be achieved by filling in a low area with fill material and covering it with a high density polyethylene (HDPE) liner. This will provide an additional 1.5 feet before reaching the required one foot freeboard level. The low area in the berm currently serves to catch storm water runoff from the west parking area located south of the SPEP.

Once the berm is raised, the ground surface south of the SPEP and north of the parking lot will be regraded to divert storm water runoff from approximately four acres of the parking lot in a westerly direction to an area of undisturbed land located west of the SPEP. The storm water to be diverted by these activities will be unaffected by salt storage activities.

Pursuant to the Water Quality Control Commission (WQCC) Regulations (20.6.2 NMAC) this request to amend DP-831 for the above referenced facility is hereby approved, subject to the conditions listed below. The renewal and modification of DP-831 was approved on September 9, 2008. In approving this Discharge Permit Amendment, NMED has determined that the requirements of 20.6.2.3109 NMAC have been met.

AMMENDED PERMIT CONDITIONS

Condition 2e of the current September 9, 2008 Discharge Permit Renewal and Modification, DP-831, shall be revised as follows.

Permitted Discharge Flow Rates

2. During the term of this Discharge Permit Renewal and Modification, the DOE shall manage discharges as follows. [20.6.2.3109 NMAC]

   e. The DOE is permitted to collect storm water runoff from the Salt Pile to the Salt Pile Evaporation Pond (SPEP) at a designed flow of 1,677,633 gallons per day based on a 25 year/24 hour storm event (3.90 inches). The pond capacity is 5,403,305 gallons not allowing for any freeboard.

ADDITIONAL PERMIT CONDITIONS

The following condition shall be added per this amendment to DP-831.

1. Within 90 days of completing the construction activities to increase the capacity of the SPEP and regrade the surrounding areas to divert storm water runoff, the DOE shall submit as-built plans to NMED. The plans shall show the improvements made the SPEP and the post-grade surface topography of the areas south and west of the SPEP where storm water will be diverted. [20.6.2.3109 NMAC]

OTHER REQUIREMENTS

The terms and conditions contained herein and those in the Discharge Permit that remain unchanged shall be complied with by the DOE and are enforceable by NMED pursuant to 20.6.2.3104 NMAC and NMSA 1978 74-6-5 and 75-6-10. Please be advised that this Discharge Permit Amendment does not relieve the DOE of liability should its operation result in actual pollution of surface or ground water which may be actionable under other laws and/or regulations.

PERIOD OF APPROVAL

Pursuant to 20.6.2.3109.H.4 NMAC, the term of this Discharge Permit Amendment for the DP-381 shall be the same as the remaining term of the Discharge Permit DP-831, which will expire on September 9, 2013. The DOE must submit an application for renewal at least 120 days before the permit expiration date. The timely submission of the renewal request keeps the permit and this amendment active until the renewal process is complete in accordance with 20.6.2.3106.F NMAC.

Approval of this Discharge Permit Amendment does not relieve the DOE of its responsibility to comply with the Water Quality Act (WQA), the WQCC Regulations, and any other applicable federal, state, and/or local laws and regulations.

If at any time in the future the DOE intends to change the disposition of any discharge relating to this amendment, the DOE is required to notify NMED prior to changing the discharge.

Please contact Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027 with any questions.

Sincerely,

William Olson, Chief
Ground Water Quality Bureau

WO:CLM

xc: Mary Ann Menetrey, Program Manager, MECS-GWQB

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

OCT 1 4 2009

Mr. William Olson, Chief
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

OCT 16 2009

BY:

Subject: Conceptual Design for Controlling Storm Water and Minimizing Erosion of the Covered Salt Pile

Reference: DOE Memorandum CBFO:OPC:DF:MAG:09-0226:UFC:5486.00 from Dr. D. C. Moody to Mr. W. Olson, dated March 6, 2009, Subject: Plan for Controlling Storm Water and Minimizing Erosion of the Salt Pile

Dear Mr. Olson:

The purpose of this letter is to provide you with the conceptual design for controlling storm water and minimizing erosion on the covered salt pile in accordance with the commitment made in the March 6, 2009 letter referenced above. The enclosed figure illustrates the following improvements for controlling storm water and minimizing erosion:

- Installation of two new run-off chutes (one on the southwest corner and one on the southeast corner of the salt pile). The chutes will be similar in material and construction to the existing chutes.
- Additional berms will be constructed to aid in directing storm water flow to the four run-off chutes. The berms will be of similar construction to the existing berms.
- Grading will be performed to direct flows to the run-off chutes.
- Vegetation will be reestablished in the disturbed areas.

The conceptual design redefines the water shed of the salt pile and creates distinct flow paths for the run-off to the Salt Pile Evaporation Pond or Salt Storage Extension Basin. The enclosed figure contains arrows illustrating the post grading flows across the top of the salt pile. The conceptual design is expected to minimize erosion and control storm water runoff. Periodic maintenance will still be required on the salt pile cover due to erosion processes. During construction and following completion of the enhancements to the salt pile, the Permittee will continue efforts to identify efficiencies and improvements in controlling storm water and minimizing erosion and protecting groundwater.

Upon your approval of this plan, the design will be finalized and procurement of services to implement the design will be initiated.

If you have any concerns or need additional information regarding this matter, please contact Mr. Dan Ferguson at (575)234-8128.

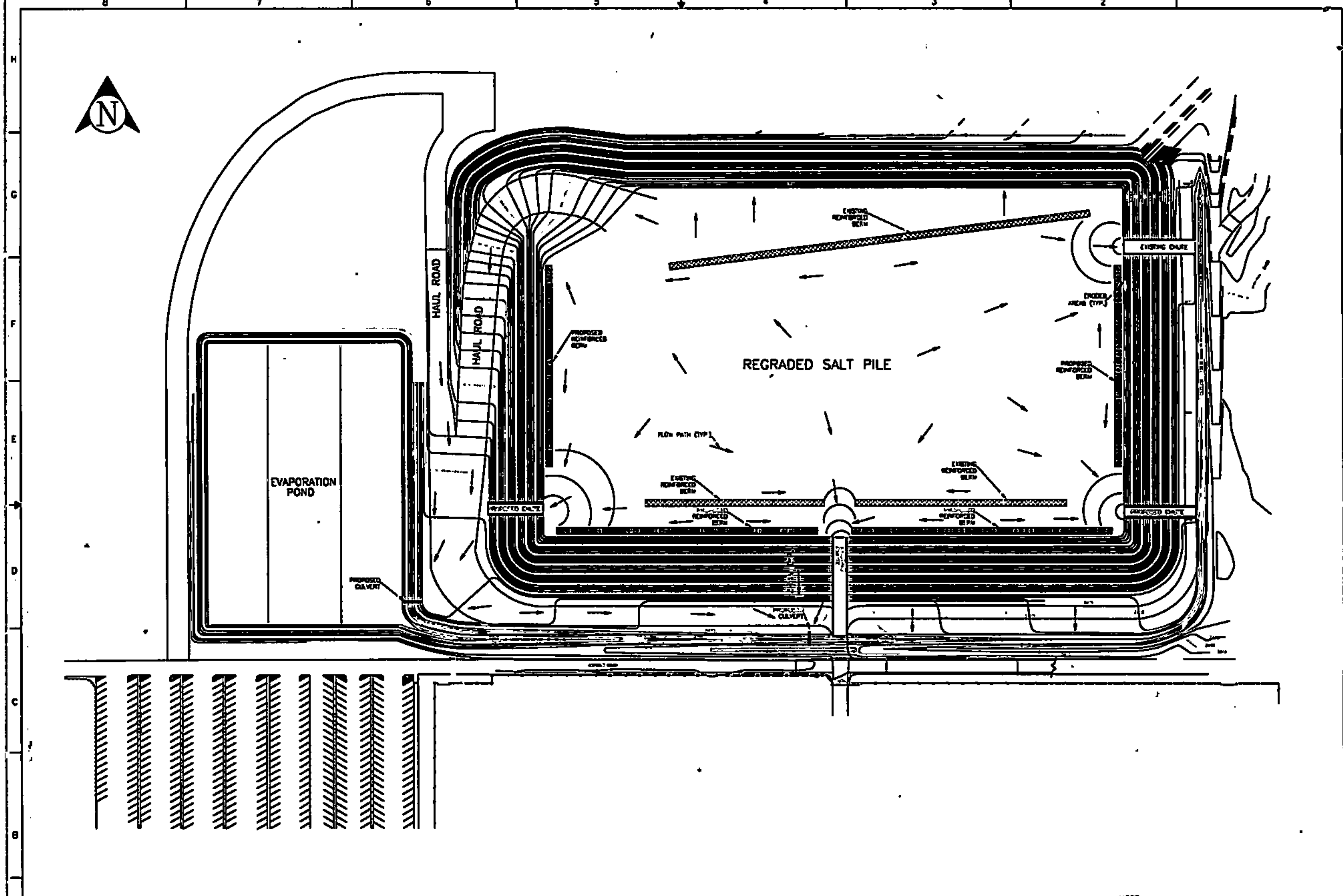
Sincerely,

David C Moody

David C. Moody
Manager

Enclosure

cc:
C. Marshall, NMED *ED
M. A. Menetrey, NMED ED
*ED denotes electronic distribution



NOTE:
1. Drawing Not to Scale (NTS)
2. Chutes are shown in approximate locations

Waste Isolation Pilot Plant Carlsbad, New Mexico
COVERED SALT PILE STORM WATER AND EROSION CONTROLS
ENG-09-001

CONCEPTUAL DRAWING FOR INFORMATION ONLY

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

SEP 3 0 2009

Mr. Clint Marshall
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

RECEIVED
OCT 05 2009

Subject: Corrected DP-831 Amendment Request to Increase the Capacity of the Salt Pile Evaporation Pond

Dear Mr. Marshall:

This letter is intended to replace the August 21, 2009 request for an amendment to the Discharge Permit, DP-831, for the Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) facility located 26 miles east of Carlsbad, NM. The DOE requests to raise the berm on the south side of the Salt Pile Run-off Ditch to an elevation equivalent to the height of the south berm of the Salt Pile Evaporation Pond (SPEP). This will result in allowing the full capacity of the Salt Pile Evaporation Pond to be used. Currently, water would back up in the Salt Pile Run-off Ditch and overflow prior to the SPEP capacity being reached. The total capacity of the pond is approximately 722,400 cubic feet (5,403,350 gallons). The primary change in the discharge is the diversion of approximately 4 acres of the SPEP's drainage area to an area west of the SPEP.

This will be accomplished by increasing the berm height of the Salt Pile Run-off Ditch approximately two and a half feet at the lowest point. This will be accomplished by filling in a low area in the ditch with soil and covering the filled area with a High Density Poly Ethylene (HDPE) liner.

Once the berm is raised, we propose to regrade the soil area south of the SPEP and north of the parking lot to divert run-off from approximately four acres of the parking lot area west of the SPEP and then north into undisturbed terrain. The first page of the enclosure (Vicinity Map) shows the location to be graded relative to the covered salt pile and SPEP as the area enclosed with heavy dotted lines. The second page of the enclosure (SPEP Drainage Channel) shows the details as a conceptual post grading topographic survey with the arrows showing the direction of water flow. The water diverted in this manner will be storm water that is unaffected by the salt storage activities. If the final "as-built" elevation of the new berm or pond capacity differs from the proposed elevation and capacity, we will notify your office to revise this amendment request.

If you have any concerns or need additional information regarding this request for an amendment, please call me at 575-234-8128.

Sincerely,

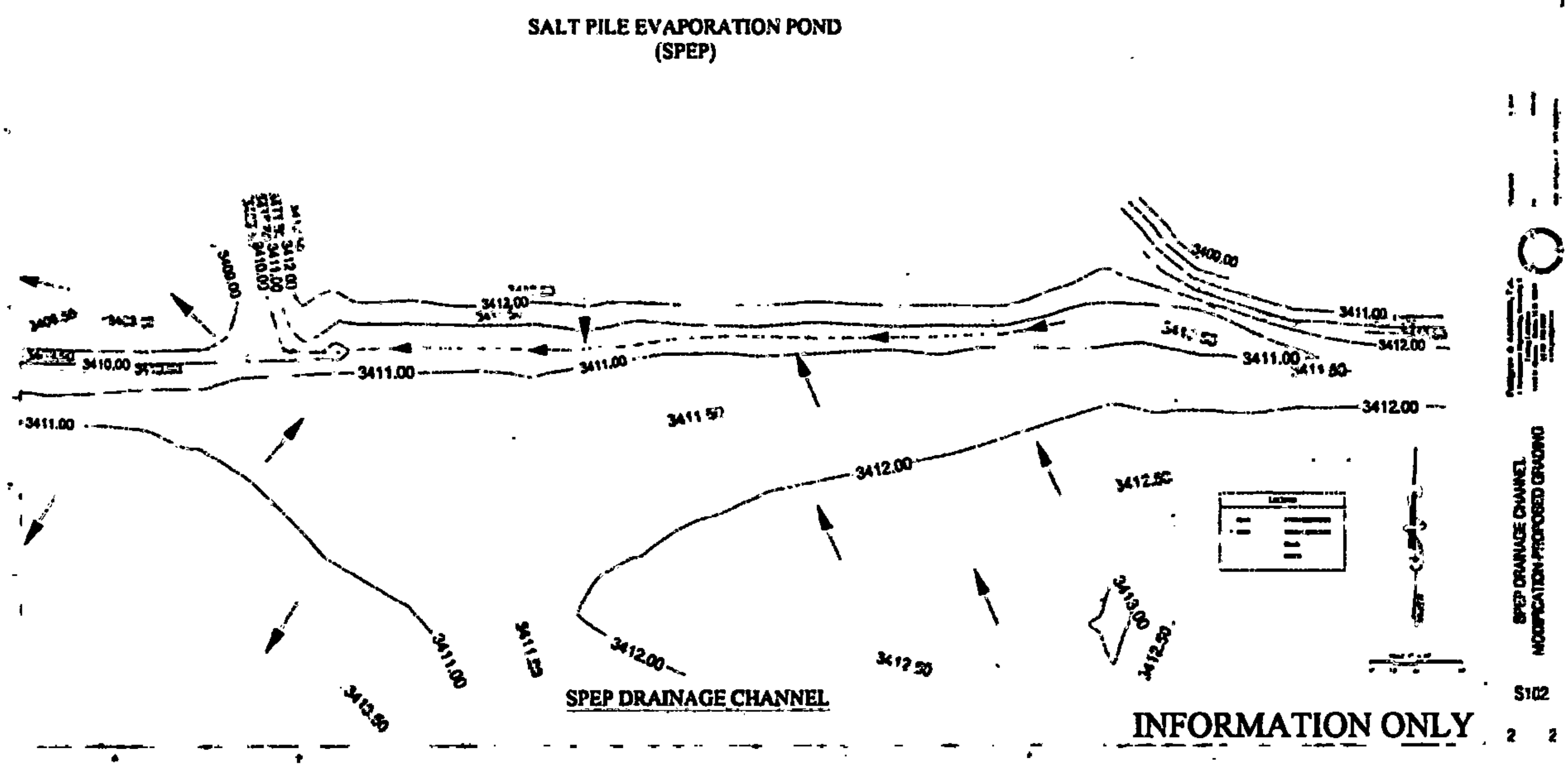
Dan Ferguson
Site Regulatory Specialist

Enclosures (2)

cc:
Mary Ann Menetrey, NMED *ED
William Olsen, NMED ED
*ED denotes electronic distribution

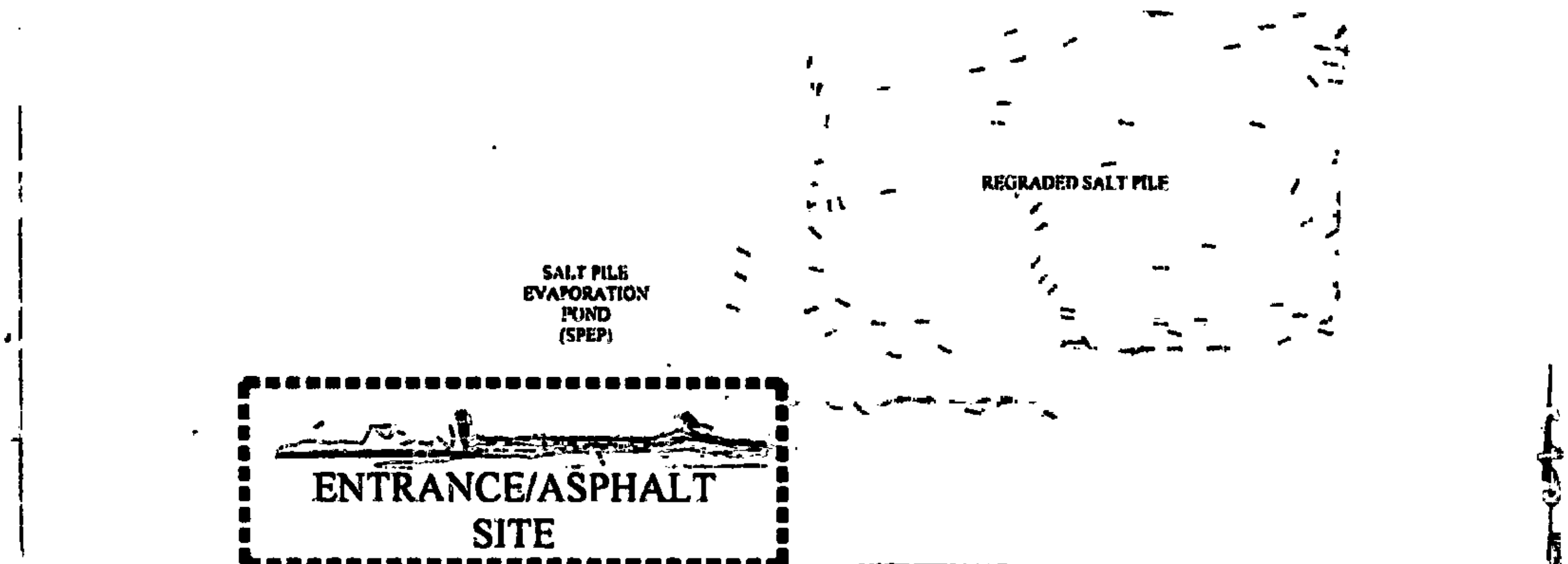
CBFO:ORC:DF:CC:09-0320:UFC:5486.00

TOPOGRAPHIC SURVEY OF SPEP DRAINAGE CHANNEL - WIPP SITE



INFORMATION ONLY

TOPOGRAPHIC SURVEY OF SPEP DRAINAGE CHANNEL - WIPP SITE



VICINITY MAP
N.T.S.

INFORMATION ONLY

SPEP DRAINAGE CHANNEL
VICINITY MAP

S101

1 2

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

SEP 30 2009

OCT 05 2009

Mr. Clint Marshall
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Schedule for the Installation of New Liners in Evaporation Ponds A and B at the WIPP Sewage Treatment Facility

Reference: D. C. Moody to William Olson, *Corrective Action Report for the WIPP Sewage Lagoon*, March 3, 2009

Dear Mr. Marshall:

The purpose of this letter is to notify you that the installation of the new liner in Evaporation Pond B will be completed on schedule by September 30, 2009. However, rain storms in September have resulted in a delay of the completion of liner installation in Evaporation Pond A, completion is now expected in early October 2009.

As noted in the referenced letter, we had proposed to complete the liner replacement in both ponds during fiscal year 2009. In the event the installation of the new liner in Evaporation Pond A cannot be completed by October 31, 2009, we will notify your office of any additional delay time.

If you have any concerns or need additional information regarding this matter, please call me at 575-234-8128.

Sincerely,

Dan Ferguson

Dan Ferguson
Site Regulatory Specialist

cc:
Mary Ann Menetrey, NMED *ED
William Olsen, NMED ED
*ED denotes electronic distribution

CBFO:ORC:DF:CC:09-0321:UFC:5486.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
August 28, 2009

GROUND WATER

SEP 01 2009

BUREAU

Mr. Clint Marshall
Mining Environmental Compliance Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Schedule for Construction of the New Salt Storage Extension Basin

Dear Mr. Marshall:

The purpose of this letter is to provide you with a construction schedule for the new Salt Storage Extension Basin (SSEB-II) in accordance with your letter dated July 15, 2009, and a summary of the work conducted to date. The construction contractor was mobilized on July 27, 2009. The SSEB-II location was surveyed and staked between July 30 and August 3, 2009. Excavation began on August 6, 2009. Approximately 150,000 cubic yards of soil will be removed to excavate the pond. Excavation is anticipated to be completed about October 28, 2009.

The primary 60 mil High Density Polyethylene (HDPE) liner, the 200 mil geonet drainage layer, and then the secondary 60 mil HDPE liner will be installed. As much of the liner system that can be installed will be installed; however, it is necessary to leave enough unlined area to allow room to excavate and install two 12-inch culverts to connect the existing SSEB with the SSEB-II.

If the Discharge Permit Modification for the SSEB-II has not been approved by the time it is necessary to connect the two ponds, the Department of Energy will request a temporary authorization to discharge for up to 120 days in accordance with 20.6.2.3106.B. NMAC. This will authorize the transfer of water from the SSEB to the SSEB-II to facilitate completion of the culvert installation. Following installation of the culverts and back filling the berm, the liner installation in the SSEB-II will be completed. Assuming no issues with the weather or contractor resources, the construction of the new pond is projected to be completed by February 28, 2010.

If you have any questions or need additional information regarding the above projects, please contact me at (575) 234-8128.

Sincerely,

Daniel J. Ferguson
Site Regulatory Specialist

cc:
Mary Ann Menetrey, NMED * ED
William Olsen, NMED ED
*ED denotes electronic distribution

CBFO:ORC:DF:AAC:09-0302:UFC 5486.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

AUG 2 4 2009

The Honorable Bill Richardson
Governor of New Mexico
490 Old Santa Fe Trail
State Capitol, Room 400
Santa Fe, NM 87501

Mr. Doug Burger, District Manager
United States Department of Interior
Bureau of Land Management
Pecos District Office
2909 W. Second Street
Roswell, NM 88201-2019

Subject: Consultation Regarding the Viable Sale of Salt Tailings at the Waste Isolation Pilot Plant

Dear Governor Richardson and Mr. Burger:

This letter is to notify you that the U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) through the managing and operating contractor for the Waste Isolation Pilot Plant (WIPP) site, Washington TRU Solutions (WTS), intends to sell excess salt tailings generated by mining activities at the WIPP to Magnum Blue Ribbon Feeds, Inc. (Magnum), a Texas-based cattle feed company. This letter is being written pursuant to Section 4 of the WIPP Land Withdrawal Act (LWA) that requires that the Secretary of Energy consult the Secretary of the Interior and the State of New Mexico in discharging its responsibilities pursuant to managing the LWA.

Section 4 (b)(4) of the WIPP LWA provides that the Secretary of Energy shall dispose of salt tailings extracted from the withdrawal that the Secretary of Energy determines are not needed for backfill at WIPP and that the disposal of such tailings shall be made under §§2 and 3 of the Act of July 31, 1947 (30 U.S.C. §§602, 603; commonly referred to as the "Materials Act of 1947"). Under the Materials Act, DOE is required to dispose of excess salt tailings to the highest responsible qualified bidder after formal advertising unless the tailings can be used for a federal, state and local government works program for which a public exigency precludes formal advertising or it is otherwise impracticable to obtain competition for them. WTS formally issued an expression of interest letter to four prospective buyers. Magnum was the only qualified bidder to respond to the expression of interest.

Mining activities at the WIPP facility result in approximately 2,000 tons per week of salt tailings being excavated when mining operations are in progress. These tailings are brought to the surface and stored in a high density polyethylene lined, uncovered area (Cell B). The staging area for buyer pickup of the excess salt tailings would be located at the existing active salt tailings storage area (Cell B). Truck/trailers belonging to the buyer would be provided access to the staging area via existing roads. The buyer would be responsible for constructing a ramp over an existing berm to gain access to the salt storage area. This constructed ramp would allow the buyer separate access to the staging area without interacting with the site traffic (e.g., trucks hauling salt tailings from the salt skip to Cell B), impinging upon the WIPP Property Protection Area, or otherwise impacting existing site infrastructure or operations. The buyer would be responsible for loading the salt tailings into their trucks and then transporting the material offsite. No processing of the salt tailings would be allowed within the WIPP Land Withdrawal Area. Other than the new ramp, no new facilities would be constructed in conjunction with the

CBFO:ORC:SEM:SES:09-0295:UFC 1000.00

sale of the salt. A review of the potential environmental impacts of the sale of the salt tailings was conducted and a summary of that review is provided in an enclosure to this letter. Also enclosed is a site map showing the locations of Cell B and the proposed access ramp.

The sale of excess salt tailings from mining at WIPP to commercial interests will result in significant cost savings to the DOE. It will reduce the level of DOE resources presently required to manage excess salt tailings and, ultimately, will reduce costs to remediate the salt tailings storage area at the time of WIPP closure. The sale of excess salt tailings will help to minimize the potential for brine discharge to the subsurface thereby reducing the risk of future shallow subsurface water degradation.

WTS, on behalf of the CBFO, will begin the process of releasing salt tailings to Magnum as soon as practicable given the need to complete contracting agreements and the construction requirements previously mentioned.

If you have any comments or questions regarding this sale, please contact Ms. Susan McCauslin at (575) 234-7349.

Sincerely,

for David C. Moody
Manager

Enclosures

cc:
Ms. Joanna Prukop
Cabinet Secretary and Chairman
Radioactive Waste Consultation Task Force
Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505

Mr. Ron Curry
Secretary
New Mexico Environment Department
PO Box 5469
Santa Fe, New Mexico 87502-5469

CBFO:ORC:SEM:SES:09-0295:UFC 1000.00

Summary of Environmental Review – Salt Tailings Sale

Review of Existing NEPA Documentation

A review of the environmental impacts associated with the construction and operation of the WIPP facility can be found in the Waste Isolation Pilot Plant Final Environmental Statement (FEIS) (DOE/EIS-0026) and the Waste Isolation Pilot Plant Disposal Phase Supplemental Environmental Impact Statement (SEIS-II) (DOE/EIS-0026-S-2). The management and disposition of excavated salt tailings at the WIPP facility is addressed in the SEIS-II. Review of the subject document finds that one of the disposition pathways considered for unneeded salt tailings is to sell it in accordance with the Materials Act (see pp. 3-10, 3-15, 4-6, 5-6 of the SEIS-II).

Environmental Impacts

Construction-Related Activities: Implementation of the proposed action would require the construction of a ramp over an existing berm to the active salt tailings storage area (Cell B). The purpose of this ramp would be to provide buyer access to the salt tailings storage area without impinging upon the WIPP Property Protection Area or impacting existing site infrastructure or operations. Review of available data finds that there are no environmentally sensitive resources (e.g., threatened and endangered species, critical habitat, and archaeological/ cultural resources) in the area of the proposed ramp. Assuming implementation of appropriate best management practices (BMP's) (e.g., soil erosion control and spill prevention control), construction of the ramp would not significantly impact human health or the environment.

Truck Traffic: The proposed action would allow buyer truck/trailers separate access to the salt tailings storage area without interacting with onsite traffic involved with the receipt of TRU waste or hauling mined salt tailings from the skip to Cell B. Assuming that salt tailings dumping and pickup operations occurred in separate locations within the salt tailings storage area, the potential for interaction or accidents between the respective traffic streams would be negligible.

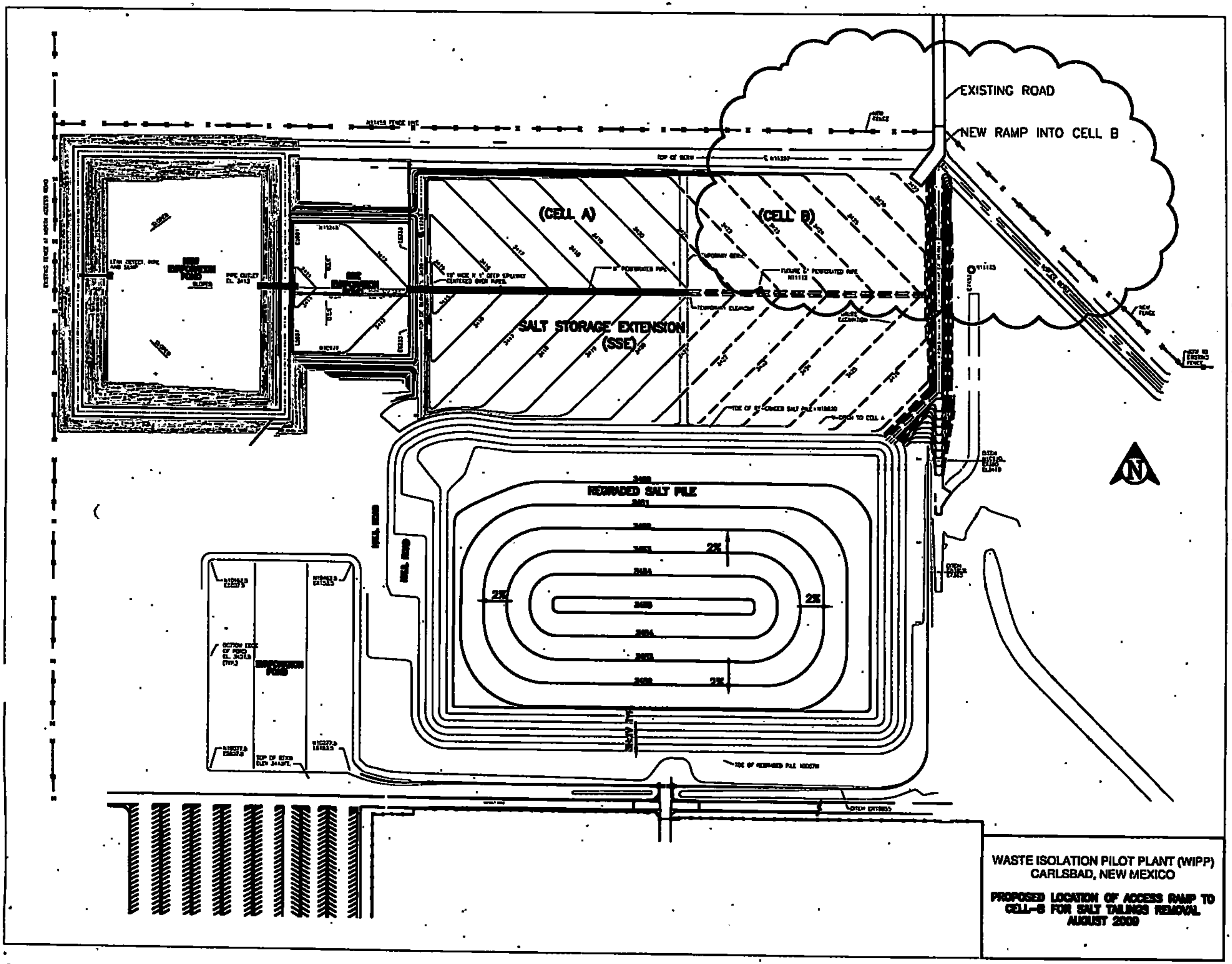
The North Access Road, which connects the WIPP facility to U.S. Highway 62/180, was constructed to provide access for employees and heavy transports bringing TRU waste to the facility. The traffic on this road presently averages approximately 800 vehicles per day. Only two percent of this traffic volume involves heavy haul trucks. It is estimated that up to 96 trucks per week may be required to transport excess salt tailings offsite. This new traffic stream would not interact with onsite traffic and would easily be accommodated by the existing area road system (e.g., North Access Road, U.S. Highway 62/180 or the South Access Road, Highway 128). The environmental impacts of increased truck traffic associated with the proposed action would be negligible.

Air Quality: Air emissions associated with the proposed action (e.g., fugitive dust, airborne particulates and engine exhaust) would result from ramp construction activities and the loading/transport of salt tailings by the buyer. Construction-related activities would result in fugitive dust and engine exhaust emissions. The environmental impacts of these air emissions would be transient and limited to the project area. If required, these impacts could be partially mitigated by the application of appropriate Best Management Practices (e.g., wetting the road surface during construction). The proposed loading and transport of excess salt tailings by the buyer would result in the generation of airborne particulates and engine exhaust emissions. The environmental impacts of these air emissions would be limited to the project area and would not pose an unacceptable and adverse impact on air quality. Engine exhaust emissions associated with the loading and subsequent transport of salt tailings would have a negligible impact on area air quality.

Water Quality: Implementation of the proposed action reduces the quantity of salt tailings stored on site and will not adversely impact surface or ground water quality. The proposed action may in fact minimize the potential future contribution of brine discharge to the subsurface thereby reducing the risk of future shallow subsurface water degradation.

Other Impacts: The sale of excess salt tailings to commercial interests would reduce the level of DOE resources required to manage excess salt tailings and, ultimately, to remediate the salt tailings storage area at the time of WIPP closure.

Conclusion and Recommendation: Although implementation of the proposed action would result in airborne emissions resulting from ramp construction and the loading/transport of excess salt tailings, the incremental and cumulative impacts of these activities on the human environment are negligible. Additionally, reduction in the amount of salt tailings in storage as the result of the sale of excess salt tailings may result in significant cost savings to the DOE and will partially mitigate potential degradation of subsurface water from brine discharges. Accordingly, the proposed action will be tiered back to DOE/EIS-0026-S-2. No further NEPA review is required.



WASTE ISOLATION PILOT PLANT (WIPP)
CARLSBAD, NEW MEXICO

PROPOSED LOCATION OF ACCESS RAMP TO CELL–B FOR SALT TAILINGS REMOVAL
AUGUST 2009

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

AUG 21 2009

AUG 26 2009

Mr. Clint Marshall
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: DP-831 Amendment Request to Increase the Capacity of the Salt Pile Evaporation Pond

Dear Mr. Marshall:

The purpose of this letter is to request an amendment to the Discharge Permit, DP-831, for the Department of Energy (DOE) Waste Isolation Pilot Plant facility located 26 miles east of Carlsbad, New Mexico. The DOE requests to modify the Salt Pile Evaporation Pond (SPEP) to increase the available water storage capacity from approximately 200,000 cubic feet with one foot of freeboard to approximately 494,000 cubic feet with one foot of freeboard. This will be accomplished by increasing the berm height approximately two and a half feet by filling in a low area with soil and covering the filled area with a High Density Polyethylene liner, thereby providing an additional 1.5 feet of capacity before reaching the one foot freeboard level.

Once the berm is raised, we propose to regrade the soil area south of the SPEP and north of the parking lot to divert run-off from approximately four acres of the parking lot area west of the SPEP and then north into undisturbed terrain. The first page of the enclosure (Vicinity Map) shows the location to be graded relative to the covered salt pile and SPEP as the area enclosed with heavy dotted lines. The second page of the enclosure (SPEP Drainage Channel) shows the details as a conceptual post grading topographic survey with the arrows showing the direction of water flow. The water diverted in this manner will be storm water that is unaffected by the salt storage activities. If the final "as built" elevation of the new berm or pond capacity differs from the proposed elevation and capacity, we will notify your office to revise this amendment request.

If you have any concerns or need additional information regarding this request for an amendment, please call me at 575-234-8128.

Sincerely,

total
4,953,422

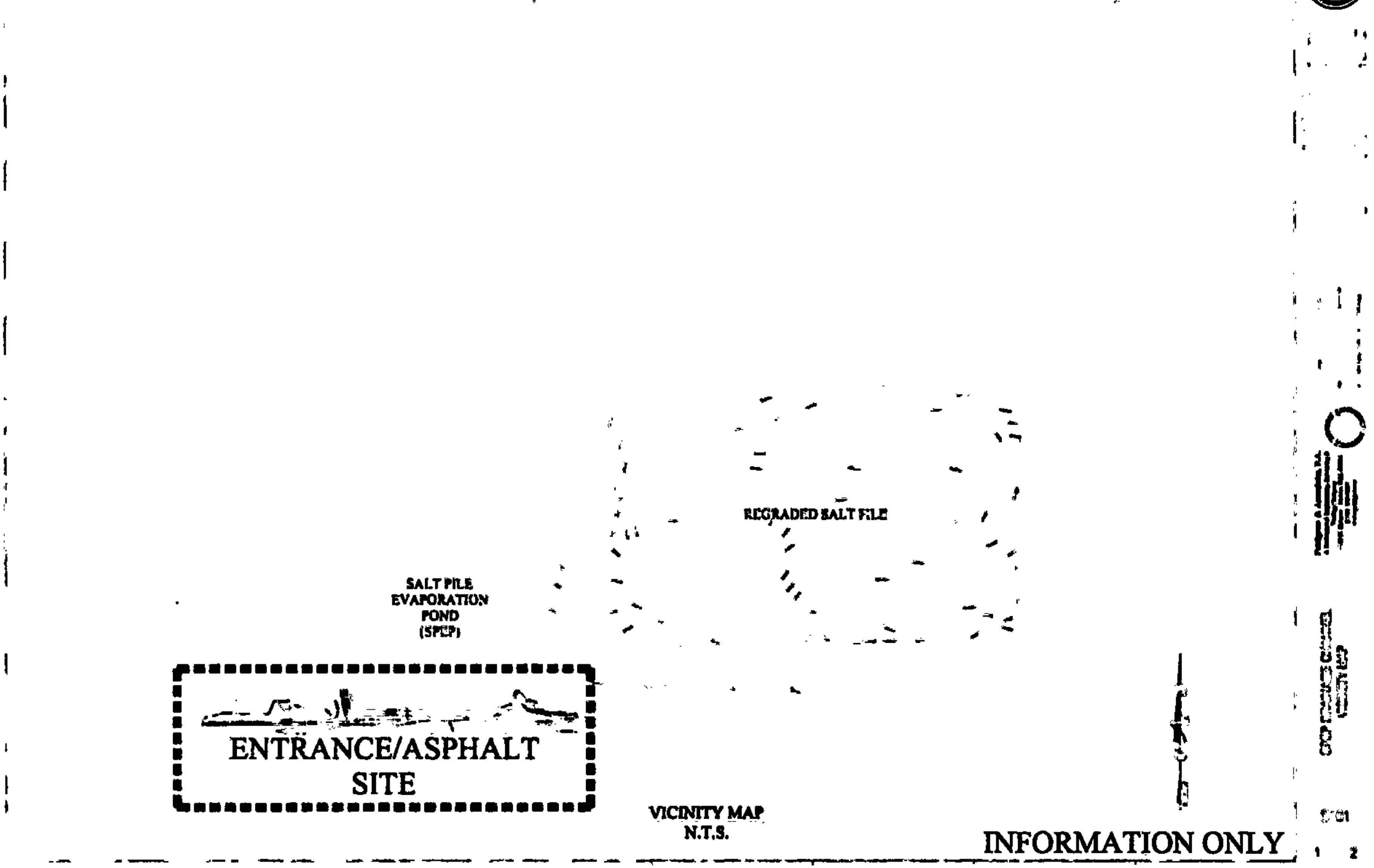
Dan Ferguson
Site Regulatory Specialist

Enclosure

cc:
M. Menetrey, NMED * ED
W. Olsen, NMED ED
*ED denotes electronic distribution

CBFO:ORC:DJF:SES:09-0296:UFC 5486.00

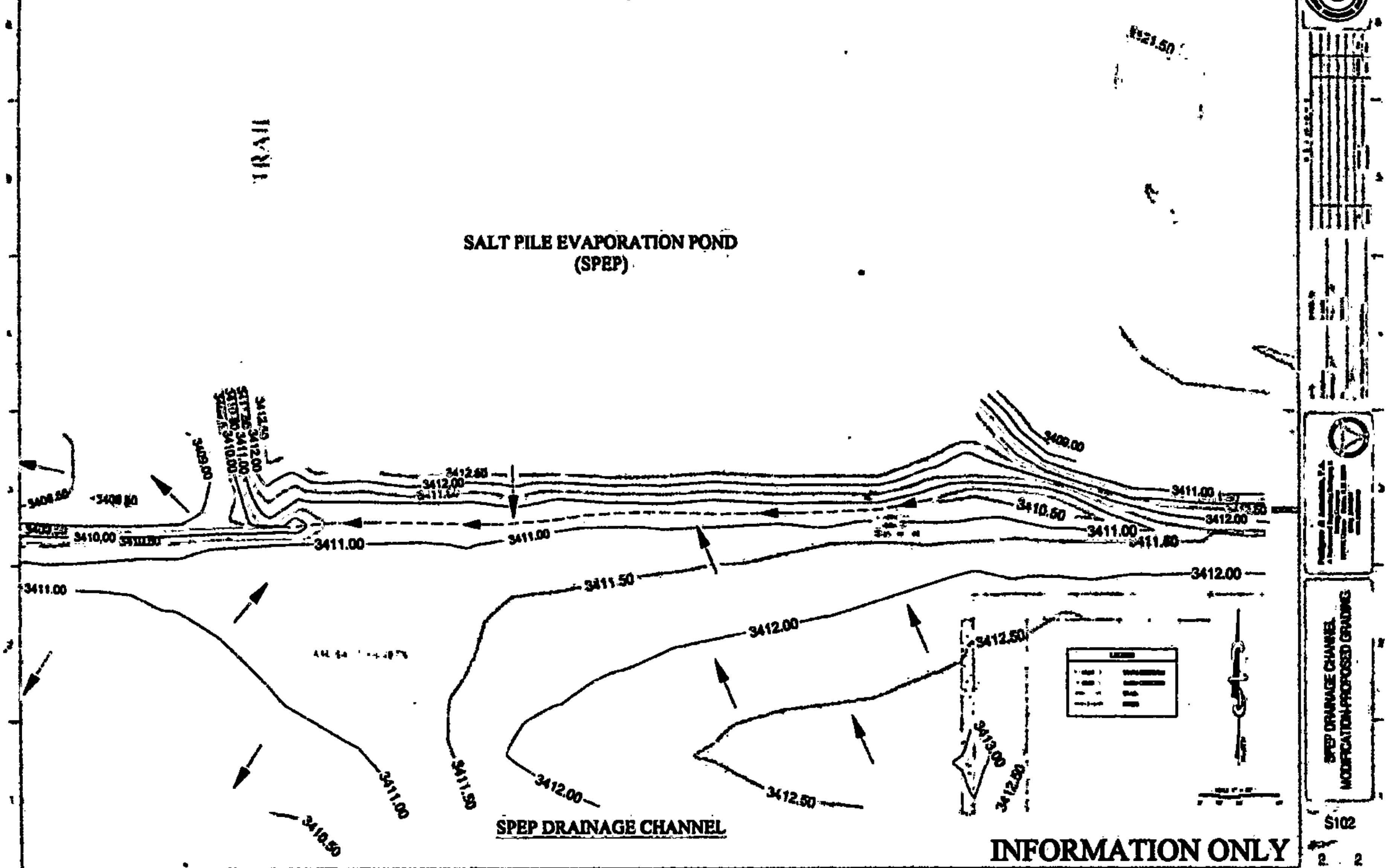
TOPOGRAPHIC SURVEY OF SPEP DRAINAGE CHANNEL - WIPP SITE



VICINITY MAP
N.T.S.

INFORMATION ONLY

TOPOGRAPHIC SURVEY OF SPEP DRAINAGE CHANNEL - WIPP SITE



INFORMATION ONLY

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

AUG 10 2009

Mr. Jon E. Hoff, Manager
Quality Assurance
Washington TRU Solutions
P.O. Box 2078
Carlsbad, NM 88221-2078

Subject: Surveillance S-09-28 of the Washington TRU Solutions Quality Assurance Program with Respect to DP-831 Procurement Activities

Dear Mr. Hoff:

The Carlsbad Field Office will conduct the subject surveillance at the Waste Isolation Pilot Plant near Carlsbad, New Mexico, September 8-10, 2009. The surveillance will be conducted in accordance with the enclosed surveillance plan. The checklists for the surveillance will be transmitted to your representative prior to the surveillance.

You are requested to provide the resources necessary to coordinate with the surveillance team, provide knowledgeable personnel to support the surveillance, arrange for appropriate space to conduct meetings, and provide the surveillance team with access to appropriate documentation and records.

If you have any questions concerning this surveillance, please contact me at (575) 234-7442.

Sincerely,

M. Lea Chism

M. Lea Chism
Quality Assurance Specialist

Enclosure

cc: w/enclosure

A. Holland, CBFO	*ED	S. Zappe, NMED	ED
H. Budweg, CBFO	ED	S. Holmes, NMED	ED
G. Basabilvazo, CBFO	ED	T. Kesterson, DOE OB WIPP NMED	ED
F. Sharif, WTS	ED	D. Winters, DNFSB	ED
M. A. Mullins, WTS	ED	P. Gomez, CTAC	ED
M. Eagle, EPA	ED	G. White, CTAC	ED
E. Feltcorn, EPA	ED	WIPP Operating Record, MS: 452-09	
R. Joglekar, EPA	ED	CBFO QA File	
S. Ghose, EPA	ED	CBFO M&RC	
R. Lee, EPA	ED	*ED denotes electronic distribution	

CBFO:QA:MLC:MAG:09-1620:UFC 2300.00

CARLSBAD FIELD OFFICE
SURVEILLANCE PLAN

Surveillance Number:	S-09-28	
Organization to be: Surveilled	Washington TRU Solutions LLC (WTS)	
Date and Location of Surveillance:	September 8 – 10, 2009 Waste Isolation Pilot Plant (WIPP) Site Offices	
Surveillance Team:	M. Lea Chism	Carlsbad Field Office (CBFO) Management Representative
	Paul C. Gomez	Surveillance Team Leader, CBFO Technical Assistance Contractor (CTAC)
	Nick Wade	Team Member, CTAC

Surveillance Scope:

The surveillance will verify the adequacy and implementation of the WTS Quality Assurance Program with respect to DP-831 procurement activities in accordance with CBFO documents. The surveillance will also evaluate and verify the implementation and effectiveness of WTS procurement services and engineering implementing processes.

Activities to be Surveilled:

- Procurement
- Control of the Discharge Permit

Governing Documents/Requirements:

The overall adequacy of WTS documents will be assessed based on DOE/CBFO-94-1012, Rev. 10, *Quality Assurance Program Document*. The Discharge Permit, DP-831, will be used as a reference.

Checklists or annotated procedures based on the active revision of WTS implementing Procedure 02-EC.07, *WIPP Affirmative Procurement Plan*, will be used for the surveillance.

In addition, the following selected support functions will be evaluated and verified:

- Quality Assurance Oversight (specific questions in each checklist)
- Management Oversight and Control (specific questions in each checklist)
- 02-EM3001, *Administrative Processes for Environmental Monitoring and Hydrology Programs* (only environmental monitoring program)

Schedule of Surveillance Activities:

A presurveillance meeting is scheduled at 8:30 a.m. Tuesday, September 8, 2009 in the Support Building LCR at the WIPP site.

Management briefings will be held at 9:00 a.m. Wednesday and Thursday, September 9 and 10, 2009, in the Safety Building Mine Rescue Room at the WIPP site.

Daily surveillance team caucus meetings will be held at 3:00 p.m. Tuesday and Wednesday, September 8 and 9, 2009, in the Safety Building Mine Rescue Room at the WIPP site, and at 1:00 p.m. Thursday September 10, 2009, to evaluate surveillance progress, concerns, and logistics.

A postsurveillance meeting will be held at 2:00 p.m., Thursday, September 10, 2009, in the Support Building LCR at the WIPP site.

Prepared by: for Date: 8-10-09
Paul C. Gomez CTAC
Surveillance Team Leader

Concurrence by: M. Lea Chism Date: 08-10-09
M. Lea Chism, CBFO
Quality Assurance Specialist

Marshall, Clint, NMENV

To: Ferguson, Daniel - DOE
Subject: RE: Berm Located Next to Salt Pile Evaporation Pond

Dan,

NMED approves your request to begin construction activities associated with raising the berm on the Salt Pile Evaporation Pond (SPEP) as described in your July 23, 2009 e-mail below. This approval is contingent on the forthcoming letter requesting an amendment to DP-831 allowing this project to be completed and put into operation. Please contact me if the situation changes or if you have questions.

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
505-827-0027

From: Ferguson, Daniel - DOE [mailto:daniel.ferguson@wipp.ws]
Sent: Thursday, July 23, 2009 8:50 AM
To: Marshall, Clint, NMENV
Cc: Jones, Stewart; Roush, Parrish
Subject: Berm Located Next to Salt Pile Evaporation Pond

Clint,

This e-mail is being sent to document the portion of our phone conversation on July 21, 2009 relevant to raising the berm on the Salt Pile Evaporation Pond to increase the pond capacity. The pond was designed with a low area in the south east corner where the Salt Pile Run-off Ditch enters the pond. The low area was an engineered feature for the collection of storm water run-off from approximately 4 acres of the north portion of the site parking lot. The bottom of the pond is at an elevation of 3408 feet. The overflow point in the low area is at an elevation of approximately 3410.5 feet placing the one foot freeboard elevation at approximately 3409.5 feet.

Increasing the berm height to approximately 3412 feet by filling in the low area with soil and covering it with HDPE will provide an additional 1.5 feet before reaching the one foot freeboard level. The soil area south of the SPEP berm and north of the parking lot will be graded to divert run-off from approximately 4 acres of the parking lot west of the SPEP and then north into undisturbed terrain..

During the phone conversation on July 21, 2009, you stated that your office had determined that this modification could be made by requesting an amendment to the permit rather following the permit modification process. The DOE will follow up with a letter requesting the amendment in the near future. In the interim we appreciate your verbal approval to conduct the work if contractor availability should be available to support this project.

Between relining the sewage lagoons, constructing the SSEB-II, and raising the SPEP berm we appreciate having the flexibility to be able to begin this project should contractor availability become available prior to the amendment request being officially approved by your office.

Thanks for your assistance in this matter,

Dan Ferguson, CBFO

(575) 234-8128

This inbound email has been scanned by the MessageLabs Email Security System.

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

1190 St. Francis Drive
P.O. Box 5469, Santa Fe, NM 87502
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us
William C. Olson, Bureau Chief

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David C. Moody, Manage
Carlsbad Field Office
US Dept of Energy
PO Box 3090
Carlsbad, NM 88221-30

PS Form 3800, August 2006

CERTIFIED MAIL – RETURN RECEPT REQUESTED

July 15, 2009

David C. Moody, Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Approval of Engineering Drawings for the New Salt Storage Evaporation Basin and Extension Approval to Submit Updated Construction Schedule and Project Completion Date, DP-831, Waste Isolation Pilot Plant

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) has reviewed the letter titled, *Proposed Engineering Modifications and Schedule for Corrective Actions for Salt Contact Run-off into the Salt Storage Evaporation Basin*, submitted by the U.S. Department of Energy (DOE) on May 28, 2009. The letter requests approval of engineering design drawings and an amended construction schedule for a new evaporation pond to increase the storage capacity and evaporative surface area of the Salt Storage Extension Basin (SSEB). The pond will be constructed at the DOE's Waste Isolation Pilot Plant (WIPP) facility located approximately 26 miles east of Carlsbad, New Mexico in Sections 20, 21, 28 and 29, T22S, R31E, Eddy County.

In a letter dated December 24, 2008, the DOE committed to present NMED with proposed engineering modifications to minimize the likelihood of the loss of freeboard or overflow of the SSEB and a preliminary schedule of construction activities by May 15, 2009. The DOE met this requirement at a meeting with NMED on May 12, 2009. In addition to the information presented to NMED at the meeting, the DOE committed to submit updated design drawings for the new evaporation basin (SSEB-II) for NMED approval, which were enclosed with the May 28, 2009 letter. DOE's December 24, 2008 letter also indicated that the SSEB-II would likely be completed by the end of August 2009, and a schedule for completion of the project would be submitted to NMED by June 12, 2009. NMED issued a Notice of Violation (NOV) to the DOE on March 3, 2009, requiring the DOE to complete the corrective actions proposed in the December 24, 2008 letter by August 31, 2009.

The SSEB-II that is proposed to be constructed is a double synthetically lined 4-acre evaporation pond with a leak detection system designed to expand the storage and evaporation capacity of the existing SSEB. The combined storage capacity of both ponds together will be 1,300,000 cubic feet equaling approximately 3.5 times the 25-year, 24 hour storm event. The pond was sized estimating the evaporation rate of the saturated brines to be 70% of the evaporation rate of fresh water.

Based on the information presented at the May 12, 2009 meeting, and the information enclosed in the May 28, 2009 letter, the scope and magnitude of the corrective actions has increased significantly since the initial December 24, 2008 letter was submitted to NMED. Therefore, the DOE is seeking NMED approval for the following requests.

1. Approval is requested for Engineering Design Drawings 23-2-014-W1, 23-2-014-W2, 23-2-014-W3 for the SSEB-II. This will allow the DOE to begin construction on the evaporation ponds prior to receiving a discharge permit modification.

2. Relief is requested from the June 12, 2009 submittal date for an updated construction schedule as initially proposed in DOE's December 24, 2008 letter. The DOE proposes to submit a revised construction schedule once a successful bid is received for the project and in no case later than August 31, 2009.

3. Relief is requested from the August 31, 2009 deadline to complete pond construction as set forth in the NOV dated March 3, 2009. A new project completion date will be proposed in the revised construction schedule described in Item 2 above.

Pursuant to 20.6.2.1203A(7), NMED hereby approves the requests for the corrective action modifications described above. If additional information becomes available indicating these corrective actions are inadequate, then additional actions may be required. Approval of these corrective action modifications does not relieve you of your responsibility to comply with any other applicable federal, state and/or local laws and regulations.

If you have any questions, please contact Clint Marshall of the NMED Mining Environmental Compliance Section at 505- 827-0027.

Sincerely,

Clint Marshall, Hydrogeologist
Mining Environmental Compliance Section
Ground Water Quality Bureau

MAM:clm

xc: Mary Ann Menetrey, Program Manager, MECS
Steve Zappe, HWB

GROUND WATER

MAY 29 2009

BUREAU

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAY 28 2009

William C. Olson, Chief
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Proposed Engineering Modifications and Schedule for Corrective Actions for Salt Contact Run-off into the Salt Storage Evaporation Basin

Reference: DOE Letter CBFO:AMO:HLP:KJB:08-1426:UFC5486 from Dr. D. C. Moody to Mr. C. Marshall dated December 24, 2008, Subject: *Schedule for Permanent Corrective Actions for Salt Contact Run-off into the Salt Storage Extension Evaporation Basin*

NMED Letter dated March 3, 2009 from William C. Olson to David C. Moody RE: *Notice of Violation, DP-831, U.S. Department of Energy Waste Isolation Pilot Plant*

Dear Mr. Olson:

The purpose of this letter is to provide the Ground Water Quality Bureau (GWQB) with the following:

a) updated drawings and engineering calculations for the proposed construction of a new evaporation pond,
b) provide justification for an extension to the August 31, 2009 completion date for the construction of a new pond noted in the March 3, 2009 NOV, and,
c) notify the GWQB that an updated schedule for construction will be provided promptly following the receipt of a schedule from the contractor which is not likely to occur by the June 12, 2009 date committed to in the December 24, 2008 letter.

In the December 24, 2008 letter, *Schedule for Permanent Corrective Actions for Salt Contact Run-off into the Salt Storage Extension Evaporation Basin*, the Department of Energy (DOE) committed to present the GWQB the proposed engineering modifications to minimize the likelihood of the loss of freeboard or overflow of the Salt Storage Evaporation Basin (SSEB) and a preliminary schedule of activities by May 15, 2009. In order to meet this commitment, the DOE met with Mr. C. Marshall of the GWQB on May 12, 2009. The proposed

CBFO:ORC:DF:SES:09-0257:UFC5486

modification to construct an additional pond for the collection and evaporation of salt contact storm water run-off from the Salt Storage Extension Area was presented. In addition, DOE provided the GWQB with preliminary copies of drawings, a water balance, preliminary schedule of activities, and provided a general explanation of various aspects of the new design for the additional evaporation pond.

At the May 12, 2009 meeting, the agreement was reached that DOE would provide the GWQB with a letter and updated drawings for approval. The letter was to note that a permit modification would follow the GWQB's approval and provide a justification for an extension to the August 31, 2009 completion date for the corrective actions noted in the March 3, 2009 Notice of Violation.

Enclosed are drawings (23-2-014-W1, 23-2-014-W2, and 23-2-014-W3) and the design calculations for determining the size of the proposed evaporation pond. The new pond provides approximately four acres of additional evaporative surface area. The new pond, in conjunction with the existing evaporation pond, will provide the storage capacity for 1,300,000 cubic feet of water (approximately 3.5 times the 25-year, 24 hour storm event). The new pond was sized based on a water balance evaluating three years of monthly average rainfall and estimating the evaporation rate of the saturated brines to be 70 percent of the evaporation rate of fresh water. One 25 year/24 hour rainfall event of 3.9 inches results in the accumulation of 368,000 cubic feet of water.

DOE stated in the December 24, 2008 letter that efforts would be directed to complete this project by the end of August 2009 and proposed to provide the GWQB a schedule for completion of the project by June 12, 2009. However, the GWQB issued a Notice of Violation dated March 3, 2009 requiring these corrective actions be completed by August 31, 2009. During the design development it became apparent that the new double lined pond with leak detection would require a large surface area and storage capacity due to the slower evaporation rate for salt water. The increased size and corresponding higher cost has resulted in estimated schedules that will most likely extend into late fall.

A schedule has been estimated by DOE based on previous work of a similar nature; however, this involves making certain assumptions about the successful bidder's resources and time required for mobilization. This schedule assumes that a qualified successful bid is received and no weather interruptions occur during the project. For these reasons, DOE requests relief from the August 31, 2009 date for completion of this project set forth in the Notice of Violation dated March 3, 2009.

CBFO:ORC:DF:SES:09-0257:UFC5486

Once the successful offeror is selected and their schedule is reviewed, DOE will provide the completion schedule to the GWQB. The DOE committed to provide a schedule for completion by June 12, 2009 in the December 24, 2008 letter, this date will be difficult to meet. The DOE will provide the contractor's schedule to the GWQB promptly upon receipt; this new schedule is expected to indicate the project completion date well into the fall of 2009.

DOE has completed the interim corrective measures for the loss of freeboard in the SSEB by raising the berm between the SSEB and the Salt Storage Extension by approximately two feet and installing a high density polyethylene liner over the previously unlined berm. The DOE believes that the increased capacity of the SSEB will be sufficient to prevent overflow of the SSEB and no negative impacts to human health or the environment are likely to occur from extending the schedule to complete the construction of the new pond later into the fall of 2009.

Please advise us if you approve of the proposed corrective measures or if you have any concerns or comments regarding this matter. Additionally, please notify the DOE if the GWQB is amenable to an extension to the August 31, 2009 date for completion of the construction of the new evaporation pond to a date that DOE would prefer to propose upon contract issuance.

Thank you for your assistance and feel free contact Mr. Dan Ferguson of my staff at 575-234-8128 if you have any questions or need additional information.

Sincerely,

David C. Moody
Manager

Enclosures (4)

cc: w/enclosures
C. Marshall, NMED *ED

cc: w/o enclosures

J. Bearzi, NMED	ED
J. Kieling, NMED	ED
S. Zappe, NMED	ED

*ED denotes electronic distribution

CBFO:ORC:DF:SES:09-0257:UFC5486

Marshall, Clint, NMENV

To: Ferguson, Daniel - DOE
Subject: RE: WIPP Surface Discharge Meeting, May 12, 2009
Attachments: DP-831 Meeting Summary 5-12-09.pdf

Thanks Dan. I will enter this meeting summary into the DP-831 file along with my own (see attached).

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
505-827-0027

From: Ferguson, Daniel - DOE [mailto:daniel.ferguson@wipp.ws]
Sent: Wednesday, May 20, 2009 1:11 PM
To: Marshall, Clint, NMENV
Cc: Basabilvazo, George - DOE; Daub, Vernon - DOE; Jones, Stewart; Plum, Jody - DOE; Yocum, Patrick; Bostick, Leroy; Britain, Randy; Bryan, Wesley; Bellows, Hardy; Freeman, David; Chavez, Rick; Kehrman, Bob; Kouba, Steve; Jones, Stewart; Roush, Parrish; Siegel, Joel; Wierzbicki, William
Subject: WIPP Surface Discharge Meeting, May 12, 2009

Clint Marshall,

Ground Water Pollution Prevention Section

New Mexico Environment Department

P.O. Box 26110

Santa Fe, NM 87502

Subject: May 12, 2009 meeting to Present the Proposed Engineering Modifications and Schedule for Corrective Actions for Salt Contact Run-off into the Salt Storage Extension

RE:

DOE Letter CBFO:AMO:HLP:KJB:08-1426:UFC5486 from Dr. D. C. Moody to Mr. C. Marshall dated December 24, 2008, Subject: *Schedule for Permanent Corrective Actions for Salt Contact Run-off into the Salt Storage Extension Evaporation Basin*

NMED Letter dated March 3, 2009 William C. Olson to David C. Moody, RE: *Notice of Violation, DP-831, U.S. Department of Energy Waste Isolation Pilot Plant*

Dear Mr. Marshall:

The purpose of this letter is to document this meeting which was conducted to meet the May 15, 2009, commitment established in the December 24, 2008 letter. Thank you for providing the Department of Energy (DOE) with the opportunity to present the proposed engineering modifications and preliminary schedule of activities set forth in the

December 24, 2008 Schedule for Permanent Corrective Actions for Salt Contact Run-off into the Salt Storage Extension Evaporation Basin.

During the meeting, the proposed corrective actions were discussed that involved the construction of a new Salt Storage Extension Evaporation Pond. This pond will have an evaporative surface area of approximately four acres, and in conjunction with the existing Salt Storage Extension Evaporation Basin, will contain the average annual precipitation and approximately three, 25 year/ 24-hour storm events prior to backing water up into the Salt Storage Extension. You noted that the proposed pond and sizing calculations (water balance values) seemed to be reasonable. In addition, it was also noted that the berm between the salt pile (Cell A) and the salt pile evaporation pond has been raised and liner has been placed over the berm to prevent salt water infiltration to the environment and increased water holding capacity until the new pond is completed.

During the meeting you were provided with the latest estimated schedule that was based on experience with similar projects at WIPP. We explained that upon evaluating design criteria, noting the size of the pond, incorporating federal procurement requirements, and the corresponding high cost, the initial date of completion by August 31, 2009 was not practical. We further explained that a firm schedule is not possible until the contract is awarded and the successful bidder provides the DOE with a schedule based on their resources, procurement of materials, subcontractor availability, and mobilization time.

It was noted that you will be provided with an approved construction design drawing package and justification for an extension of the August 31, 2009 date for completion of the corrective actions for overtopping the Salt Storage Extension Evaporation Pond for approval on or about May 26, 2009.

Thank you again for meeting with us on this subject and if you have any questions or need additional information please call me at 575.234.8128.

Sincerely,

Dan Ferguson,

Site Regulatory Specialist

This inbound email has been scanned by the MessageLabs Email Security System.

STATE OF NEW MEXICO
ENVIRONMENT DEPARTMENT

MAY 2009
DOCKETED BY THE HEARING CLERK BEFORE THE SECRETARY OF ENVIRONMENT

NEW MEXICO ENVIRONMENT DEPARTMENT, Complainant,	)	No. HWB 08-46 (NOV) (H-19)
v.	)	
UNITED STATES DEPARTMENT OF ENERGY, and WASHINGTON TRU SOLUTIONS LLC, Respondents.	)	

STIPULATED FINAL ORDER

The New Mexico Environment Department ("Department") and Respondents the United States Department of Energy ("DOE") and Washington TRU Solutions LLC ("WTS"), pursuant to 20.1.5.600B(2) NMAC, stipulate to resolve the Notice of Violation issued to Respondents on November 14, 2008 on the terms and conditions specified in this Stipulated Final Order.

I. BACKGROUND

1. The Department is authorized to administer and enforce the New Mexico Hazardous Waste Act, ("HWA") NMSA 1978, §§74-4-14, the Hazardous Waste Management Regulations ("HWMR"), 20.4.1 NMAC, the Water Quality Act, ("WQA") NMSA 1978 §74-6-10 and the New Mexico Water Quality Control Regulations, 20.6.2 NMAC ("WQCC Regulations") including assessing civil penalties for violations thereof.

2. Respondents are DOE, who is a department of the United States government and the owner and operator of the Waste Isolation Pilot Plant ("WIPP") and WTS, who is a co-operator of WIPP, a mixed waste storage and disposal facility, located 26 miles east of Carlsbad in Eddy County, New Mexico for which a permit is required under the HWMR, 20.4.1.900 NMAC, incorporating 40 CFR §270.1(a), and a discharge permit is required under WQCC Regulations, 20.6.2.3104 NMAC.

3. On October 27, 1999, the Department issued a hazardous waste facility permit, No. NM4890139088-TSDF (the "Facility Permit"), for the storage and disposal of mixed transuranic waste at WIPP, pursuant to section 74-4-4.2(C) of the HWA.

4. On January 16, 1992, the Department issued Discharge Permit DP-831 to the DOE that included the conditions for the discharge of effluent to the H-19 Evaporation Pond at WIPP. DP-831 has been renewed and subsequent issuances modified as appropriate.

5. On November 9, 2007, the Respondents discharged approximately 150 gallons of brine from the Exhaust Shaft Intercept Borehole collection system into the H-19 Evaporation Pond at WIPP that exceeded the regulatory limit of 5 mg/L for lead. The Department was orally notified of the discharge on November 16, 2007, received an initial written notification of the discharge dated November 20, 2007, and received a written report on the incident dated November 30, 2007.

6. On January 18, 2008, NMED requested information and supporting documentation associated with the discharge from DOE and WTS. The response to this request was transmitted to NMED by the Respondents on February 21, 2008, and received on February 25, 2008.

II. ALLEGED VIOLATIONS

7. On November 14, 2008, the Department issued a Notice of Violation ("Notice of Violation") to the Respondents alleging the following violations:

A. The Respondents disposed of approximately 150 gallons of characteristic hazardous waste (D008) in the H-19 Evaporation Pond, an unpermitted disposal unit, in violation of 20.4.1.900 NMAC (incorporating 40 CFR 270.1(c)).

B. The Respondents disposed of approximately 150 gallons of characteristic hazardous waste (D008) in the H-19 Evaporation Pond without treating the waste to meet appropriate treatment standards specified in 20.4.1.800 NMAC (incorporating 40 CFR part 268, subpart D) in violation of 20.4.1.800 (incorporating 40 CFR 268.34).

C. Respondent DOE disposed of approximately 150 gallons of characteristic hazardous waste D008 in the H-19 Evaporation Pond, in violation of Ground Water Discharge Permit Renewal (DP-831) Condition 3.

III. COMPROMISE AND SETTLEMENT

8. The parties enter into this Stipulated Final Order to settle and completely resolve the violations alleged in the Notice of Violation, and to avoid further litigation and expense.

9. The Respondents admit the jurisdictional allegations of the Notice of Violation, and consent to the relief specified in this Stipulated Final Order including the civil penalty. This Stipulated Final Order shall not be construed as an admission by Respondents of the violations alleged in the Notice of Violation.

10. In compromise and settlement of the violations alleged in the Notice of Violation, the parties agree that the Respondents shall pay a civil penalty as follows:

A. Respondents agree to pay a civil penalty of $4,368.00 to resolve violations of the Hazardous Waste Act alleged in the Notice of Violation. Respondents shall pay the civil penalty to the State of New Mexico within 30 days after the effective date of this Stipulated Final Order. Payment shall by certified check or other guaranteed negotiable instrument, payable to the *State of New Mexico*, and shall be sent to the Department at the following address:

James P. Bearzi
Chief, Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

B. Respondent DOE agrees to pay a civil penalty of $7,875.00 to resolve violations of the Water Quality Act alleged in the Notice of Violation. Respondent DOE shall pay the civil penalty to the State of New Mexico within 30 days after the effective date of this Stipulated Final Order. Payment shall by certified check or other guaranteed negotiable instrument, payable to the *State of New Mexico*, and shall be sent to the Department at the following address:

William C. Olson, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
1190 St. Francis Dr., Suite N-2250
Santa Fe, NM 87502

C. Respondents shall provide written notification of the payments to the following address:

Charles F. Noble, Assistant General Counsel
Office of General Counsel
New Mexico Environment Department
1190 St. Francis Drive
Santa Fe, New Mexico 87502
Facsimile: (505) 827-1628

D. If Respondents fail to make timely and complete payment, Respondents shall pay interest on the outstanding balance at the rate established for judgments and decrees under NMSA 1978, §56-8-4.

IV. OTHER TERMS AND CONDITIONS

A. ENFORCEMENT

NMED retains the right to pursue any relief authorized by the HWA, the HWMR, the WQA and the WQCC Regulations for any violation not raised in the Notice of Violation.

B. COVENANTS NOT TO SUE

i. The Department covenants not to sue or take any administrate or civil action against Respondents for the violations of the HWA, HWMR, WQA or WQCC Regulations and the facility permits alleged in the Notice of Violation.

ii. Respondents covenant not to sue the State of New Mexico for any claims arising from the Notice of Violation.

C. EFFECTIVE DATE

This Stipulated Final Order shall become effective on the date it is approved and signed by the Department Secretary.

D. INTEGRATION

This Stipulated Final Order merges all prior written and oral communications between NMED and the Respondents concerning the subject matter of this Stipulated Final Order and contains the entire agreement between NMED and the Respondents.

E. BINDING EFFECT

This Stipulated Final Order shall be binding upon NMED and its successor agencies and shall be binding upon the Respondents and any employees, agents, subsidiaries, successors, assigns, trustees, heirs, or receivers of the Respondents.

F. AUTHORITY OF SIGNATORIES

The persons executing this Stipulated Final Order represent that they have the requisite authority to bind either NMED or the Respondents, as appropriate, to this Stipulated Final Order, and that their representation shall be legally sufficient evidence of actual or apparent authority to bind NMED or the Respondents to this Stipulated Final Order.

For the NEW MEXICO ENVIRONMENT DEPARTMENT

By: ______________________ Date: 5/13/09

MARCY LEAVITT
DIRECTOR
WATER AND WASTE MANAGEMENT DIVISION

For the UNITED STATES DEPARTMENT OF ENERGY

By: David C. Moody Date: 5/4/09

DAVID MOODY
MANAGER
CARLSBAD FIELD OFFICE
DEPARTMENT OF ENERGY
P.O. BOX 3090
CARLSBAD, NEW MEXICO 88221-3090

For WASHINGTON TRU SOLUTIONS LLC

By: ______________________ Date: 4-30-09

FAROK SHARIF
PRESIDENT
WASHINGTON TRU SOLUTIONS LLC
P.O. BOX 2078
CARLSBAD, NEW MEXICO 88221-2078

FINAL ORDER

Pursuant to 20.1.5.600.B(2) NMAC, this Stipulated Final Order, agreed to by the Department and by Respondents, DOE and WTS, is hereby APPROVED as a FINAL ORDER.

RON CURRY
SECRETARY OF ENVIRONMENT

Date: 5/14/09

Memorandum of Meeting or Phone Conversation

☐ Telephone X - Meeting	Time: 9:00 am	Date:

Individuals Involved

Clint Marshall	☐ called	Stewart Jones
	☐ returned call to	Dan Ferguson
	☐ teleconference	Parrish Roush
	☐ other:	Alan Grow

Subject: Proposed engineering designs for an additional salt storage extension basin (SSEB)

Discussion:

DOE and WTS presented preliminary plans and specifications for a new evaporation basin to be constructed adjacent to the existing Salt Storage Extension Basin (SSEB). The group went over plans and specifications for the proposed 5-acre synthetically lined impoundment including precipitation and evaporation calculations that were used in the sizing of the pond. This presentation meets the commitment by DOE's December 24, 2008 letter to present NMED with proposed engineering modifications and a preliminary schedule of activities. DOE will deliver a final set of drawings and a request for approval by approximately May 26, 2009. Upon NMED approval of the final design DOE may choose to break ground on the project. The new evaporation basin will be incorporated into the DP-831 through a permit modification and the application will be submitted after the plans are approved. The May 26 submittal date for the design package will not allow NMED approval by May 22, 2009, the date suggested in DOE's December 24 letter.

DOE also presented the agency with a proposal to eliminate a spillway on the SE corner of the Salt Pile Evaporation Pond (SPEP). The spillway drains storm water off the north end of the parking lot (approximately 3.8 acres) into the SPEP. This design change will significantly will significantly increase the capacity of the SPEP. The DOE will contact NMED with a proposed timeline for accomplishing this task.

Conclusions:

NMED awaiting design plans for evaporation pond.

Distribution:

Initialed CM

May 12, 2009, meeting to disuss proposed engineering modifications addressing a new salt water evaporation pond associated with the WPD DP-831 permit.

Name	Affiliation	Telephone
MARK TURNBOUGH	WTS	915 526 4548
Dan Ferguson	CDFO	575 234-7018
B. P. Roush	WRES	575-234-8078
ALAN D. GROW	WTS	575-234-8880
Stewart Jones	WRES	575. 234. 8293
Clint Marshall	NMED	505-827-0027

Proposed Schedule of Activities for Construction of the New Salt Storage Extension Evaporation Pond

Following the overtopping of the Salt Storage Extension Evaporation Pond in October 2008 the following accomplishments have been made:

- Pumped water to Ponds B and C at the Sewage Lagoons to restore freeboard.
- The berm between the Salt Storage Extension Area and the Salt Storage Extension Evaporation Pond has been raised approximately 2 feet and installed a liner, welding the liner of the Salt Storage Extension to the Salt Storage Extension Basin.
- An engineering firm was contracted to evaluate options for both Control of Storm Water and Erosion Control on the Salt Pile and the options for managing storm water run-off from the Salt Storage Extension.
- A second engineer was contracted who has evaluated the existing Salt Storage Extension, Precipitation Patterns in the region and developed a Conceptual Design for the construction of a second Pond.
- An independent engineering firm has conducted an independent review of the design and all calculations used in sizing the new pond.
- Engineering and Procurement have begun developing the Request for Proposals.

In accordance with the December 24, 2008 letter, *Schedule for Permanent Corrective Actions for Salt Contact Run-Off into the Salt Storage Extension Evaporation Basin*, this schedule of activities is being provided to the Ground Water Quality Bureau. This schedule of activities is based on experience with similar projects at WIPP and requires making certain assumptions about the selected contractor's resources, their ability to mobilize people and equipment, and the availability of qualified liner contractors. This schedule assumes that there are no grievances based on the contract award and no weather delays are encountered.

Scheduled activities include:

Generate Request for Proposal	5/12/09
Evaluate and Award Subcontract	6/10/09
Provide NMED with final Schedule	6/12/09 **(This needs to be based on Contractors' Schedule)**
Procure Liner Materials	7/8/09 (Pending Contractors Schedule)
Excavate Pond	8/6/09 (Pending Contractors Schedule)

Complete 80-90% liner and leak detections system	9/3/09 (Pending Contractors Schedule)
Pump SSEB water to new Pond	9/10/09 (Pending Contractors Schedule)
Excavate and install 12" Culvert	9/17/09 (Pending Contractors Schedule)
Complete Liner Installation	10/12/09 (Pending Contractors Schedule)
Inspection and Turnover	10/20/09 (Pending Contractors Schedule)

Hall Environmental Analysis Laboratory, Inc.

Date: *20-Apr-09*

CLIENT:	Waste Isolation Pilot Plant	**Client Sample ID:**	WST-09-022
Lab Order:	0903385	**Collection Date:**	3/23/2009 1:31:00 PM
Project:	T409304-3	**Date Received:**	3/25/2009
Lab ID:	0903385-05	**Matrix:**	AQUEOUS

Analyses		Result	Qual	MDL	PQL	Units	DF	Date Analyzed
CAS #	**SM 4500 NORG C: TKN**							Analyst: KMS
7727-37-9	Nitrogen, Kjeldahl, Total	50		0.47	2.0	mg/L	1	4/8/2009

Sewage Lagoon Settling Pond 2-A
Liquid collected 3-23-09

Qualifiers:

- ND - Not Detected at the Reporting Limit
- J - Analyte detected below quanititation limits
- B - Analyte detected in the associated Method Blank
- * - Value exceeds Maximum Contaminant Level
- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- E - Value above quantitation range

Hall Environmental Analysis Laboratory, Inc. Date: *13-Mar-09*

CLIENT:	Waste Isolation Pilot Plant	**Client Sample ID:**	WST-09-005
Lab Order:	0902219	**Tag Number:**	
Project:	T409304-3	**Collection Date:**	2/18/2009 8:33:00 AM
Lab ID:	0902219-02A **Date Received:** 2/20/2009	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
TCLP VOLATILES BY 8260B						Analyst: NSB
Benzene	ND	0.50		mg/L	1	2/23/2009 2:28:22 PM
2-Butanone	ND	10		mg/L	1	2/23/2009 2:28:22 PM
Carbon Tetrachloride	ND	0.50		mg/L	1	2/23/2009 2:28:22 PM
Chlorobenzene	ND	100		mg/L	1	2/23/2009 2:28:22 PM
Chloroform	ND	6.0		mg/L	1	2/23/2009 2:28:22 PM
1,4-Dichlorobenzene	ND	7.5		mg/L	1	2/23/2009 2:28:22 PM
1,2-Dichloroethane (EDC)	ND	0.50		mg/L	1	2/23/2009 2:28:22 PM
1,1-Dichloroethene	ND	0.70		mg/L	1	2/23/2009 2:28:22 PM
Hexachlorobutadiene	ND	0.50		mg/L	1	2/23/2009 2:28:22 PM
Tetrachloroethene (PCE)	ND	0.70		mg/L	1	2/23/2009 2:28:22 PM
Trichloroethene (TCE)	ND	0.50		mg/L	1	2/23/2009 2:28:22 PM
Vinyl chloride	ND	0.20		mg/L	1	2/23/2009 2:28:22 PM
Surr: 1,2-Dichloroethane-d4	98.1	69.9-130		%REC	1	2/23/2009 2:28:22 PM
Surr: 4-Bromofluorobenzene	96.5	71.2-123		%REC	1	2/23/2009 2:28:22 PM
Surr: Dibromofluoromethane	94.8	73.9-134		%REC	1	2/23/2009 2:28:22 PM
Surr: Toluene-d8	88.3	81.9-122		%REC	1	2/23/2009 2:28:22 PM

Sewage Lagoon Settling Pond 1-A, under west-side liner. The liquid was collected on 2-18-09.

Qualifiers: *	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *13-Mar-09*

CLIENT:	Waste Isolation Pilot Plant	**Client Sample ID:**	WST-09-005
Lab Order:	0902219	**Tag Number:**	
Project:	T409304-3	**Collection Date:**	2/18/2009 8:33:00 AM
Lab ID:	0902219-02B **Date Received:** 2/20/2009	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8081: PESTICIDES						Analyst: JDC
Chlordane	ND	30		µg/L	1	3/2/2009 8:04:45 PM
Endrin	ND	20		µg/L	1	3/2/2009 8:04:45 PM
gamma-BHC	ND	400		µg/L	1	3/2/2009 8:04:45 PM
Heptachlor	ND	8.0		µg/L	1	3/2/2009 8:04:45 PM
Heptachlor epoxide	ND	8.0		µg/L	1	3/2/2009 8:04:45 PM
Methoxychlor	ND	100		µg/L	1	3/2/2009 8:04:45 PM
Toxaphene	ND	500		µg/L	1	3/2/2009 8:04:45 PM
Surr: Decachlorobiphenyl	64.4	50.8-104		%REC	1	3/2/2009 8:04:45 PM
Surr: Tetrachloro-m-xylene	57.4	49.2-103		%REC	1	3/2/2009 8:04:45 PM
EPA METHOD 8270C TCLP						Analyst: JDC
2,4-Dinitrotoluene	ND	0.13		mg/L	1	2/23/2009
Hexachlorobenzene	ND	0.13		mg/L	1	2/23/2009
Hexachlorobutadiene	ND	0.50		mg/L	1	2/23/2009
Hexachloroethane	ND	3.0		mg/L	1	2/23/2009
Nitrobenzene	ND	2.0		mg/L	1	2/23/2009
Pentachlorophenol	ND	100		mg/L	1	2/23/2009
Pyridine	ND	5.0		mg/L	1	2/23/2009
2,4,5-Trichlorophenol	ND	400		mg/L	1	2/23/2009
2,4,6-Trichlorophenol	ND	2.0		mg/L	1	2/23/2009
Cresols, Total	ND	200		mg/L	1	2/23/2009
Surr: 2,4,6-Tribromophenol	92.7	20.9-128		%REC	1	2/23/2009
Surr: 2-Fluorobiphenyl	80.0	18.3-119		%REC	1	2/23/2009
Surr: 2-Fluorophenol	52.4	16.6-101		%REC	1	2/23/2009
Surr: 4-Terphenyl-d14	73.4	32.3-135		%REC	1	2/23/2009
Surr: Nitrobenzene-d5	77.4	22.6-117		%REC	1	2/23/2009
Surr: Phenol-d5	47.1	8-77.9		%REC	1	2/23/2009

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

Date: *13-Mar-09*

CLIENT:	Waste Isolation Pilot Plant	**Client Sample ID:**	WST-09-005
Lab Order:	0902219	**Tag Number:**	
Project:	T409304-3	**Collection Date:**	2/18/2009 8:33:00 AM
Lab ID:	0902219-02C **Date Received:** 2/20/2009	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 7470: MERCURY						Analyst: SNV
Mercury	ND	0.20		mg/L	1	2/24/2009 3:20:22 PM
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: TES
Arsenic	ND	5.0		mg/L	1	2/26/2009 6:59:15 PM
Barium	ND	100		mg/L	1	2/25/2009 9:11:22 AM
Cadmium	ND	1.0		mg/L	1	2/25/2009 9:11:22 AM
Chromium	ND	5.0		mg/L	1	2/25/2009 9:11:22 AM
Lead	ND	5.0		mg/L	1	2/25/2009 9:11:22 AM
Selenium	ND	1.0		mg/L	1	2/25/2009 9:11:22 AM
Silver	ND	5.0		mg/L	1	2/25/2009 9:11:22 AM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

CLIENT:	Waste Isolation Pilot Plant	**Client Sample ID:**	WST-09-005
Lab Order:	0902219	**Tag Number:**	
Project:	T409304-3	**Collection Date:**	2/18/2009 8:33:00 AM
Lab ID:	0902219-02D **Date Received:** 2/20/2009	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: **RAGS**
Nitrogen, Nitrate (As N)	0.25	0.10	H	mg/L	1	2/20/2009 12:56:16 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc. Date: *13-Mar-09*

CLIENT:	Waste Isolation Pilot Plant		**Client Sample ID:**	WST-09-005
Lab Order:	0902219		**Tag Number:**	
Project:	T409304-3		**Collection Date:**	2/18/2009 8:33:00 AM
Lab ID:	0902219-02F	**Date Received:** 2/20/2009	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
SM 4500 NORG C: TKN						Analyst: TAF
Nitrogen, Kjeldahl, Total	15	1.0		mg/L	1	3/10/2009

Qualifiers: *	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
ND	Not Detected at the Reporting Limit	RL	Reporting Limit
S	Spike recovery outside accepted recovery limits		

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

1190 St. Francis Drive
P.O. Box 5469, Santa Fe, NM 87502
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us
William C. Olson, Bureau Chief

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David C. Moody, Man
Carlsbad Field Offi
US Dept. of Energy
P.O. ... 3090

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

May 5, 2009

David C. Moody, Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Corrective Action Approval, DP-831, February 16, 2009 Discharge of Domestic Effluent from Sewage Settling Pond 1A, Waste Isolation Pilot Plant

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) received oral notification from the U.S. Department of Energy (DOE) of a discharge of domestic wastewater at the Waste Isolation Pilot Plant (WIPP) on February 17, 2009. The discharge was discovered at Settling Pond 1A of the Sewage Lagoon System at approximately 5:00 p.m. on February 16, 2009. The DOE submitted written notification containing interim corrective actions on February 23, 2009, and a corrective action report on March 3, 2009. The WIPP facility is located approximately 26 miles east of Carlsbad, New Mexico in Sections 20, 21, 28 and 29, T22S, R31E, Eddy County.

<u>Spill Description and Investigation</u>

At 5:00 p.m. on February 16, 2009, WIPP facility personnel while conducting the daily inspection of the lagoon system noticed erosion and ground settlement on the west side of Settling Pond 1A. Excavation in the area of settlement yielded water pooled underneath the liner and a sample of the water was collected for laboratory analysis. WIPP personnel believed at the time of discovery that an estimated 300 gallons of domestic wastewater had leaked beneath the liner. After the lagoon was emptied and the liner inspected, it was determined that there was no apparent liner leak, seam separation or other visible damage that would have caused a discharge. WIPP personnel then concluded that the pooled water was storm water rather than effluent.

Corrective Actions

Upon discovery of the leak all further discharged sewage was diverted to Settling Pond 2A and the equalization valve between Settling Ponds 1A and 2A was closed. All sewage in Settling Pond 1A was pumped to Evaporation Pond A. Necessary actions to bring Settling Pond 1A back into service include removing the liner from the affected area, filling and compacting the underlying material to 90 percent proctor, and performing repairs to the synthetic liner if needed. The repairs are scheduled to be complete within the summer timeframe. If liner damage is discovered, NMED will be notified.

Evaporation Pond A had been previously removed from service in early 2008 to facilitate replacement of the liner in accordance with a November 3, 2005 corrective action. Pursuant to 20.6.2.1203A(6), NMED hereby confirms the following actions, authorized by NMED in a telephone conversation on February 24, 2009, to facilitate the corrective actions described above.

1. DOE is permitted to temporarily transfer domestic effluent to Evaporation Pond A while repairs are made to Settling Pond 1A.

2. DOE is granted an extension to reline Evaporation Ponds A and B until the end of fiscal year 2009.

Pursuant to 20.6.2.1203A(7), NMED hereby approves the Corrective Action Report. If additional information becomes available indicating these corrective actions are inadequate, then additional actions may be required. Approval of this corrective action report does not relieve you of your responsibility to comply with any other applicable federal, state and/or local laws and regulations.

If you have any questions, please contact Clint Marshall of the Mining Environmental Compliance Section at 505- 827-0027 or clint.marshall@state.nm.us.

Sincerely,

Mary Ann Menetrey, Program Manager
Mining Environmental Compliance Section
Ground Water Quality Bureau

MAM/CLM

xc: Gary Beatty, Manager, NMED District 4, Roswell
Mary Ann Menetrey, Program Manager, MECS

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

GROUND WATER

MAY 05 2009

BUREAU

MAY 01 2009

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Mining and Environmental Compliance Section
P.O. Box 26110
Santa Fe, NM 87502

Subject: Submittal of WIPP Water Volumetrics Reports for Years 2006, 2007, and 2008

Dear Mr. Marshall:

The purpose of this letter is to transmit to you the Waste Isolation Pilot Plant water volumetrics reports for 2006, 2007, and 2008 on the enclosed compact disc.

If you have any questions about this report or require any additional information, please contact me at (575) 234-7462.

Sincerely,

H. L. Plum, RCRA Program Manager
Carlsbad Field Office

Enclosure

cc: w/enclosure
J. Bearzi, NMED *ED
J. Kieling, NMED ED
*ED denotes electronic distribution

CBFO:ORC:HLP:SES:09-0242:UFC5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAY 01 2009

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Mining and Environmental Compliance Section
P.O. Box 26110
Santa Fe, NM 87502

Subject: Submittal of WIPP Water Volumetrics Reports for Years 2006, 2007, and 2008

Dear Mr. Marshall:

The purpose of this letter is to transmit to you the Waste Isolation Pilot Plant water volumetrics reports for 2006, 2007, and 2008 on the enclosed compact disc.

If you have any questions about this report or require any additional information, please contact me at (575) 234-7462.

Sincerely,

H. L. Plum, RCRA Program Manager
Carlsbad Field Office

Enclosure

cc: w/enclosure
J. Bearzi, NMED *ED
J. Kieling, NMED ED
*ED denotes electronic distribution

CBFO:ORC:HLP:SES:09-0242:UFC5486

Washington
TRU Solutions LLC

WRES:06:105
UFC:5486.00

October 3, 2006

Mr. D. Mercer
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR SEPTEMBER 2006

Dear Mr. Mercer:

The purpose of this letter is to provide you with the September 2006 volumetrics of Exhaust Shaft intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There were 2,105 gallons of water collected from the 700 fans and 2,120 gallons of water collected from the Exhaust Shaft intercept boreholes in September 2006.

Attachments 1 and 2 are the monthly volumetrics of water removed from the underground and exhaust ductwork by month and by date, respectively. Attachment 3 is the precipitation data collected monthly from January through September 2006.

If you have any questions, please call me at Extension 7545.

Sincerely,

D. T. Bignell, Manager
Regulatory Compliance

RW:rlj

Attachments (3)

cc: G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
H. L. Plum, CBFO
C. Stroud, LANL

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Borehole Intercept Water		Waste Shaft Sump Water	
Calendar Year 2006		Calendar Year 2006		Calendar Year 2006	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March	725	March	0	March	0
April	890	April	500	April	0
May	700	May	0	May	0
June	550	June	0	June	0
July	2,800	July	250	July	0
August	9,430	August	820	August	0
September	2,105	September	2,120	September	0
October		October		October	
November		November		November	
December		December		December	

3690

Attachment 2

Water Removed From the WIPP Underground and Exhaust Ductwork by Date

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Borehole Intercept Water		Waste Shaft Sump Water	
January 2006 to Present		January 2006 to Present		January 2006 to Present	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
01/01-01/31/06	0	01/01-01/31/06	0	01/01-01/31/06	0
02/01-02/28/06	0	02/01-02/28/06	0	02/01-02/28/06	0
03/08/06	200	03/01-03/31/06	0	03/01-03/31/06	0
03/16/06	525	04/01-04/30/06	500	04/01-04/30/06	0
04/27/06	890	05/01-05/31/06	0	05/01-05/31/06	0
05/22/06	700	06/01-06/30/06	0	06/01-06/30/06	0
06/14/06	550	07/01/-07/31/06	250	07/01-07/31/06	0
07/07/06	1,800	08/01-08/31/06	820	08/01-08/31/06	0
07/31/06	1,000	09/01-09/30/06	2,120	09/01-09/30/06	0
08/02/06	1,000				
08/04/06	1,000				
08/15/06	1,000				
08/16/06	1,580				
08/17/06	1,350				
08/18/06	600				
08/22/06	1,000				
08/23/06	1,000				
08/24/06	900				
09/01/06	525				
09/07/06	580				
09/18/06	1,000				

Attachment 3

Total Precipitation by Month (Inches)

	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	August 2006	September 2006	October 2006	November 2006	December 2006
1	0	0	0	0	0	0.27	0	0	0.61			
2	0	0	0	0	0	0	0	0.03	1.01			
3	0	0	0	0	0	0	0	0	1.42			
4	0	0	0.08	0	0	0	0	0.11	1.29			
5	0	0	0	0	0	0	0.46	0	0.01			
6	0	0	0	0	0	0	0	0	0			
7	0	0	0	0	0	0	0	0.01	0			
8	0	0	0	0	0	0	0	0	0			
9	0	0	0	0	0	0	0	0	0			
10	0	0.05	0	0	0	0	0	0	0			
11	0	0	0	0	0	0	0.21	0.14	0			
12	0	0	0	0	0	0	0.05	0	0.43			
13	0	0	0	0	0	0	0.10	1.37	0			
14	0	0	0	0	0	0	0	0.02	0.08			
15	0	0	0	0	0.05	0	0	1.06	0			
16	0	0	0	0	0	0	0	0.81	0			
17	0	0	0	0	0	0	0	0	0			
18	0	0	0.05	0	0	0	0	0.13	0			
19	0	0	0.81	0	0	0	0	0	0.44			
20	0	0	0	0	0	0	0	0.04	0			
21	0	0	0	0	0	0	0	0	0			
22	0	0	0	0	0	0.28	0.01	0.30	0			
23	0	0.14	0	0	0	0.18	0	0	0.03			
24	0	0.05	0	0	0	0	0	0	0.01			
25	0	0.01	0	0	0	0	0	0	0			
26	0	0	0	0	0	0.49	0	0	0			
27	0	0	0	0	0	0	0	0	0			
28	0	0	0.05	0	0	0	0	0	0			
29	0		0	0	0	0	0.10	0	0			
30	0		0	0	0	0.01	0.47	0	0			
31	0		0		0.29		0.47	0.03				
Total	0	0.25	0.99	0.00	0.34	1.22	1.87	4.08	5.31	0.00	0.00	0.00

Washington
TRU Solutions LLC

WRE:06:518
UFC:5486.00

February 9, 2006

Mr. H. L. Plum, RCRA Program Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT CATCH BASIN, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR JANUARY 2006

Dear Mr. Plum:

The purpose of this letter is to provide you with the January 2006 volumetrics of exhaust shaft catch basin water, waste shaft sump water, 700-fan condensate, and precipitation data. There was no water generated at any of these locations in January 2006. Additionally there was no recordable precipitation in January 2006.

As there are no volumetrics or precipitation data to report for the current calendar year, no attachments are included with this transmittal.

If you have any questions, please call me at Extension 7545.

Sincerely,

D. T. Bignell

D. T. Bignell, Manager
Regulatory Compliance

cc: G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
D. Mercer, CBFO
C. Stroud, LANL
C. A. Zvonar, CBFO

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (505) 234-7200 • Fax: (505) 234-7083

COPY

Washington
TRU Solutions LLC

WRES:06:528
UFC:5480.00

March 7, 2006

Mr. H. L. Plum, RCRA Program Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT CATCH BASIN, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR FEBRUARY 2006

Dear Mr. Plum:

The purpose of this letter is to provide you with the February 2006, volumetrics of exhaust shaft catch basin water, waste shaft sump water, 700-fan condensate, and precipitation data. There was no water collected at any of these locations in February 2006.

Attachments 1 and 2 are the monthly volumetrics of water removed from the underground and exhaust ductwork by month and by date, respectively. Attachment 3 is the precipitation data collected monthly from January through February 2006.

If you have any questions, please call me at Extension 7545. .

Sincerely,

D. T. Bignell, Manager
Regulatory Compliance

KG/dgy

cc: (without attachments)
G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
D. Mercer, CBFO
C. Stroud, LANL
C. A. Zvonar, CBFO

UNIQUE #	DOE UFC	DATE RECVD	ADDRESSEES
[illegible]	5480	MAR 0 8 2006	L Plum H Johnson D Mercer G Basabilvazo C Zvonar

01670

borehole intercept

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft ~~Catch Basin~~ Water		Waste Shaft Sump Water	
Calendar Year 2006		Calendar Year 2006		Calendar Year 2006	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March	725	March	0	March	0
April		April		April	
May		May		May	
June		June		June	
July		July		July	
August		August		August	
September		September		September	
October		October		October	
November		November		November	
December		December		December	

borehole intercept

Attachment 2

Water Removed From the WIPP Underground and Exhuast Ductwork by Date

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft ~~Catch Basin~~ Water		Waste Shaft Sump Water	
January 2006 to Present		January 2006 to Present		January 2006 to Present	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
1/1-1/31/06	0	1/1-1/31/06	0	1/1-1/31/06	0
2/1-2/28/06	0	2/1-2/28/06	0	2/1-2/28/6	0
03/06/06	200	3/1-3/31/06	0	3/1-3/31/06	0
03/16/06	525				

Attachment 3

Total Precipitation by Month (Inches)

	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	August 2006	September 2006	October 2006	November 2006	December 2006
1	0	0	0									
2	0	0	0									
3	0	0	0									
4	0	0	0.08									
5	0	0	0									
6	0	0	0									
7	0	0	0									
8	0	0	0									
9	0	0	0									
10	0	0.05	0									
11	0	0	0									
12	0	0	0									
13	0	0	0									
14	0	0	0									
15	0	0	0									
16	0	0	0									
17	0	0	0									
18	0	0	0.05									
19	0	0	0.81									
20	0	0	0									
21	0	0	0									
22	0	0	0									
23	0	0.14	0									
24	0	0.05	0									
25	0	0.01	0									
26	0	0	0									
27	0	0	0									
28	0	0	0.05									
29	0		0									
30	0		0									
31	0		0									
Total	0	0.25	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Washington
TRU Solutions LLC

WRES:06:557
UFC:5486.00

April 10, 2006

Mr. H. L. Plum, RCRA Program Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT BOREHOLE INTERCEPT, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR MARCH 2006

Dear Mr. Plum:

The purpose of this letter is to provide you with the March 2006 volumetrics of exhaust shaft borehole intercept water, waste shaft sump water, 700-fan condensate, and precipitation data. There were 725 gallons of water collected from the 700 fans in March 2006.

Attachments 1 and 2 are the monthly volumetrics of water removed from the underground and exhaust ductwork by month and by date, respectively. Attachment 3 is the precipitation data collected monthly from January through March 2006.

If you have any questions, please call me at Extension 7545.

Sincerely,

Steve C Kash

for D. T. Bignell, Manager
Regulatory Compliance

KG:llp

Attachments (3)

cc: G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
D. Mercer, CBFO
C. Stroud, LANL
C. A. Zvonar, CBFO

Attachment 3

Total Precipitation by Month (Inches)

	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	August 2006	September 2006	October 2006	November 2006	December 2006
1	0	0	0	TBD*								
2	0	0	0									
3	0	0	0									
4	0	0	0.08									
5	0	0	0									
6	0	0	0									
7	0	0	0									
8	0	0	0									
9	0	0	0									
10	0	0.05	0									
11	0	0	0									
12	0	0	0									
13	0	0	0									
14	0	0	0									
15	0	0	0									
16	0	0	0									
17	0	0	0									
18	0	0	0.05									
19	0	0	0.81									
20	0	0	0									
21	0	0	0									
22	0	0	0									
23	0	0.14	0									
24	0	0.05	0									
25	0	0.01	0									
26	0	0	0									
27	0	0	0									
28	0	0	0.05									
29	0		0									
30	0		0									
31	0		0									
Total	0	0.25	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* Precipitation data for the month of April has not yet been validated. The data will be updated in the May report.

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WRES:06:566
UFC:5486.00

May 10, 2006

Mr. H. L. Plum, RCRA Program Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT BOREHOLE INTERCEPT, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR APRIL 2006

Dear Mr. Plum:

The purpose of this letter is to provide you with the April 2006 volumetrics of exhaust shaft borehole intercept water, waste shaft sump water, 700-fan condensate, and precipitation data. There were 890 gallons of water collected from the 700 fans and 500 gallons of water collected from the exhaust shaft borehole intercept in April 2006. April precipitation data have not been validated and will be updated in the May 2006 report.

Attachments 1 and 2 are the monthly volumetrics of water removed from the underground and exhaust ductwork by month and by date, respectively. Attachment 3 is the precipitation data collected monthly from January through March 2006.

If you have any questions, please call me at Extension 7545.

Sincerely,

Steve C. Kouba

for D. T. Signell, Manager
Regulatory Compliance

KG:dgy

Attachments (3)

cc: G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
D. Mercer, CBFO
C. Stroud, LANL
C. A. Zvonar, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
0601783	5486.00	MAY 10 2006	H. Plum G. Basabilvazo H. Johnson D. Mercer C. Zvonar

bcc: <u>WRES Distribution</u>

(without attachments)

R. R. Chavez	ED
K. S. Guillermo	ED
S. B. Jones	ED
R. F. Kehrman	ED
S. C. Kouba	ED
R. D. Reeves	ED
J. Siegel	ED

<u>WTS Distribution</u>

(with attachments)

G. J. Johnson	ED

(without attachments)

R. D. Raaz	ED
L. N. Steven	ED

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (505) 234-7200 • Fax: (505) 234-7083

Attachment 3

Total Precipitation by Month (Inches)

	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	August 2006	September 2006	October 2006	November 2006	December 2006
1	0	0	0	TBD*								
2	0	0	0									
3	0	0	0									
4	0	0	0.08									
5	0	0	0									
6	0	0	0									
7	0	0	0									
8	0	0	0									
9	0	0	0									
10	0	0.05	0									
11	0	0	0									
12	0	0	0									
13	0	0	0									
14	0	0	0									
15	0	0	0									
16	0	0	0									
17	0	0	0									
18	0	0	0.05									
19	0	0	0.81									
20	0	0	0									
21	0	0	0									
22	0	0	0									
23	0	0.14	0									
24	0	0.05	0									
25	0	0.01	0									
26	0	0	0									
27	0	0	0									
28	0	0	0.05									
29	0		0									
30	0		0									
31	0		0									
Total	0	0.25	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

* Precipitation data for the month of April has not yet been validated. The data will be updated in the May report.

Attachment 3

Total Precipitation by Month (Inches)

	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	August 2006	September 2006	October 2006	November 2006	December 2006
1	0	0	0	0	0							
2	0	0	0	0	0							
3	0	0	0	0	0							
4	0	0	0.08	0	0							
5	0	0	0	0	0							
6	0	0	0	0	0							
7	0	0	0	0	0							
8	0	0	0	0	0							
9	0	0	0	0	0							
10	0	0.05	0	0	0							
11	0	0	0	0	0							
12	0	0	0	0	0							
13	0	0	0	0	0							
14	0	0	0	0	0							
15	0	0	0	0	0.05							
16	0	0	0	0	0							
17	0	0	0	0	0							
18	0	0	0.05	0	0							
19	0	0	0.81	0	0							
20	0	0	0	0	0							
21	0	0	0	0	0							
22	0	0	0	0	0							
23	0	0.14	0	0	0							
24	0	0.05	0	0	0							
25	0	0.01	0	0	0							
26	0	0	0	0	0							
27	0	0	0	0	0							
28	0	0	0.05	0	0							
29	0		0	0	0							
30	0		0		0							
31	0		0		0							
Total	0	0.25	0.99	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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WRES:06:575
UFC:5486.00

June 9, 2006

Mr. H. L. Plum, RCRA Program Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT BOREHOLE INTERCEPT, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR MAY 2006

Dear Mr. Plum:

The purpose of this letter is to provide you with the May 2006 volumetrics of exhaust shaft borehole intercept water, waste shaft sump water, 700-fan condensate, and precipitation data. There were 700 gallons of water collected from the 700 fans in May 2006. The report includes April precipitation data, which were not available when the April report was produced, as well as precipitation data for May.

Attachments 1 and 2 are the monthly volumetrics of water removed from the underground and exhaust ductwork by month and by date, respectively. Attachment 3 is the precipitation data collected monthly from January through May 2006.

If you have any questions, please call me at Extension 7545.

Sincerely,

D. T. Bignell, Manager
Regulatory Compliance

KG:dgy

Attachments (3)

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
060609	5486.00	JUN 09 2006	Plum Basabilvazo Mercer CZvonar

cc: G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
D. Mercer, CBFO
C. Stroud, LANL
C. A. Zvonar, CBFO

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (505) 234-7200 • Fax: (505) 234-7083

bcc: <u>WRES Distribution</u>

(without attachments)

R. R. Chavez	ED
K. S. Guillermo	ED
S. B. Jones	ED
R. F. Kehrman	ED
S. C. Kouba	ED
R. D. Reeves	ED
J. Siegel	ED

<u>WTS Distribution</u>

(with attachments)

G. J. Johnson	ED

(without attachments)

R. D. Raaz	ED
L. N. Steven	ED

Attachment 2

Water Removed From the WIPP Underground and Exhuast Ductwork by Date

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Borehole Intercept Water		Waste Shaft Sump Water	
January 2006 to Present		January 2006 to Present		January 2006 to Present	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
01/01-01/31/06	0	01/01-01/31/06	0	01/01-01/31/06	0
02/01-02/28/06	0	02/01-02/28/06	0	02/01-02/28/06	0
03/06/06	200	03/01-03/31/06	0	03/01-03/31/06	0
03/16/06	525	04/01-04/30/06	500	04/01-04/30/06	0
04/27/06	890	05/01-05/31/06	0	05/01-05/31/06	0
05/22/06	700	06/01-06/30/06	0	06/01-06/30/06	0
06/14/06	550				

Attachment 3

Total Precipitation by Month (Inches)

	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	August 2006	September 2006	October 2006	November 2006	December 2006
1	0	0	0	0	0	0.27						
2	0	0	0	0	0	0						
3	0	0	0	0	0	0						
4	0	0	0.08	0	0	0						
5	0	0	0	0	0	0						
6	0	0	0	0	0	0						
7	0	0	0	0	0	0						
8	0	0	0	0	0	0						
9	0	0	0	0	0	0						
10	0	0.05	0	0	0	0						
11	0	0	0	0	0	0						
12	0	0	0	0	0	0						
13	0	0	0	0	0	0						
14	0	0	0	0	0	0						
15	0	0	0	0	0.05	0						
16	0	0	0	0	0	0						
17	0	0	0	0	0	0						
18	0	0	0.05	0	0	0						
19	0	0	0.81	0	0	0						
20	0	0	0	0	0	0						
21	0	0	0	0	0	0						
22	0	0	0	0	0	0.29						
23	0	0.14	0	0	0	0.16						
24	0	0.05	0	0	0	0						
25	0	0.01	0	0	0	0						
26	0	0	0	0	0	0.49						
27	0	0	0	0	0	0						
28	0	0	0.05	0	0	0						
29	0		0	0	0	0						
30	0		0	0	0	0.01						
31	0		0		0.29							
Total	0	0.25	0.99	0.00	0.34	1.22	0.00	0.00	0.00	0.00	0.00	0.00

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WRES:06:582
UFC:5486.00

July 12, 2006

Mr. H. L. Plum, RCRA Program Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT BOREHOLE INTERCEPT, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR JUNE 2006

Dear Mr. Plum:

The purpose of this letter is to provide you with the June 2006 volumetrics of exhaust shaft borehole intercept water, waste shaft sump water, 700-fan condensate, and precipitation data. There were 700 gallons of water collected from the 700 fans in June 2006. The report includes April precipitation data, which were not available when the April report was produced, as well as precipitation data for May.

Attachments 1 and 2 are the monthly volumetrics of water removed from the underground and exhaust ductwork by month and by date, respectively. Attachment 3 is the precipitation data collected monthly from January through June 2006.

If you have any questions, please call me at Extension 7545.

Sincerely,

D. T. Bignell, Manager
Regulatory Compliance

KG:dgy

Attachments (3)

cc: G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
D. Mercer, CBFO
C. Stroud, LANL
C. A. Zvonar, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
060326	5486.00	JUL 1 2 2006	H. Plum G. Basabilvazo H. Johnson C. Zvonar

bcc: <u>WRES Distribution</u>

(without attachments)

R. R. Chavez	ED
K. S. Guillermo	ED
S. B. Jones	ED
R. F. Kehrman	ED
S. C. Kouba	ED
J. Siegel	ED

<u>WTS Distribution</u>

(with attachments)

G. J. Johnson	ED

(without attachments)

R. D. Raaz	ED
L. N. Steven	ED

Washington
TRU Solutions LLC

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WRES:06:598
UFC:5486.00

August 10, 2006

Mr. H. L. Plum, RCRA Program Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR JULY 2006

Dear Mr. Plum:

The purpose of this letter is to provide you with the July 2006 volumetrics of exhaust shaft intercept borehole water, waste shaft sump water, 700-fan condensate, and precipitation data. There were 2800 gallons of water collected from the 700 fans and 250 gallons of water collected from the waste shaft intercept boreholes in July 2006.

Attachments 1 and 2 are the monthly volumetrics of water removed from the underground and exhaust ductwork by month and by date, respectively. Attachment 3 is the precipitation data collected monthly from January through July 2006.

If you have any questions, please call me at Extension 7545.

Sincerely,

Steven C. Kouba

for D. T. Bignell, Manager
Regulatory Compliance

RW:dgy

Attachments (3)

cc: G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
D. Mercer, CBFO
C. Stroud, LANL

UNIQUE #	DCL UFC	DATE REC'VD	ADDRESSEES
[illegible]	5486.00	AUG 1 0 2006	Plum G Basabilvazo D Mercer

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (505) 234-7200 • Fax: (505) 234-7083

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Borehole Intercept Water		Waste Shaft Sump Water	
Calendar Year 2006		Calendar Year 2006		Calendar Year 2006	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March	725	March	0	March	0
April	890	April	500	April	0
May	700	May	0	May	0
June	550	June	0	June	0
July	2,800	July	250	July	0
August		August		August	
September		September		September	
October		October		October	
November		November		November	
December		December		December	

Attachment 2

Water Removed From the WIPP Underground and Exhuast Ductwork by Date

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Borehole Intercept Water		Waste Shaft Sump Water	
January 2006 to Present		January 2006 to Present		January 2006 to Present	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
01/01-01/31/06	0	01/01-01/31/06	0	01/01-01/31/06	0
02/01-02/28/06	0	02/01-02/28/06	0	02/01-02/28/06	0
03/06/06	200	03/01-03/31/06	0	03/01-03/31/06	0
03/16/06	525	04/01-04/30/06	500	04/01-04/30/06	0
04/27/06	890	05/01-05/31/06	0	05/01-05/31/06	0
05/22/06	700	06/01-06/30/06	0	06/01-06/30/06	0
06/14/06	550	07/01/-07/31/06	250	07/01-07/31/06	0
07/07/06	1,800				
07/31/06	1,000				

Washington
TRU Solutions LLC

WRES:06:606
UFC:5486.00

September 12, 2006

Mr. D. Mercer, Physical Scientist
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR AUGUST 2006

Dear Mr. Mercer:

The purpose of this letter is to provide you with the August 2006 volumetrics of exhaust shaft intercept borehole water, waste shaft sump water, 700-fan condensate, and precipitation data. There were 9430 gallons of water collected from the 700 fans and 820 gallons of water collected from the waste shaft intercept boreholes in August 2006.

Attachments 1 and 2 are the monthly volumetrics of water removed from the underground and exhaust ductwork by month and by date, respectively. Attachment 3 is the precipitation data collected monthly from January through August 2006.

If you have any questions, please call me at Extension 7545.

Sincerely,

Steve C. Kohler

for D. T. Bignell, Manager
Regulatory Compliance

RW:dgy

Attachments (3)

cc: G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
H. L. Plum, CBFO
C. Stroud, LANL

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
060287	5486.00	SEP 1 2 2006	D. Mercer G. Basabilvazo H. Johnson H. Plum

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (505) 234-7200 • Fax: (505) 234-7083

bcc: <u>WRES Distribution</u>

(without attachments)

R. R. Chavez	ED
S. B. Jones	ED
R. F. Kehrman	ED
S. C. Kouba	ED
J. Siegel	ED
R. Whiteley	ED

<u>WTS Distribution</u>

(with attachments)

G. J. Johnson	ED

(without attachments)

R. D. Raaz	ED
L. N. Steven	ED

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Borehole Intercept Water		Waste Shaft Sump Water	
Calendar Year 2008		Calendar Year 2008		Calendar Year 2008	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March	725	March	0	March	0
April	890	April	600	April	0
May	700	May	0	May	0
June	550	June	0	June	0
July	2,600	July	250	July	0
August	9,430	August	820	August	0
September		September		September	
October		October		October	
November		November		November	
December		December		December	

Attachment 2

Water Removed From the WIPP Underground and Exhaust Ductwork by Date

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Borehole Intercept Water		Waste Shaft Sump Water	
January 2006 to Present		January 2006 to Present		January 2006 to Present	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
01/01-01/31/06	0	01/01-01/31/06	0	01/01-01/31/06	0
02/01-02/28/06	0	02/01-02/28/06	0	02/01-02/28/06	0
03/06/06	200	03/01-03/31/06	0	03/01-03/31/06	0
03/16/06	525	04/01-04/30/06	500	04/01-04/30/06	0
04/27/06	880	05/01-05/31/06	0	05/01-05/31/06	0
05/22/06	700	06/01-06/30/06	0	06/01-06/30/06	0
06/14/06	550	07/01/-07/31/06	250	07/01-07/31/06	0
07/07/06	1,800	08/01-08/31/06	820	08/01-08/31/06	0
07/31/06	1,000				
08/02/06	1,000				
08/04/06	1,000				
08/15/06	1,000				
08/16/06	1,580				
08/17/06	1,350				
08/18/06	600				
08/22/06	1,000				
08/23/06	1,000				
08/24/06	900				

Attachment 3

Total Precipitation by Month (Inches)

	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	August 2006	September 2006	October 2006	November 2006	December 2006
1	0	0	0	0	0	0.27	0	0				
2	0	0	0	0	0	0	0	0.03				
3	0	0	0	0	0	0	0	0				
4	0	0	0.08	0	0	0	0	0.11				
5	0	0	0	0	0	0	0.46	0				
6	0	0	0	0	0	0	0	0				
7	0	0	0	0	0	0	0	0.01				
8	0	0	0	0	0	0	0	0				
9	0	0	0	0	0	0	0	0				
10	0	0.05	0	0	0	0	0	0				
11	0	0	0	0	0	0	0.21	0.14				
12	0	0	0	0	0	0	0.05	0				
13	0	0	0	0	0	0	0.10	1.37				
14	0	0	0	0	0	0	0	0.02				
15	0	0	0	0	0.05	0	0	1.06				
16	0	0	0	0	0	0	0	0.81				
17	0	0	0	0	0	0	0	0				
18	0	0	0.05	0	0	0	0	0.13				
19	0	0	0.81	0	0	0	0	0				
20	0	0	0	0	0	0	0	0.04				
21	0	0	0	0	0	0	0	0				
22	0	0	0	0	0	0.29	0.01	0.30				
23	0	0.14	0	0	0	0.16	0	0				
24	0	0.05	0	0	0	0	0	0				
25	0	0.01	0	0	0	0	0	0				
26	0	0	0	0	0	0.49	0	0				
27	0	0	0	0	0	0	0	0				
28	0	0	0.05	0	0	0	0	0				
29	0		0	0	0	0	0.10	0				
30	0		0	0	0	0.01	0.47	0				
31	0		0		0.29		0.47	0.03				
Total	0	0.25	0.99	0.00	0.34	1.22	1.87	4.05	0.00	0.00	0.00	0.00

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Borehole Intercept Water		Waste Shaft Sump Water	
Calendar Year 2006		Calendar Year 2006		Calendar Year 2006	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March	725	March	0	March	0
April	890	April	500	April	0
May	700	May	0	May	0
June	550	June	0	June	0
July	2,800	July	250	July	0
August	9,430	August	820	August	0
September	2,105	September	2,120	September	0
October		October		October	
November		November		November	
December		December		December	

Attachment 3

Total Precipitation by Month (inches)

	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	August 2006	September 2006	October 2006	November 2006	December 2006
1	0	0	0	0	0	0.27	0	0	0.61			
2	0	0	0	0	0	0	0	0.03	1.01			
3	0	0	0	0	0	0	0	0	1.42			
4	0	0	0.08	0	0	0	0	0.11	1.29			
5	0	0	0	0	0	0	0.46	0	0.01			
6	0	0	0	0	0	0	0	0	0			
7	0	0	0	0	0	0	0	0.01	0			
8	0	0	0	0	0	0	0	0	0			
9	0	0	0	0	0	0	0	0	0			
10	0	0.05	0	0	0	0	0	0	0			
11	0	0	0	0	0	0	0.21	0.14	0			
12	0	0	0	0	0	0	0.05	0	0.43			
13	0	0	0	0	0	0	0.10	1.37	0			
14	0	0	0	0	0	0	0	0.02	0.06			
15	0	0	0	0	0.05	0	0	1.06	0			
16	0	0	0	0	0	0	0	0.81	0			
17	0	0	0	0	0	0	0	0	0			
18	0	0	0.05	0	0	0	0	0.13	0			
19	0	0	0.81	0	0	0	0	0	0.44			
20	0	0	0	0	0	0	0	0.04	0			
21	0	0	0	0	0	0	0	0	0			
22	0	0	0	0	0	0.29	0.01	0.30	0			
23	0	0.14	0	0	0	0.16	0	0	0.03			
24	0	0.05	0	0	0	0	0	0	0.01			
25	0	0.01	0	0	0	0	0	0	0			
26	0	0	0	0	0	0.49	0	0	0			
27	0	0	0	0	0	0	0	0	0			
28	0	0	0.05	0	0	0	0	0	0			
29	0		0	0	0	0	0.10	0	0			
30	0		0	0	0	0.01	0.47	0	0			
31	0		0		0.29		0.47	0.03				
Total	0	0.25	0.99	0.00	0.34	1.22	1.87	4.05	5.31	0.00	0.00	0.00

Washington
TRU Solutions LLC

WRES:06:648
UFC:5486.00

November 10, 2006

Mr. D. Mercer, Physical Scientist
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR OCTOBER 2006

Dear Mr. Mercer:

The purpose of this letter is to provide you with the October 2006 volumetrics of Exhaust Shaft intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There were 900 gallons of water collected from the 700 fans. There was no water collected from the Exhaust Shaft intercept boreholes or the Waste Shaft sump in October 2006.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the precipitation data collected monthly from January through October 2006.

If you have any questions, please call me at Extension 7545.

Sincerely,

Steve C. Kouba

for D. T. Bignell, Manager
Regulatory Compliance

RW:dgy

Attachments (2)

UNIQUE #	DOC. UFC	DATE REC'VD	ADDRESSEES
060981	548600	NOV 1 0 2006	D Mercer G Basabilvazo H Johnson

cc: G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
H. Plum, CBFO
C. Stroud, LANL

01697

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Borehole Intercept Water		Waste Shaft Sump Water	
Calendar Year 2006		Calendar Year 2006		Calendar Year 2006	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March	0	March	0	March	0
April	0	April	0	April	0
May	700	May	0	May	0
June	550	June	0	June	0
July	2,800	July	250	July	0
August	9,430	August	820	August	0
September	2,105	September	2,120	September	0
October	900	October	0	October	0
November		November		November	
December		December		December	

Attachment 2

Total Precipitation by Month (Inches)

	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	August 2006	September 2006	October 2006	November 2006	December 2006
1	0	0	0	0	0	0.27	0	0	0.61	0		
2	0	0	0	0	0	0	0	0.03	1.01	0		
3	0	0	0	0	0	0	0	0	1.42	0		
4	0	0	0.08	0	0	0	0	0.11	1.29	0		
5	0	0	0	0	0	0	0.46	0	0.01	0		
6	0	0	0	0	0	0	0	0	0	0		
7	0	0	0	0	0	0	0	0.01	0	0		
8	0	0	0	0	0	0	0	0	0	0.01		
9	0	0	0	0	0	0	0	0	0	1.17		
10	0	0.05	0	0	0	0	0	0	0	0.04		
11	0	0	0	0	0	0	0.21	0.14	0	0		
12	0	0	0	0	0	0	0.05	0	0.43	0		
13	0	0	0	0	0	0	0.10	1.37	0	0		
14	0	0	0	0	0	0	0	0.02	0.06	0.35		
15	0	0	0	0	0.05	0	0	1.06	0	0.92		
16	0	0	0	0	0	0	0	0.81	0	0		
17	0	0	0	0	0	0	0	0	0	0		
18	0	0	0.05	0	0	0	0	0.13	0	0.15		
19	0	0	0.81	0	0	0	0	0	0.44	0		
20	0	0	0	0	0	0	0	0.04	0	0		
21	0	0	0	0	0	0	0	0	0	0		
22	0	0	0	0	0	0.29	0.01	0.30	0	0		
23	0	0.14	0	0	0	0.16	0	0	0.03	0		
24	0	0.05	0	0	0	0	0	0	0.01	0.06		
25	0	0.01	0	0	0	0	0	0	0	0		
26	0	0	0	0	0	0.49	0	0	0	0		
27	0	0	0	0	0	0	0	0	0	0		
28	0	0	0.05	0	0	0	0	0	0	0		
29	0		0	0	0	0	0.10	0	0	0		
30	0		0	0	0	0.01	0.47	0	0	0		
31	0		0		0.29		0.47	0.03		0		
Total	0	0.25	0.99	0.00	0.34	1.22	1.87	4.05	5.31	2.70	0.00	0.00
Total Precipitation from January to October in (Inches)					16.73							

Washington
TRU Solutions LLC

WRES:06:660
UFC:5486.00

December 08, 2006

Mr. D. Mercer
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR NOVEMBER 2006

Dear Mr. Mercer:

The purpose of this letter is to provide you with the November 2006 volumetrics of Exhaust Shaft intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There were 550 gallons of water collected from the Exhaust Shaft intercept boreholes and 1,375 gallons of water collected from the Waste Shaft sump. There was no water collected from the 700 fans in November 2006.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the precipitation data collected monthly from January through November 2006.

If you have any questions, please call me at Extension 7545.

Sincerely,

Rick [signature]

D. T. Bignell, Manager
Regulatory Compliance

RW:dgy

Attachments (3)

cc: G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
H. Plum, CBFO
C. Stroud, LANL

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEE
[illegible]	5486.00	DEC 0 8 2006	D Mercer G Basabilvazo H Plum

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

700 Fan Condensate Water (Above-Ground Exhaust Ductwork)		Exhaust Shaft Borehole Intercept Water		Waste Shaft Sump Water	
Calendar Year 2006		Calendar Year 2006		Calendar Year 2006	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March	0	March	0	March	0
April	0	April	0	April	0
May	700	May	0	May	0
June	550	June	0	June	0
July	2,800	July	250	July	0
August	9,430	August	820	August	0
September	2,105	September	2,120	September	0
October	900	October	0	October	0
November	0	November	550	November	1,375
December		December	0	December	

3740

Attachment 2

Total Precipitation by Month (Inches)

	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	August 2006	September 2006	October 2006	November 2006	December 2006
1	0	0	0	0	0	0.27	0	0	0.61	0	0	
2	0	0	0	0	0	0	0	0.03	1.01	0	0	
3	0	0	0	0	0	0	0	0	1.42	0	0	
4	0	0	0.08	0	0	0	0	0.11	1.29	0	0	
5	0	0	0	0	0	0	0.46	0	0.01	0	0	
6	0	0	0	0	0	0	0	0	0	0	0	
7	0	0	0	0	0	0	0	0.01	0	0	0	
8	0	0	0	0	0	0	0	0	0	0.01	0.01	
9	0	0	0	0	0	0	0	0	0	1.17	0	
10	0	0.05	0	0	0	0	0	0	0	0.04	0	
11	0	0	0	0	0	0	0.21	0.14	0	0	0	
12	0	0	0	0	0	0	0.05	0	0.43	0	0	
13	0	0	0	0	0	0	0.10	1.37	0	0	0	
14	0	0	0	0	0	0	0	0.02	0.06	0.35	0	
15	0	0	0	0	0.05	0	0	1.06	0	0.92	0	
16	0	0	0	0	0	0	0	0.81	0	0	0	
17	0	0	0	0	0	0	0	0	0	0	0	
18	0	0	0.05	0	0	0	0	0.13	0	0.15	0	
19	0	0	0.81	0	0	0	0	0	0.44	0	0	
20	0	0	0	0	0	0	0	0.04	0	0	0	
21	0	0	0	0	0	0	0	0	0	0	0	
22	0	0	0	0	0	0.29	0.01	0.30	0	0	0	
23	0	0.14	0	0	0	0.16	0	0	0.03	0	0	
24	0	0.05	0	0	0	0	0	0	0.01	0.06	0	
25	0	0.01	0	0	0	0	0	0	0	0	0	
26	0	0	0	0	0	0.49	0	0	0	0	0	
27	0	0	0	0	0	0	0	0	0	0	0.51	
28	0	0	0.05	0	0	0	0	0	0	0	0	
29	0		0	0	0	0	0.10	0	0	0	0	
30	0		0	0	0	0.01	0.47	0	0	0	0	
31	0		0		0.29		0.47	0.03		0		
Total	0	0.25	0.99	0.00	0.34	1.22	1.87	4.05	5.31	2.70	0.52	0.00

Total Precipitation from January to November (Inches) 17.25

Attachment 2

Total Precipitation by Month (Inches)

	January 2006	February 2006	March 2006	April 2006	May 2006	June 2006	July 2006	August 2006	September 2006	October 2006	November 2006	December 2006
1	0	0	0	0	0	0.27	0	0	0.61	0	0	0
2	0	0	0	0	0	0	0	0.03	1.01	0	0	0
3	0	0	0	0	0	0	0	0	1.42	0	0	0
4	0	0	0.08	0	0	0	0	0.11	1.29	0	0	0
5	0	0	0	0	0	0	0.46	0	0.01	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0.01	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0.01	0.01	0
9	0	0	0	0	0	0	0	0	0	1.17	0	0
10	0	0.05	0	0	0	0	0	0	0	0.04	0	0
11	0	0	0	0	0	0	0.21	0.14	0	0	0	0
12	0	0	0	0	0	0	0.05	0	0.43	0	0	0
13	0	0	0	0	0	0	0.10	1.37	0	0	0	0
14	0	0	0	0	0	0	0	0.02	0.06	0.35	0	0
15	0	0	0	0	0.05	0	0	1.06	0	0.92	0	0
16	0	0	0	0	0	0	0	0.81	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0.05	0	0	0	0	0.13	0	0.15	0	0
19	0	0	0.81	0	0	0	0	0	0.44	0	0	0.47
20	0	0	0	0	0	0	0	0.04	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0.29	0.01	0.30	0	0	0	0
23	0	0.14	0	0	0	0.16	0	0	0.03	0	0	0
24	0	0.05	0	0	0	0	0	0	0.01	0.06	0	0
25	0	0.01	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0.49	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0.51	0
28	0	0	0.05	0	0	0	0	0	0	0	0	1.20
29	0		0	0	0	0	0.10	0	0	0	0	0
30	0		0	0	0	0.01	0.47	0	0	0	0	0
31	0		0		0.29		0.47	0.03		0		0
Total	0	0.25	0.99	0.00	0.34	1.22	1.87	4.05	5.31	2.70	0.52	1.67
Total Precipitation from January to December (Inches)					18.92							

Washington
TRU Solutions LLC

WRES:07:502
UFC:5486.00

January 11, 2007

Mr. H. E. Johnson, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR DECEMBER 2006

Dear Mr. Johnson:

The purpose of this letter is to provide you with the December 2006 volumetrics of Exhaust Shaft Intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There were 200 gallons of water collected from the 700 fans. There was no water collected from the Exhaust Shaft Intercept boreholes or the Waste Shaft sump in December 2006.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the precipitation data collected monthly from January through December 2006.

If you have any questions, please call me at Extension 7545.

Sincerely,

W. M. Wierzbicki, Manager
Regulatory Compliance

RW:dgy

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. Plum, CBFO
C. Stroud, LANL

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
0700108	5486.00	JAN 12 2007	H.E. Johnson G.T. Basabilvazo H. Plum

bcc: <u>WRES Distribution</u>

(without attachments)

R. R. Chavez	ED
S. B. Jones	ED
R. F. Kehrman	ED
S. C. Kouba	ED
J. Siegel	ED
R. Whiteley	ED

<u>WTS Distribution</u>

(with attachments)

G. J. Johnson	ED

(without attachments)

L. N. Steven	ED

Attachment 2

Total Precipitation by Month (Inches)

	January 2007	February 2007	March 2007	April 2007	May 2007	June 2007	July 2007	August 2007	September 2007	October 2007	November 2007	December 2007
1	0	0	0	0	0	0	0	0				
2	0.77	0.01	0	0	0.52	0	0	0.25				
3	0	0.01	0	0	0	0	0	0.16				
4	0	0	0	0	0	0.13	0	0				
5	0	0	0	0	0	0	0	0				
6	0	0	0	0	0	0	0.16	0				
7	0	0	0	0.02	0	0	0	0				
8	0	0	0	0	0.98	0	0	0				
9	0	0	0	0	0.55	0.08	0	0				
10	0	0	0	0.01	0	0.01	0	0				
11	0	0	0	0	0	0	0.42	0				
12	0.04	0	0.06	0	0	0	0	0				
13	0.03	0.05	0.25	0	0	0	0	0				
14	0	0.12	0.01	0	0	0	0	0				
15	0	0	0	0	0.50	0	0.01	0				
16	0	0	0	0	0.64	0	0	0				
17	0	0	0	0	0	0.01	0	0				
18	0.02	0	0	0	0	0	0	0				
19	0.01	0	0	0.19	0	0	0	0				
20	0.64	0	0	0	0	0	0	0				
21	0.17	0	0	0	0	0	2.22	0.05				
22	0	0	0	0	0	0.01	0.02	0				
23	0.23	0	0.15	0	0	0	0	0				
24	0	0	1.41	0	0	0	0	0				
25	0	0	0	0	0.01	0	0	0				
26	0	0	0.29	0	0.03	0.46	0	0				
27	0	0	0	0	0	0.01	0.32	0				
28	0	0	0	0	0	0.19	0.02	0				
29	0	[redacted]	0	0	0	0	0	0				
30	0	[redacted]	0	0.93	0	0	0.46	0				
31	0.02	[redacted]	0	[redacted]	0.09	[redacted]	0.33	0	[redacted]		[redacted]	
Total	1.93	0.19	2.17	1.15	3.32	0.80	3.96	0.46				

Total Precipitation from January through August (Inches) = 14.08

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Intercept Borehole Water		Waste Shaft Sump Water	
Calendar Year 2007		Calendar Year 2007		Calendar Year 2007	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
January	110	January	310	January	0
February	0	February	0	February	0
March	610	March	0	March	0
April	1,400	April	0	April	0
May	2,900	May	75	May	0
June	4,800	June	200	June	0
July		July		July	
August		August		August	
September		September		September	
October		October		October	
November		November		November	
December		December		December	
Yearly total	9,820	Yearly total	585	Yearly total	0

COPY

Washington
TRU Solutions LLC

WRES:07:124
UFC:5486.00

July 9, 2007

Mr. H. E. Johnson, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR JUNE 2007

Dear Mr. Johnson:

The purpose of this letter is to provide you with the June 2007 volumetrics of Exhaust Shaft intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There were 200 gallons of water collected from the Exhaust Shaft intercept boreholes; 4,800 gallons of water collected from the 700 fan ductwork; no water was collected from the Waste Shaft sump; and June had a total precipitation accumulation of 0.90 inches.

Attachment 1 is the monthly volumetrics of water removed from the exhaust fan ductwork, exhaust shaft boreholes, and waste shaft sump. Attachment 2 is the calendar year 2007 precipitation data noted by month.

If you have any questions, please call me at Extension 7545.

Sincerely,

Steve C. Kouba

for W. M. Wierzbicki, Manager
Regulatory Compliance

RW:rlj

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO
C. Stroud, LANL

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
070188	5486.00	JUL 09 2007	H Johnson G Basabilvazo H Plum

Attachment 2

Total Precipitation by Month (Inches)

	January 2007	February 2007	March 2007	April 2007	May 2007	June 2007	July 2007	August 2007	September 2007	October 2007	November 2007	December 2007
1	0	0	0	0	0	0	0					
2	0.77	0.01	0	0	0.52	0	0					
3	0	0.01	0	0	0	0	0					
4	0	0	0	0	0	0.13	0					
5	0	0	0	0	0	0	0					
6	0	0	0	0	0	0	0.16					
7	0	0	0	0.02	0	0	0					
8	0	0	0	0	0.98	0	0					
9	0	0	0	0	0.55	0.08	0					
10	0	0	0	0.01	0	0.01	0					
11	0	0	0	0	0	0	0.42					
12	0.04	0	0.06	0	0	0	0					
13	0.03	0.05	0.25	0	0	0	0					
14	0	0.12	0.01	0	0	0	0					
15	0	0	0	0	0.50	0	0.01					
16	0	0	0	0	0.64	0	0					
17	0	0	0	0	0	0.01	0					
18	0.02	0	0	0	0	0	0					
19	0.01	0	0	0.19	0	0	0					
20	0.64	0	0	0	0	0	0					
21	0.17	0	0	0	0	0	2.22					
22	0	0	0	0	0	0.01	0.02					
23	0.23	0	0.15	0	0	0	0					
24	0	0	1.41	0	0	0	0					
25	0	0	0	0	0.01	0	0					
26	0	0	0.29	0	0.03	0.46	0					
27	0	0	0	0	0	0.01	0.32					
28	0	0	0	0	0	0.19	0.02					
29	0		0	0	0	0	0					
30	0		0	0.93	0	0	0.46					
31	0.02		0		0.09		0.33					
Total	1.93	0.19	2.17	1.15	3.32	0.90	3.96					

Total Precipitation from January through June (Inches) = 13.62

COPY

Washington
TRU Solutions LLC

WRES:07:142
UFC:5486.00

August 6, 2007

Mr. H. E. Johnson, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR JULY 2007

Dear Mr. Johnson:

The purpose of this letter is to provide you with the July 2007 volumetrics of Exhaust Shaft intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There were 1,640 gallons of water collected from the Exhaust Shaft intercept boreholes, 12,400 gallons of water collected from the 700 fan ductwork, no water was collected from the Waste Shaft sump, and July had a total accumulation of 3.96 inches of precipitation.

Attachment 1 is the monthly volumetrics of water removed from the exhaust fan ductwork, exhaust shaft boreholes, and waste shaft sump. Attachment 2 is the calendar year 2007 precipitation data noted by month.

If you have any questions, please call me at Extension 7545.

Sincerely,

William M. Wierzbicki

W. M. Wierzbicki, Manager
Regulatory Compliance

REW:rlj

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO
C. Stroud, LANL

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
070164	5486.00	AUG 06 2007	H. Johnson G. Basabilvazo J. Plum

Washington
TRU Solutions LLC

WRES:07:167
UFC:5486.00

October 9, 2007

Mr. H. E. Johnson, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: MONTHLY SUMMARY OF ENVIRONMENTAL REGULATIONS AND FEDERAL REGISTER NOTICES REVIEWED FOR IMPACT TO WIPP

Dear Mr. Johnson:

Washington Regulatory and Environmental Services has completed review of environmental regulations and Federal Register (FR) notices for impact to the WIPP Program for September 2007. This review is part of the scope found in the Activity Based Cost estimate for the Site Environmental Compliance Program, Activity #1250106.

This review focused on the evaluation of environmental compliance related publications such as those provided in the FR by the DOE, the U.S. Environmental Protection Agency (EPA), the U.S. Department of Interior's Bureau of Land Management and Fish and Wildlife Service, as well as revisions to the State of New Mexico environmental regulations. The monthly regulatory review spans FR, Volume 72, Numbers 170 through 188.

The following items; one EPA proposed rule, one EPA notice, one EPA Final Rule, one EPA final action, one Nuclear Regulatory Commission (NRC) Guidance notice, two DOE Memorandums, and one New Mexico Environment Improvement Board update were noted with the potential to impact the WIPP during this review period.

OCT 0 9 2007

H. Johnson
CBFO Mgmt

<u>NRC Guidance for Activities Related to U.S. Department of Energy Waste Determinations</u>

On September 4, 2007, the NRC published a notice of NUREG-1854 providing guidance to the NRC staff in evaluating non-high-level waste determinations developed by the DOE for the Savannah River Site, Idaho National Laboratory, Hanford, and West Valley for certain wastes that are a result of the reprocessing of spent nuclear fuel. NUREG-1854 does not set forth regulatory requirements for NRC or for the DOE, and compliance with NUREG-1854 is not required.

Impact Assessment

This notice provides assistance to Savannah River Site, Idaho National Laboratory, Hanford, and West Valley for wastes that result from reprocessing spent nuclear fuel. The Ronald Reagan Defense Authorization Act for Fiscal Year 2005 authorizes NRC to consult with the DOE on its waste determinations and to monitor the DOE disposal actions to assess compliance with the performance objectives in 10 CFR part 61, subpart C. If any of the waste that this process applies to was formerly managed as high level waste or was managed in the tanks listed in the WIPP hazardous waste facility permit, then the process of determining that the waste is TRU waste will have to be included in a Class 3

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permit modification request to authorize management and disposal of the waste. Consequently, the WIPP staff should become familiar with this guidance to assure it is applied to the waste in a manner that satisfies the permitting requirements.

Approval and Promulgation of Air Quality Implementation Plans; New Mexico

On September 5, 2007, the EPA published a final action to approve the State Implementation Plan (SIP) revisions that the Governor of New Mexico submitted on December 29, 2005. This submittal consists of revisions to two regulations that are already part of the New Mexico SIP. The affected regulations are 20.2.74 New Mexico Administrative Code (NMAC) (Permits-Prevention of Significant Deterioration (PSD)) and 20.2.79 NMAC (Permits-Non-attainment Areas). The revisions will update New Mexico's PSD and New Source Review (NSR) regulations to make them consistent with changes to the Federal NSR regulations published on December 31, 2002 (67 FR 80186) and November 7, 2003 (68 FR 63021).

Impact Assessment

The WIPP facility is not located in a non-attainment area. Currently, the WIPP facility does not have projects planned to install equipment that would increase the emissions from the facility. The revisions in the New Mexico SIP involve non-attainment areas and new emission sources. Therefore, this does not affect the WIPP facility at this time. In the event that new emission sources are added to the facility, this change will affect the facility.

New Mexico Environmental Improvement Board Issues Solid Waste Rules Updates

On September 6, 2007, the New Mexico Environmental Improvement Board announced updates to the solid waste rules. This part applies to the transportation, storage, transfer, processing, transformation, recycling, composting, nuisance abatement and disposal of solid waste. The objective of these updates is to establish regulations in the general requirements, requirements of public entities, prohibited acts and exceptions, entry by the department, and procedures for exemptions, specific approvals, waivers for small municipal landfills and variances.

Impact Assessment

The updates submitted by the New Mexico Environmental Improvement Board apply to the transportation, storage, transfer, processing, transformation, recycling, composting, nuisance abatement and disposal of solid waste. The WIPP facility only transports recyclable waste off-site and disposes of demolition and construction debris on-site. These regulations deal with the transporters and disposal side of solid waste and not the generator. The WIPP operates the on-site industrial landfill according to regulations to eliminate nuisance and vector problems. At this time, these new regulations will not impact the WIPP facility.

DOE Memorandum on Protection of Stratospheric Ozone

On September 6, 2007, the DOE issued a memorandum urging DOE facilities to seek safe alternative chemicals to replace Ozone Depleting Substances (ODS) used as cleaning solvents. On May 30, 2007, the EPA issued a final rule on phasing out ODS used as cleaning solvents and in adhesives and listed some substitutes to replace the ODS. This DOE memorandum establishes guidance in seeking replacements for those ODS used at DOE sites.

Impact Assessment

The WIPP facility uses a high flash point Stoddard Solvent made up of petroleum distillates and not ODS to clean oily or greasy parts. No ODS are used on the WIPP property as a solvent or in an adhesive. Chemicals used on the WIPP site are screened as to the chemical content. Procurement and Site Environmental Compliance will review new products to prevent ODS from being used on the WIPP property as a solvent or in adhesives.

<u>DOE Memorandum on Options for the Expression of Daily Loads in Total Maximum Daily Loads</u>

On September 6, 2007, the DOE issued a memorandum addressing the June 22, 2007, EPA draft technical document, "Options for the Expression of Daily Loads in TMDLs". A TMDL (total maximum daily load) is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. The document provides options for expressing daily pollutant loads where TMDLs are calculated using greater than daily allocation time frames (e.g., annually, monthly, seasonally). National Pollutant Discharge Elimination System (NPDES) rules regulate the TMDLs. The EPA is soliciting feedback on the application of the recommended technical approaches in the draft document.

Impact Assessment

The WIPP facility does not discharge into any body of water or any waters of the U.S. Because of this, WIPP does not have a NPDES permit. This memorandum does not pertain to the WIPP facility.

<u>EPA Give Inspection Credentials to State Environment Department</u>

On September 11, 2007, the EPA issued credentials to the NMED to perform inspections on its behalf. The credentials are for inspections done under the NPDES program. The credentials allow NMED to work directly with local governments, residents and other entities to ensure water quality is protected. The NMED staff will have the authority to assess federal provisions not covered by state law.

Impact Assessment

Since the WIPP does not have a NPDES permit and does not discharge to a water of the U.S., this does not affect the WIPP.

<u>EPA Proposes to Revise Regulations for State and Federal Operating Permit Programs</u>

On September 12, 2007, the EPA issued a proposed rule revising the regulations governing State and Federal operating permit programs required by title V of the Clean Air Act (CAA) and the New Source Review (NSR) programs required by parts C and D of title I. The proposed revisions clarify how permitting flexibility can often be done in the existing regulatory framework of the operating permit programs. The proposed revisions also add major NSR requirements for Green Groups, which allow future changes to occur within a group of emissions activities, provided that they are ducted to a common air pollution control device which is determined to meet "best available control technology" or "lowest achievable emission rate" as applicable and that they are determined to comply with all relevant ambient requirements.

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Impact Assessment

Entities potentially affected by these proposed actions are facilities currently required to obtain title V permits under State, local, tribal or Federal operating permits programs, and State, local and tribal governments that are authorized by the EPA to issue such operating permits. Other entities potentially affected by this proposed action are facilities required to obtain major NSR permits under State, local, tribal or Federal major NSR programs, and State, local and tribal governments that issue such permits pursuant to approved part 51 major NSR programs. Since the WIPP facility does not have a Title V permit or a NSR permit, this proposed rule will not affect the WIPP facility.

Comprehensive Procurement Guideline V for Procurement of Products Containing Recovered Materials

On September 14, 2007, the EPA issued a final rule amending the Comprehensive Procurement Guideline (CPG) for recovered content products. Specifically, EPA is revising the list of items designated in the category of landscaping products. First, EPA is changing the description of "compost" by consolidating all compost designations under one item designation: "compost made from recovered organic materials." At the same time, the Agency is amending the definition of compost. The effect of the two changes will be to include compost from bio-solids and manure, and not limit the designation to specific types of organic materials. Second, EPA has added "fertilizer made from recovered materials" as a designated landscaping item and added a definition for "fertilizer made from recovered organic materials."

Impact Assessment

This action may potentially affect procuring agencies that purchase compost made from recovered organic materials and fertilizers made from recovered organic materials. Section 6002 defines procuring agencies to include the following: (1) any federal agency; (2) any state or local agency using appropriated federal funds for procurement; or (3) any contractors of these agencies who are procuring these items for work they perform under the contract (see Resource Conservation and Recovery Act section 1004(17)). The requirements of section 6002 apply to these procuring agencies only when the agencies procure designated items whose price exceeds $10,000 or when the quantity of the item purchased in the previous year exceeded $10,000. This rule will go into effect on September 15, 2008. The WIPP facility will need to begin the procurement of recovered organic materials and fertilizers for the landscaping performed at the site.

If you have any questions regarding this report, please contact me at Extension 7545.

Sincerely,

William M. Wierzbicki

W. M. Wierzbicki, Manager
Regulatory Compliance

WHJ:rlj

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Intercept Borehole Water		Waste Shaft Sump Water	
Calendar Year 2007		Calendar Year 2007		Calendar Year 2007	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
January	110	January	310	January	0
February	0	February	0	February	0
March	610	March	0	March	0
April	1,400	April	0	April	0
May	2,900	May	75	May	0
June	4,800	June	200	June	0
July	12,400	July	1,640	July	0
August	13,400	August	2,230	August	3,200
September	5,400	September	820	September	0
October		October	0	October	
November		November	150	November	
December		December	410	December	
Yearly total	41,020	Yearly total	5,275	Yearly total	3,200

5834

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

Calendar Year 2007		Calendar Year 2007		Calendar Year 2007	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
January	110	January	310	January	0
February	0	February	0	February	0
March	610	March	0	March	0
April	1,400	April	0	April	0
May	2,900	May	75	May	0
June	4,800	June	200	June	0
July	12,400	July	1,640	July	0
August	13,400	August	2,230	August	3,200
September	5,400	September	820	September	0
October		October		October	
November		November		November	
December		December		December	
Yearly total	41,020	Yearly total	5,275	Yearly total	3,200

Attachment 2

Total Precipitation by Month (Inches)

	January 2007	February 2007	March 2007	April 2007	May 2007	June 2007	July 2007	August 2007	September 2007	October 2007	November 2007	December 2007
1	0											
2	0.77											
3	0											
4	0											
5	0											
6	0											
7	0											
8	0											
9	0											
10	0											
11	0											
12	0.04											
13	0.03											
14	0											
15	0											
16	0											
17	0											
18	0.02											
19	0.01											
20	0.64											
21	0.17											
22	0											
23	0.23											
24	0											
25	0											
26	0											
27	0											
28	0											
29	0											
30	0											
31	0.02											
Total	1.93											

Total Precipitation for 2007 (Inches) = 1.93

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Washington
TRU Solutions LLC

WRES:07:532
UFC:5486.00

February 07, 2007

Mr. H. E. Johnson, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLES, WASTE SHAFT SUMP, 700-FAN CONDENSATE, AND PRECIPITATION DATA FOR JANUARY 2007

Dear Mr. Johnson:

The purpose of this letter is to provide you with the January 2007 volumetrics of Exhaust Shaft intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There were 310 gallons of water collected from the Exhaust Shaft intercept boreholes and 110 gallons of water collected from the 700 fans. There was no water collected from the Waste Shaft sump in January 2007.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the January precipitation data and the calendar year 2007 running total.

If you have any questions, please call me at Extension 7545.

Sincerely,

William M. Wierzbicki

W. M. Wierzbicki, Manager
Regulatory Compliance

RW:dgy

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. Plum, CBFO
C. Stroud, LANL

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
070034?	5486.00	FEB 07 2007	H. Johnson G. Basabilvazo H. Plum

bcc: WRES Distribution

(without attachments)

R. R. Chavez	ED
S. B. Jones	ED
R. F. Kehrman	ED
S. C. Kouba	ED
J. Siegel	ED
R. Whiteley	ED

WTS Distribution

(without attachments)

S. Anderson	ED

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Borehole Intercept Water		Waste Shaft Sump Water	
Calendar Year 2007		Calendar Year 2007		Calendar Year 2007	
Date Discharged to H-19	Amount Discharged (Gallons)	Date	Gallons	Date	Gallons
January	110	January	310	January	0
February	0	February	0	February	0
March		March		March	
April		April		April	
May		May		May	
June		June		June	
July		July		July	
August		August		August	
September		September		September	
October		October		October	
November		November		November	
December		December		December	
Yearly total	110	Yearly total	310	Yearly total	0

Washington
TRU Solutions LLC

WRES:07:545
UFC:5486.00

March 7, 2007

COPY

Mr. H. L. Plum, RCRA Program Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR FEBRUARY 2007

Dear Mr. Plum:

The purpose of this letter is to provide you with the February 2007 volumetrics of Exhaust Shaft Intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. No water was collected from the Exhaust Shaft Intercept boreholes, Waste Shaft sump or 700 fans in February 2007.

Attachment 1 is the monthly volumetrics of water removed from the above ground 700 fan ductwork, Exhaust Shaft Intercept Boreholes, and the Waste Shaft Sump. Attachment 2 is the running calendar year noting precipitation data collected monthly from January through December 2007.

If you have any questions, please call me at Extension 7545.

Sincerely,

W. M. Wierzbicki
Manager

RW:dgy

Attachments (2)

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
0700645	5486.00	MAR 07 2007	H. Plum G. Basabilvazo H. Johnson

cc: G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
C. Stroud, LANL
R. Steger, CTAC

bcc: <u>WRES Distribution</u>

(without attachments)

R. R. Chavez	ED
S. B. Jones	ED
R. F. Kehrman	ED
S. C. Kouba	ED
J. Siegel	ED
R. Whiteley	ED

<u>WTS Distribution</u>

(with attachments)

S. Sethi	ED
G. J. Johnson	ED

(without attachments)

L. N. Steven	ED

Attachment 2

Total Precipitation by Month (Inches)

	January 2007	February 2007	March 2007	April 2007	May 2007	June 2007	July 2007	August 2007	September 2007	October 2007	November 2007	December 2007
1	0	0	0									
2	0.77	0.01	0									
3	0	0.01	0									
4	0	0	0									
5	0	0	0									
6	0	0	0									
7	0	0	0									
8	0	0	0									
9	0	0	0									
10	0	0	0									
11	0	0	0									
12	0.04	0	0.06									
13	0.03	0.05	0.25									
14	0	0.12	0.01									
15	0	0	0									
16	0	0	0									
17	0	0	0									
18	0.02	0	0									
19	0.01	0	0									
20	0.64	0	0									
21	0.17	0	0									
22	0	0	0									
23	0.23	0	0.15									
24	0	0	1.41									
25	0	0	0									
26	0	0	0.29									
27	0	0	0									
28	0	0	0									
29	0		0									
30	0		0									
31	0.02		0									
Total	1.93	0.19	2.17									

Total Precipitation from January to March (Inches) = 4.29

Washington
TRU Solutions LLC

WRES:07:560
UFC:5486.00

April 5, 2007

Mr. H. E. Johnson, NEPA Program Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR MARCH 2007

Dear Mr. Johnson:

The purpose of this letter is to provide you with the March 2007 volumetrics of Exhaust Shaft intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There were 610 gallons of water collected from the 700 Fans. No water was collected from the Exhaust Shaft intercept boreholes or Waste Shaft sump in March 2007.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the precipitation data collected monthly from January through December 2007.

If you have any questions, please call me at Extension 7545.

Sincerely,

W. M. Wierzbicki

W. M. Wierzbicki, Manager
Regulatory Compliance

RW:dgy

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. E. Johnson, CBFO
R. Steger, CTAC
C. Stroud, LANL

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
0700959	5486.00	APR 0 5 2007	H. Johnson G. Basabilvazo

Washington
TRU Solutions LLC

WRES:07:566
UFC:5486.00

May 10, 2007

Mr. H. E. Johnson, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR APRIL 2007

Dear Mr. Johnson:

The purpose of this letter is to provide you with the April 2007 volumetrics of Exhaust Shaft intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There were 1400 gallons of water collected from the 700 fans. No water was collected from the Exhaust Shaft intercept boreholes or the Waste Shaft sump in April 2007.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the precipitation data collected monthly from January through December 2007.

If you have any questions, please call me at Extension 7545.

Sincerely,

W. M. Wierzbicki, Manager
Regulatory Compliance

RW:dgy

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO
C. Stroud, LANL

bcc: <u>WRES Distribution</u>

(without attachments)

R. R. Chavez	ED
S. B. Jones	ED
R. F. Kehrman	ED
S. C. Kouba	ED
J. Siegel	ED
R. Whiteley	ED

<u>WTS Distribution</u>

(with attachments)

G. J. Johnson	ED

(without attachments)

L. N. Steven	ED

Attachment 2

Total Precipitation by Month (Inches)

	January 2007	February 2007	March 2007	April 2007	May 2007	June 2007	July 2007	August 2007	September 2007	October 2007	November 2007	December 2007
1	0	0	0	0								
2	0.77	0.01	0	0								
3	0	0.01	0	0								
4	0	0	0	0								
5	0	0	0	0								
6	0	0	0	0								
7	0	0	0	0.02								
8	0	0	0	0								
9	0	0	0	0								
10	0	0	0	0.01								
11	0	0	0	0								
12	0.04	0	0.06	0								
13	0.03	0.05	0.25	0								
14	0	0.12	0.01	0								
15	0	0	0	0								
16	0	0	0	0								
17	0	0	0	0								
18	0.02	0	0	0								
19	0.01	0	0	0.19								
20	0.64	0	0	0								
21	0.17	0	0	0								
22	0	0	0	0								
23	0.23	0	0.15	0								
24	0	0	1.41	0								
25	0	0	0	0								
26	0	0	0.29	0								
27	0	0	0	0								
28	0	0	0	0								
29	0		0	0								
30	0		0	0.93								
31	0.02		0									
Total	1.93	0.19	2.17	1.15								

Total Precipitation from January through April (Inches) = 5.44

Attachment 2

Total Precipitation by Month (Inches)

	January 2007	February 2007	March 2007	April 2007	May 2007	June 2007	July 2007	August 2007	September 2007	October 2007	November 2007	December 2007
1	0	0	0	0	0							
2	0.77	0.01	0	0	0.52							
3	0	0.01	0	0	0							
4	0	0	0	0	0							
5	0	0	0	0	0							
6	0	0	0	0	0							
7	0	0	0	0.02	0							
8	0	0	0	0	0.98							
9	0	0	0	0	0.55							
10	0	0	0	0.01	0							
11	0	0	0	0	0							
12	0.04	0	0.06	0	0							
13	0.03	0.05	0.25	0	0							
14	0	0.12	0.01	0	0							
15	0	0	0	0	0.50							
16	0	0	0	0	0.64							
17	0	0	0	0	0							
18	0.02	0	0	0	0							
19	0.01	0	0	0.19	0							
20	0.64	0	0	0	0							
21	0.17	0	0	0	0							
22	0	0	0	0	0							
23	0.23	0	0.15	0	0							
24	0	0	1.41	0	0							
25	0	0	0	0	0.01							
26	0	0	0.29	0	0.03							
27	0	0	0	0	0							
28	0	0	0	0	0							
29	0		0	0	0							
30	0		0	0.93	0							
31	0.02		0		0.09							
Total	1.93	0.19	2.17	1.15	3.32							

Total Precipitation from January through May (Inches) = 8.76

COPY

Washington
TRU Solutions LLC

WRES:07:571
UFC:5488.00

June 8, 2007

Mr. H. E. Johnson, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR MAY 2007

Dear Mr. Johnson:

The purpose of this letter is to provide you with the May 2007 volumetrics of Exhaust Shaft Intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There were 75 gallons of water collected from the Exhaust Shaft intercept boreholes; 2,900 gallons of water collected from the 700 fan ductwork; no water was collected from the Waste Shaft sump; and there was a total accumulation of 3.32 inches of precipitation during the month of May.

Attachment 1 is the monthly volumetrics of water removed from the exhaust fan ductwork, exhaust shaft boreholes, and waste shaft sump. Attachment 2 is the calendar year 2007 precipitation data noted by month.

If you have any questions, please call me at Extension 7545.

Sincerely,

W. M. Wierzbicki, Manager
Regulatory Compliance

REW:dgy

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO
C. Stroud, LANL

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
070633	548800	JUN 0 8 2007	H Johnson G Basabilvazo J Plum

Attachment 2

Total Precipitation by Month (Inches)

	January 2007	February 2007	March 2007	April 2007	May 2007	June 2007	July 2007	August 2007	September 2007	October 2007	November 2007	December 2007
1	0	0	0	0	0	0	0	0				
2	0.77	0.01	0	0	0.52	0	0	0.25				
3	0	0.01	0	0	0	0	0	0.16				
4	0	0	0	0	0	0.13	0	0				
5	0	0	0	0	0	0	0	0				
6	0	0	0	0	0	0	0.16	0				
7	0	0	0	0.02	0	0	0	0				
8	0	0	0	0	0.98	0	0	0				
9	0	0	0	0	0.55	0.08	0	0				
10	0	0	0	0.01	0	0.01	0	0				
11	0	0	0	0	0	0	0.42	0				
12	0.04	0	0.06	0	0	0	0	0				
13	0.03	0.05	0.25	0	0	0	0	0				
14	0	0.12	0.01	0	0	0	0	0				
15	0	0	0	0	0.50	0	0.01	0				
16	0	0	0	0	0.64	0	0	0				
17	0	0	0	0	0	0.01	0	0				
18	0.02	0	0	0	0	0	0	0				
19	0.01	0	0	0.19	0	0	0	0				
20	0.64	0	0	0	0	0	0	0				
21	0.17	0	0	0	0	0	2.22	0.05				
22	0	0	0	0	0	0.01	0.02	0				
23	0.23	0	0.15	0	0	0	0	0				
24	0	0	1.41	0	0	0	0	0				
25	0	0	0	0	0.01	0	0	0				
26	0	0	0.29	0	0.03	0.46	0	0				
27	0	0	0	0	0	0.01	0.32	0				
28	0	0	0	0	0	0.19	0.02	0				
29	0		0	0	0	0	0	0				
30	0		0	0.93	0	0	0.46	0				
31	0.02		0		0.09		0.33	0				
Total	1.93	0.19	2.17	1.15	3.32	0.90	3.96	0.46				

Total Precipitation from January through August (Inches) = 14.08

Washington
TRU Solutions LLC

COPY

WRES:07:582
UFC:5486.00

September 6, 2007

Mr. H. E. Johnson, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR AUGUST 2007

Dear Mr. Johnson:

The purpose of this letter is to provide you with the August 2007 volumetrics of Exhaust Shaft intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There were 2,230 gallons of water collected from the Exhaust Shaft intercept boreholes; 3,200 gallons collected from the Waste Shaft sump; 13,400 gallons of water collected from the 700 fan ductwork; and August had a total accumulation of 0.46 inches of precipitation.

Attachment 1 is the monthly volumetrics of water removed from the exhaust fan ductwork, exhaust shaft boreholes, and waste shaft sump. Attachment 2 is the calendar year 2007 precipitation data noted by month.

If you have any questions, please call me at Extension 7545.

Sincerely,

William M. Wierzbicki

W. M. Wierzbicki, Manager
Regulatory Compliance

REW:dgy

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
070281	5486.00	SEP 07 2007	H. Johnson G. Basabilvazo [illegible]

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (505) 234-7200 • Fax: (505) 234-7083

Attachment 2

Total Precipitation by Month (Inches)

	January 2007	February 2007	March 2007	April 2007	May 2007	June 2007	July 2007	August 2007	September 2007	October 2007	November 2007	December 2007
1	0	0	0	0	0	0	0	0	0	0		
2	0.77	0.01	0	0	0.52	0	0	0.25	0	0		
3	0	0.01	0	0	0	0	0	0.16	0	0		
4	0	0	0	0	0	0.13	0	0	0	0		
5	0	0	0	0	0	0	0	0	0	0		
6	0	0	0	0	0	0	0.16	0	0	0		
7	0	0	0	0.02	0	0	0	0	0.39	0		
8	0	0	0	0	0.98	0	0	0	0	0		
9	0	0	0	0	0.55	0.08	0	0	0.28	0		
10	0	0	0	0.01	0	0.01	0	0	1.58	0		
11	0	0	0	0	0	0	0.42	0	0.02	0		
12	0.04	0	0.06	0	0	0	0	0	0	0		
13	0.03	0.05	0.25	0	0	0	0	0	0	0		
14	0	0.12	0.01	0	0	0	0	0	0	0		
15	0	0	0	0	0.50	0	0.01	0	0	0		
16	0	0	0	0	0.64	0	0	0	0	0		
17	0	0	0	0	0	0.01	0	0	0.03	0		
18	0.02	0	0	0	0	0	0	0	0	0		
19	0.01	0	0	0.19	0	0	0	0	0	0		
20	0.64	0	0	0	0	0	0	0	0.88	0		
21	0.17	0	0	0	0	0	2.22	0.05	0.15	0		
22	0	0	0	0	0	0.01	0.02	0	0	0		
23	0.23	0	0.15	0	0	0	0	0	0.09	0		
24	0	0	1.41	0	0	0	0	0	0.06	0		
25	0	0	0	0	0.01	0	0	0	0	0		
26	0	0	0.29	0	0.03	0.46	0	0	0.39	0		
27	0	0	0	0	0	0.01	0.32	0	0	0		
28	0	0	0	0	0	0.19	0.02	0	0	0		
29	0		0	0	0	0	0	0	0.59	0		
30	0		0	0.93	0	0	0.46	0	0	0		
31	0.02		0		0.09		0.33	0		0		
Total	1.93	0.19	2.17	1.15	3.32	0.90	3.96	0.46	4.46	0.00		

Total Precipitation from January through October (Inches) = 18.54

COPY

Washington
TRU Solutions LLC

WRES:07:610
UFC:5486.00

November 8, 2007

Mr. H. E. Johnson, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLES, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR OCTOBER 2007

Dear Mr. Johnson:

The purpose of this letter is to provide you with the October 2007 volumetrics of the Exhaust Shaft intercept borehole water, 700-fan condensate, Waste Shaft sump water, and precipitation data. There were 1,400 gallons of water collected from the 700 fan ductwork. No water was collected from the Exhaust Shaft intercept boreholes or Waste Shaft sump, and there was zero precipitation recorded for the month of October.

Attachment 1 is the monthly volumetrics of water removed from the exhaust fan ductwork, exhaust shaft boreholes, and waste shaft sump. Attachment 2 is the calendar year 2007 precipitation data noted by month.

If you have any questions, please contact me at Extension 7545.

Sincerely,

W. M. Wierzbicki

W. M. Wierzbicki, Manager
Regulatory Compliance

REW:dgy

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
0703008	5486.00	NOV 08 2007	H. Johnson G. Basabilvazo H. Plum

Attachment 2

Total Precipitation by Month (Inches)

	January 2007	February 2007	March 2007	April 2007	May 2007	June 2007	July 2007	August 2007	September 2007	October 2007	November 2007	December 2007
1	0	0	0	0	0	0	0	0	0	0	0	
2	0.77	0.01	0	0	0.52	0	0	0.25	0	0	0	
3	0	0.01	0	0	0	0	0	0.16	0	0	0	
4	0	0	0	0	0	0.13	0	0	0	0	0	
5	0	0	0	0	0	0	0	0	0	0	0	
6	0	0	0	0	0	0	0.16	0	0	0	0	
7	0	0	0	0.02	0	0	0	0	0.39	0	0	
8	0	0	0	0	0.98	0	0	0	0	0	0	
9	0	0	0	0	0.55	0.08	0	0	0.28	0	0	
10	0	0	0	0.01	0	0.01	0	0	1.58	0	0	
11	0	0	0	0	0	0	0.42	0	0.02	0	0	
12	0.04	0	0.06	0	0	0	0	0	0	0	0	
13	0.03	0.05	0.25	0	0	0	0	0	0	0	0	
14	0	0.12	0.01	0	0	0	0	0	0	0	0	
15	0	0	0	0	0.50	0	0.01	0	0	0	0	
16	0	0	0	0	0.64	0	0	0	0	0	0	
17	0	0	0	0	0	0.01	0	0	0.03	0	0	
18	0.02	0	0	0	0	0	0	0	0	0	0	
19	0.01	0	0	0.19	0	0	0	0	0	0	0	
20	0.64	0	0	0	0	0	0	0	0.88	0	0	
21	0.17	0	0	0	0	0	2.22	0.05	0.15	0	0	
22	0	0	0	0	0	0.01	0.02	0	0	0	0.03	
23	0.23	0	0.15	0	0	0	0	0	0.09	0	0.19	
24	0	0	1.41	0	0	0	0	0	0.06	0	0.01	
25	0	0	0	0	0.01	0	0	0	0	0	0.38	
26	0	0	0.29	0	0.03	0.46	0	0	0.39	0	0.01	
27	0	0	0	0	0	0.01	0.32	0	0	0	0	
28	0	0	0	0	0	0.19	0.02	0	0	0	0	
29	0		0	0	0	0	0	0	0.59	0	0	
30	0		0	0.93	0	0	0.46	0	0	0	0.04	
31	0.02		0		0.09		0.33	0		0		
Total	1.93	0.19	2.17	1.15	3.32	0.90	3.96	0.46	4.46	0.00	0.66	

Total Precipitation from January through November (inches) = 19.20

Washington
TRU Solutions LLC

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WRES:07:620
UFC:5486.00

December 10, 2007

Mr. H. E. Johnson, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLES, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR NOVEMBER 2007

Dear Mr. Johnson:

The purpose of this letter is to provide you with the November 2007 volumetrics of Exhaust Shaft intercept borehole water, 700-fan condensate, Waste Shaft sump water and precipitation data. There were 150 gallons of water collected from the Exhaust Shaft intercept boreholes. No water was collected from the 700 fan ductwork or the Waste Shaft sump, and November had a total accumulation of 0.66 inches of precipitation.

Attachment 1 is the monthly volumetrics of water removed from the exhaust fan ductwork, exhaust shaft boreholes, and waste shaft sump. Attachment 2 is the calendar year 2007 precipitation data noted by month.

If you have any questions, please contact me at Extension 7545.

Sincerely,

W. M. Wierzbicki, Manager
Regulatory Compliance

REW:dgy

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
0708253	5486.00	DEC 11 2007	H. Johnson G. Basabilvazo L. Plum

Attachment 2

Total Precipitation by Month (Inches)

	January 2007	February 2007	March 2007	April 2007	May 2007	June 2007	July 2007	August 2007	September 2007	October 2007	November 2007	December 2007
1	0	0	0	0	0	0	0	0	0	0	0	0.01
2	0.77	0.01	0	0	0.52	0	0	0.25	0	0	0	0
3	0	0.01	0	0	0	0	0	0.16	0	0	0	0
4	0	0	0	0	0	0.13	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0.16	0	0	0	0	0
7	0	0	0	0.02	0	0	0	0	0.39	0	0	0
8	0	0	0	0	0.98	0	0	0	0	0	0	0
9	0	0	0	0	0.55	0.08	0	0	0.28	0	0	0
10	0	0	0	0.01	0	0.01	0	0	1.58	0	0	0.43
11	0	0	0	0	0	0	0.42	0	0.02	0	0	0.13
12	0.04	0	0.06	0	0	0	0	0	0	0	0	0
13	0.03	0.05	0.25	0	0	0	0	0	0	0	0	0
14	0	0.12	0.01	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0.50	0	0.01	0	0	0	0	0
16	0	0	0	0	0.64	0	0	0	0	0	0	0
17	0	0	0	0	0	0.01	0	0	0.03	0	0	0
18	0.02	0	0	0	0	0	0	0	0	0	0	0
19	0.01	0	0	0.19	0	0	0	0	0	0	0	0
20	0.64	0	0	0	0	0	0	0	0.88	0	0	0
21	0.17	0	0	0	0	0	2.22	0.05	0.15	0	0	0
22	0	0	0	0	0	0.01	0.02	0	0	0	0.03	0
23	0.23	0	0.15	0	0	0	0	0	0.09	0	0.19	0
24	0	0	1.41	0	0	0	0	0	0.06	0	0.01	0
25	0	0	0	0	0.01	0	0	0	0	0	0.38	0
26	0	0	0.29	0	0.03	0.46	0	0	0.39	0	0.01	0
27	0	0	0	0	0	0.01	0.32	0	0	0	0	0
28	0	0	0	0	0	0.19	0.02	0	0	0	0	0
29	0		0	0	0	0	0	0	0.59	0	0	0
30	0		0	0.93	0	0	0.46	0	0	0	0.04	0
31	0.02		0		0.09		0.33	0		0		0
Total	1.93	0.19	2.17	1.15	3.32	0.90	3.96	0.46	4.46	0.00	0.66	0.57
Total Precipitation from January through December (Inches) = 19.77												

COPY

Washington
TRU Solutions LLC

WRES:08:502
UFC:5486.00

January 9, 2008

Mr. R. L. Patterson, Compliance Certification Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR DECEMBER 2007

Dear Mr. Patterson:

The purpose of this letter is to provide you with the December 2007 volumetrics of Exhaust Shaft intercept borehole water, 700-fan condensate, Waste Shaft sump water and precipitation data. There were 410 gallons of water collected from the Exhaust Shaft intercept boreholes and 1,200 gallons of water collected from the Waste Shaft sump. No water was collected from the 700 fan ductwork and December had a total accumulation of 0.57 inches of precipitation.

Attachment 1 is the monthly volumetrics of water removed from the exhaust fan ductwork, exhaust shaft boreholes, and waste shaft sump. Attachment 2 is the calendar year 2007 precipitation data noted by month.

If you have any questions, please call me at Extension 7545.

Sincerely,

W. M. Wierzbicki

W. M. Wierzbicki, Manager
Regulatory Compliance

RW:dgy

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
0800033	5486.00	JAN 0 9 2007	R. Patterson G. Basabilvazo H. Plum

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

Calendar Year 2008		Calendar Year 2008		Calendar Year 2008	
Date	Gallons	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March	0	March	650	March	0
April	0	April	0	April	2000
May		May		May	
June		June		June	
July		July		July	
August		August		August	
September		September		September	
October		October		October	
November		November		November	
December		December		December	
Yearly total	0	Yearly total	650	Yearly total	2,000

Washington
TRU Solutions LLC

WRES:08:193
UFC:5486.00

May 5, 2008

Ms. S. McCauslin, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR APRIL 2008

Dear Ms. McCauslin:

The purpose of this letter is to provide you with the April 2008 volumetrics of Exhaust Shaft intercept borehole water, 700-fan condensate, Waste Shaft sump water, and precipitation data. There were 2,000 gallons of water collected from the Waste Shaft sump and no water was collected from the Exhaust Shaft intercept boreholes or the 700-fan ductwork. There was no precipitation for the month of April.

Attachment 1 is the monthly volumetrics of water removed from the exhaust fan ductwork, exhaust shaft boreholes, and waste shaft sump. Attachment 2 is the 2008 calendar year of precipitation data noted by month.

If you have any questions, please call me at Extension 7545.

Sincerely,

William M. Wierzbicki

W. M. Wierzbicki, Manager
Regulatory Compliance

RW:dg

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H.L. Plum, CBFO

Attachment 2

Total Precipitation by Month (Inches)

	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0.05	0	0							
	0	0	0	0	0							
	0	0	0	0	0.26							
	0	0	0	0	0.04							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0.34							
	0	0	0	0	0.01							
	0	0	0	0	0.01							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0							
	0.01	0	0	0	0							
	0.01	0	0	0	0.06							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0							
	0	0	0	0	0							
	0		0	0	0							
	0		0		0							
	0.02	0	0.05	0	0.72							

COPY

Washington
TRU Solutions LLC

WRES:08:232
UFC:5486.00

June 5, 2008

Ms. S. McCauslin, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR MAY 2008

Dear Ms. McCauslin:

The purpose of this letter is to provide you with the May 2008 volumetrics of Exhaust Shaft intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There was no water collected from the Exhaust Shaft intercept boreholes, Waste Shaft sump, or the 700-fan ductwork. There was a total of 0.72 inches of precipitation for the month of May.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the precipitation data collected monthly from January through May 2008.

If you have any questions, please call me at Extension 7545.

Sincerely,

W. M. Wierzbicki, Manager
Regulatory Compliance

RW:dg

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H.L. Plum, CBFO

080442 548600 JUN 0 5 2008 S McCauslin G Basabilvazo

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Attachment 2

Total Precipitation by Month (Inches)

	January 2008	February 2008	March 2008	April 2008	May 2008	June 2008	July 2008	August 2008	September 2008	October 2008	November 2008	December 2008
1	0											
2	0											
3	0											
4	0											
5	0											
6	0											
7	0											
8	0											
9	0											
10	0											
11	0											
12	0											
13	0											
14	0											
15	0											
16	0											
17	0											
18	0											
19	0											
20	0											
21	0											
22	0											
23	0											
24	0.01											
25	0.01											
26	0											
27	0											
28	0											
29	0											
30	0											
31	0											
Total	0.02											

Total Precipitation for 2008 (Inches) = 0.02

COPY

Washington
TRU Solutions LLC

WRES:08:514
UFC:5486.00

February 6, 2008

Ms. S. McCauslin, Compliance Certification Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR JANUARY 2008

Dear Ms. McCauslin:

The purpose of this letter is to provide you with the January 2008 volumetrics of Exhaust Shaft intercept borehole water, 700-fan condensate, Waste Shaft sump water and precipitation data. There was no water collected from the Exhaust Shaft intercept boreholes, Waste Shaft sump, or the 700-fan ductwork. There was a total accumulation of 0.02 inches of precipitation in January.

Attachment 1 is the monthly volumetrics of water removed from the exhaust fan ductwork, exhaust shaft boreholes, and waste shaft sump. Attachment 2 is the 2008 calendar year of precipitation data noted by month.

If you have any questions, please call me at Extension 7545.

Sincerely,

Steve C Kouba

for W. M. Wierzbicki, Manager
Regulatory Compliance

REW:dgy

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
080024	5486.00	FEB 0 6 2008	S. McCauslin G Basabilvazo HPlum

01743

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Intercept Borehole Water		Waste Shaft Sump Water	
Calendar Year 2008		Calendar Year 2008		Calendar Year 2008	
Date	Gallons	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March		March		March	
April		April		April	
May		May		May	
June		June		June	
July		July		July	
August		August		August	
September		September		September	
October		October		October	
November		November		November	
December		December		December	
Yearly total	0	Yearly total	0	Yearly total	0

Washington
TRU Solutions LLC

WRES:08:518
UFC:5486.00

March 10, 2008

Ms. S. McCauslin, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

COPY

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR FEBRUARY 2008

Dear Ms. McCauslin:

The purpose of this letter is to provide you with the February 2008 volumetrics of Exhaust Shaft intercept borehole water, 700-fan condensate, Waste Shaft sump water and precipitation data. There was no water collected from the Exhaust Shaft intercept boreholes, Waste Shaft sump, 700-fan ductwork and there was no accumulation of precipitation in February.

Attachment 1 is the monthly volumetrics of water removed from the exhaust fan ductwork, exhaust shaft boreholes, and waste shaft sump. Attachment 2 is the 2008 calendar year of precipitation data noted by month.

If you have any questions, please call me at Extension 7545.

Sincerely,

Willie L. Wzbk

W. M. Wierzbicki, Manager
Regulatory Compliance

REW:dgy

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
080534	5486.00	MAR 10 2008	S. McCauslin G. Basabilvazo H. Plum

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (505) 234-7200 • Fax: (505) 234-7083

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

700 Fan Condensate Water (Above Ground Exhaust Ductwork)		Exhaust Shaft Intercept Borehole Water		Waste Shaft Sump Water	
Calendar Year 2008		Calendar Year 2008		Calendar Year 2008	
Date	Gallons	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March		March		March	
April		April		April	
May		May		May	
June		June		June	
July		July		July	
August		August		August	
September		September		September	
October		October		October	
November		November		November	
December		December		December	
Yearly total	0	Yearly total	0	Yearly total	0

Attachment 2

Total Precipitation by Month (Inches)

	January 2008	February 2008	March 2008	April 2008	May 2008	June 2008	July 2008	August 2008	September 2008	October 2008	November 2008	December 2008
1	0	0										
2	0	0										
3	0	0										
4	0	0										
5	0	0										
6	0	0										
7	0	0										
8	0	0										
9	0	0										
10	0	0										
11	0	0										
12	0	0										
13	0	0										
14	0	0										
15	0	0										
16	0	0										
17	0	0										
18	0	0										
19	0	0										
20	0	0										
21	0	0										
22	0	0										
23	0	0										
24	0.01	0										
25	0.01	0										
26	0	0										
27	0	0										
28	0	0										
29	0	0										
30	0											
31	0											
Total	0.02	0										

Total Precipitation from January through February 2008 (Inches) = 0.02

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

Calendar Year 2008		Calendar Year 2008		Calendar Year 2008	
Date	Gallons	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March	0	March	0	March	0
April		April		April	
May		May		May	
June		June		June	
July		July		July	
August		August		August	
September		September		September	
October		October		October	
November		November		November	
December		December		December	
Yearly total	0	Yearly total	0	Yearly total	0

Washington
TRU Solutions LLC

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WRES:08:532
UFC:5486.00

April 10, 2008

Ms. S. McCauslin, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR MARCH 2008

Dear Ms. McCauslin:

The purpose of this letter is to provide you with the March 2008 volumetrics of Exhaust Shaft intercept borehole water, 700-fan condensate water, Waste Shaft sump water, and precipitation data. There was no water collected from the Waste Shaft sump, or the 700-fan ductwork. There were 650 gallons collected in the Exhaust Shaft intercept boreholes. There was a total accumulation of 0.05 inches of precipitation in March.

Attachment 1 is the monthly volumetrics of water removed from the exhaust fan ductwork, exhaust shaft boreholes, and waste shaft sump. Attachment 2 is the 2008 calendar year of precipitation data noted by month.

If you have any questions, please call me at Extension 7545.

Sincerely,

W. M. Wierzbicki

W. M. Wierzbicki, Manager
Regulatory Compliance

REW:dgy

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
080020	5486.00	APR 10 2008	S McCauslin G Basabilvazo H Plum

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (505) 234-7200 • Fax: (505) 234-7083

Attachment 2

Total Precipitation by Month (Inches)

0	0	0	0	0	0						
0	0	0	0	0	0						
0	0	0.05	0	0	0						
0	0	0	0	0	0						
0	0	0	0	0.26	0						
0	0	0	0	0.04	0						
0	0	0	0	0	0						
0	0	0	0	0	0						
0	0	0	0	0	0.02						
0	0	0	0	0	0						
0	0	0	0	0	0						
0	0	0	0	0	0						
0	0	0	0	0	0						
0	0	0	0	0	0						
0	0	0	0	0.34	0						
0	0	0	0	0.01	0						
0	0	0	0	0.01	0						
0	0	0	0	0	0						
0	0	0	0	0	0						
0	0	0	0	0	0.12						
0	0	0	0	0	0.36						
0	0	0	0	0	0						
0	0	0	0	0	0						
0.01	0	0	0	0	0						
0.01	0	0	0	0.06	0						
0	0	0	0	0	0						
0	0	0	0	0	0						
0	0	0	0	0	0.01						
0	0	0	0	0	0.06						
0		0	0	0	0						
0		0		0.00							
0.02	0	0.05	0	0.72	0.57						

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Washington
TRU Solutions LLC

WRES:08:542
UFC:5486.00

July 09, 2008

Ms. Susan McCauslin, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLE, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR JUNE 2008

Dear Ms. McCauslin:

The purpose of this letter is to provide you with the June 2008 volumetrics of Exhaust Shaft intercept borehole water, Waste Shaft sump water, 700-fan condensate, and precipitation data. There was no water collected from the Exhaust Shaft intercept boreholes or the 700-fan ductwork. There were 2,000 gallons of water collected from the Waste Shaft sump and for the month of June there was 0.57 inches of precipitation.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the precipitation data collected monthly from , January through June 2008.

If you have any questions, please call me at Extension 7545.

Sincerely,

W. M. Wierzbicki, Manager
Regulatory Compliance

RW:hdm

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
080700	5486.00	JUL 09 2008	S McCauslin G Basabilvazo T-Plum

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (505) 234-7200 • Fax: (505) 234-7083

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

Calendar Year 2008	
Date	Gallons
January	0
February	0
March	0
April	0
May	0
June	0
July	8,650
August	
September	
October	
November	
December	
Yearly total	8,650

Calendar Year 2008	
Date	Gallons
January	0
February	0
March	650
April	0
May	0
June	0
July	225
August	
September	
October	
November	
December	
Yearly total	875

Calendar Year 2008	
Date	Gallons
January	0
February	0
March	0
April	2000
May	0
June	2000
July	0
August	
September	
October	
November	
December	
Yearly total	4,000

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WRES:08:563
UFC:5486.00

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August 7, 2008

Ms. Susan McCauslin, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLES, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR JULY 2008

Dear Ms. McCauslin:

The purpose of this letter is to provide you with the July 2008 volumetrics of 700-fan condensate, Exhaust Shaft intercept borehole water, Waste Shaft sump water, and precipitation data. There were 8,650 gallons of water collected from the 700 fan ductwork and 225 gallons of water was collected from the Exhaust Shaft intercept boreholes. No water was collected from the Waste Shaft sump. There was a total of 2.04 inches of precipitation in July.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the precipitation data collected monthly from January through July 2008.

If you have any questions, please call me at Extension 7545.

Sincerely,

W. M. Wierzbicki

W. M. Wierzbicki
Manager of Regulatory Compliance

RW:hdm

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H. L. Plum, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
0802072	5486.00	AUG 07 2008	S. McCauslin G. Basabilvazo H. Plum

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

Calendar Year 2008		Calendar Year 2008		Calendar Year 2008	
Date	Gallons	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March	0	March	650	March	0
April	0	April	0	April	2,000
May	0	May	0	May	0
June	0	June	0	June	2,000
July	8,650	July	225	July	0
August	800	August	50	August	2,000
September		September		September	
October		October		October	
November		November		November	
December		December		December	
Yearly total	9,450	Yearly total	925	Yearly total	6,000

Attachment 2

Total Precipitation by Month (Inches)

0	0	0	0	0	0	0	0				
0	0	0	0	0	0	0	0				
0	0	0.05	0	0	0	0	0				
0	0	0	0	0	0	0	0				
0	0	0	0	0.26	0	0	0				
0	0	0	0	0.04	0	0	0				
0	0	0	0	0	0	0	0				
0	0	0	0	0	0	0	0				
0	0	0	0	0	0.02	0.42	0				
0	0	0	0	0	0	0.97	0				
0	0	0	0	0	0	0	0				
0	0	0	0	0	0	0	0				
0	0	0	0	0	0	0.02	0				
0	0	0	0	0	0	0.32	0.25				
0	0	0	0	0.34	0	0	0				
0	0	0	0	0.01	0	0.01	0.17				
0	0	0	0	0.01	0	0	0				
0	0	0	0	0	0	0	0.70				
0	0	0	0	0	0	0	0				
0	0	0	0	0	0.12	0	0				
0	0	0	0	0	0.36	0.01	0				
0	0	0	0	0	0	0	0				
0	0	0	0	0	0	0	0				
0.01	0	0	0	0	0	0	0				
0.01	0	0	0	0.06	0	0.02	0				
0	0	0	0	0	0	0.07	0				
0	0	0	0	0	0	0	0.54				
0	0	0	0	0	0.01	0	0.08				
0	0	0	0	0	0.06	0.20	0				
0		0	0	0	0	0	0.04				
0		0		0.00		0	0.05				
0.02	0	0.05	0	0.72	0.57	2.04	1.83				

Washington
TRU Solutions LLC

WRES:08:573
UFC:5486.00

COPY

September 8, 2008

Ms. S. McCauslin, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLES, WASTE SHAFT SUMP, 700-FAN CONDENSATE AND PRECIPITATION DATA FOR AUGUST 2008

Dear Ms. McCauslin:

The purpose of this letter is to provide you with the August 2008 volumetrics of 700-fan condensate, Exhaust Shaft intercept borehole water, Waste Shaft sump water, and precipitation data. There were 800 gallons of water collected from the 700 fan ductwork; 50 gallons of water collected from the Exhaust Shaft intercept boreholes and 2,000 gallons of water collected from the Waste Shaft sump. There was a total of 1.83 inches of precipitation in August.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month. Attachment 2 is the precipitation data collected monthly from January through August 2008.

If you have any questions, please call me at Extension 7545.

Sincerely,

William M. Wierzbicki

W. M. Wierzbicki
Manager of Regulatory Compliance

RW:hdm

Attachments (2)

cc: G. T. Basabilvazo, CBFO
D. J. Ferguson, CBFO
H. L. Plum, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
080412	5486.00	SEP 0 9 2008	S. McCauslin G. Basabilvazo D. Ferguson J. Plum

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

Calendar Year 2008		Calendar Year 2008		Calendar Year 2008	
Date	Gallons	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March	0	March	650	March	0
April	0	April	0	April	2,000
May	0	May	0	May	0
June	0	June	0	June	2,000
July	8,650	July	225	July	0
August	800	August	50	August	2,000
September	3,600	September	115	September	1,500
October		October		October	
November		November		November	
December		December		December	
Yearly total	13,050	Yearly total	1,040	Yearly total	7,500

Washington
TRU Solutions LLC

WRES:08:590
UFC:5486.00

October 8, 2008

Ms. S. McCauslin, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE 700-FAN CONDENSATE, EXHAUST SHAFT INTERCEPT BOREHOLES, WASTE SHAFT SUMP, AND PRECIPITATION DATA FOR SEPTEMBER 2008

Dear Ms. McCauslin:

The purpose of this letter is to provide you with the September 2008 volumetrics of 700-fan condensate, Exhaust Shaft intercept borehole water, Waste Shaft sump water, and precipitation data. There were 3,600 gallons of water collected from the 700 fan ductwork, 115 gallons of water collected from the Exhaust Shaft intercept boreholes and 1,500 gallons of water collected from the Waste Shaft sump. There was a total of 2.03 inches of precipitation in September.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the precipitation data collected monthly from January through September 2008.

If you have any questions, please call me at Extension 7545.

Sincerely,

William M. Wierzbicki

W. M. Wierzbicki
Manager of Regulatory Compliance

RW:hdm

Attachments (2)

cc: G. T. Basabilvazo, CBFO
D. J. Ferguson, CBFO
H. L. Plum, CBFO

DOC NO.	[illegible]	DATE REC'VD	ADDRESSEE
080830	[illegible]	OCT 07 2008	S McCauslin G Basabilvazo D Ferguson J. Plum

P.O. Box 2078 • Carlsbad, New Mexico USA 88221-2078
Phone: (575) 234-7200 • Fax: (575) 234-7083

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

Calendar Year 2008	
Date	**Gallons**
January	0
February	0
March	0
April	0
May	0
June	0
July	8,650
August	800
September	3,600
October	2,000
November	
December	
Yearly total	15,050

Calendar Year 2008	
Date	**Gallons**
January	0
February	0
March	650
April	0
May	0
June	0
July	225
August	50
September	115
October	0
November	
December	
Yearly total	1,040

Calendar Year 2008	
Date	**Gallons**
January	0
February	0
March	0
April	2,000
May	0
June	2,000
July	0
August	2,000
September	1,500
October	0
November	
December	
Yearly total	7,500

[redacted]

November 10, 2008

Ms. Susan McCauslin, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE 700-FAN CONDENSATE, EXHAUST SHAFT INTERCEPT BOREHOLES, WASTE SHAFT SUMP, AND PRECIPITATION DATA FOR OCTOBER 2008

Dear Ms. McCauslin:

The purpose of this letter is to provide you with the October 2008 volumetrics of 700-fan condensate, Exhaust Shaft intercept borehole water, Waste Shaft sump water, and precipitation data. There were 2,000 gallons of water collected from the 700 fan ductwork. There was no water collected from the Exhaust Shaft intercept boreholes or the Waste Shaft sump. There was a total of 4.18 inches of precipitation in October.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the precipitation data collected monthly from January through October 2008.

If you have any questions, please call me at Extension 7545.

Sincerely,

(Original signature on file)

W. M. Wierzbicki, Manager
Regulatory Compliance

RW:hdm

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H.L. Plum, CBFO

Attachment 1

Water Removed From the WIPP Underground and Exhaust Ductwork by Month

Calendar Year 2008		Calendar Year 2008		Calendar Year 2008	
Date	Gallons	Date	Gallons	Date	Gallons
January	0	January	0	January	0
February	0	February	0	February	0
March	0	March	650	March	0
April	0	April	0	April	2,000
May	0	May	0	May	0
June	0	June	0	June	2,000
July	8,650	July	225	July	0
August	800	August	50	August	2,000
September	3,600	September	115	September	1,500
October	2,000	October	0	October	0
November	0	November	65	November	0
December		December	0	December	
Yearly total	15,050	Yearly total	1,105	Yearly total	7,500

1105

COPY

Washington
TRU Solutions LLC

WRES:08:620
UFC: 5486.00

December 3, 2008

Ms. Susan McCauslin, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE 700-FAN CONDENSATE, EXHAUST SHAFT INTERCEPT BOREHOLES, WASTE SHAFT SUMP, AND PRECIPITATION DATA FOR NOVEMBER 2008

Dear Ms. McCauslin:

The purpose of this letter is to provide you with the November 2008 volumetrics of Exhaust Shaft intercept borehole water, 700 fan condensate, Waste Shaft sump water, and precipitation data. There were 65 gallons of water collected from the Exhaust Shaft intercept boreholes. There was no 700-fan condensate or Waste Shaft sump water collected for this month. There was a total of 0.08 inches of precipitation in November.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the precipitation data collected monthly from January through November 2008.

If you have any questions, please call me at Extension 7545.

Sincerely,

W. M. Wierzbicki

W. M. Wierzbicki, Manager
Regulatory Compliance

RW:hdm

Attachments (2)

cc: G. T. Basabilvazo, CBFO
H.L. Plum, CBFO

5486.00 | DEC 03 2008 | S. McCauslin
G Basabilvazo T Plum

COPY

Washington
TRU Solutions LLC

WRES:09:504
UFC: 5486.00

January 07, 2009

Ms. Susan McCauslin, NEPA Compliance Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Subject: VOLUMETRICS FOR WATER REMOVED FROM THE EXHAUST SHAFT INTERCEPT BOREHOLES, 700-FAN CONDENSATE, WASTE SHAFT SUMP, AND PRECIPITATION DATA FOR DECEMBER 2008

Dear Ms. McCauslin:

The purpose of this letter is to provide you with the December 2008 volumetrics of Exhaust Shaft intercept borehole water, 700 fan condensate, Waste Shaft sump water, and precipitation data. There was no water collected from the Exhaust Shaft intercept boreholes, 700-fan condensate or Waste Shaft sump and there was no precipitation in the month of December.

Attachment 1 is the monthly volumetrics of water removed from the underground and exhaust ductwork by month, respectively. Attachment 2 is the precipitation data collected monthly from January through December 2008.

If you have any questions, please call me at Extension 7545.

Sincerely,

W. M. Wierzbicki

W. M. Wierzbicki, Manager
Regulatory Compliance

RW:hdm

Attachments (2)

cc: G. T. Basabilvazo, CBFO
D. J. Ferguson, CBFO
H.L. Plum, CBFO

UNIQUE #	DOE UFC	DATE REC'VD	ADDRESSEES
090001	5486.00	JAN 07 2009	S. McCauslin G. Basabilvazo D. Ferguson T. Plum

Attachment 2

Total Precipitation by Month (Inches)   Data retrieved from the WIPP Meteorological Station

0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0.05	0	0	0	0	0	0.56	0	0	0
0	0	0	0	0	0	0	0	0	0.02	0	0
0	0	0	0	0.26	0	0	0	0	0.46	0	0
0	0	0	0	0.04	0	0	0	0	0.01	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0.54	0	0	0
0	0	0	0	0	0.02	0.42	0	0	0	0	0
0	0	0	0	0	0	0.97	0	0	0	0	0
0	0	0	0	0	0	0	0	0.09	0	0	0
0	0	0	0	0	0	0	0	0	0.59	0	0
0	0	0	0	0	0	0.02	0	0	2.67	0	0
0	0	0	0	0	0	0.32	0.25	0.84	0.42	0	0
0	0	0	0	0.34	0	0	0	0	0.01	0	0
0	0	0	0	0.01	0	0.01	0.17	0	0	0	0
0	0	0	0	0.01	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0.70	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0.12	0	0	0	0	0	0
0	0	0	0	0	0.36	0.01	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0.01	0	0	0	0	0	0	0	0	0	0	0
0.01	0	0	0	0.06	0	0.02	0	0	0	0	0
0	0	0	0	0	0	0.07	0	0	0	0	0
0	0	0	0	0	0	0	0.54	0	0	0.08	0
0	0	0	0	0	0.01	0	0.08	0	0	0	0
0	0	0	0	0	0.06	0.20	0	0	0	0	0
0		0	0	0	0	0	0.04	0	0	0	0
0		0		0.00		0	0.05		0		0
0.02	0	0.05	0	0.72	0.57	2.04	1.83	2.03	4.18	0.08	0

11.5 for 2008

Pre-Application Meetings

Waste Isolation Pilot Plant

May 5, 2009	May 7, 2009
5 to 7 p.m.	2 to 4 p.m.
WIPP Information Center	6 to 8 p.m.
Skeen-Whitlock Building	Courtyard by Marriott
4021 National Parks Highway	3347 Cerrillos Road
Carlsbad, New Mexico	Santa Fe, New Mexico

The U.S. Department of Energy Carlsbad Field Office and Washington TRU Solutions (co-permittees) are hosting pre-application meetings regarding the Hazardous Waste Facility Permit (HWFP) renewal application for the Waste Isolation Pilot Plant (WIPP).

This notice is to inform the public of the pre-application meeting for the WIPP HWFP Renewal Application, as required by the New Mexico Hazardous Waste Management Regulations. The purpose of the pre-application meetings for the WIPP HWFP Renewal Application is to inform stakeholders of the proposed hazardous waste management activities and to solicit questions. The radioactive components of WIPP waste are regulated separately by the U.S. Environmental Protection Agency.

The effective term for the WIPP HWFP is ten years. At least 180-days before the expiration of the current permit (November 26, 2009), the Permittees must reapply for a permit. The Renewal Application must be submitted to NMED no later than May 30, 2009.

The WIPP facility, located 30 miles east of Carlsbad, New Mexico, is designed for permanent disposal of defense-generated transuranic waste, the byproduct of nuclear weapons research and production. WIPP is permitted to dispose only this type of waste. Project facilities include disposal rooms excavated 2,150 feet underground in a stable salt formation.

To obtain information regarding the reapplication or about WIPP operations, contact Mr. Bobby St. John at 1-800-336-9477. The draft renewal application submittal may also be viewed on the WIPP web site, http://www.wipp.energy.gov, and at the WIPP Information Center, Skeen-Whitlock Building, 4021 National Parks Highway, Carlsbad, New Mexico.

Persons requiring special assistance to participate in these meetings may also contact Mr. St. John at the telephone number noted above at least 72 hours prior to the meeting.

GROUND WATER

APR 20 2009

BUREAU

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

April 16, 2009

~NOTICE~

Waste Isolation Pilot Plant
Class 1 Permit Modification Notification

The U.S. Department of Energy and Washington TRU Solutions LLC hereby inform you of the following Class 1 Permit Modifications to the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), Permit Number: NM4890139088-TSDF.

The New Mexico Environment Department (NMED) was notified of the following Class 1 permit modifications on the date indicated below. Summary of the change follows.

January 30, 2009

- Revise Panel Figures to include Panel 5
- Revise Firewater Distribution System Figures

February 27, 2009

- Revise Table I-1 to include actual dates that waste emplacement was started, completed, closure began and partial closure ended in Panels 1, 2, 3 and 4.

- Revise Attachment B6 checklist to include quality assurance objectives for visual examination. These were previously inadvertently omitted from the previous B6 checklist.

- Revise the permit to make the following changes regarding the Facility transfer Vehicle:
    1. Add an additional FTV inspection procedure to table D-1
    2. Allow facility pallets to be stored on either the floor of the Waste handling Building or on the facility pallet stands
    3. Revise the FTV description
    4. Increase the capacity of the FTVs from 26,000 pounds to 30,000 pounds

Marshall, Clint, NMENV

From: Marshall, Clint, NMENV
Sent: Monday, April 06, 2009 2:50 PM
To: Jody Plum (jody.plum@wipp.ws)
Subject: Approval of Storm Water / Erosion Plan for Salt Pile

Jody,

NMED has reviewed the submittal from DOE titled, *Plan for Controlling Storm Water and Mininmizing Erosion of the Salt Pile* dated March 6, 2009. NMED approves the plan and construction schedule as proposed. Please contact me at the address below if you have any questions.

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
505-827-0027

From: Stone, Marissa, NMENV
Sent: Thursday, March 26, 2009 3:45 PM
Subject: WIPP the new Yucca?

Some suggest NM area could replace Yucca Mountain

The Associated Press

Thu, Mar 26, 2009 (1:06 p.m.)

Longtime Carlsbad Mayor Bob Forrest recalls the days when no one wanted to take the federal government's radioactive waste except his southern New Mexico community.

Ten years after it opened, the Waste Isolation Pilot Plant, commonly known as WIPP, remains the government's only radioactive waste dump.

But now, Forrest says, the climate for all things nuclear has changed, and communities across the nation are fighting for projects.

Forrest himself believes the vast, 250 million-year-old salt beds that house WIPP east of his community of about 25,000 could store high-level nuclear waste such as that once destined for the Yucca Mountain project the Obama administration is apparently abandoning.

Such a repository would be separate from WIPP, he said.

WIPP, excavated 2,150 feet below the surface of the desert, is designed for so-called transuranic waste generated by the nation's defense work _ such things as plutonium-contaminated rags, tools or clothing. Although it takes some defense waste that's so radioactive it's handled by robotic machines, high-level and commercial nuclear waste are prohibited.

Some worry that could change as the nation looks for a place to put nearly 60,000 tons of highly radioactive fuel rods generated by the nuclear power industry.

For two decades, Yucca Mountain in the Nevada desert northwest of Las Vegas was the focus of government plans for such waste. But earlier this month, Energy Secretary Steven Chu said Yucca Mountain no longer is viewed as an option.

Instead, Chu said the administration believes used reactor fuel can remain at power plants while a comprehensive plan for disposal is developed. He hopes to have a recommendation from a special panel on alternatives to Yucca Mountain and long-term disposal before the end of the year.

Forrest said Monday he has high hopes of making the Carlsbad area "the next Yucca Mountain" and will lobby for such a project. It would be separate from WIPP in another part of the salt beds.

"The community's ready, the timing couldn't be better. ... I think the stage is right to move forward," Forrest said.

He believes Carlsbad would be behind the idea _ unlike Nevada was with Yucca Mountain.

Polls conducted by Nevada newspapers consistently showed most Nevadans opposed the project, and Senate Majority Leader Harry Reid, D-Nev., vowed to starve it of funds.

"If you don't have the community support you can't get to first base," Forrest said. "That's the key to our success (with WIPP) but it didn't happen overnight."

State Environment Secretary Ron Curry said there will always be some who want to expand WIPP's mission, but noted Gov. Bill Richardson ordered the state Environment Department to modify WIPP's permit to ensure high-level reactor waste isn't stored at the site.

Curry does not favor a Yucca Mountain-type facility, even if it's not part of WIPP.

"The federal government must abide by the promise it made to New Mexicans more than a decade ago and focus on WIPP's original purpose to dispose of only transuranic waste," he said. "We will vigorously oppose any attempt to expand or alter the mission of WIPP to allow high-level waste."

Don Hancock of the Southwest Research and Information Center in Albuquerque, a longtime WIPP watchdog, said the idea of burying high-level defense waste or nuclear fuel at WIPP keeps coming up _ despite being prohibited by the land withdrawal act that authorized the permanent repository.

He said the administration's recent actions over Yucca Mountain have raised concerns, but he believes New Mexicans would fight any attempt to put such a repository in the state.

Waste that would go into a Yucca Mountain-type dump "is orders of magnitude different (from WIPP) in terms of the order of radioactivity, in terms of the physical heat generated," he said. Hancock also said scientific studies that came up during hearings over WIPP demonstrated salt was unsuitable for such waste.

Roger Nelson, chief scientist for the DOE's Carlsbad field office, said if Yucca Mountain is to be replaced, the nation should consider disposal in salt.

Nelson said that doesn't mean WIPP.

"WIPP has a mission. It's been designed and legislated and authorized," he said. "If Congress or any other agency wanted to change WIPP, it would jeopardize this mission that is working so well."

There are other places _ the formation where WIPP lies covers thousands of square miles that are virtually contiguous into central Kansas, "so there's a lot of real estate for a salt repository in the U.S.," he said.

From the beginning of the nuclear age in the 1940s, scientists studied what to do with radioactive waste that remains dangerous for tens of thousands of years. Early ideas included sending it on a rock to the sun or burying it in deep sea subduction zones.

Eventually, they turned to salt beds.

"The safest way to isolate something that you don't want for a very, very long time is find an ancient salt formation and put your waste in the middle," Nelson said. "Salt is still there for a very good reason, it has not been eroded away. It's indicator of hydrological stability. The same hydrological barriers that protect the salt will protect the waste."

Still, some critics have argued for years the WIPP site is the wrong place.

Concerns over water leaching into the salt were raised in numerous hearings on the repository over the years; the DOE eventually dismissed them. But Citizens for Alternatives to Radioactive Dumping scheduled a news conference in Albuquerque on \. .. ?'s 10th anniversary Thursday to relea hydrological report that argues the conceptual groundwater model used to assess the WIPP site was fatally flawed.

Forrest has proposed advertising in major newspapers that Carlsbad has a solution for nuclear power waste. In recent years, Carlsbad has competed for, but lost, projects to make fuel for commercial nuclear power plants.

"It's been a lifesaver for us, and there's a lot of potential for more projects," the mayor said. "As long as we keep safety as the No. 1 issue, I think the sky's the limit."

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

March 6, 2009

MAR 13 2009

Mr. William Olson, Chief
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: PLAN FOR CONTROLLING STORM WATER AND MINIMIZING EROSION OF THE SALT PILE

Dear Mr. Olson:

The U.S. Department of Energy's (DOE) Waste Isolation Pilot Plant (WIPP) Discharge Permit Renewal and Modification (DP-831) issued on September 9, 2008 contains a requirement, (Condition 6), that states:

> *Within 180 days of issuance of this Discharge Permit, the DOE shall submit, for NMED approval, a plan for controlling storm water and minimizing erosion of the earthen cover of the Salt Pile. The plan shall assess and potentially incorporate options including, but not limited to 1) rock armoring of the side slopes, 2) recontouring of the top surface, 3) the use of alternate borrow sources for cover material, and 4) revegetation of the top surface and side slopes.*

An engineering evaluation of erosion of the earthen cover of the Salt Pile was conducted by a contracted engineering firm in accordance with the September 9, 2008 Discharge Permit requirement in order to develop a plan for controlling storm water and minimizing erosion. This engineering evaluation drew upon a complementary study conducted in 2005. Observations by both engineering evaluations resulted in the same conclusion.

The primary concern that needs to be addressed is the erosion of the side slopes due to concentrated run-off at several locations on the Salt Pile top surface. This issue can be best addressed by grading of the top surface of the Salt Pile and facilitating the flow of water from the top surface of the Salt Pile down the side slopes to the perimeter ditches.

The following options, as well as others, were evaluated:

1. Rock armoring of the side slopes or the construction of chutes with rip rap or gabions. The liner contractor strongly recommends against the use of rock armoring due to the likelihood of damage to the liner. The 2009 contractor agreed that this was a potential concern. This recommendation and the good performance of the high density polyethylene (HDPE) liner discharge chutes installed following the 2005 engineering evaluation resulted in the decision to install additional HDPE lined discharge chutes to promote drainage from the top surface of the Salt Pile to the perimeter ditches.

2. Recontouring of the top surface has been evaluated and is important to promote the drainage of water from the top surface of the Salt Pile to engineered discharge chutes and the perimeter ditches. Recontouring of the top surface of the Salt Pile to engineered discharge chutes is central to the concept of promoting the safe, fast and efficient removal of precipitation from the top surface of the Salt Pile to the perimeter discharge ditches.

   As a result of the 2005 Engineering Evaluation, two storm water diversion berms were constructed. One on the south side of the pile to divert water to a discharge chute located in the center of the south side of the Salt Pile. The second storm water diversion berm was constructed on the north side of the Salt Pile to divert water to a discharge chute on the northeast corner of the Salt Pile. These berms were constructed with soil and turf reinforcement mats and seeded with native vegetation. The 2009 engineering evaluation confirmed that the chutes are adequately sized to accommodate the volume and velocity of the run-off from the Salt Pile top surface in the event of the 24-hour, 25-year storm event. The principle problem is that the grading of the top surface of the Salt Pile is not steep enough to accommodate the efficient run-off from the top surface of the Salt Pile to the two discharge chutes.

3. The use of alternate cover material and revegetation of the side slopes was extensively evaluated considering the blending of rock or caliche with native soils, the use of turf reinforcement mats, rolled erosion control products, live turf installation with sprig and sod strips, deploying cellular containment systems and various combinations of the aforementioned options. Options that require anchors that penetrate the liner (cellular containment systems) have been dismissed. Blending the native soil with rock or caliche are the most viable options.

4. Revegetation of the top surface and side slopes has been integral to all concepts of maintaining the Salt Pile top surface and side slope erosion. The use of non-native vegetation is not currently an option without consultation with the Bureau of Land Management (BLM). Continued efforts will be made to improve the existing vegetation, including reseeding and irrigation with storm water. Additionally, the plan discussed below attempts to minimize damage to the existing vegetation by minimizing grading and providing additional chutes to facilitate the removal of storm water from the Salt Pile top surface.

5. Other options evaluated and dismissed included adding detention to the Salt Pile top surface and the construction of a berm on the Salt Pile rim. The potential for overflow of any water detained on the top surface of the Salt Pile could result in considerably worse erosion than has been experienced to date. The construction of berms could result in the undesirable detention of water in low areas and promote new erosion around the berms.

Following consultation with the contractor utilized in the 2009 engineering evaluation, input from past liner contractors, and our observations of the effects of on the Salt Pile cover, the conceptual plan for controlling storm water run-off and minimizing erosion includes:

- The construction of HDPE run-off chutes at the locations where the concentrated run-off causes the greatest erosion. Based on current observations, as many as five chutes may be necessary depending on volumes of fill material and the extent of grading required to direct water to chutes.
- Re-grading the Salt Pile top surface to facilitate flow to the HDPE lined run-off chutes.
- Soils used to conduct repairs on the Salt Pile side slopes will be blended with caliche to provide better resistance to the forces creating the erosion.
- As the conceptual design is developed, the evaluation of alternative erosion control products will be evaluated based on flow calculations.

The schedule for the design is outlined in the table below which contains the time frame anticipated to complete the main phases of the project design and will have a start date pending approval of this plan by the Ground Water Quality Bureau. Until the conceptual design is finalized, a realistic construction schedule is not possible. The following time frames (in work days) are derived from previous experience in conducting similar Salt Pile projects.

Experience indicates that each discharge chute requires at least 35 days to construct due to hand digging, styrofoam block placement and liner installation. Currently, there appears to be five areas that could be candidates for HDPE chutes. Based on the final design, the number of chutes may be minimized by grading and directing to less than five drainage chutes. Limitations on contract labor availability and the limited number of qualified liner installation companies makes the construction of more than one drainage chute at a time unlikely. Therefore, the drainage chutes will probably have to be installed one at a time (up to 25 weeks for five).

Procure Engineering Support	45 days
Develop Final Design • Perform a topographical survey	90 days
Obtain NMED approve for Final Design	30 days
Award Construction Contract	45 days
Field Work • Regrade salt pile surface areas as needed • Install drainage Chute #1 • Install drainage Chute #2-X • Side slope erosion repairs	To be determined based on the number of chutes and extent of required grading and quantity of fill material needed.

DOE and its contractors (Washington TRU Solutions, LLC [WTS] and independent consultants) have evaluated the Salt Pile erosion issues and believe that the proposed plan is the best approach for controlling storm water and minimizing erosion. However, this plan, nor any options evaluated, would result in a Salt Pile cover that would not require ongoing routine maintenance.

If you have any further questions regarding this matter or need additional information, please contact Mr. Dan Ferguson of my staff at (575) 234-8128.

CBFO:OPC:DF:MAG:09-0226:UFC:5486.00

Sincerely,

David C. Moody
Manager

cc:

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NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

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William C. Olson, Bureau Chief

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City, State, ZIP+4 Carlsbad Field Offi
PO Box 3090
PS Form 3800, August 2006

NOTICE OF VIOLATION

CERTIFIED MAIL – RETURN RECEPT REQUESTED

March 3, 2009

David C. Moody, Manager
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, New Mexico 88221

RE: Notice of Violation, DP-831, U.S. Department of Energy Waste Isolation Pilot Plant

The New Mexico Environment Department (NMED, the Department) has determined that the U.S. Department of Energy (DOE) has violated the Water Quality Act, the Water Quality Control Commission (WQCC) Regulations, and Discharge Permit 831 (DP-831) due to unauthorized discharges at the Waste Isolation Pilot Plant (WIPP). The violations resulted from the unauthorized discharge of brine from an unlined portion of the spillway between the Salt Storage Extension (SSE) Cell A and the Salt Storage Extension Basin (SSEB). The spillway was required to be synthetically lined in accordance with Condition 2 of the December 22, 2003 Discharge Permit Modification as incorporated into the current Discharge Permit Renewal and Modification dated September 9, 2008.

Background

NMED received oral notification followed by a written corrective action report dated October 31, 2008 of a discharge of brine water from the SSE and the SSEB at the DOE Waste Isolation Pilot Plant (WIPP). A follow-up letter detailing corrective action activities was submitted to NMED on November 14, 2008, and a Modified Corrective Action Plan was submitted on December 5, 2008. The report, letter and plan were submitted in accordance with Condition 3 of the September 9, 2008 Discharge Permit Renewal and Modification (DP-831) and approved by NMED on December 5, 2008.
According to the Report, the WIPP site received 2.96 inches of rain over a 15-hour period beginning October 13, 2008. The rainfall caused the water level in the SSEB to rise above the

one foot of freeboard required in DP-831. On October 22, 2008, as water levels continued to rise, it was discovered that the water had covered the spillway between the SSE and the SSEB. It was also discovered that the center of the spillway was not covered with a synthetic liner, which is in violation of the construction design requirements in Condition 2 of the December 22, 2003 Discharge Permit Modification. The rise in salt-contaminated water over the unprotected spillway berm resulted in a discharge to the ground.

Enforcement Authority

Pursuant to section 74-6-5 of the Water Quality Act, the Department has the authority to terminate or modify the WIPP discharge permit, DP-831, prior to its date of expiration for any of the following causes:

1) violation of any condition of the permit;
2) obtaining the permit by misrepresentation or failure to disclose fully all relevant facts;
3) violation of any provisions of the Water Quality Act, or any applicable regulations, standard of performance or water quality standards;
4) violation of any applicable state or federal effluent regulations or limitations; or
5) change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

Additionally, the Department may issue a compliance order that assesses a civil penalty pursuant to section 74-6-10 of the Water Quality Act. Penalties may be assessed for up to $15,000 per day for discharge permit violations and violations of section 74-6-5 of the Water Quality Act, and up to $10,000 per day for violations of other sections of the Water Quality Act and regulations adopted pursuant to those sections.

As an alternative to the remedies described above, the Department may commence an action in district court for appropriate relief, including injunctive relief.

Nature of Violation

Section 20.6.2.3104 NMAC provides that "...no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water." That section further provides, "When a permit has been issued, discharges must be consistent with the terms and conditions of the permit." Condition 2 of the December 22, 2003 Discharge Permit Modification as incorporated into the current Discharge Permit Renewal and Modification dated September 9, 2008 states, "The installation of the storm water control structures shall be in accordance with the application for discharge permit modification dated April 24, 2003, or in accordance with subsequent design and specification amendments subject to approval by NMED."

The DOE violated Section 20.6.2.3104 NMAC and Condition 2 of DP-831 (December 22, 2003) by failing to construct the liner between the SSE and the SSEB according to the plans submitted as part of the application for discharge plan modification April 24, 2003. The approved plans called for a synthetic liner to fully cover the spillway between the SSE and the SSEB. While implementing corrective actions to address rising water in the SSEB, the DOE informed NMED in a letter dated October 31, 2008, that the spillway was not protected with a synthetic liner.

Remedial Action Required

The DOE must take the following remedial actions to correct its violations.

1. The DOE shall continue with the interim corrective actions described in the letter titled, *Modified Corrective Action Plan for Loss of Freeboard in the Salt Storage Extension Basin,* submitted on December 5, 2008 and approved by NMED by letter on the same day.

2. The DOE shall implement the permanent corrective actions described in the letter titled, *Schedule for Permanent Corrective Actions for Salt Contact Run-Off into the Salt Storage Extension Evaporation Basin* submitted to NMED on December 24, 2008. The permanent corrective actions must be completed by **August 31, 2009.**

Failure to comply with these remedial actions and associated deadlines may subject the DOE to enforcement actions as described above, including termination or modification of its discharge permit, issuance of a compliance order, assessment of penalties, or filing of a district court action. In any event, the Department reserves the right to seek civil penalties for the violations described above.

If you have any questions, please contact Mary Ann Menetrey, Program Manager of the Mining Environmental Compliance Section at 505- 827-2944, or Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027.

Sincerely,

William C. Olson, Chief
Ground Water Quality Bureau

WCO/CLM

xc: Chuck Noble, OGC
Mary Ann Menetrey, Program Manager, MECS
Steve Zappe, Project Manager, HWB
District Manager, NMED District 4

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 0 3 2009

GROUND WATER

MAR 12 2009

BUREAU

Mr. William Olson
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Corrective Action Report for the WIPP Sewage Lagoon

Dear Mr. Olson:

The purpose of this letter is to provide the Corrective Action Plan for the erosion that occurred under the liner of Settling Pond 1A at the U. S. Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) sewage treatment facility. It was verbally reported to your office on the afternoon of February 17, 2009, and confirmed in writing in a letter dated February 23, 2009, that erosion was observed and that water existed outside the liner. At the time, it was believed that the water was the result of a discharge from the Pond, possibly due to a liner tear, seam separation, or separation from the weir. Corrective Actions included diverting sewage influent into Settling Pond 2A and isolating Settling Pond 1A from the sewage treatment system. Water was also pumped from Settling Pond 1A to Evaporation Pond A. These actions were performed to prevent any further discharge from Settling Pond 1A.

We have inspected the liner in Settling Pond 1A and have determined that there is no apparent liner tear, seam separation, or other visible damage to the liner that would lead to a discharge. We now believe the water observed is storm water runoff that created the erosion and became trapped under the liner after the erosion event. If, during repair of the erosion and reestablishment of the pond integrity, there is liner damage noted, your office will be informed of any additional corrective actions that were necessary.

This notwithstanding, repairs to the pond are necessary prior to bringing it back into service to avoid liner damage in the future. The time and repairs required to return Settling Pond 1A to service are anticipated to require removing the liner from the affected area, filling in the eroded area, compacting the secondary liner (compacted caliche to 90 percent proctor), and performing repairs to the synthetic liner, if needed. Our goal is to complete the repairs in the summer timeframe.

As discussed in a telephone call to you on February 24, 2009, it was necessary to pump water from Settling Pond 1A into Evaporation Pond A in order to investigate the condition of Pond 1A. Prior to this, Evaporation Pond A had been removed from service in early

2008 to facilitate replacement of the liner in accordance with a November 3, 2005, Corrective Action Plan. The February 24, 2009, phone conversation authorized the use of Evaporation Pond A and provided DOE relief from the liner replacement schedule for Evaporation Pond A. DOE proposes to complete the liner replacement in Evaporation Pond A and B during fiscal year 2009 provided precipitation and evaporation rates accommodate emptying the ponds.

The corrective actions described in this report are intended to meet all the reporting requirements of 20.6.2.1203 NMAC and DP-831 as renewed on September 9, 2008.

If you have any further questions regarding this matter or need additional information please contact Mr. Dan Ferguson at (575) 234-8128.

Sincerely,

David C Moody

David C. Moody
Manager

cc:
J. Bearzi, NMED *ED
C. Marshall, NMED ED
*ED denotes electronic distribution

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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

GROUND WATER

FEB 25 2009

BUREAU

FEB 23 2009

Mr. William Olson
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Notification of Discharge

Dear Mr. Olson:

The purpose of this letter is to confirm the U. S. Department of Energy's (DOE), Carlsbad Field Office (CBFO) verbal report to your office on the afternoon of February 17, 2009. This report was made by Dan Ferguson, DOE/CBFO. This information is being provided to you in accordance with the WIPP Discharge Permit (DP-831) which references 20.6.2.1203 NMAC, NOTIFICATION OF DISCHARGE-REMOVAL:

(a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility:

Persons in charge of the facility:	David C. Moody, Manager 4021 National Parks Highway Carlsbad, New Mexico, 88220 (575) 234-7300
Owner of the facility:	U. S. Department of Energy
Operator of the facility:	Washington TRU Solutions LLC

(b) Name and address of the facility:

U. S. Department of Energy
Waste Isolation Pilot Plant
30 miles east of Carlsbad, New Mexico off of State Highway 128
Carlsbad, NM 88220

CBFO:ORC:DJF:KLJB:09-0224:UFC5486

(c) The date, time, location, and duration of the discharge:

Date: February 16 through the present (February 23, 2009)
Time: 5:00 p.m. (approximately)
Location: WIPP Site, Sewage Lagoon 1A
Latitude: 32 22.215, Longitude 103 47.641
Duration: seven days and currently; assuming that water under the liner started collecting at the time the ground settling was noted on February 16, 2009.

(d) The source and cause of the discharge:

Source: Sewage water in Sewage Lagoon 1A

Cause of discharge:

At 5:00 p.m. on Monday February 16, 2009, WIPP Facility Operations performed the daily inspection of the sewage lagoons. The inspector noticed erosion that resulted in ground settling on the west end of Lagoon 1A. As the inspector further investigated the site, he noticed a bulge in the liner which looked as if the soil had sloughed off the side of the lagoon and collected underneath the liner below the water level. Water, approximately one gallon, was also observed in the bottom of the area where the soil settled.

On Tuesday February 17, 2009, plans and documentation were completed to excavate the area in order to determine the source of the water. Disinfectant was applied prior to excavation activities. The area where the water was located was excavated to an approximate four foot depth and the soil was dry below ground level. Water was discovered under the liner after the edge of the liner was lifted. With hand tools the area under the liner was partially excavated, and at that time water ran from under the liner and partially filled the previously excavated area. At this time sand bags were used to dam off the water and keep it isolated to the area adjacent to the weir structure under the edge of the liner. The liner was not rolled back at this time due to excessive winds. There were no visible leaks or separation in the seams of the liner. The liner in this lagoon was replaced in March 2008.

(e) A description of the discharge, including chemical composition:

The discharged water is sewage water from the WIPP facility. Analyses for the Sewage Lagoon 1A Sludge was performed on September 5, 2007. Toxicity Characteristic Leachate Procedure analyses including heavy metals, volatile and semi-volatile organic compounds, and pesticides were performed on the sludge. None of the constituents were found above the regulatory threshold values. The WIPP Sample Team has collected a sample of the water and a full analysis of heavy metals, volatile and semi-volatile organic compounds, pesticides, and nitrate will be performed on the water to verify its non-hazardous status.

(f) The estimated volume of the discharge:

The ground settling extended underneath the upper edge of the liner for approximately ten feet. The width of the settling, underneath the liner, is approximately eight feet wide. The water has apparently pooled underneath the liner allowing an estimated 300 gallons, given a six inch depth available for discharge. With the sand bagging of the area after the excavation, the intent was to confine the area where the water is located outside of the liner to decrease the potential for infiltration.

(g) Any actions taken to mitigate immediate damage from this discharge:

- Upon identifying the source of the subsidence on February 17, 2009, a corrective action plan was being prepared for submittal to the NMED as required by DP-831.
- No sewage is being introduced into the pond. All sewage from the WIPP facility was rerouted into Pond 2A.
- In addition, the equalization valve connecting Pond 1A and Pond 2A was closed on February 17, 2009 to prevent water from flowing into Pond 1A from Pond 2A.

We believe this discharge poses minimal threat to the environment and to human health. The influent controls implemented to Pond 1A will minimize discharge from the pond. Work packages are being developed to clean up the effects of the discharged sewage

CBFO:ORC:DJF:KLJB:09-0224:UFC5486

water, repair the leaking liner, and place the pond back into service. The corrective actions described in this report are intended to meet the seven day reporting requirements of 20.6.2.1203 NMAC and DP-831 as renewed on September 9, 2008. If you have any further questions regarding this matter or need additional information please contact me at (575) 234-7300.

Sincerely,

David C. Moody

David C. Moody
Manager

cc:
C. Marshall, NMED *ED
J. Bearzi, NMED ED
*ED denotes electronic distribution

CBFO:ORC:DJF:KLJB:09-0224:UFC5486

GROUND WATER

JAN 05 2009

BUREAU

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

DEC 24 2008

Mr. Clint Marshall
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Schedule for Permanent Corrective Actions for Salt Contact Run-Off into the Salt Storage Extension Evaporation Basin

RE: (1) DOE Letter CBFO:AMO:HLP:KJB:08-1426:UFC5486 from Dr. D. C. Moody to Mr. C. Marshall dated November 14, 2008, Subject: Interim Corrective Actions

(2) DOE Letter CBFO:AMO:HLP:KJB:08-1438:UFC:5486 from Dr. D. C. Moody to Mr. C. Marshall dated December 5, 2008, Subject: Modified Corrective Action Plan for Loss of Freeboard in the Salt Storage Extension Evaporation Basin

The purpose of this letter is to provide the New Mexico Environment Department - Ground Water Pollution Prevention Section a schedule of activities to implement permanent corrective actions for the management of salt contact run-off water into the Salt Storage Extension Evaporation Basin (SSEB) as noted in the referenced letter sent to your office on November 14, 2008. The following table notes the schedule of required actions:

Schedule for Corrective Actions to Improve SSEB Capacity

DATE	ACTIVITY
January 30, 2009	Develop the statement of work for the service subcontract to procure the engineering services to review drawings, calculations, current field applications / construction, and provide a report detailing recommendations with a path forward.
February 27, 2009	Procure engineering services.
April 30, 2009	Complete an evaluation of documentation and field review from subcontractor with suggested corrective modifications to the existing salt pile run-off area and evaporation pond.
May 15, 2009	Present to the Ground Water Quality Bureau the proposed engineering modifications for review and preliminary schedule of activities.
May 22, 2009	Receive from the Ground Water Quality Bureau approval to proceed with the engineering modifications.
June 12, 2009	Provide the Groundwater Quality Bureau a schedule for completion of this project.

01786

CBFO:AMO:HLP:MAG:08-1441:UFC:5486.00

These dates are approximate. An estimated completion date will be determined upon the contract award. Efforts will be directed to complete this project by the end of August, 2009.

In previous discussions and correspondence with your office (December 5, 2008), we informed you that water in the SSEB would be pumped to Evaporation Ponds B and C at the sewage treatment facility. This effort begán December 5, 2008 and has continued since that date. On December 12, 2008, water was below the top of the liner of the SSEB. Pumping efforts through December 16, 2008 have created additional freeboard.

Contracting efforts were initiated December 10, 2008 to address the need for brine water containment enhancements associated with the WIPP DP-831 permit.

Engineering actions are on schedule to raise the elevation of the east berm of the SSEB separating it from the Salt Storage Extension - Cell-A providing increased freeboard capacity. Details of this action will be provided to your office in the DP-831 semi-annual report due to your office on January 31, 2009.

If you have any questions regarding this matter, please call H. L. (Jody) Plum at (575)234-7462.

Sincerely,

David C. Moody,
Manager

cc:

J. Bearzi, NMED	*ED
J. Kieling, NMED	ED
S. Zappe, NMED	ED

ED denotes electronic distribution

CBFO:AMO:HLP:MAG:08-1441:UFC:5486.00

Hydrologic Assessment of Shallow Subsurface Water

Waste Isolation Pilot Plant

Carlsbad, New Mexico

Prepared for **Washington TRU Solutions LLC**

December 18, 2008

Daniel B. Stephens & Associates, Inc.

6020 Academy NE, Suite 100 • Albuquerque, New Mexico 87109

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List of Acronyms

ac-ft	acre-feet
bgs	below ground surface
Cl	chloride
cm/s	centimeters per second
DBS&A	Daniel B. Stephens & Associates, Inc.
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
ft^2	square feet
ft/d	feet per day
ft/ft	foot per foot
ft/yr	feet per year
GCL	geosynthetic clay liner
GWQB	Ground Water Quality Bureau (NMED)
HDPE	high-density polyethylene
in/yr	inches per year
K_{sat}	saturated hydraulic conductivity
K_{θ}	unsaturated hydraulic conductivity
m/s	meters per second
mg/L	milligrams per liter
Na	sodium
NaCl	halite
NMED	New Mexico Environment Department
SPDV	Site and Preliminary Design Validation
SSE	Salt Storage Extension
SSW	shallow subsurface water
TDS	total dissolved solids
USGS	U.S. Geological Survey
WIPP	Waste Isolation Pilot Plant
WTS	Washington TRU Solutions LLC

Executive Summary

The hydrologic assessment presented in this report examines the shallow subsurface water (SSW) conditions at the Waste Isolation Pilot Plant (WIPP) site near Carlsbad, New Mexico. The hydrologic assessment was conducted on behalf of the U.S. Department of Energy (DOE) by Daniel B. Stephens & Associates, Inc. (DBS&A), under contract to Washington TRU Solutions LLC (WTS). The assessment provides an update to previous SSW investigations and examines the effects of infiltration controls that have been implemented to halt recharge to the SSW.

The goal of the SSW hydrologic assessment was to evaluate data collected since the installation of the infiltration controls for the purpose of updating the conceptual model of the important hydrologic processes controlling the SSW hydrologic system. The hydrologic assessment uses the complete monitoring record from 1996 to 2008 to examine the effects of infiltration controls installed in 2004 and 2005. The assessment considers the observed hydrologic responses that are evident from the monitoring to determine whether the infiltration controls are producing positive results. A comprehensive database was assembled to bring together all of the relevant monitoring data to analyze trends in SSW flow and water quality before and after infiltration control systems were put in place. The liners and covers that have been put in place will halt the primary SSW recharge; however, the infiltration controls will not eliminate the existing SSW lens, which will persist in the Santa Rosa sandstone and potentially migrate laterally or downward into the Dewey Lake redbeds.

The infiltration control systems require continued operation and maintenance in order to effectively manage on-site stormwater. The lined stormwater ponds that receive stormwater with elevated salinity (Salt Storage Extension and Salt Pile Evaporation Ponds) are designed for full retention through an inflow/evaporation water balance. The lined stormwater ponds that receive relatively fresh stormwater runoff (Detention Basin A, Pond 1, and Pond 2) are designed with evaporation capacities that are supplemented by using stormwater for irrigation of vegetation on the Salt Storage Area final cover.

A time-series analysis completed to examine SSW water level trends shows that the water table has risen since the first monitor wells were installed in 1996. Recharge causing a rising water table is correlated with precipitation rates. Water level rises occur 3 to 9 months after periods of heavy precipitation. The June 2008 measurements indicated a decline in water levels in most wells, potentially the first sign of a response to the infiltration controls; however, it is too early to reach a conclusion regarding a possible trend toward water level declines without a longer monitoring record. Monitor wells that appear to be at the fringes of the SSW saturated lens show rising water levels and increasing saturated thickness. In March 2007, saturation was detected for the first time in monitor well PZ-08, which had previously been dry. Water levels at the three new monitor wells installed in 2007 around the Site and Preliminary Design Validation (SPDV) pile suggest that the saturation found in this area is not directly hydrologically connected to the main SSW saturated lens.

The SSW water quality is dominated by highly saline brine that is representative of halite (NaCl) dissolution. Total dissolved solids (TDS) concentrations range from less than 10,000 milligrams per liter (mg/L) to as high as 245,000 mg/L. The highest TDS concentration is in monitor well PZ-13, installed in 2007 near the SPDV pile. Within the 15 monitor wells in the main SSW lens underlying the WIPP facilities area, higher TDS concentrations are found in the northern half of the site near the Salt Storage Area and Salt Pile Evaporation Pond. TDS concentrations are much lower in the southern half of the site, where low-TDS water recharged the SSW from stormwater retention ponds prior to installation of liners to prevent recharge. Sufficient time has not yet elapsed since installation of the liners to observe water quality changes that can be attributed to reduced SSW recharge.

Due to the implementation of the infiltration controls, the initially high moisture content of the vadose zone materials will gradually drain to lower moisture content. Calculations of moisture redistribution in the vadose zone beneath former recharge sources estimate the duration and magnitude of transient drainage providing continued moisture input to the SSW. Moisture redistribution calculations were completed for a 5-year duration for a range of vadose zone hydrologic properties. Based on likely hydrologic parameters that are representative of field conditions, a total of approximately 120 acre-feet of transient drainage is estimated to occur.

During the 3 years since the infiltration controls were completed in 2005, most of the rapid transient drainage should have occurred. Under all cases tested for variable hydrologic properties, transient drainage reaches slow (but continuing) rates beyond 3 years. The transient drainage volume is estimated to add approximately 12 to 33 percent additional water to the SSW and cause an estimated water table rise of between 8 feet over the immediate area around the former recharge sources and 2 feet over the entire SSW lens.

- not reflected in 2018 monitoring Report. 7

The primary benefit of implementing the infiltration controls is prevention of continued recharge that was predicted to continue increasing the SSW saturated volume. Due to the effect of transient drainage, water level field data do not yet show the expected positive effect of the infiltration controls to gradually reduce water levels.

1. Introduction

The hydrologic assessment presented in this report examines the shallow subsurface water (SSW) conditions at the Waste Isolation Pilot Plant (WIPP) site near Carlsbad, New Mexico. The assessment provides an update to previous SSW investigations and examines the effects of infiltration controls that have been implemented to halt recharge to the SSW. The hydrologic assessment was conducted on behalf of the U.S. Department of Energy (DOE) by Daniel B. Stephens & Associates, Inc. (DBS&A), under contract to Washington TRU Solutions LLC (WTS).

The hydrologic assessment focuses on updating the SSW conceptual model that was developed during previous investigations. Much of the investigation field work was completed in 1996 and 1997. In 2003, DBS&A completed a water budget analysis to quantify the recharge sources and characteristics of the SSW. Infiltration control systems were constructed in 2004 and 2005. The hydrologic assessment considers new monitoring data collected since the 2003 water budget analysis to determine the effects of infiltration controls on the SSW hydrology and water quality. The hydrologic assessment provides a comprehensive review of all SSW monitoring data from before and after implementation of infiltration controls to improve understanding of the effectiveness of the surface infiltration controls that have been implemented at WIPP.

The goal of the SSW hydrologic assessment is to update the conceptual model of the important hydrologic processes controlling the SSW hydrologic system. The assessment evaluates how the infiltration controls may be affecting SSW water levels, water chemistry, and the rate and direction of flow.

The overall purpose of the SSW hydrologic assessment is to support DOE efforts to ensure regulatory compliance at the WIPP and to provide information that will assist DOE decision makers in determining the efficacy of actions to control and monitor the SSW.

2. Hydrologic Assessment Methodology

The hydrologic assessment uses the complete monitoring record from 1996 to 2008 to examine the SSW conditions and the effects of the infiltration control systems since 2005. The hydrologic assessment considers the highly variable SSW water quality measured at monitor wells to evaluate the sources of recharge water quality and mixing of various waters that could lead to the SSW geochemistry observed. To examine the effects of infiltration controls, the assessment considers the observed hydrologic responses that are evident in the monitor well network to determine whether the infiltration controls are producing positive results.

The SSW hydrologic assessment includes the following components:

- A comprehensive database was assembled to bring together all of the relevant SSW monitoring data, including water level measurements, water quality monitoring, well construction details, geologic information, and climate data.

- A time-series analysis was completed using hydrographs that show the water level, total dissolved solids (TDS) concentration, and precipitation at each monitor well for the complete monitoring record.

- Maps showing water level elevation contours for the SSW monitor wells were prepared to show water level and flow direction changes at approximately annual time steps over the complete monitoring record.

- Maps showing TDS contours for the SSW monitor wells were prepared to show water quality changes at approximately annual time steps over the complete monitoring record.

- SSW geochemistry was evaluated based on water quality within the SSW monitor wells:
  - Charge balance was calculated to determine water chemistry data quality.
  - Saturation indices were calculated for the water quality at each monitor well to classify the water quality and mineral dissolution from recharge sources.

- Durov plots were prepared to display water quality characteristics of major cations and anions, TDS, and pH.

- Moisture redistribution calculations were completed to estimate the rate of draindown of residual moisture beneath the infiltration controls in order to understand the rate and impact of moisture movement below the former recharge sources.

Each component of the hydrologic assessment is described in this report, followed by a discussion of the results.

3. Hydrologic Setting

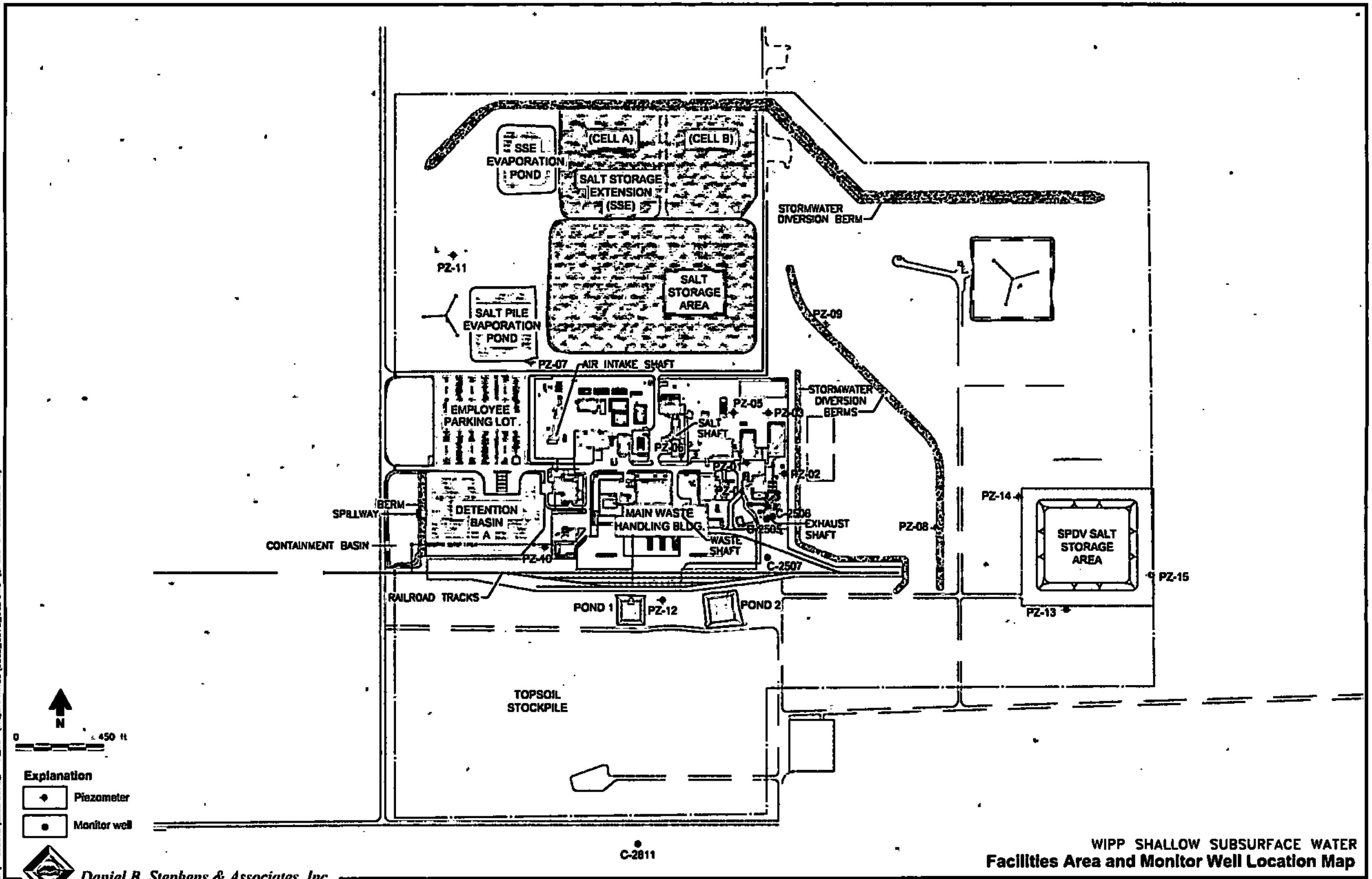
The WIPP site is located in eastern Eddy County, New Mexico, in a remote area 26 miles east of Carlsbad, New Mexico. The entire land withdrawal area for the WIPP site is 16 square miles, and the surface facilities area covers roughly 150 acres. A detailed site plan of the WIPP surface facilities is provided in Figure 1. An aerial photograph of the WIPP surface facilities area from 2005 is provided in Figure 2.

3.1 Climate and Physiography

The WIPP site is located in a semiarid region of the U.S. desert southwest. The average annual precipitation for Carlsbad, New Mexico is 12.22 inches per year (in/yr) based on records beginning in 1949 for the Carlsbad Federal Aviation Administration (FAA) Airport. Records of precipitation from the on-site WIPP weather station for 1986 to 2007 show an average annual precipitation of 13.48 in/yr. Annual evaporation from surface water for the Carlsbad area exceeds 98 in/yr (Mercer, 1983). Native vegetation consists of mesquite, scrub oak, and other plants typical of the northern Chihuahuan Desert (Mercer, 1983). Surficial soils at the WIPP site are characterized by sand and dune sand deposits (Campbell et al., 1996).

Climate data used in the hydrologic evaluation were obtained from the Carlsbad FAA Airport weather station and an on-site weather station (Table 1). The detailed climate data required for some analyses are available only for more recent years; therefore, data from various time frames were used in the water budget analysis (Table 1). The primary precipitation data used for the hydrologic evaluation are monthly precipitation totals from the WIPP weather station from 1995 to 2008.

The long-term record of precipitation data from the Carlsbad FAA Airport and the WIPP weather station is illustrated in Figure 3. As shown in this figure, precipitation was below normal until around 1970 and above normal from 1984 (the year that construction of the main WIPP facilities began) to 1992. Above-average precipitation has also been experienced at WIPP each year from 2004 to 2007.



WIPP SHALLOW SUBSURFACE WATER

Facilities Area and Monitor Well Location Map

Daniel B. Stephens & Associates, Inc.

9-03-08

JN ES08.0072

Figure 1

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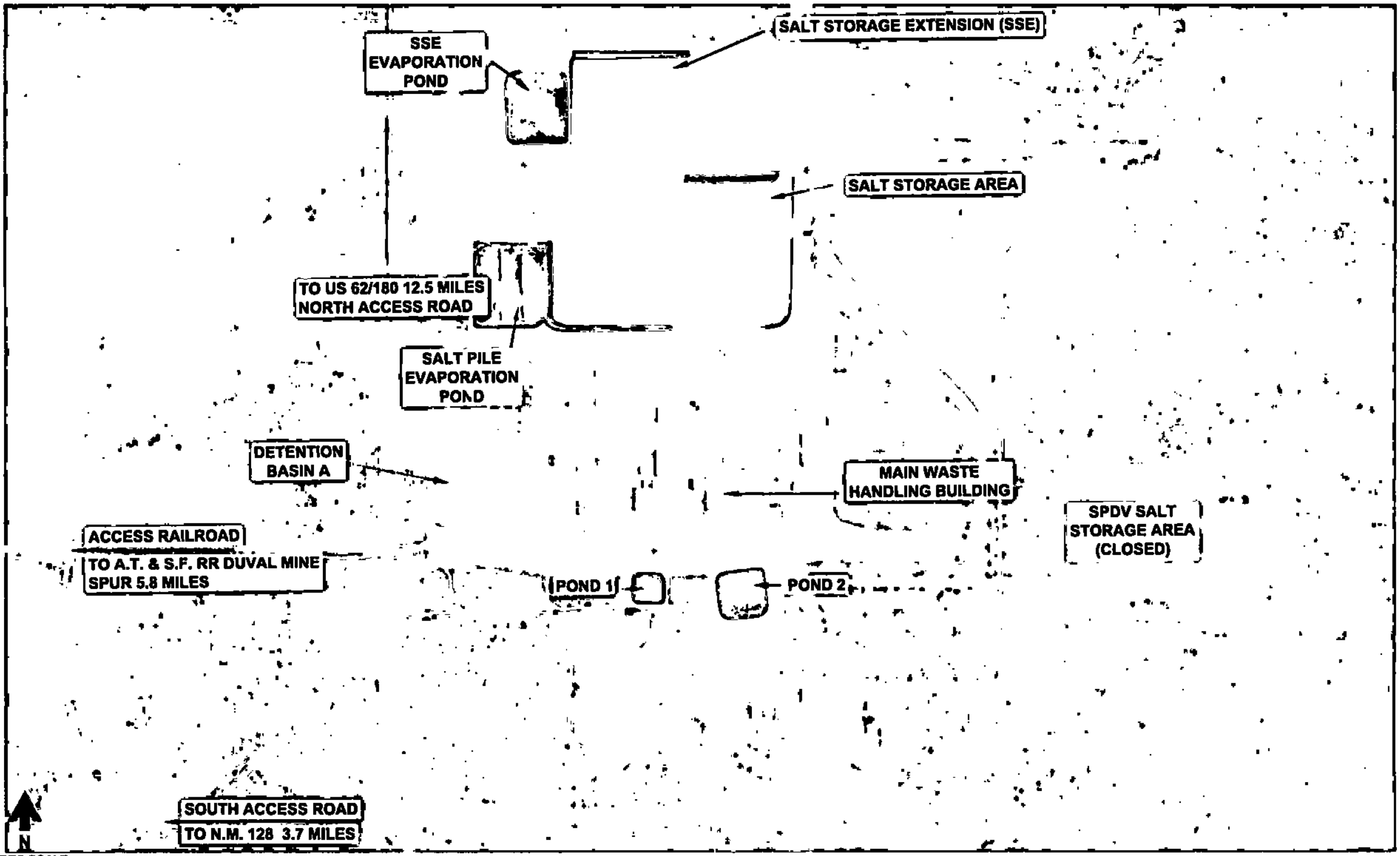

Source: June 25, 2005 aerial photograph provided by Google Earth.

Daniel B. Stephens & Associates, Inc.
9-2-08 JN ES08.0072

WIPP SHALLOW SUBSURFACE WATER
Aerial Photograph of WIPP Facilities Area, 2005

Figure 2

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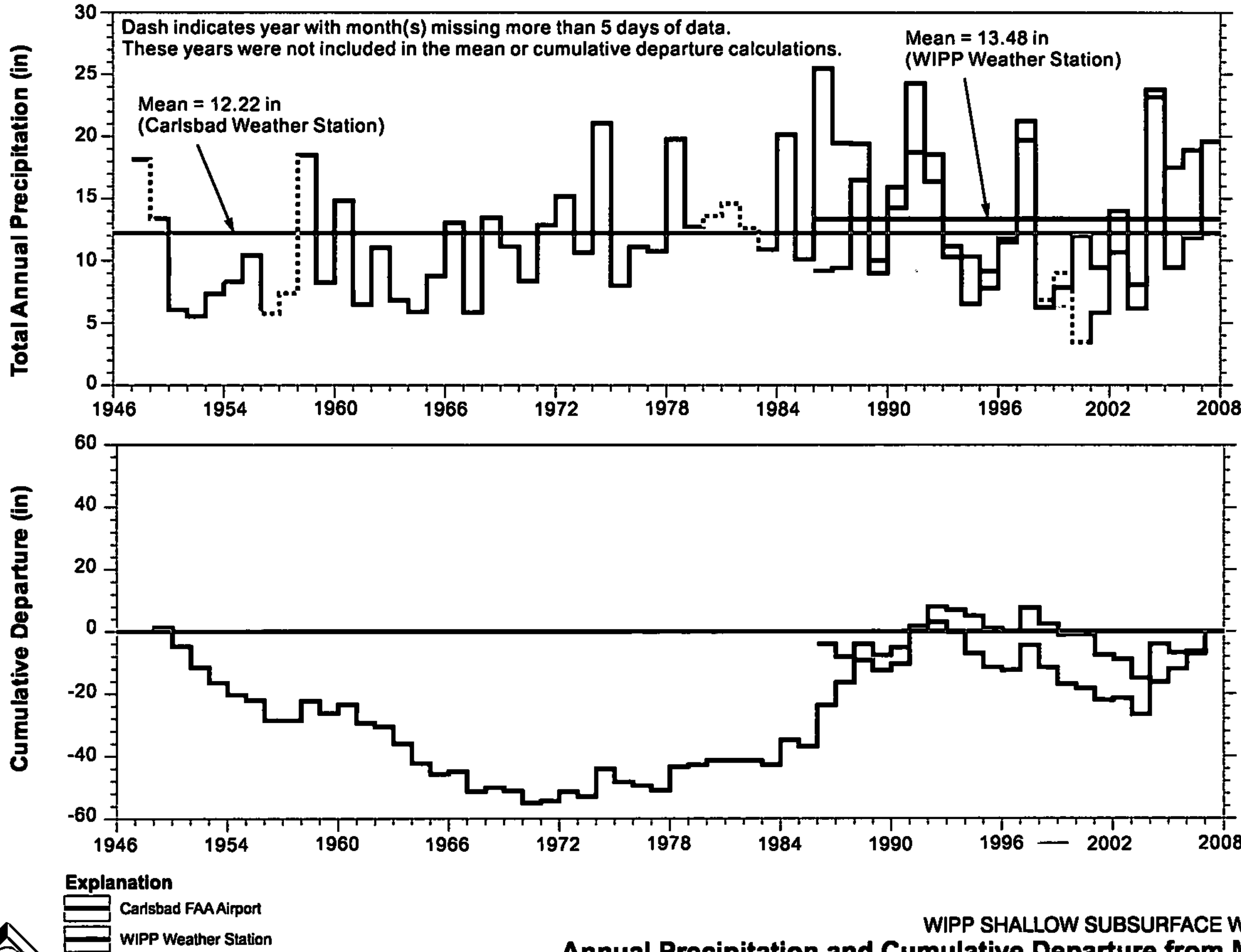


Figure 3

WIPP SHALLOW SUBSURFACE WATER

Annual Precipitation and Cumulative Departure from Mean

Daniel B. Stephens & Associates, Inc.

9-2-08

JN ES08.0072

Based on the long-term precipitation records available from the Carlsbad FAA Airport, the average annual precipitation has been 13.65 in/yr over the years from the initial development of the WIPP facilities in 1984 through 2007. This precipitation rate is approximately 12 percent above the long-term average (Table 1).

Table 1. Precipitation Summary Statistics

Station	Start Date	End Date	Duration (years)	Annual Precipitation (inches)		
				Mean	Maximum	Minimum
Carlsbad FAA[a]	Jan-49	Dec-07	59	12.22	25.48	5.76
Carlsbad FAA[a]	Jan-84	Dec-07	24	13.65	25.48	5.82
WIPP station	Jan-86	Dec-07	22	13.48	23.78	6.25
WIPP station	Jan-95	Dec-07	13	13.79	23.78	6.25

[a] Excludes years with more than five days missing in any month.
FAA = Federal Aviation Administration WIPP = Waste Isolation Pilot Plant

3.2 Hydrogeologic Regime

The regional hydrogeologic regime in the area of the WIPP has been described by several investigators. Comprehensive reports by Hendrickson and Jones (1952) and Bachman (1984) describe the regional geologic setting. A more detailed description of the local hydrogeologic regime at the WIPP site is provided by Mercer (1983).

At the WIPP site, Powers (1995) reports the following stratigraphic column from geologic mapping of the WIPP Exhaust Shaft:

0 to 7.5 feet below ground surface (bgs)	Quaternary dune sand
7.5 to 17 feet bgs	Mescalero caliche
17 to 34 feet bgs	Gatuña Formation
34 to 54 feet bgs	Santa Rosa Sandstone Formation
54 to 546 feet bgs	Dewey Lake Redbeds Formation
546 to 851 feet bgs	Rustler Formation
851 to 2,150(+) feet bgs	Salado Formation

The SSW hydrologic assessment focuses on unsaturated flow processes in the vadose zone and saturated flow in the SSW perched lens in the upper formations within 100 feet of the ground surface. This section describes the geologic units in these shallower formations, including the Dewey Lake Redbeds Formation (hereafter referred to as Dewey Lake) and the overlying geologic units.

3.2.1 Dewey Lake Redbeds Formation

The Dewey Lake, which consists of alternating thin beds of siltstone and fine-grained sandstone, is the deepest formation examined in the hydrologic assessment. This formation is absent in some areas due to erosion since Triassic time, but is as thick as 560 feet in eastern Eddy County and western Lea County (Bachman, 1984) near the WIPP site. Drilling within the WIPP facilities area shows that the Dewey Lake is approximately 500 feet thick (Powers, 1995). The Dewey Lake dips gently eastward and also increases in thickness to the east (Mercer, 1983).

The Dewey Lake is at the base of the SSW, with saturated conditions found in an overlying perched zone. A siliceous layer in the upper Dewey Lake at the Santa Rosa/Dewey Lake contact (Intera, 1997a; Powers, 2003b) and a sulfate (gypsum) cementation zone in the lower Dewey Lake (Powers, 2003a) form zones of reduced permeability in the otherwise more permeable sandstone. During hydrogeologic investigations undertaken during the development of the WIPP, minor thin, discontinuous saturated zones were identified in the Dewey Lake (Mercer, 1983).

In this report, the terms upper, middle, and lower Dewey Lake are used to describe the stratigraphic position in the formation along with certain characteristics of the formation that relate to the occurrence of saturated conditions. Although these horizons are not strictly defined and their thicknesses vary, the terms upper, middle, and lower are useful to describe the hydrologic conditions.

- The upper Dewey Lake consists of a thick, generally unsaturated section.

*

- The middle Dewey Lake is the interval immediately abov... ...ite cementation change, where saturated c... ...en identified in limited areas.

Sulfate cementation
- middle Dewey Lake
- Saturation above
- page 10

- The lower Dewey Lake is be... ...lominantly low permeability.

Within the WIPP site, monitor well \ ... southwest of the surface facilities area, intersects ... is screened across an interval from 189 to 214 fe... ...proximately 165 feet bgs (Stensrud, 1995). At thi... ...pth of 35 to 410 feet bgs (U.S. DOE, 1996), which ... e portion of the formation.

The Dewey Lake generally does not yield a water supply to wells; however, in a localized area at the Mills Ranch (formerly James Ranch, located about 1 mile south of the WIPP site boundary in T23S, R31E, Sections 6 and 7), domestic and stock supply wells produce water from the middle Dewey Lake at depths of 94 to 212 feet bgs (Mercer, 1983).

3.2.2 Santa Rosa Sandstone Formation

The Santa Rosa Sandstone Formation (hereafter referred to as Santa Rosa), of Triassic age, unconformably overlies the Dewey Lake. The Santa Rosa consists of gray and red sandstone with lenses of shale and conglomerate (Hendrickson and Jones, 1952). The Santa Rosa encountered in potash exploration holes immediately east of the WIPP site boundary is 200 to 300 feet thick; however, due to erosion, its thickness is much reduced in the central part of the WIPP site and is zero west and southwest of the site (U.S. DOE, 2004). Drilling within the WIPP facilities area (Intera, 1997a) shows that the Santa Rosa ranges in thickness from 16 to 39 feet in the area of the SSW.

Shallow water in the Santa Rosa is the focus of the water budget. Earlier hydrogeologic investigations show that the Santa Rosa was generally not water-bearing at the WIPP site.

Saturation was detected in the lower part of the Santa Rosa in two test holes drilled approximately 3 miles northeast of the WIPP surface facilities (Mercer, 1983).

At the WIPP facilities area, water in the Santa Rosa is perched on the relatively impermeable underlying Dewey Lake. Small amounts of water may discharge downward into the Dewey Lake through fractures and along bedding planes, although drilling performed to investigate the Santa Rosa perched water found the Dewey Lake to be dry below the Santa Rosa (U.S. DOE, 2000).

3.2.3 Gatuña Formation

The Gatuña Formation (hereafter referred to as the Gatuña), of Pleistocene age, unconformably overlies the Santa Rosa at the WIPP site. This formation consists of silt, sand, and clay, and is discontinuous, with deposits in localized depressions (Hendrickson and Jones, 1952). Boring logs from on-site drilling by Sergent, Hauskins & Beckwith (1979) describe the Gatuña as predominantly sandstone with interbedded siltstone that is highly weathered, fractured, and moderately hard. Drilling within the WIPP facilities area shows that the Gatuña ranges in thickness from 19 to 31 feet (Intera, 1997a).

The Gatuña is water-bearing in some areas, with saturation occurring in discontinuous perched zones. However, because of its erratic distribution, the Gatuña has no known continuous saturated zone (Mercer, 1983). Drilling at the WIPP site, including 30 exploration borings drilled between 1978 and 1979 in the surface facilities area, did not identify any saturated zones in the Gatuña.

3.2.4 Mescalero Caliche

The Mescalero Caliche is an informal stratigraphic unit consisting of well-lithified deposits of finely crystalline limestone (caliche) that developed below the surficial soils and in the upper portion of the Gatuña (Mercer, 1983). Powers (2002) indicates that the caliche is generally well developed in the vicinity of the WIPP. The Mescalero Caliche is described in detail by Phillips (1987), who indicates that although the caliche is continuous and well-lithified in some areas, it is often dissected by holes, fractures, and other discontinuities. The Mescalero Caliche is typically between 2 and 10 feet thick, with the upper contact of the caliche between 5 and 10 feet bgs (Sergent, Hauskins & Beckwith, 1979).

3.2.5 Soils

Berino series soils make up the sandy, surficial soils at the WIPP site (Bachman, 1980). These soils are developed in reddish, noncalcareous, wind-worked deposits, generally about 3 feet in thickness. The Berino soils are classified as loamy fine sands with a sandy clay loam subsoil and are very susceptible to wind and water erosion, often forming hummocks or dunes.

3.2.6 Recharge in Native Soils

Under natural conditions, recharge rates through the native soils are extremely low, and little recharge to the Santa Rosa SSW zone is likely to occur in the vicinity of the WIPP site. Most precipitation falls on rangeland and is returned to the atmosphere through evapotranspiration. Hunter (1985) estimated an evapotranspiration rate of 96 percent for a broad water balance study area encompassing 2,000 square miles in Eddy and Lea Counties. A preliminary water balance estimate for a 400-square-mile area surrounding the WIPP site determined recharge rates of 0.5 to 2 percent of precipitation, or less than 0.25 in/yr (Hunter, 1985). A study by Campbell et al. (1996) determined recharge rates for the WIPP site based on stable isotopes in soil waters and chloride mass balance analysis. These investigators estimated recharge rates in surficial soils of only 0.06 to 0.6 percent of precipitation, or less than 0.08 in/yr.

The extremely low recharge rates that occur in native soils covered with desert vegetation indicate that natural recharge around the WIPP facilities area is likely an insignificant component of recharge to the SSW. However, site development at the WIPP has altered the recharge conditions by focusing stormwater in retention ponds and removing vegetation over large areas, thereby decreasing evapotranspiration and increasing recharge in comparison to natural conditions.

3.3 Previous SSW Investigation

Early exploratory drilling at the WIPP site (Sergent, Hauskins & Beckwith, 1979; Mercer, 1983) and geologic mapping of the Exhaust Shaft in 1984 and 1985 (Powers, 1995) did not detect saturated conditions in the Santa Rosa at the WIPP site prior to site development. Seepage into the Exhaust Shaft was first detected in 1995 (U.S. DOE, 2002), and subsurface investigations of the source of this seepage determined that a saturated zone had developed in the Santa Rosa underlying the WIPP surface facilities.

3.3.1 Site Investigation Activities

While many hydrogeologic investigations have been conducted at the WIPP site, this section describes only the investigations that focus on the SSW. SSW investigations were initiated following the May 1995 detection of fluid seeping through cracks in the Exhaust Shaft concrete liner at depths of 50 to 80 feet bgs (Intera, 1996). This section describes a series of investigations and ongoing monitoring to characterize the SSW and meet regulatory requirements.

3.3.1.1 1996 to 1997 Initial Investigation

A series of SSW investigation activities was conducted by Intera in 1996 and 1997 (Intera, 1996, 1997a, and 1997b), including the following:

- Geophysical survey to identify saturated zones in the subsurface
- Drilling of 3 monitor wells (C-2505, C-2506, and C-2507 [4-inch-diameter])
- Drilling of 12 piezometers (PZ-01 through PZ-12 [2-inch-diameter])
- Pumping and slug tests to determine hydrologic properties of the saturated zone
- Sampling of the SSW for water quality analysis

Hereafter, this report refers to the 3 C-series monitor wells and the 12 PZ-series piezometers collectively as monitor wells. The locations of monitor wells installed to investigate the SSW and shaft seepage are shown in Figure 1. Copies of well logs (Intera, 1996 and 1997a) are provided in Appendix A.

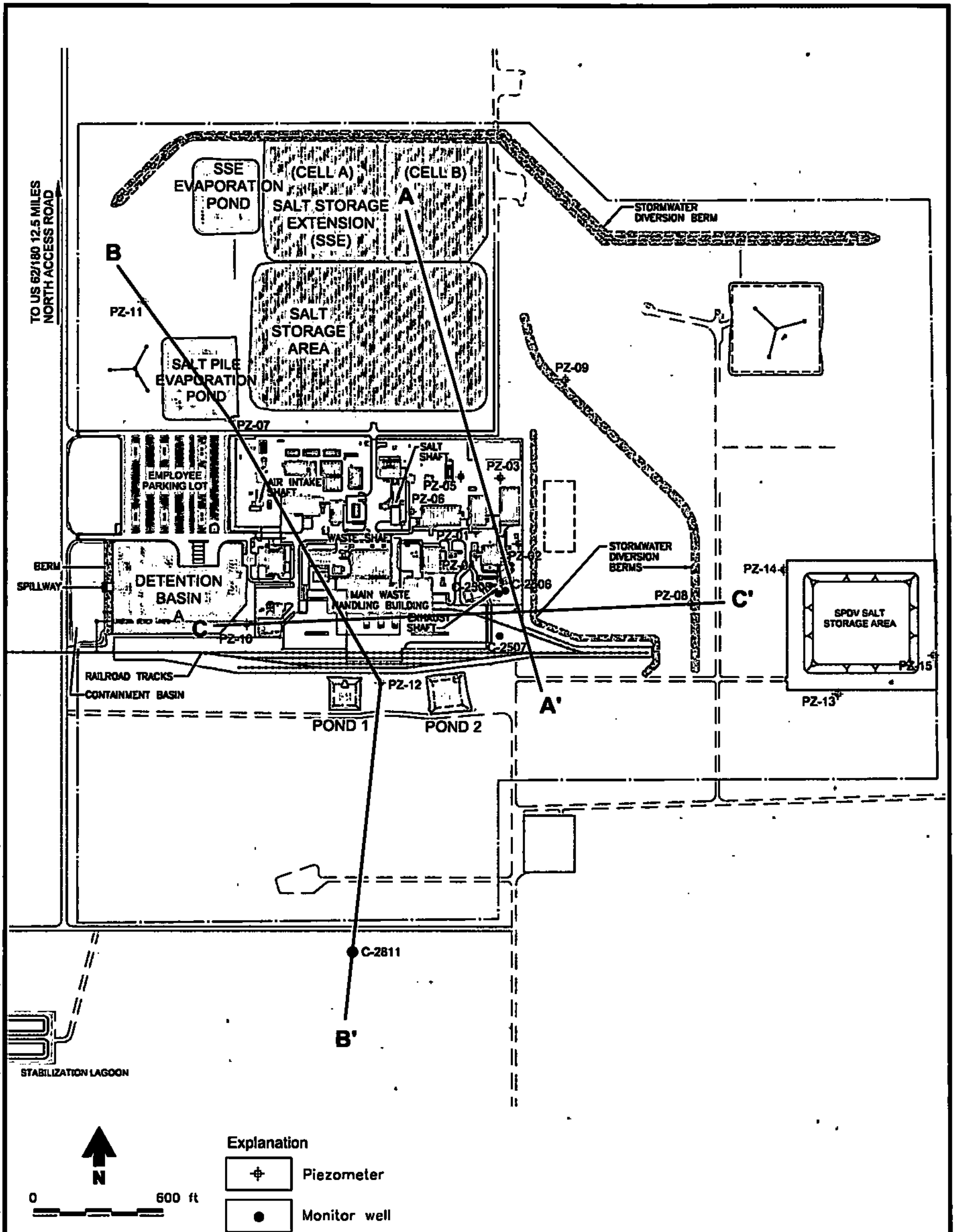
During the initial investigation, a saturated zone ranging in thickness from 12 to 32 feet was encountered in the Santa Rosa in wells completed at depths ranging from 54 to 75 feet bgs. The well screens are predominantly in the saturated interval in the lower portion of the Santa Rosa, and the wells typically penetrate approximately 5 to 10 feet into the Dewey Lake. The Dewey Lake was found to be dry in the interval penetrated, although one borehole (C-2507) was reported to have saturation within the upper 5 feet of the Dewey Lake (Intera, 1996). The dry Dewey Lake horizon below the saturated Santa Rosa indicates that the saturated lens in the Santa Rosa is perched and downward infiltration into the Dewey Lake occurs very slowly in the low-permeability redbeds. Piezometer PZ-08, the easternmost piezometer at the time of the initial investigation, located approximately 0.25 mile east of the facilities area, did not intersect the SSW, indicating a limit on the saturated zone in this area.

Water quality analysis of samples from the monitor wells and piezometers indicated TDS concentrations ranging from 3,700 to 155,000 milligrams per liter (mg/L) (Intera, 1997a). Pumping and slug tests showed saturated hydraulic conductivity (K_{sat}) values for the Santa Rosa of 2.64×10^{-8} to 5.48×10^{-5} meters per second (m/s) (Intera, 1996 and 1997a).

The monitor well and piezometer installations showed that the lower portion of the Santa Rosa contains a substantial saturated zone, the areal extent of which includes the entire WIPP surface facilities area. Based on a typical porosity range of 5 to 30 percent for sandstone, Intera (1997a) estimated a total volume of SSW between 20 to 120 million gallons. Intera (1997b) concluded that the increase in water level and gradient observed between October 1996 and March 1997 indicated a significant recharge source north of the Exhaust Shaft.

3.3.1.2 2001 Investigation

Water encountered in the upper Dewey Lake at monitor well C-2811 may be interconnected with the SSW in the Santa Rosa, although the interconnection is uncertain (Powers, 2002). Shallow monitor well C-2811, drilled in March 2001 approximately 1,300 feet south of the nearest SSW monitoring location, PZ-12 (Figure 4), was completed in the upper Dewey Lake and intersected water at a depth of approximately 60 feet bgs (Powers, 2002). According to Powers (2002), the Dewey Lake encountered at C-2811 was not saturated during drilling of earlier wells nearby. The thin zone of Santa Rosa, encountered from 35 to 45 feet bgs at the



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WIPP SHALLOW SUBSURFACE WATER

Monitor Well and Cross Section Location Map

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9-2-08

JN ES08.0072

Figure 4

C-2811 location, was not water-bearing. The water quality from C-2811 is consistent with that of the SSW wells, with similar molar ratios (Powers, 2002). The TDS concentration in C-2811 was 2,630 mg/L, which is lower than TDS concentrations in the SSW wells but follows the trend of decreasing TDS concentration toward the south.

Figures 4 through 7 show geologic cross sections through the SSW perched zone that are based on drilling logs from previous investigations (Appendix A). Cross section B-B′ (Figure 6) shows the relationship of the Santa Rosa, where the SSW is known to occur, and the shallow saturated zone encountered at well C-2811 in the predominantly unsaturated upper Dewey Lake. The saturated zone in the Dewey Lake at C-2811 is stratigraphically lower than the SSW occurring in the Santa Rosa to the north.

The location of monitor well WQSP-6A in relation to the WIPP facilities area and SSW monitor wells is shown in Figure 8. Geologic cross section D-D' (Figure 9) shows the SSW perched lens in the Santa Rosa in relation to the deeper water table encountered at WQSP-6A in the middle Dewey Lake. The saturated zone at C-2811 in the upper Dewey Lake is both vertically and laterally distinct from the water at monitor well WQSP-6A, located about 1 mile southwest, where saturation occurs in the middle Dewey Lake.

3.3.1.3 2007 Investigation

Recent investigations in 2007 included installation of 3 new SSW monitor wells near the Site and Preliminary Design Validation (SPDV) salt and mine rock pile (U.S. DOE, 2008). As shown in Figure 1, the SPDV pile is located east of the WIPP facilities area and the other SSW monitor wells. The SPDV pile covers approximately 10 acres and ranges in height from approximately 7 to 20 feet above ground surface. The approximate pile volume, including an estimate of 10 percent below grade, is 168,000 cubic yards (DBS&A, 1996). The pile is about 95 percent mined salt interspersed with various types of construction debris and fine-grained sediments generated during drilling of shafts and underground excavation. A final cover was constructed over the SPDV pile in 2000, consisting of a geosynthetic clay liner covered by 3 feet of soil cover with a revegetated surface (U.S. DOE, 2008).

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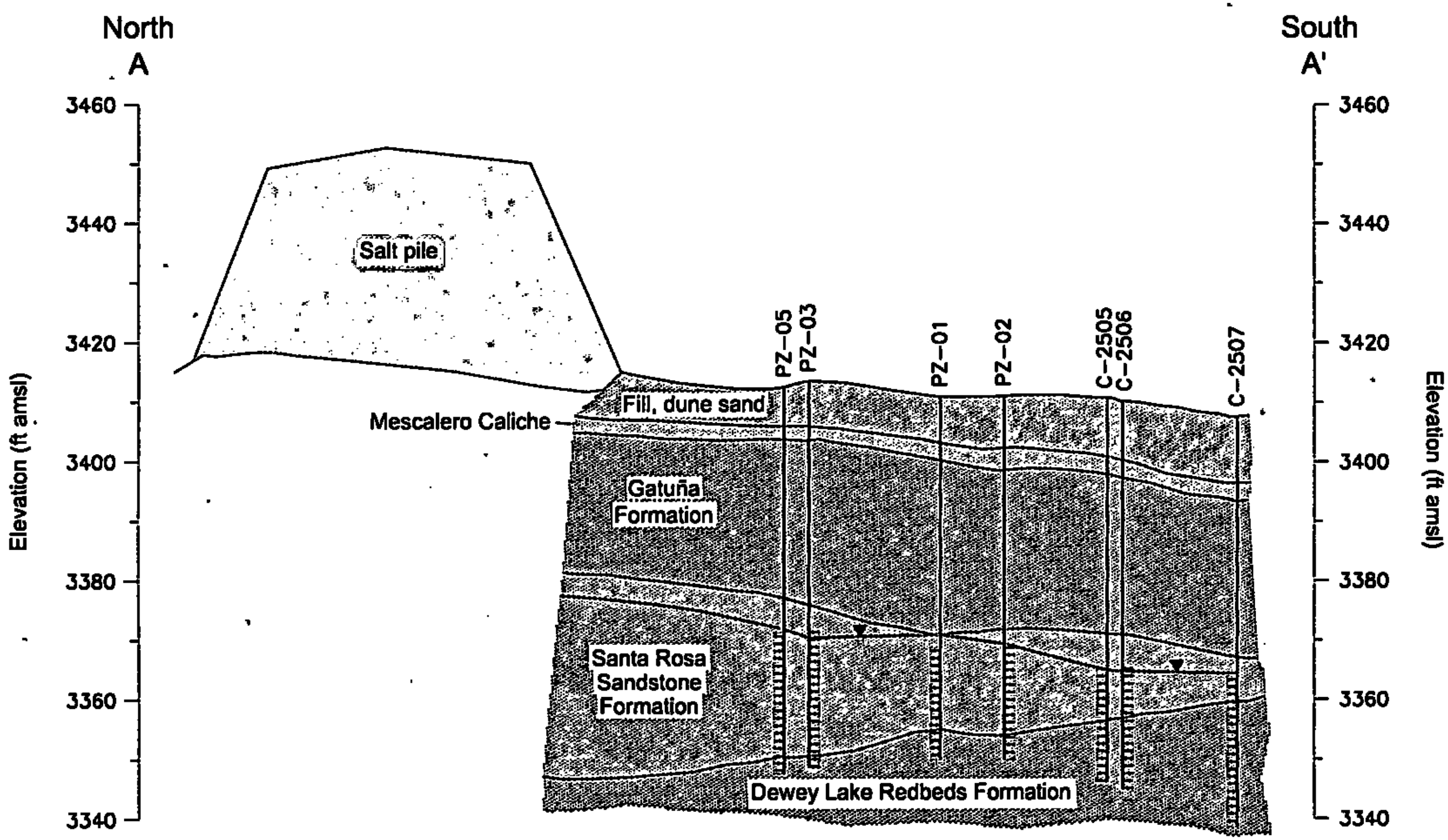

Vertical exaggeration = 10x

0 300 ft

Explanation

Water level (phreatic) surface

Note: Monitor well and water level elevations are projected to the cross section line in Figure 4.

WIPP SHALLOW SUBSURFACE WATER

Cross Section A-A'

Figure 5

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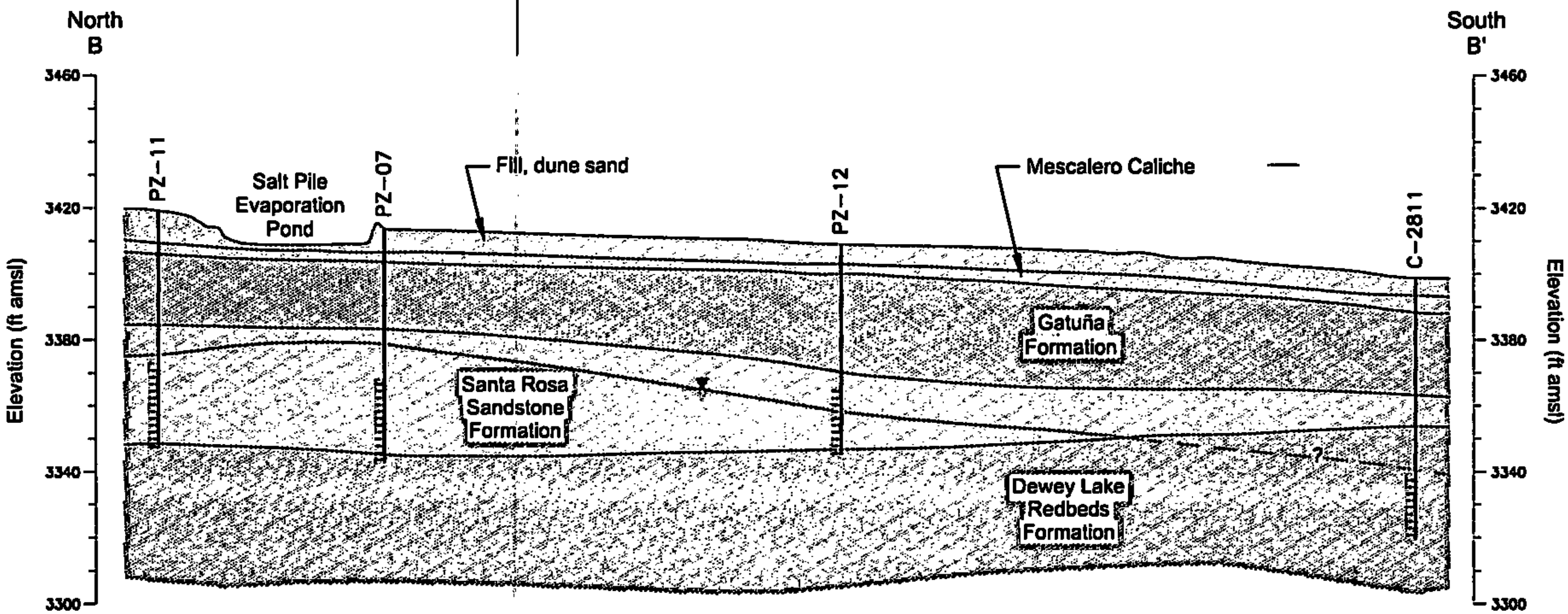

Vertical exaggeration = 10x

0 500 ft

Explanation

Water level (phreatic) surface

? Continuity of water table uncertain in Dewey Lake Redbeds Formation

Note: Monitor well and water level elevations are projected to the cross section line in Figure 4.

WIPP SHALLOW SUBSURFACE WATER
Cross Section B-B'

Figure 6

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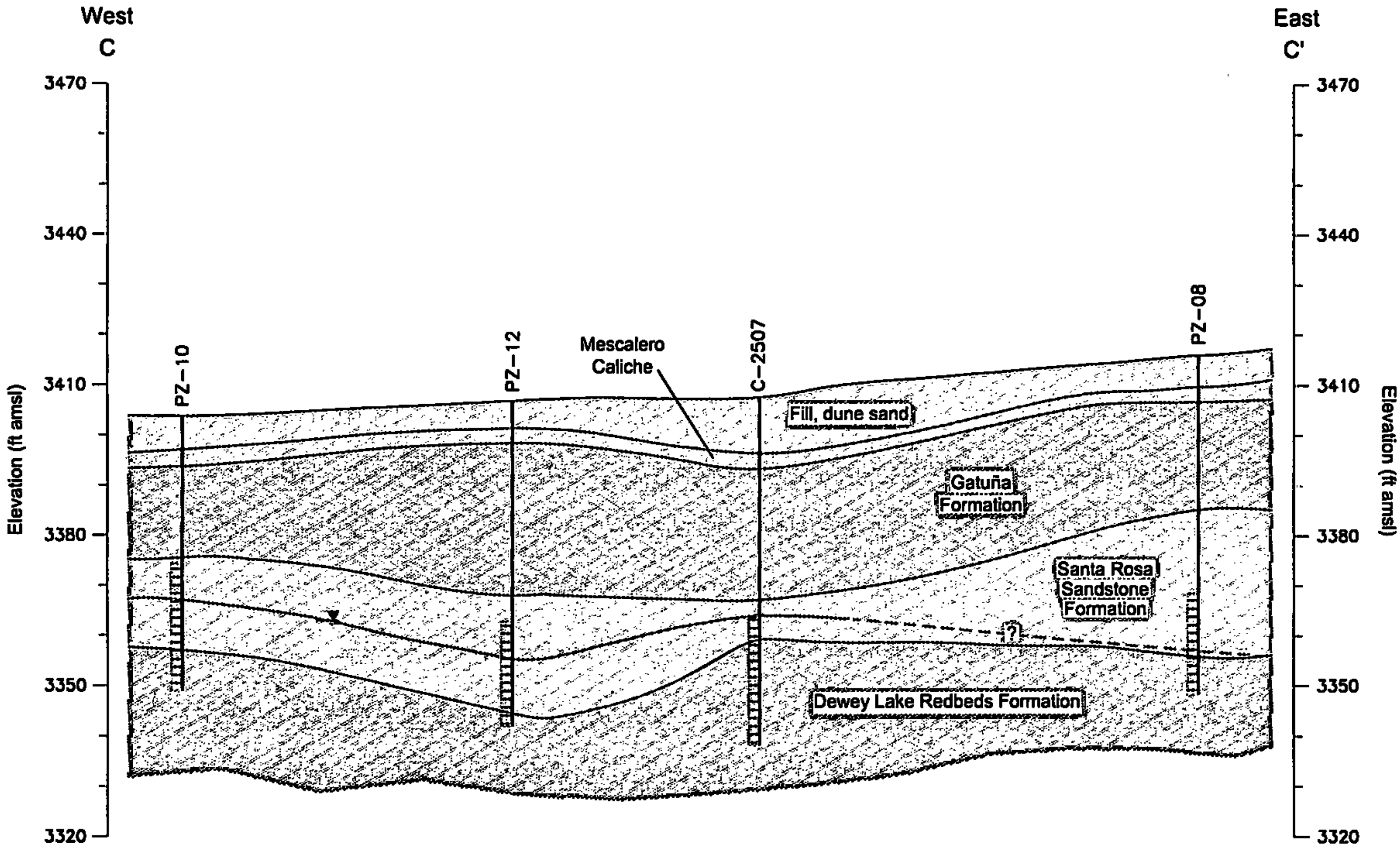

Vertical exaggeration = 10x

0 300 ft

Explanation

Water level (phreatic) surface

Note: Monitor well and water level elevations are projected to the cross section line in Figure 4.

WIPP SHALLOW SUBSURFACE WATER

Cross Section C-C'

Figure 7

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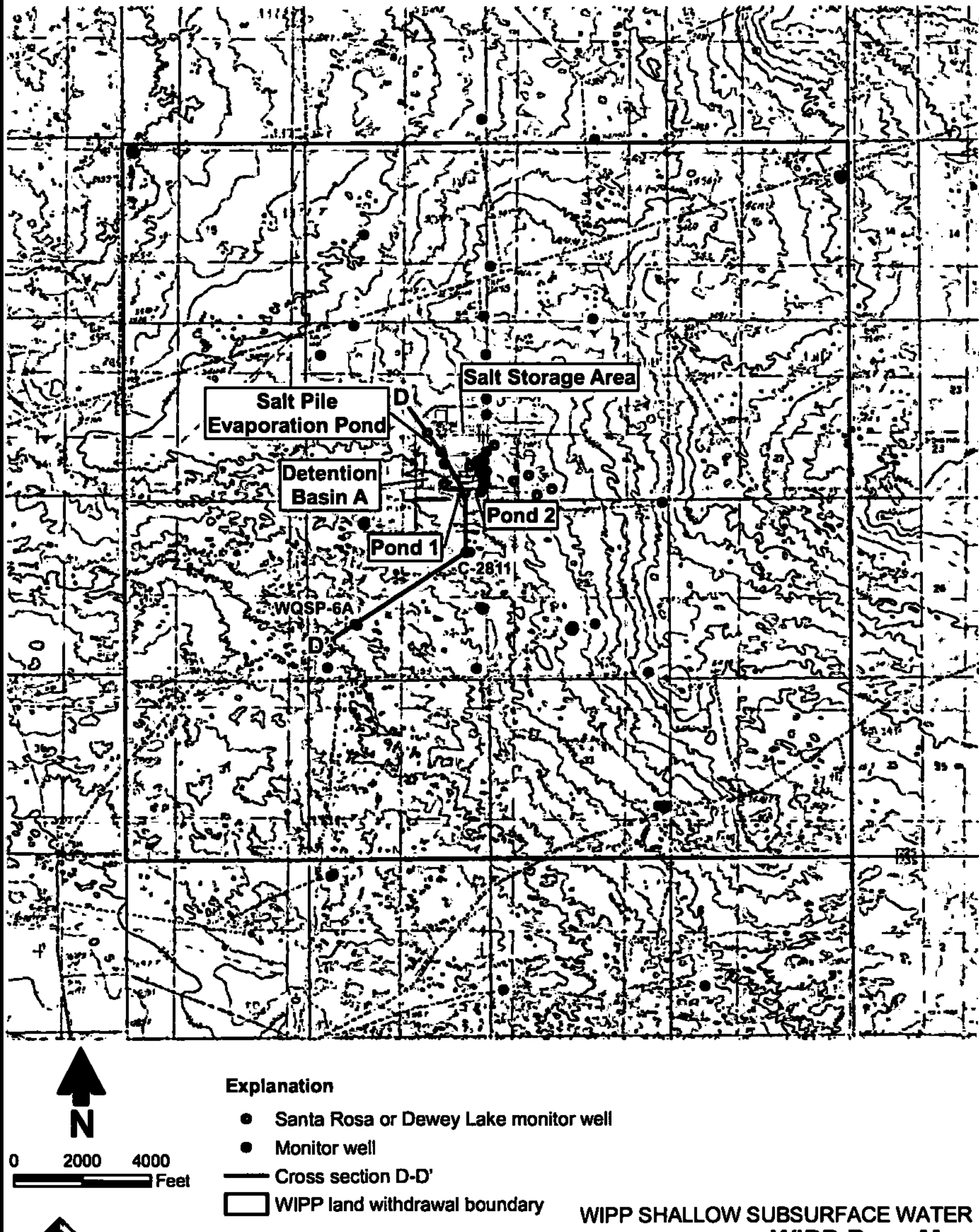

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WIPP SHALLOW SUBSURFACE WATER

WIPP Base Map

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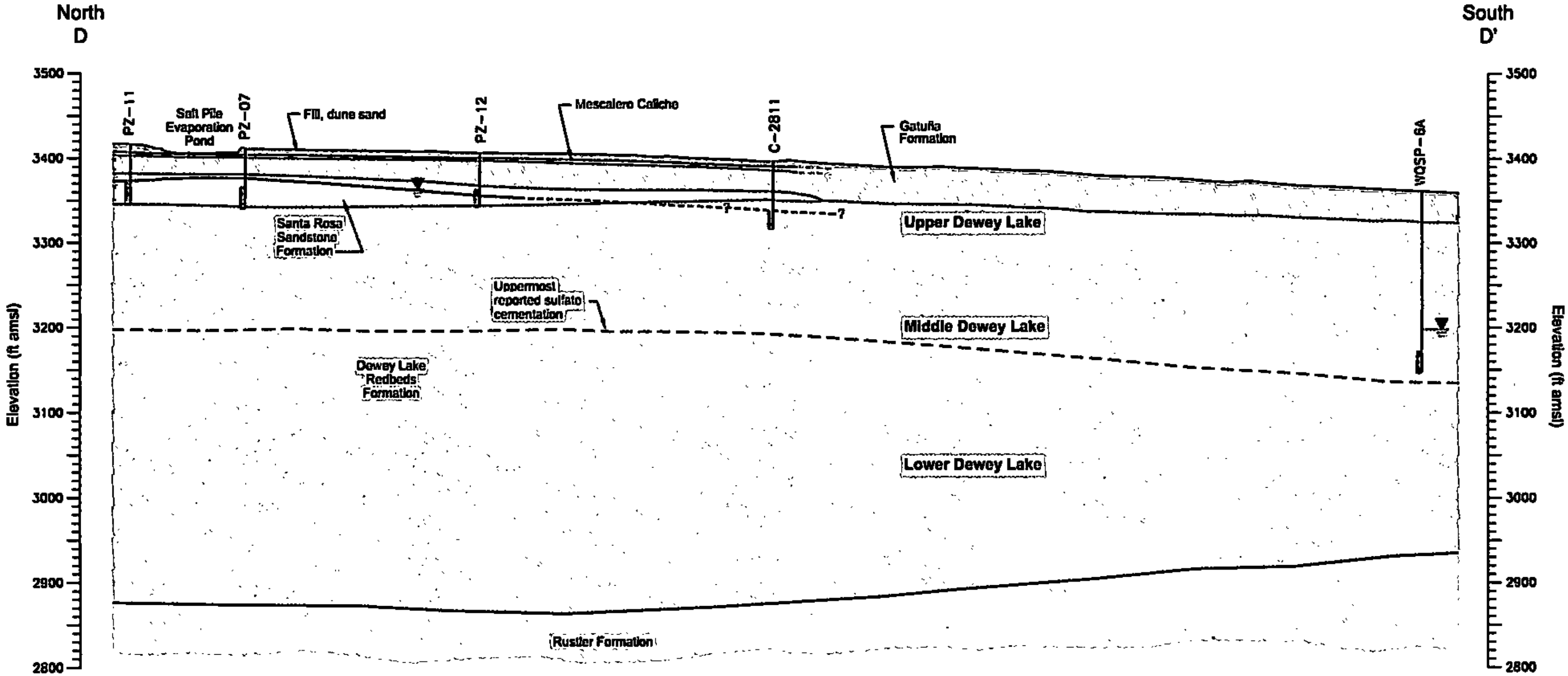
Figure 8



Vertical exaggeration = 5x

0 600 ft

Explanation

Water level (phreatic) surface

? Continuity of water table uncertain in Dewey Lake Redbeds Formation

Note: Monitor well and water level elevations are projected to the cross section line in Figure 8.

WIPP SHALLOW SUBSURFACE WATER
Cross Section D-D'

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11-13-08 JN ES08.0072

Figure 9

Complete details of the 2007 well installations are provided in an October 2008 report by DOE (U.S. DOE, 2008). The SPDV monitor wells, PZ-13, -14, and -15, encountered water in thin saturated zones in formation horizons that differ from the other SSW monitor wells in the previously studied SSW saturated lens. Only PZ-14 encountered saturation in the lower Santa Rosa, perched on the Dewey Lake contact, consistent with other SSW monitor wells. A thin saturated layer 0.8 foot thick was identified in PZ-14, overlying dry Dewey Lake claystone/siltstone. At PZ-13, a saturated interval 2.5 feet thick was encountered in a sandy siltstone layer in the middle Santa Rosa. This saturated interval is perched above a hard sandstone layer in the lower Santa Rosa, approximately 10 feet higher than the Dewey Lake contact. At PZ-15, saturation was encountered in the lower Gatuña, above the Santa Rosa, where a dry and very hard sandstone was encountered. The water quality in the SPDV pile monitor wells is highly variable. The TDS is reported to be 2,060 mg/L in PZ-15, 106,000 mg/L in PZ-14, and 245,500 mg/L in PZ-13. Based on the variability in the formation intervals where saturation occurs and water quality, the water encountered in the SPDV pile wells is not clearly linked to the main SSW saturated lens and may be a result of infiltration through the SPDV pile prior to final cover construction or recharge from other sources.

3.3.1.4 Ongoing Monitoring

The current understanding of the SSW conditions is based on the culmination of the investigation activities from 1996 through 2008 and ongoing monitoring and interpretation of the SSW monitor wells (well logs in Appendix A). Monitoring activities have been carried out by DOE since 1996 to meet the regulatory requirements of groundwater discharge permit DP-831, administered by the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB). The groundwater discharge plan regulates the SSW, as well as WIPP wastewater facilities that are not addressed by this hydrologic assessment. Continued water quality monitoring and water level measurements have been carried out by WIPP personnel from 1996 to present. During some monitoring intervals, DOE has tested for water quality parameters that exceed the discharge plan requirements. The complete monitoring record has been used in this hydrologic assessment.

The current groundwater discharge permit was approved on September 9, 2008 (NMED, 2008). It includes sampling of PZ-01, PZ-05, PZ-06, PZ-07, PZ-09, PZ-10, PZ-11, PZ-12, PZ-13, C-2507, C-2811, and WQSP-6A. The required water quality parameters include the following:

- Field parameters: pH, temperature, specific conductance
- General chemistry: sulfate, chloride, TDS
- Nitrate-nitrogen and total Kjeldahl nitrogen in WQSP-6A only

Water level measurements are required in all 20 monitor wells, including the additional PZ-series and C-series wells that are not included in water quality sampling. Monitoring is performed on a semiannual basis.

The complete set of water quality data collected for the SSW monitor wells is provided in Appendix B. Over the complete monitoring record, water quality testing has included variable parameters during sampling intervals, with some monitoring events testing for a more extensive list of chemical parameters. The monitoring frequency has varied during the period of record, ranging from monthly to annually. The monitoring data used in this hydrologic assessment include the complete monitoring record for all 20 wells used for SSW monitoring.

3.3.2 Water Budget Analysis

A water budget analysis was completed in 2003 to quantify the SSW sources and consider the potential for migration and the effectiveness of planned infiltration controls (DBS&A, 2003). The water budget refined the conceptual model of the SSW by quantifying the important hydrologic processes controlling the SSW system, providing the following:

- An estimate of the volume of water contained within the perched zone
- Quantification of seepage inputs to the SSW from past and current practices
- A model of SSW accumulation, flow conditions, and potential long-term migration
- Determination of the effects of engineered seepage reduction measures that could be implemented at existing seepage sources

The water budget analysis focused on the sources of water introduced to the subsurface as a result of site development at the WIPP. Because site investigation found the Santa Rosa to be unsaturated prior to site development, the SSW is considered to be anthropogenic, the result of a variety of water discharges and changes in site drainage that have occurred since on-site development of the WIPP began. Increases in recharge from the site have contributed to the saturated, perched zone at depths of 40 to 60 feet bgs within the Santa Rosa.

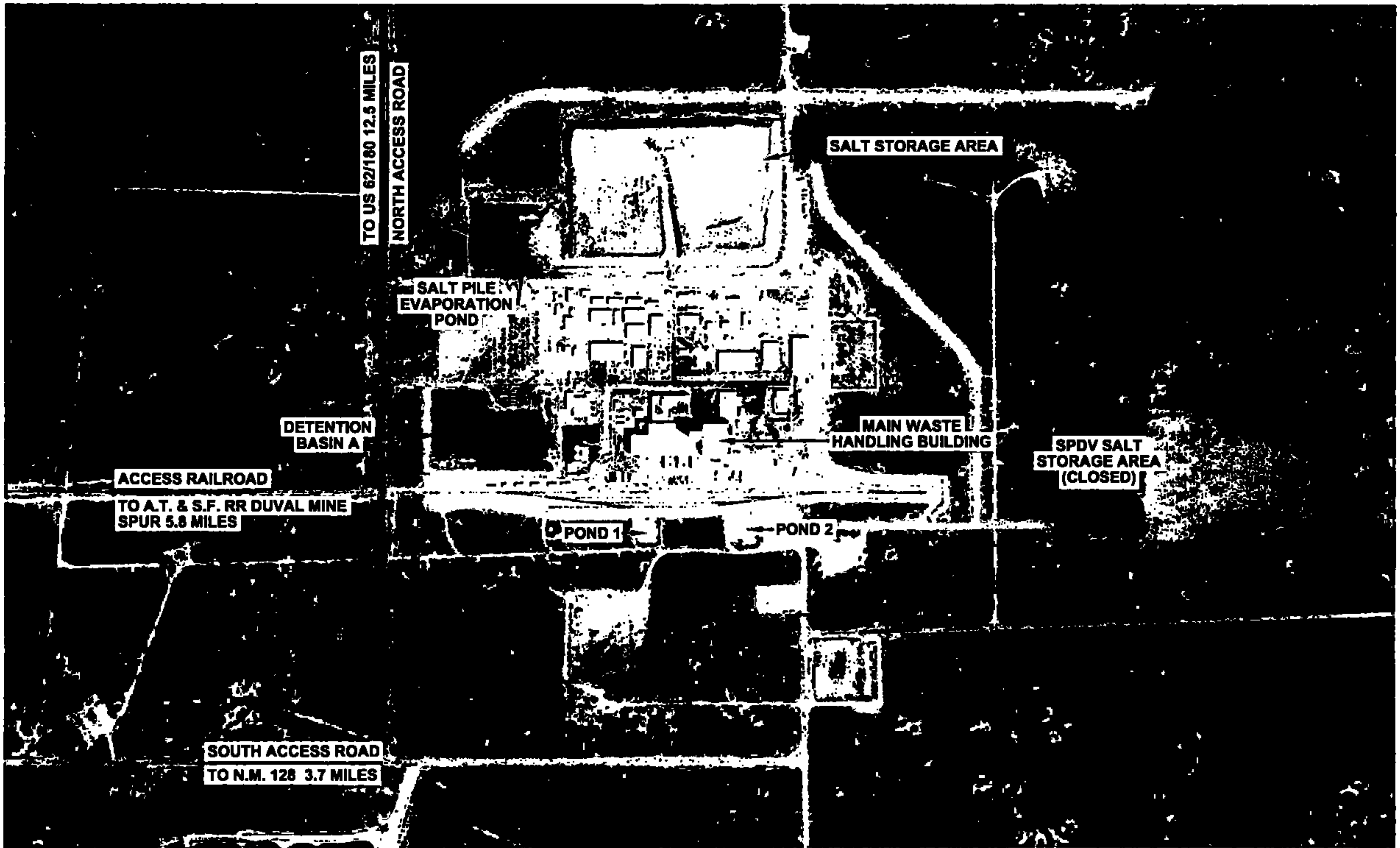
The water budget analyses included seepage estimates from five principal SSW recharge sources within the WIPP surface facilities area: (1) the Salt Storage Area, (2) the Salt Pile Evaporation Pond, (3) Detention Basin A, (4) stormwater retention pond 1, and (5) stormwater retention pond 2. An aerial photograph from 2000 (Figure 10) shows the condition of these recharge sources before liners and covers were constructed to control infiltration. Since 1984, when the WIPP surface facilities were constructed, recharge of precipitation to the subsurface has increased because runoff from impervious surfaces is routed into retention ponds. Recharge from the Salt Storage Area occurs when precipitation falling on the salt pile infiltrates through the highly fractured surface.

The water budget included the following analyses:

- *Compilation of recorded discharges:* Records of past discharges were compiled to quantify the extent of discharges from activities such as drilling, shaft dewatering, water line purging, water line leakage, and sewage treatment.

- *Site drainage summary:* Stormwater runoff calculations were completed to determine the volume of on-site stormwater that drains to the four stormwater retention ponds, where seepage may contribute to the SSW.

- *Surface infiltration modeling:* Infiltration rates were modeled for the four stormwater retention ponds and the Salt Storage Area. The model calculated evaporation and plant transpiration losses and the amount of recharge to the SSW.



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WIPP SHALLOW SUBSURFACE WATER
Aerial Photograph of WIPP Facilities Area, 2000

Figure 10

- *Saturated flow modeling:* Saturated flow modeling was conducted to quantify recharge from the stormwater retention ponds and Salt Storage Area and to determine whether such recharge accounts for observed conditions in the SSW.

- *Long-term migration modeling:* The long-term SSW migration was modeled for a 100-year time frame to evaluate whether the SSW has the potential to migrate to known groundwater resources. The potential for migration was examined both with and without the engineered infiltration controls to prevent recharge and reduce SSW migration.

The water budget results indicated that seepage from the five primary sources provides sufficient recharge to account for the observed SSW saturated lens and that the lens is expected to spread. The water budget results quantified the following components of the SSW hydrologic system:

- The SSW saturated zone covers approximately 150 to 520 acres to a maximum saturated thickness exceeding 30 feet, and contains a total estimated volume of water in the range of 108 to 315 million gallons.

- Average annual precipitation on the 85-acre watershed surrounding the WIPP facilities area amounts to approximately 29.2 million gallons per year, and average annual stormwater flow to the retention ponds and precipitation falling on the Salt Storage Area amounts to approximately 25.0 million gallons per year.

- Modeling by three independent methods produces seepage estimates in the range of 5.4 to 16.9 million gallons per year from the five primary seepage sources, which is equivalent to 18 to 58 percent of on-site precipitation.

- Records of discrete discharges from drilling and construction activities during the 1980s indicate that these discharges total approximately 6 million gallons, with evaporative losses further reducing the volume that these discharges may have contributed to the SSW.

- The estimated leakage from water lines providing input to the SSW is 0.22 million gallons per year, totaling approximately 4 million gallons of water line leakage since the WIPP facilities opened in 1984.

- Seepage into the Exhaust Shaft, which is a loss from the SSW, amounts to approximately 4 million gallons since seepage was detected in 1995.

The quantified water budget components show that seepage from on-site precipitation is the most significant recharge source providing input to the SSW saturated lens. To develop a valid conceptual model of the SSW, considering the uncertainties of the models and calculations, multiple analysis methods were used to obtain a range of independent results, enhancing the reliability of the overall analysis.

The potential extent of long-term SSW migration was examined by expanding the saturated flow model domain to include the 16–square-mile WIPP land withdrawal area. A two-layer model was established. The upper model layer includes the SSW perched lens in the Santa Rosa and the Gatuña. The lower model layer includes the Dewey Lake, which is the shallowest groundwater depth interval used for water supply near the WIPP boundary. If SSW migration toward the regional groundwater were to occur, the potential migration of SSW would involve downward flow from the Santa Rosa moving vertically through the unsaturated upper Dewey Lake and laterally to areas where a natural water table exists in the middle Dewey Lake. The two-layer model is conservative in that it simulates all of the Dewey Lake recharge accumulating in a saturated lens, whereas a complex system of discontinuous saturated pathways in the predominantly unsaturated upper Dewey Lake may disperse the flow and lead to less migration. The rate of downward flow from the Santa Rosa to the Dewey Lake, controlled by the vertical hydraulic conductivity, was established by a model calibration phase that matched observed SSW water levels for the 1996 to 2002 record. The calibrated model was then run for 100-year predictive simulations of SSW migration with seepage ending in either 2035 when the facility closes or in 2006 after the implementation of engineered infiltration controls.

The long-term migration model simulations indicated that the engineered seepage controls that were subsequently implemented by DOE in 2004 and 2005 would substantially reduce the extent of migration. The simulations predicted that without seepage controls, the SSW has the potential to migrate as far as the northern WIPP boundary and to the Dewey Lake saturated zone in the southwestern corner of the WIPP site near monitor well WQSP-6A over a 100-year time frame. The predictive modeling results showed that engineered infiltration controls would prevent the existing SSW saturated volume from otherwise doubling over the next 20 years if recharge were allowed to continue. The long-term migration model predicted that the infiltration controls prevent SSW migration from reaching the facility boundary within 100 years.

4. Infiltration Controls

In order to reduce or eliminate recharge to the SSW, engineered infiltration control systems were constructed over the primary recharge sources in 2004 and 2005. The infiltration controls consist of liners installed in each of the stormwater retention ponds, an impermeable cover over the Salt Storage Area, and new lined areas for salt storage and stormwater containment.

4.1.1 Stormwater Retention Ponds

Prior to construction of the infiltration controls, surface water drainage at the WIPP site consisted of four watershed areas that drain to four on-site stormwater retention ponds. The four ponds include the following:

- Salt Pile Evaporation Pond
- Detention Basin A
- Stormwater retention pond 1
- Stormwater retention pond 2

The areas of the ponds and watersheds, including the pervious and impervious areas, are summarized in Table 2. The surface conditions of the watersheds range from relatively permeable bare ground to impermeable pavement and rooftops. Three of the ponds receive relatively clean stormwater from the surface facilities, while the Salt Pile Evaporation Pond received runoff containing dissolved salt from the outer slopes of the Salt Storage Area prior to cover construction. Stormwater runoff calculations by DBS&A (2003) found that the average annual stormwater runoff for a 5-year period of record from 1997 to 2001 was 19.8 million gallons. The total runoff is divided among the four ponds as follows:

- Detention Basin A: 55.5 percent
- Salt Pile Evaporation Pond: 26.5 percent
- Pond 1: 5.0 percent
- Pond 2: 13.0 percent

Table 2. Summary of Watershed and Pond Areas

Pond	Pervious [a] Watershed Area		Impervious [b] Watershed Area		Entire Pond Area		Total Watershed Area [c]	
	ft^2	acres	ft^2	acres	ft^2	acres	ft^2	acres
Salt Pile Evaporation Pond	724,393	16.6	0	0	158,024	3.63	882,417	20.3
Detention Basin A	502,172	11.5	890,778	20.4	249,956	5.74	1,642,906	37.7
Stormwater retention pond 1	119,793	2.75	16,615	0.38	21,818	0.50	158,226	3.63
Stormwater retention pond 2	98,643	2.26	222,328	5.10	32,416	0.74	353,387	8.11
Totals	1,445,001	33.1	1,129,721	25.9	462,214	10.61	3,036,936	69.7

[a] Pervious surfaces represent bare ground, gravel, and vegetated ground conditions.
[b] Impervious surfaces represent asphalt and concrete surfaces, and rooftops.
[c] Areas adjacent to the railroad tracks are excluded from the watersheds. Little runoff is expected from these gravel surfaces, which are level or in swales without an apparent discharge point.

Past observations of the stormwater retention ponds found that water collected to a significant depth (up to a depth of 8 feet) following storm events. Water levels in the basins decrease in response to combined losses of infiltration and evaporation, but ponded water may remain for days. Eventually, the ponded water completely infiltrates and/or evaporates.

Records regarding the design and construction of WIPP facilities indicate that the ponds were constructed between 1981 and 1984. The total capacity of the ponds is designed to handle the runoff from either a 100-year/24-hour storm event (U.S. DOE, 1993) or two consecutive 10-year/24-hour storms (Westinghouse, 1992). During 1993 to 1994, design improvements were completed on Detention Basin A and Ponds 1 and 2 to provide total stormwater retention (Westinghouse, 1992). Constructed berms to the north and east of the site prevent surface water from running onto the operations area at the WIPP site (hereafter referred to as on-site) (Figure 1). Therefore, all of the stormwater collected in the retention ponds is from on-site runoff.

4.1.2 Salt Storage Area

The Salt Storage Area used in the past to receive salt mined from the WIPP underground mine workings covers an area of 18.8 acres. When placement of salt in the Salt Storage Area ended in 2004, the average height of the salt pile was approximately 30 feet. The top deck of the Salt Storage Area was sloped to drain internally with perimeter berms to contain stormwater on top of the salt pile and prevent runoff of stormwater contacting the salt. The Salt Storage Area had steep side slopes to shed stormwater to a perimeter drainage channel that routed stormwater to the Salt Pile Evaporation Pond.

Precipitation that falls on the Salt Storage Area infiltrates below the salt pile surface through extensive fractures and dissolution channels (i.e., macropores) observed on the salt pile surface (DBS&A, 2003). The halite (NaCl) contained in the Salt Storage Area is susceptible to dissolution by precipitation leaching through the salt. Based on a halite solubility constant of 38.1944 (log K_{sp} = 1.528) (Parkhurst, 1995), water saturated with respect to halite contains 133,000 mg/L sodium and 205,000 mg/L chloride, and has an approximate TDS concentration of 338,000 mg/L, depending on the exact composition of the crushed rock salt. Seepage that is near saturation with respect to dissolved halite would have a TDS concentration approximately twice as high as the highest TDS concentration measured in the main SSW lens. Seepage through the Salt Storage Area may be near halite saturation, while stormwater runoff from the side slopes would be expected to be at a fraction of halite saturation concentration.

4.1.3 Infiltration Control Systems

Infiltration control systems have been constructed to prevent recharge to the SSW due to seepage beneath the stormwater retention ponds and Salt Storage Area. Details of the infiltration control systems engineering design are shown on design drawings prepared by WTS (2005). A new lined Salt Storage Extension (SSE) has been constructed for the placement of mined salt over a lined area to prevent seepage of halite-impacted water that leaches through the salt. A new lined SSE Evaporation Pond has also been constructed to contain and prevent infiltration of stormwater runoff from the SSE. These infiltration control systems were proposed by DOE and incorporated into the groundwater discharge permit DP-831 that was approved by the NMED GWQB. In addition to the infiltration controls constructed in 2004 and 2005, a final cover was constructed over the SPDV pile in 2000. The location of these infiltration control systems is shown on Figure 1.

Table 3 provides the capacity of the lined ponds and runoff quantities and areas draining to the ponds based on information provided in the WTS request for proposals for this project. Table 4 lists infiltration controls constructed in the study area. The infiltration controls listed in Table 4 are described in further detail below.

- *SPDV Pile.* A final cover has been constructed over the SPDV pile consisting of a geosynthetic clay liner (GCL) covered by a 3-foot-thick soil layer, which serves as a soil rooting medium to support vegetative growth on the cover. The final cover is designed with slopes to shed stormwater. Efforts to revegetate the final cover with shallow-rooted plants have been successful in establishing a well-vegetated surface.

- *Detention Basin A, Pond 1, and Pond 2.* These stormwater retention ponds receive relatively fresh stormwater from on-site. Each pond has had a 60-mil high-density polyethylene (HDPE) liner installed within nearly the same pond configuration as the previously unlined pond. Detention Basin A has a spillway on the west side of the pond to allow excess water to overflow to a secondary containment basin, which is unlined.

- *Salt Storage Area.*—A final cover has been constructed over the Salt Storage Area consisting of 60-mil HDPE covered by a 3-foot-thick soil layer, which serves as a soil rooting medium to support vegetative growth on the cover. The final cover is designed to shed stormwater with a minimum 2 percent slope on the top deck and 3:1 (3 horizontal to 1 vertical) side slopes. Vegetation is nearly absent on the cover and rill erosion is evident on the side slopes. The runoff conveyance ditches around the perimeter of the Salt Storage Area have also had 60-mil HDPE liners installed, with runoff directed to the Salt Storage Evaporation Pond.

- *Salt Pile Evaporation Pond.* The Salt Pile Evaporation Pond previously received runoff from the uncovered Salt Storage Area, but now receives relatively fresh stormwater after

Table 3. Infiltration Control Ponds and Runoff Volumes

Evaporation Pond	Drainage Area (ft^2)	Runoff Volume for Design Storm [a] (gallons)	Pond Capacity [b] (gallons)
Salt Pile Evaporation Pond	690,100	1,677,633	5,506,989
Salt Storage Extension Evaporation Basin	1,047,800 [c]	2,547,202 [c]	4,170,732
Pond A	1,642,199	3,992,186	6,670,940
Pond 1	178,595	434,163	813,925
Pond 2	387,681	942,452	2,447,692

[a] Runoff volumes are calculated for a 25-year/24-hour design storm event of 3.90 inches assuming 100% runoff and including the volume that falls onto the surface area of the pond.
[b] Capacity is the maximum capacity without any freeboard.
[c] Current configuration with only Cell A has a drainage area of 538,000 square feet (ft^2), runoff volumes for the 3.90-inch rainfall event is 1,307,878 gallons.

Table 4. Infiltration Controls

Infiltration Control	Completion Date [a]	Liner/Cover
SPDV pile final cover	2000	GCL cover with 3-foot soil rooting medium
SSE evaporation pond liner	January 2004	HDPE geomembrane liner
SSE liner	February 2004	HDPE geomembrane liner
Salt Storage Evaporation Pond liner	July 2004	HDPE double geomembrane liner with leak detection system
Salt Storage Area cover	July 2004	HDPE geomembrane cover with 3-foot soil rooting medium
Salt Storage Area runoff ditches	January 2005	HDPE geomembrane liner
Pond 1 liner	January 2005	HDPE geomembrane liner
Pond 2 liner	January 2005	HDPE geomembrane liner
Detention Basin A liner	July 2005	HDPE geomembrane liner

[a] Completion dates from U.S. DOE (2008) and Roush (2008)
SPDV = Site and Preliminary Design Validation
GCL = Geosynthetic clay liner
SSE = Salt Storage Extension
HDPE = High-density polyethylene

the Salt Storage Area has been covered. The Salt Pile Evaporation pond has had a 60-mil HDPE liner installed within nearly the same pond configuration as the previously unlined pond.

- *Salt Storage Extension.* The SSE has been constructed with a 60-mil HDPE liner covered by a 200-mil geonet and a 2-foot protective soil layer. The liner is constructed on a 2 percent slope and the geonet conveys any fluid on the liner to a sump that discharges to the SSE Evaporation Pond. The SSE includes Cell A, which has been constructed, and Cell B, which will be added in the future. The SSE liner is seamed directly to the Salt Storage Area cover along the north side slope of the cover.

- *Salt Storage Extension Evaporation Pond.* The SSE Evaporation Pond receives stormwater runoff from the SSE and water that is conveyed to the SSE liner sump. The water managed in the pond is highly saline, and has contacted halite in the SSE. The SSE Evaporation Pond has a double liner consisting of two layers of 60-mil HDPE with a 200-mil geonet between the liners to convey any leakage through the primary liner to a sump on the secondary liner. The liner is constructed on a 2 percent slope to convey water to the sump. Primary liner leakage in the sump is pumped back to the pond when detected.

The infiltration controls that have been constructed have eliminated the major sources of recharge to the SSW. The infiltration controls have now been in place for three years, preventing continued input to the SSW saturated lens that would have occurred had the controls not been put in place.

4.1.4 Design, Operation, and Maintenance

The infiltration control systems were designed in a manner that requires ongoing operation to manage stormwater. Based on the groundwater discharge plan (DP-831), the stormwater ponds were designed to meet the following design capacity requirements (U.S. DOE, 2003):

- Salt Pile Evaporation Pond and SSE Evaporation Pond

- Designed to contain a 25-year, 24-hour design storm event
- Designed for full retention of stormwater by an inflow/evaporation water balance based on average annual precipitation

- Detention Basin A, Pond 1, and Pond 2
  - Original unlined ponds designed with capacity to store two 10-year, 24-hour storm events
  - Lined ponds appear to have been designed to contain 25-year, 24-hour storm
  - Calculations of an inflow/evaporation water balance not provided in the discharge plan

Detention Basin A, Pond 1, and Pond 2 each have liners that were constructed within nearly the same footprint area as the original unlined ponds. The capacity and surface area of these ponds do not provide for complete evaporation of the stormwater. Monthly pond inspection records indicate that the ponds have been near capacity during the recent years of above-average precipitation (U.S. DOE, 2004-2008).

Stormwater is managed in Detention Basin A, Pond 1, and Pond 2 by pumping between the ponds using temporary water lines and portable pumps. Water is removed from the ponds and pumped to irrigate the surface of the final cover on the Salt Storage Area. Irrigation is used both to manage stormwater and to aid efforts to revegetate the final cover.

Vegetation is nearly absent on the Salt Storage Area final cover. As a result, erosion repair on the cover has been an ongoing maintenance need. The absence of vegetation also reduces the amount of stormwater that can be applied to the cover through irrigation. Without vegetation, water applied to the soil surface is lost through evaporation only. Much more water is removed from the system with plant growth on the cover because the plants remove water from the cover soil and release it to the atmosphere through transpiration.

Due to the high precipitation rates since 2005 and limits on capacity to manage stormwater in Detention Basin A, Pond 1, and Pond 2, overflows have been experienced at the spillway from

Detention Basin A (Roush, 2008). These overflows discharge to the small secondary containment basin west of Detention Basin A; this secondary containment basin is unlined, allowing for a limited amount of stormwater infiltration and recharge to the SSW.

5. Hydrologic Assessment Methods and Results

This section describes the hydrologic assessment methods and results, providing details for each of the project components identified in Section 2, including the following:

- Database compilation
- Time-series analysis using hydrographs
- Water level contour maps
- Water quality contour maps
- Geochemical analysis
- Moisture redistribution calculations

5.1 Database Compilation

A comprehensive database was organized to evaluate and present data on the SSW. DBS&A obtained a series of Microsoft Excel spreadsheets from WTS containing data potentially relevant to evaluation of the SSW. The data were organized in a central Microsoft SQL database following standard procedures developed by DBS&A to enable efficient evaluation and presentation of environmental data. Site documents obtained from WTS and from DBS&A's files from prior work were used to supplement and spot check the data for any potential problems or omissions due to the fact that the spreadsheets may not have all been originally intended for construction of a database. The types of data provided included the following:

- Water chemistry
- Water level measurements
- Geology
- Precipitation
- Survey coordinates

The water chemistry data provided in WTS spreadsheets were supplemented with details provided in available reports, including measurements of field parameters, sampling techniques that could potentially affect laboratory results, and laboratory qualifiers. The spreadsheets provided list laboratory qualifiers for most analytes, but not for TDS, chloride, sulfate, total inorganic carbon, or silicon. Water quality reports from 1998 and 1999 indicate that some of these data had been previously rejected according to criteria established by Westinghouse. These data were retained in the database and flagged with an R qualifier. The set of qualifiers reported with data from Wastren laboratory are not uncommon, but also are not universally recognized; that is, the B, E, and N qualifiers are defined differently by many other laboratories. Therefore, each qualifier was translated to a corresponding qualifier used by the U.S. Environmental Protection Agency (EPA) or to a custom qualifier with a definition provided in a separate table.

Compiling the water level elevation data in a central database provided a continuous time-series of data from multiple files and reconciled vertical elevation data that had historically been referenced to more than one datum. The majority of water level measurements were reported as elevations referenced to an early survey using the NGVD 29 datum. Therefore, more recent water level and geology data referenced to an October 2007 survey using the NAVD 88 datum were adjusted according to WTS protocol to be consistent with older data on the NGVD 29 datum. Data for horizontal coordinates were not adjusted for smaller differences on the order of one-tenth of a foot between the different surveys.

Geologic data were included in the database primarily to assist in calculation of hydraulic head above perching horizons; the data were therefore limited to elevations of these horizons relevant to the SSW assessment. Depths in the geology table were checked against boring logs.

Precipitation data in the database included monthly totals for the WIPP meteorological station; higher-resolution site data and monthly data from the Carlsbad FAA Airport station were considered but not included in the database. Precipitation data were compared to records for the WIPP station posted online by the Desert Research Institute (WRCC, 2008). The online precipitation data included a longer historical record with additional details; specifically, it listed any days missing from the record in a given month. In cases where the online data differed from data provided by WTS (apparently due to WTS having a more complete record in recent years), the data provided by WTS were assumed to be more reliable.

Complete water quality data for the full period of record since 1996 are presented in Appendix B. Water level data are presented in the hydrographs provided in Appendix C. The geologic contact elevations, based on well logs for the SSW monitor wells, are also provided on the hydrographs in Appendix C. Precipitation summary results are presented in Figure 3, and a more complete data set of monthly and annual precipitation totals is provided on the hydrographs in Appendix C.

5.2 Time-Series Analysis

A time-series analysis was completed to examine water level trends for each of the SSW monitor wells. Water level hydrographs were plotted showing the record of water level fluctuations based on regular water level measurements that have been performed on all monitor wells since their installation. Also plotted on the hydrographs are additional data including the following:

- Monthly precipitation totals from the WIPP weather station
- TDS concentration
- Elevation of the Santa Rosa/Dewey Lake contact and top of Santa Rosa
- Monitor well screened interval

The data plotted on the hydrographs allow the water level elevation to be seen in relation to the saturated thickness above the Santa Rosa/Dewey Lake contact. In some cases, the water level elevation rises into the Gatuña. The hydrographs include data needed to evaluate changes in water levels in comparison to precipitation rates and fluctuations in TDS concentration.

Hydrographs for each of the SSW monitor wells are included in Appendix C. Select hydrographs are provided in Figures 11 through 16. The SSW water levels appear to correlate with precipitation rates over the 12-year period of record.

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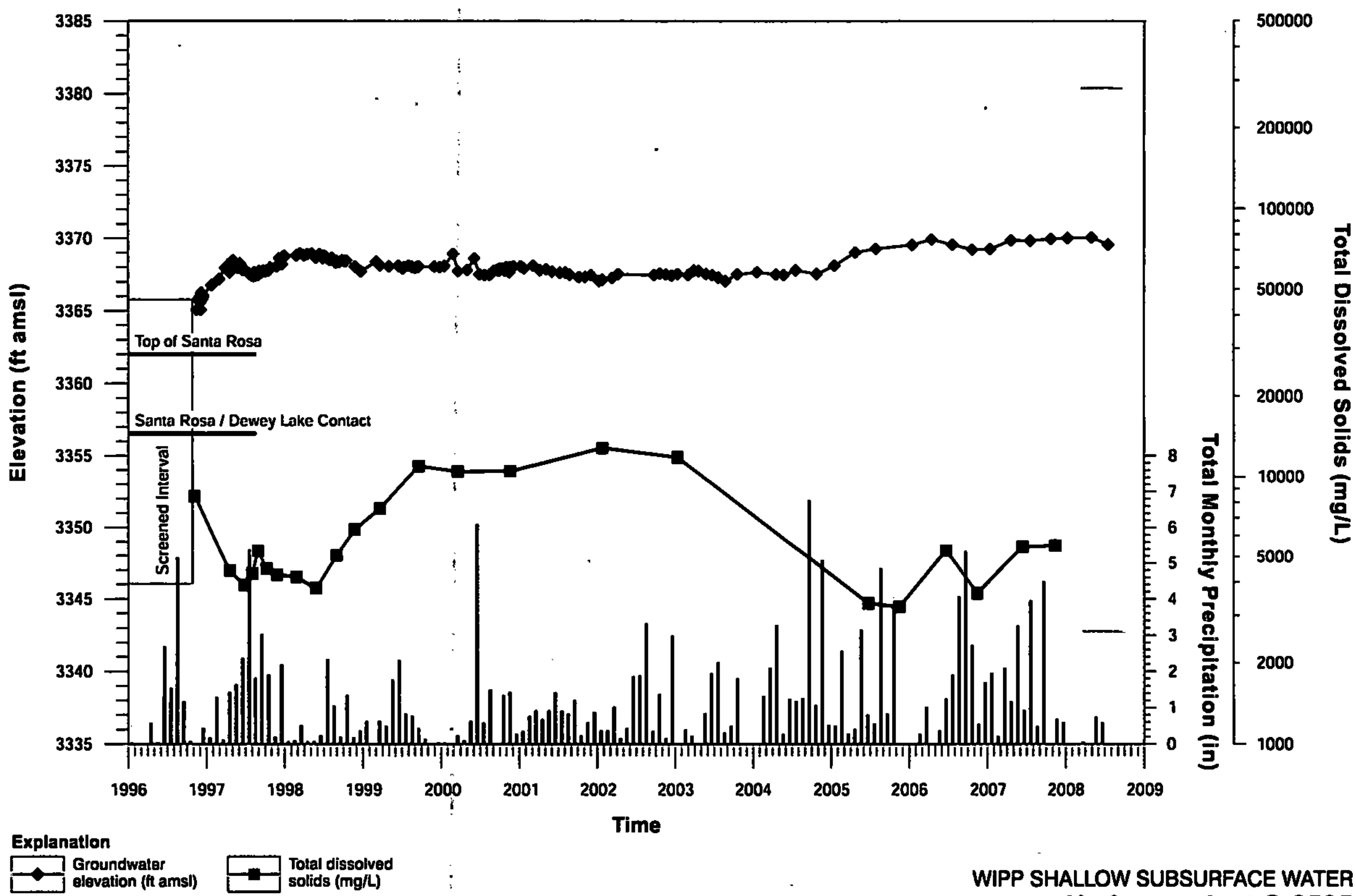

WIPP SHALLOW SUBSURFACE WATER

Hydrograph at C-2505

Monthly Precipitation and Total Dissolved Solids

Figure 11

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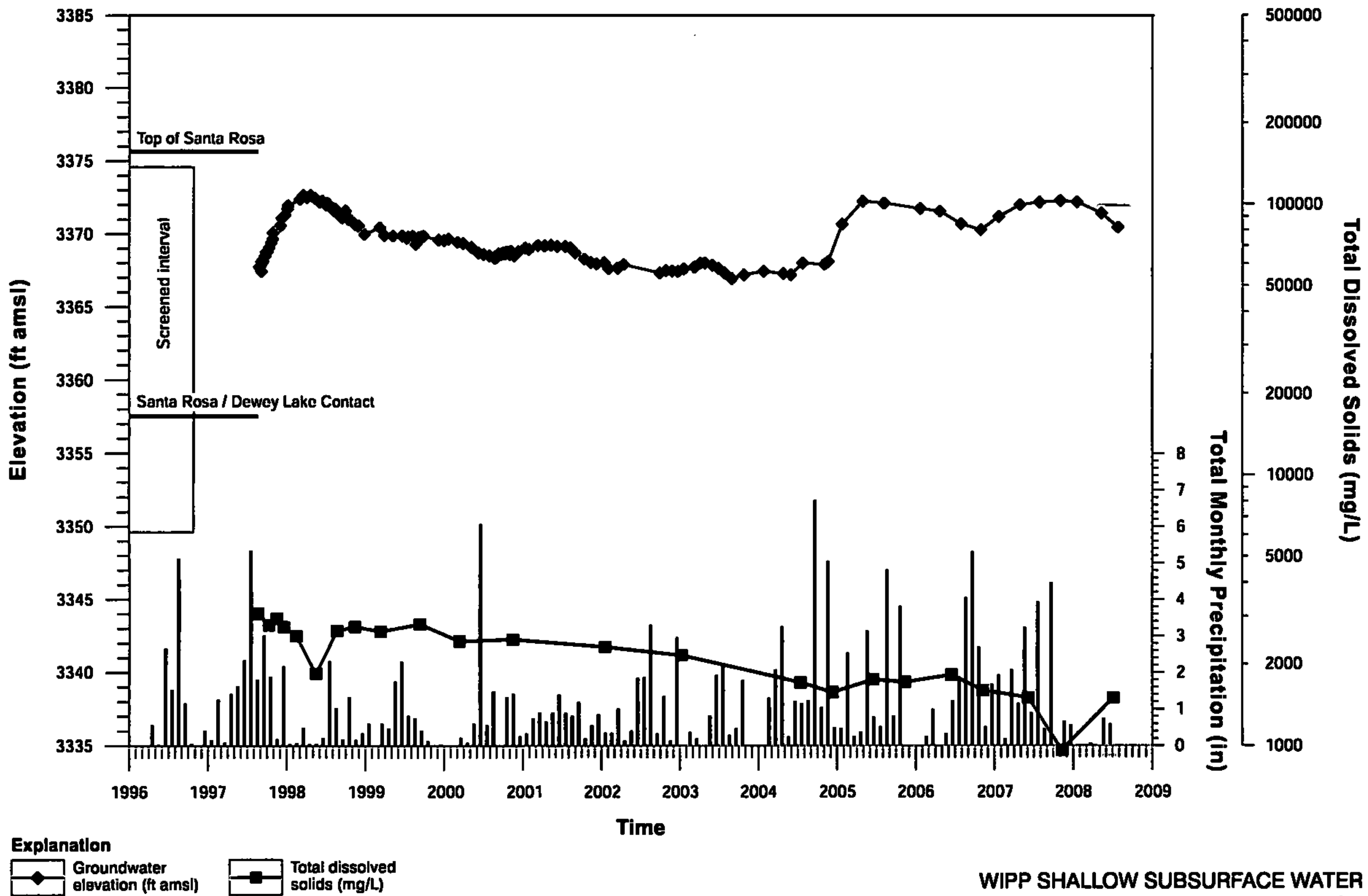

WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-10

Monthly Precipitation and Total Dissolved Solids

Figure 12

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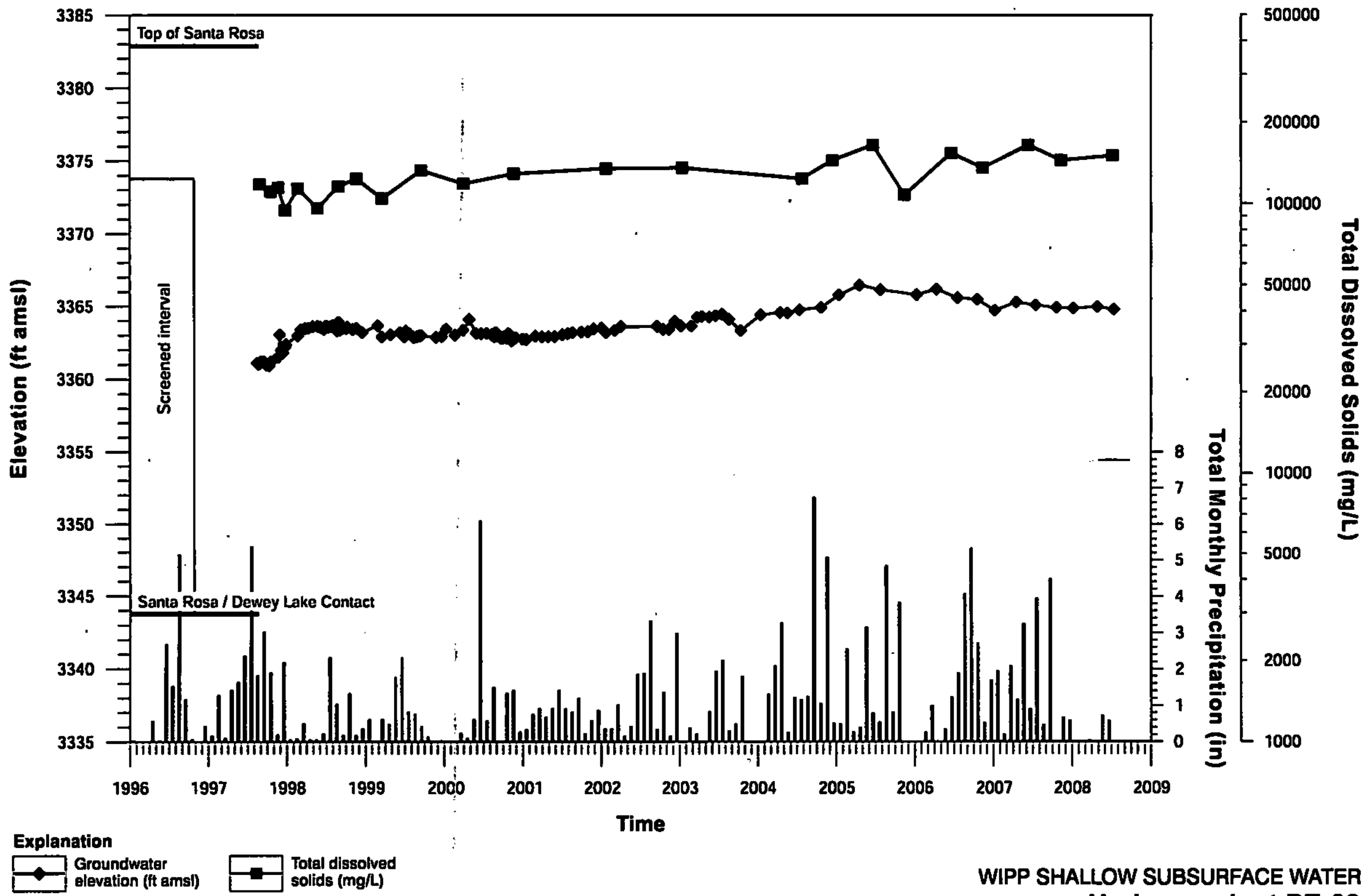

WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-09

Monthly Precipitation and Total Dissolved Solids

Figure 13

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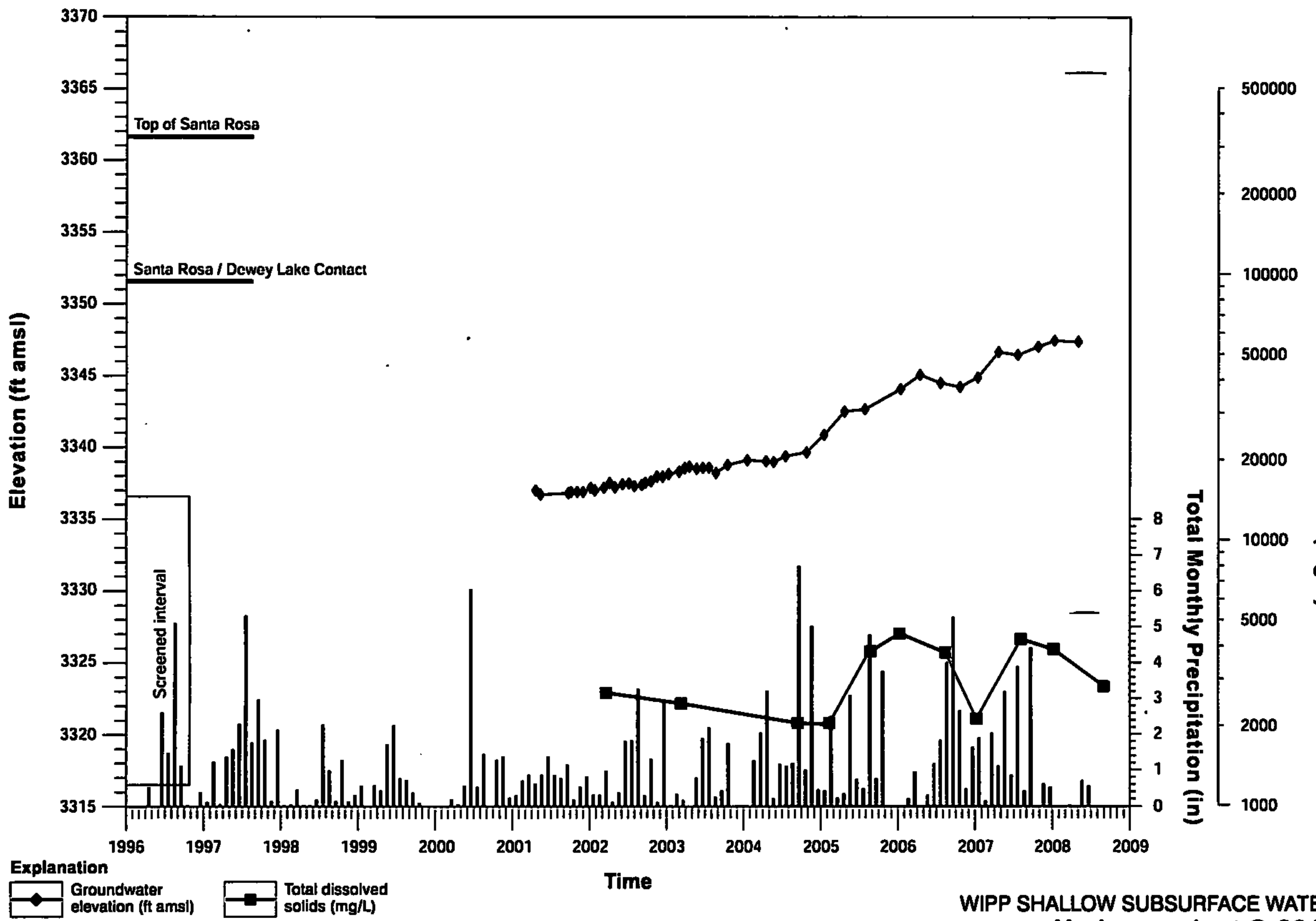

WIPP SHALLOW SUBSURFACE WATER

Hydrograph at C-2811

Monthly Precipitation and Total Dissolved Solids

Figure 14

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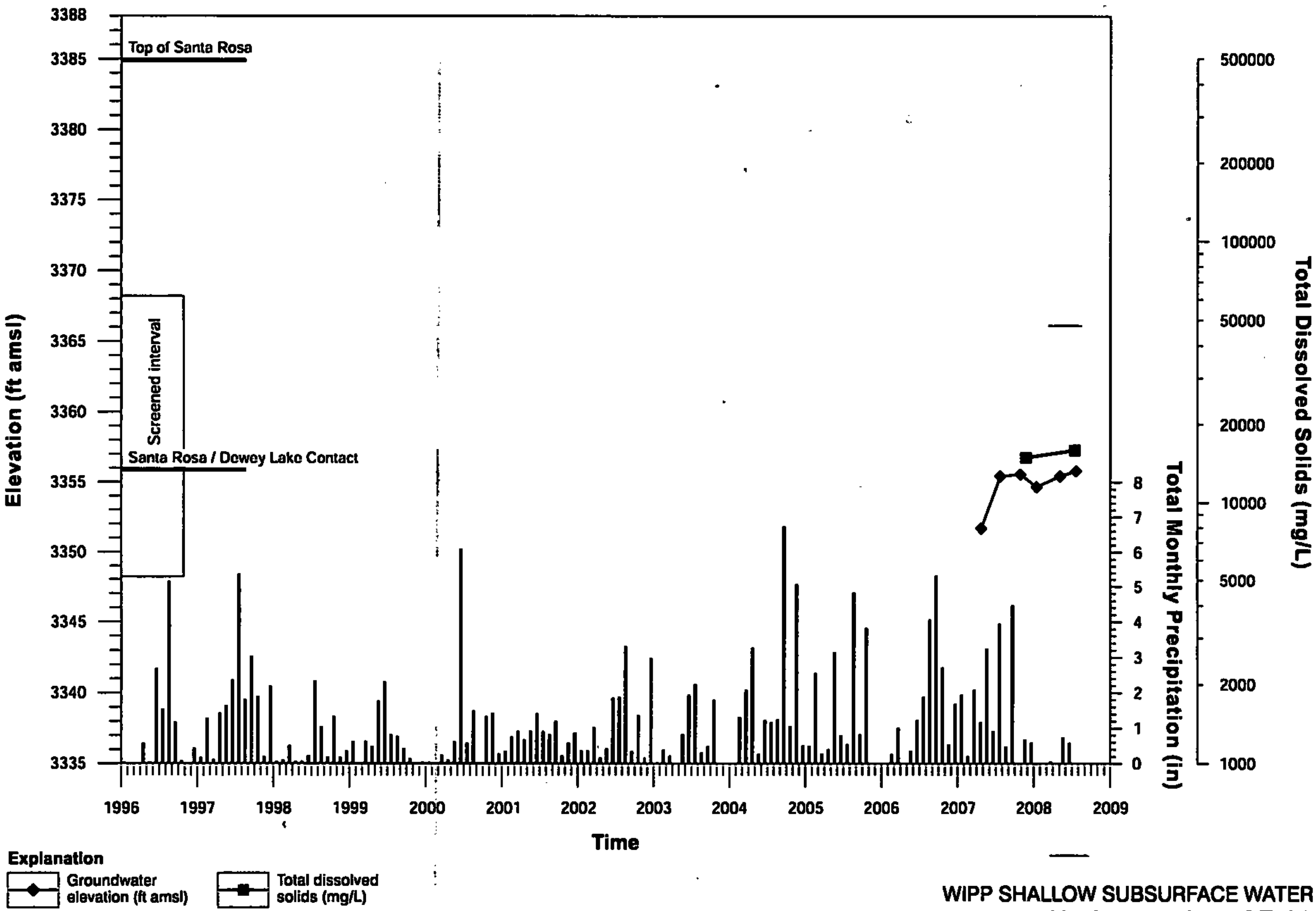

WIPP SHALLOW SUBSURFACE WATER
Hydrograph at PZ-08
Monthly Precipitation and Total Dissolved Solids

Figure 15

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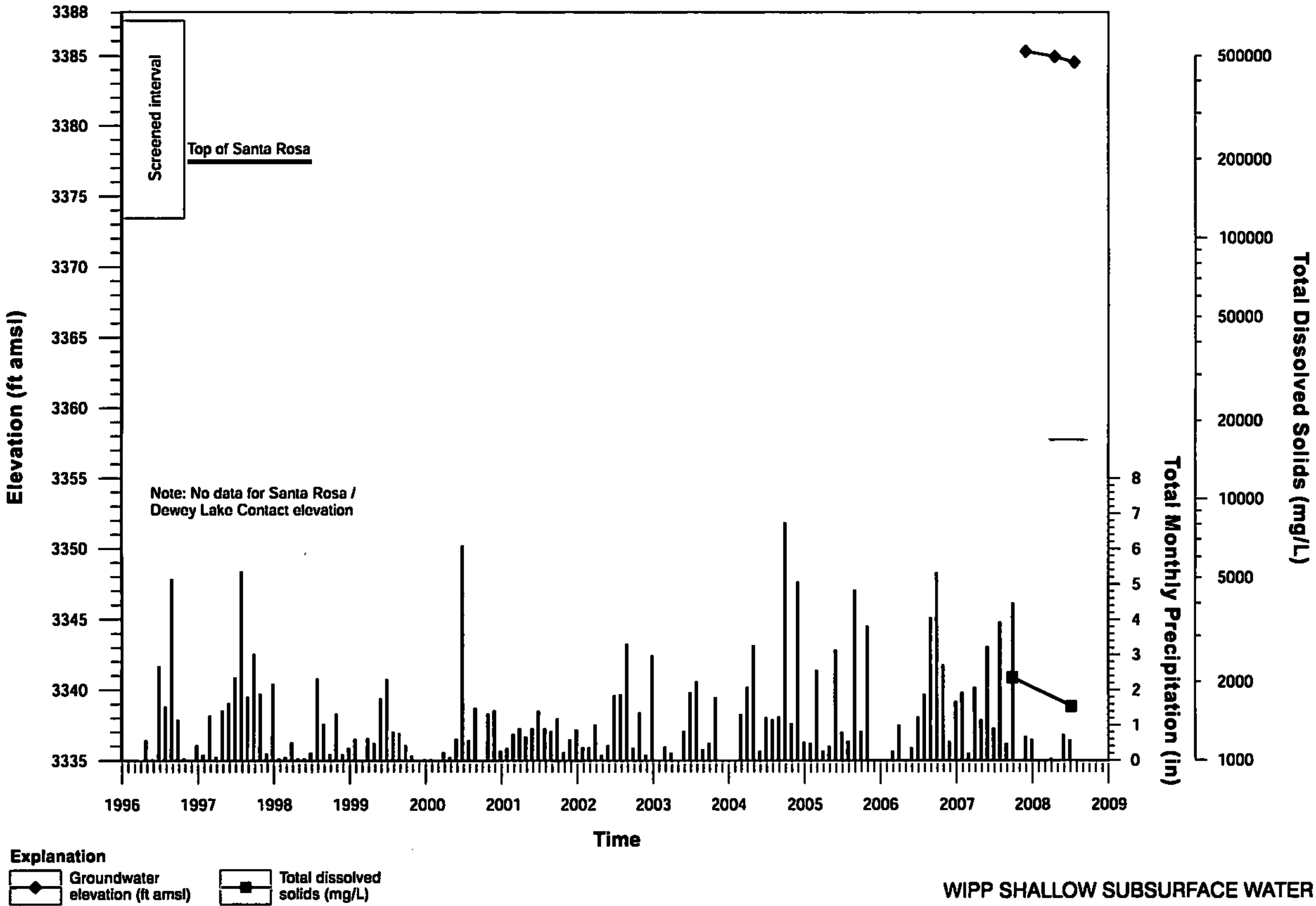

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Hydrograph at PZ-15

Monthly Precipitation and Total Dissolved Solids

Figure 16

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8-28-08

JN ES08.0072

Water levels were observed to rise significantly in the SSW monitor wells during the first years of record, from 1996 to 1998. The first 15 SSW monitor wells were installed in 1996 and 1997. In 1997, when the total annual precipitation (23.91 in/yr) was nearly twice the average annual precipitation (13.24 in/yr at the WIPP weather station), SSW water levels increased sharply. In contrast, during the ensuing years from 1999 to 2004, when the total annual precipitation was below the WIPP station average (Figure 3), water levels remained fairly constant in most monitor wells. From 1999 to 2004, some wells show gradual rising or falling trends. In 2005, a strong water level rise was observed in many of the wells, after which water levels again leveled out in 2006 and 2007. The water level rise in 2005 follows a year of heavy precipitation in 2004, when the annual precipitation was 23.78 inches. Early 2005 also had heavy precipitation (6.78 inches from January through May 2005) at the time of year when precipitation rates are typically low. The most recent monitoring event included in the database, the June 2008 event, indicated a decline in water levels in most wells.

The hydrograph for monitor well C-2505 (Figure 11) is a typical example that illustrates the general trends observed in most monitor wells. Water levels were rising quickly in 1996 and 1997, shortly after the first monitor wells were installed. The water level declines gradually from 1999 to 2004, followed by a sharp water level rise in 2005. The plot of TDS concentrations shows that the SSW salinity tends to be highly variable. The TDS concentration varies from approximately 3,000 to 13,000 mg/L, with an apparent correlation between low TDS concentrations during times of increasing water levels and higher TDS concentrations when water levels are constant.

The rise in water levels observed in 2005 occurs in the same time frame during which the infiltration control systems were being constructed to stop recharge from the four original stormwater ponds and the Salt Storage Area. The infiltration controls for these areas were completed from July 2004 to July 2005. The infiltration controls presumably prevented some recharge from occurring as a result of the heavy precipitation period in 2004 and early 2005. However, the largest recharge source, Detention Basin A, was the last area to be lined in July 2005. The response to recharge occurring in 2004 and 2005 is evident in the hydrograph trends. The strongest water level increase in 2005 is observed in monitor wells PZ-10 (Figure 12) and PZ-12, located near the stormwater retention ponds that remained unlined during 2004. The 2005 water level rise is moderate in most monitor wells in the main SSW lens and is least pronounced in the northernmost wells, PZ-09 (Figure 13) and PZ-11.

Other notable features of the hydrographs include the following:

- *C-2811* (Figure 14): A steady water level rise has been observed in monitor well C-2811 since its installation. This trend suggests that the saturation observed in this well may be connected to the SSW. The rising water level is consistent with the conceptual model of the SSW lens gradually spreading out, increasing the saturated thickness at C-2811 approximately 1,300 feet south of the nearest SSW monitoring location, PZ-12 (Figure 4). Monitor well C-2811 was drilled in March 2001. Saturation was encountered in the upper Dewey Lake at a depth of approximately 60 feet bgs (Powers, 2002). According to Powers (2002), the Dewey Lake encountered at C-2811 was not saturated during drilling of earlier wells nearby. The water level in C-2811 has risen 12 feet since its installation.

- *PZ-08* (Figure 15): In March 2007, saturation was detected at monitor well PZ-08 for the first time since monitoring began in 1996. By March 2008, the water level in this monitor well had risen 4 feet. Like at monitor well C-2811, the detection of saturation and rising water level in PZ-08 is consistent with the conceptual model of the SSW lens gradually spreading out, increasing the saturated thickness at PZ-08.

- *PZ-15* (Figure 16): The water level elevation at monitor well PZ-15 is higher than at any of the other SSW monitor wells. This saturated zone exists in the Gatuña, perched above the Santa Rosa. The water level at PZ-15 suggests that this saturated zone is not directly connected to the main SSW lens encountered by the first 12 PZ-series wells and the 3 C-series wells.

5.3 Water Level–Precipitation Cross Correlation Analysis

Cross correlation analysis was used to quantitatively examine the relationship between monitor well water levels and precipitation. Cross correlation is a statistical measure of the degree of correlation between two series. Given two time-series, each consisting of a sequence of observations of some variable measured at successive, uniform intervals, an intuitive measure of their correlation is given by multiplying the series point-by-point and summing the results. If the series are well correlated, the result will be large and positive. If they are well correlated but opposite in sign (i.e., negatively correlated), the result will be large and negative. If they are uncorrelated, the agreement and disagreement of the signs will be random and the resulting sum will be small in magnitude. The magnitude of the result can be scaled by the product of the standard deviation of the two series in order to facilitate interpretation of the result. Normalized this way, a resulting sum of 1 means that the series are perfectly correlated and a resulting sum of zero means that the series are completely uncorrelated. This operation can be performed for simultaneous observations from the two series, providing the "instantaneous" correlation between the observables. It can also be performed for measurements offset by one or more sampling intervals, providing the correlation between observables lagged in time. Each time the series are shifted, the number of overlapping data points is reduced by one, making it impracticable to evaluate the cross correlation at lags comparable to the total length of the series.

To perform the cross correlation operation, the time-series must have certain characteristics. The observations from each series must be simultaneous and separated by constant intervals of time. The series must be stationary—the descriptive statistics of the series (mean, variance and higher order moments) should not depend on when the measurement was made. In effect, this means that there should be no trend in the series; if there is, the trend should be removed. Series were tested for stationarity by examining their autocorrelation functions. Just as two series may be compared by their cross correlation, a series may be compared to itself using the autocorrelation. Operationally, autocorrelation is identical to cross correlation. The autocorrelation provides a means of assessing the similarity measurements of some observable to subsequent measurements. For a stationary series, the measurement of an observable at any given time should not correlate with previous measurements. This can be seen in the autocorrelation as a steep drop at lags greater than zero.

Four wells were included in this analysis, PZ-07 (adjacent to the Salt Pile Evaporation Pond), PZ-09 (immediately outside the east stormwater diversion berm), PZ-10 (adjacent to Detention

Basin A) and PZ-12 (between Pond 1 and Pond 2). Water levels measurements in these wells have been made on varying schedules since their installation. Quarterly measurements are available from September 1997 to March 2008, with the exception of December 1997, December 1998, September 1999, March 2002, June 2002, and September 2005. For these quarters, the water level was estimated by a linear interpolation of the previous and subsequent measurements. For quarters in which more than one measurement of water level was made, the average monthly water level was used. Quarterly cumulative precipitation was obtained from the WIPP meteorological station. Stationarity for both types of data was achieved by subtracting the fitted linear trend from each series. This approach was confirmed by analysis of the autocorrelation function, which showed the expected pattern (Appendix D).

Two scenarios were analyzed: (1) the unlined scenario (before construction of infiltration controls) and (2) the lined scenario (after construction of infiltration controls). The unlined scenario was defined to apply from September 1997 to June 2005. The lined scenario was defined to apply from October 2005 to March 2008. Cross correlation plots of the unlined scenario for PZ-07 and PZ-09 showed a similar pattern of the cross correlation of a negative correlation at zero lag rising to a positive sill at a lag of 3 (9 months). Cross correlation for PZ-10 was similar, though it rose to a sill value at a lag of 2 (6 months). The cross correlation of PZ-12 was positive at lag zero and rose to a sill at a lag of 1 (3 months) before falling off thereafter. The results for PZ-07, PZ-09 and PZ-10 are consistent with infiltration times of between 6 and 9 months. The cross correlation for PZ-12 shows a stronger correlation at lag zero and at 3 months, suggesting a shorter infiltration time. Analysis of the lined scenario did not provide useful results due to the short period of record and very limited dataset when evaluating cross correlation at lag times.

5.4 Water Level Contour Maps

Water level contour maps for the SSW were prepared to show water level and flow direction changes over the complete monitoring record. A series of water level maps is provided in Appendix E, illustrating approximately annual time steps. This section discusses the water level contour map preparation methods and results.

5.4.1 Water Level Density Correction

The high TDS concentrations in the SSW at many locations result in a measurable difference in the density of the SSW relative to freshwater. Given the differences in TDS across the site, the potential for a density gradient to contribute to the hydraulic gradient must be considered. Because of contrasting TDS concentrations observed in the SSW, corrections were made to the measured water levels to account for water density differences.

The concept of equivalent freshwater head was employed to account for density differences across the SSW. Equivalent freshwater head is the height of a column of freshwater with the same potential energy as the measured height of a column of brackish to briny water. The equivalent freshwater head represents the potentiometric surface that controls the flow rate and direction within a hydrologic regime with variable salinity.

To adjust the measured water level, a calculated specific gravity was multiplied by the height of the water column, yielding an equivalent freshwater head water elevation. The base of the column in each well was defined as the elevation of the surface on which the SSW is perched. In most of the wells, the surface used was the Dewey Lake/Santa Rosa contact. In the new wells PZ-13 and PZ-15, water is perched on hard layers within the Santa Rosa. Equivalent freshwater head was obtained in this case by multiplying the measured height of the column of SSW in a well by its specific gravity. The corresponding water level elevation was obtained by adding the resulting equivalent freshwater head to the elevation of the surface above which it was measured.

Specific gravity measurements were available over much of the period of record for most of the wells; however, the laboratory-measured specific gravity values were not reported for any wells after 2002, and they were not of high precision. Therefore, it was necessary to estimate specific gravity from the available data using a consistent procedure. It was assumed that specific gravity could be predicted from solute concentration alone, neglecting any variations in pressure and temperature across the site on a given date (Guo and Langevin, 2002).

Of the data available for the whole period of record, only TDS and chloride were considered predictive of specific gravity. Because most of the TDS in the SSW is attributable to halite dissolution, the concentrations of TDS, sodium, and chloride are typically dependent variables, although TDS is a more general measure of the total solute load. Sodium was generally not measured after 2002.

A site-specific relationship between specific gravity and TDS was preferred because relationships for saline water of differing quality do not reflect the exact composition and specific gravity of the SSW. High-precision measurements of specific gravity made with hydrometers are available for samples that were also analyzed for TDS and chloride in December 2001. Using the specific gravity data, plots were prepared of specific gravity versus TDS and specific gravity versus chloride. Despite temperature variation of a few degrees Celsius between the samples, the measured specific gravities were highly correlated to both TDS and chloride concentrations and produced simple linear relationships. One measured specific gravity value deviated significantly from the relationship and was rejected as anomalous and possibly a typographic error (an original data report could not be located, but rearrangement of the last two digits would have placed the value along the same line as the others). To avoid reliance on insignificant digits, and for easier comparison to literature values, the intercepts of the fitted lines were prescribed values of unity (Figure 17). The resulting equation relating specific gravity to TDS concentration was as follows:

$$SG = 1 + TDS \cdot 6.6 \times 10^{-7} \tag{1}$$

where SG = specific gravity

TDS = TDS concentration (mg/L)

The equation relating specific gravity to chloride concentration was as follows:

$$SG = 1 + Cl \cdot 1.2 \times 10^{-6} \tag{2}$$

where Cl = chloride concentration (mg/L)

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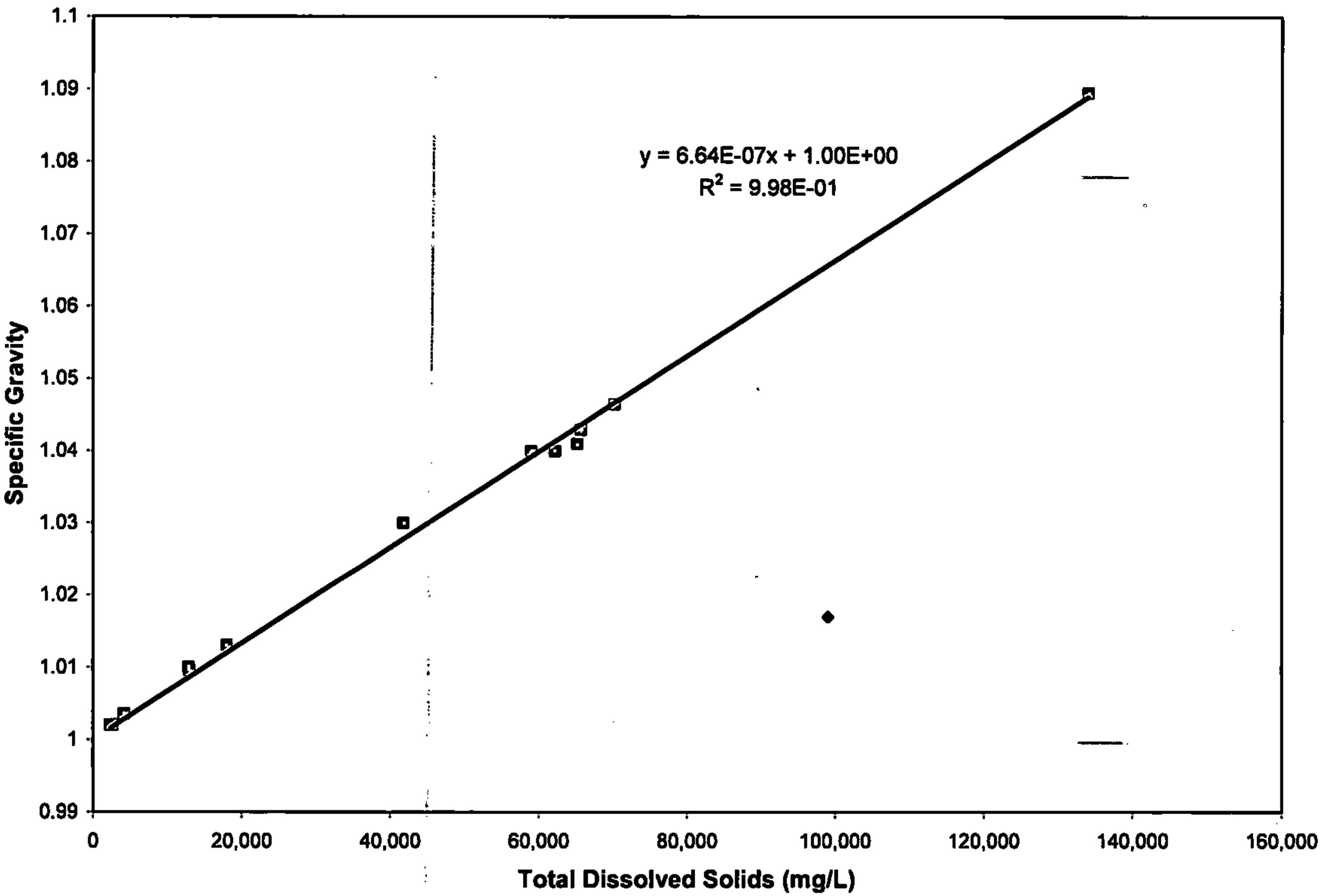

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Specific Gravity–TDS Relationship

Figure 17

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The relationship between specific gravity and TDS concentration was retained to predict specific gravities used in calculations of equivalent freshwater head. The relationship between specific gravity and chloride concentration was useful for validation purposes because a U.S. Geological Survey (USGS) study of halite brine near Syracuse, New York (Yager et al., 2007) reported a corresponding relationship intended for use with an updated version of the variable-density flow model, SEAWAT (Guo and Langevin, 2002), that was identical to the SSW relationship within the accuracy of the results. The report did not tabulate all the data used and did not state the equation of the line, but by digitizing a plot of the line, the equation was determined to be as follows:

$$SG = 1.000001 + Cl \cdot 1.19 \times 10^{-6} \qquad (3)$$

The authors reported a coefficient of determination (R^2) of 0.988 for chloride concentrations between 0 and roughly 125,000 mg/L (Yager et al., 2007).

Upon verifying the relationship between chloride concentration and measured specific gravity for the WIPP halite-dominated water, the corollary relationship between TDS concentration and measured specific gravity was used to compute the equivalent freshwater head for each water level measurement used in preparing water level contour maps for the SSW.

5.4.2 Water Level Contour Maps

Water level contour maps were prepared using the equivalent freshwater head elevations as the basis for the potentiometric surface contours. The contour maps were generated using Surfer software to interpolate the data, without any additional interpretation or revisions. A series of 12 water level contour maps is provided in Appendix E. These maps show a time-series of water level changes at approximately 1-year time steps over the monitoring record. The frequency of water level measurements has varied over the monitoring record. Most of the contour maps reflect water level measurements collected in October or another fall month each year. Fall data were selected because this sampling time follows the period of heaviest precipitation during the summer monsoon season. During some years, data were not available for a consistent time horizon; therefore, data from other seasons are used in some of the water level contour maps. The series of maps also includes the most recent water level measurements included in the database (the June 2008 measurements).

Figures 18 and 19 show the water level contours for the first (October 1997) and last (June 2008) monitoring periods selected. The time-series of maps consistently uses the set of SSW monitor wells installed in 1996 and 1997, including C-2505, -2506, and -2507 and PZ-01 through -12, but excluding PZ-08, which was dry until 2007. The contour maps exclude monitor well PZ-08, which was dry until 2007, and monitor wells PZ-13, PZ-14, and C-2811, which are not conclusively linked by a direct hydrologic connection with the main SSW lens.

5.4.3 Direction and Rate of Flow

The series of water level contour maps shows that the potentiometric surface has remained relatively consistent from 1997 to 2008 with respect to SSW flow direction and gradient. Each of the contour maps shows a similar pattern of contours. However, water levels have consistently risen in the monitor wells by approximately 2 to 4 feet.

The water level contour maps indicate that a water table mound exists near the Salt Pile Evaporation Pond and Salt Storage Area. The SSW flow pattern suggests radial flow outward from the high point at PZ-07, with a predominantly eastward flow toward PZ-03, -05, and -09 and a predominantly southward flow toward PZ-10 and -12. In the WIPP facilities area, where most SSW monitor wells are located, the SSW flows south and east from the apex of the water table mound. Monitor well PZ-11, located approximately 200 feet northwest of the Salt Pile Evaporation Pond, suggests a gradient to the north; however, the existing monitor well locations do not provide sufficient data to clearly demonstrate the gradient and extent of the SSW to the north and west of the water table mound. The SPDV monitor wells PZ-13, -14, and -15 appear to monitor SSW that is distinct from the main SSW lens. The SPDV monitor wells do not show a radial flow pattern that is consistent with the other SSW monitor wells. Water level elevations in the SPDV monitor wells are higher than the water level at PZ-08, which is located between the SPDV wells and the main SSW lens.

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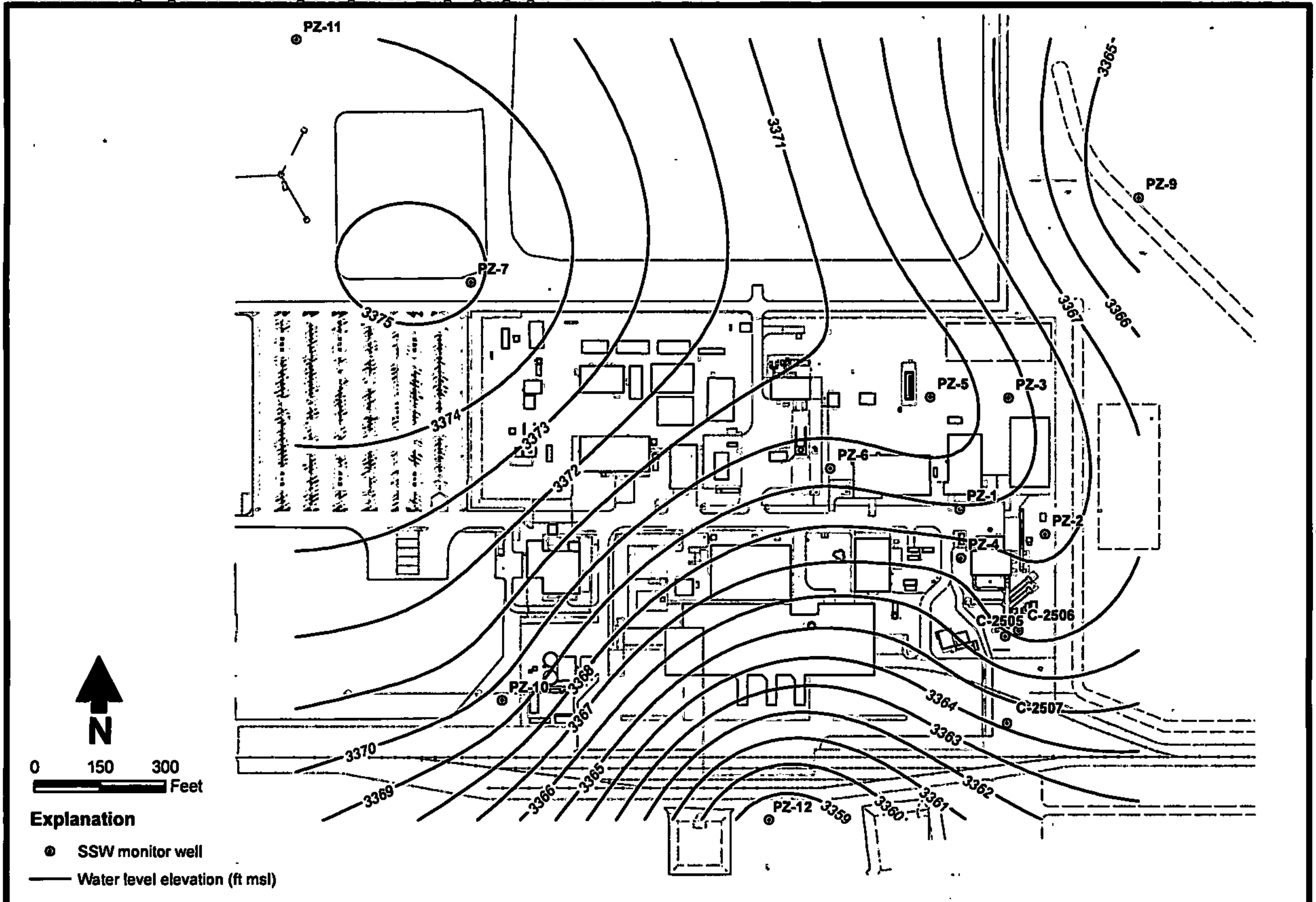

Figure 18

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Water Level Elevation, October 1997

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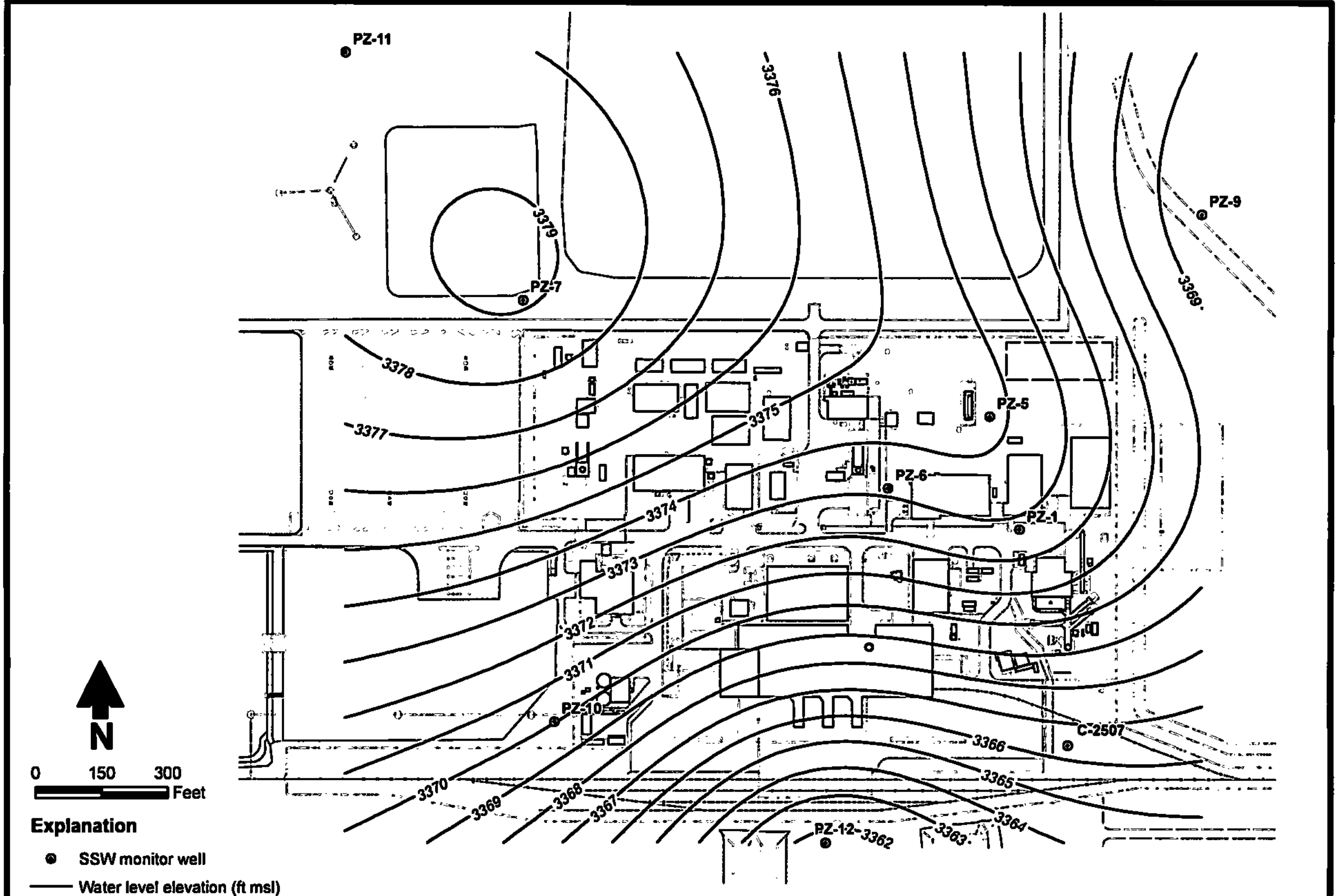

Figure 19

WIPP SHALLOW SUBSURFACE WATER

Water Level Elevation, June 2008

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9/3/2008
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The potentiometric surface is influenced by the areas of recharge and geologic controls on flow. Previous recharge estimates found that the Salt Storage Area, Salt Pile Evaporation Pond, and Detention Basin A are the most significant recharge sources (DBS&A, 2003). SSW water table mounding would be expected in these high recharge areas. The potentiometric surface is also affected by geologic controls that include the following:

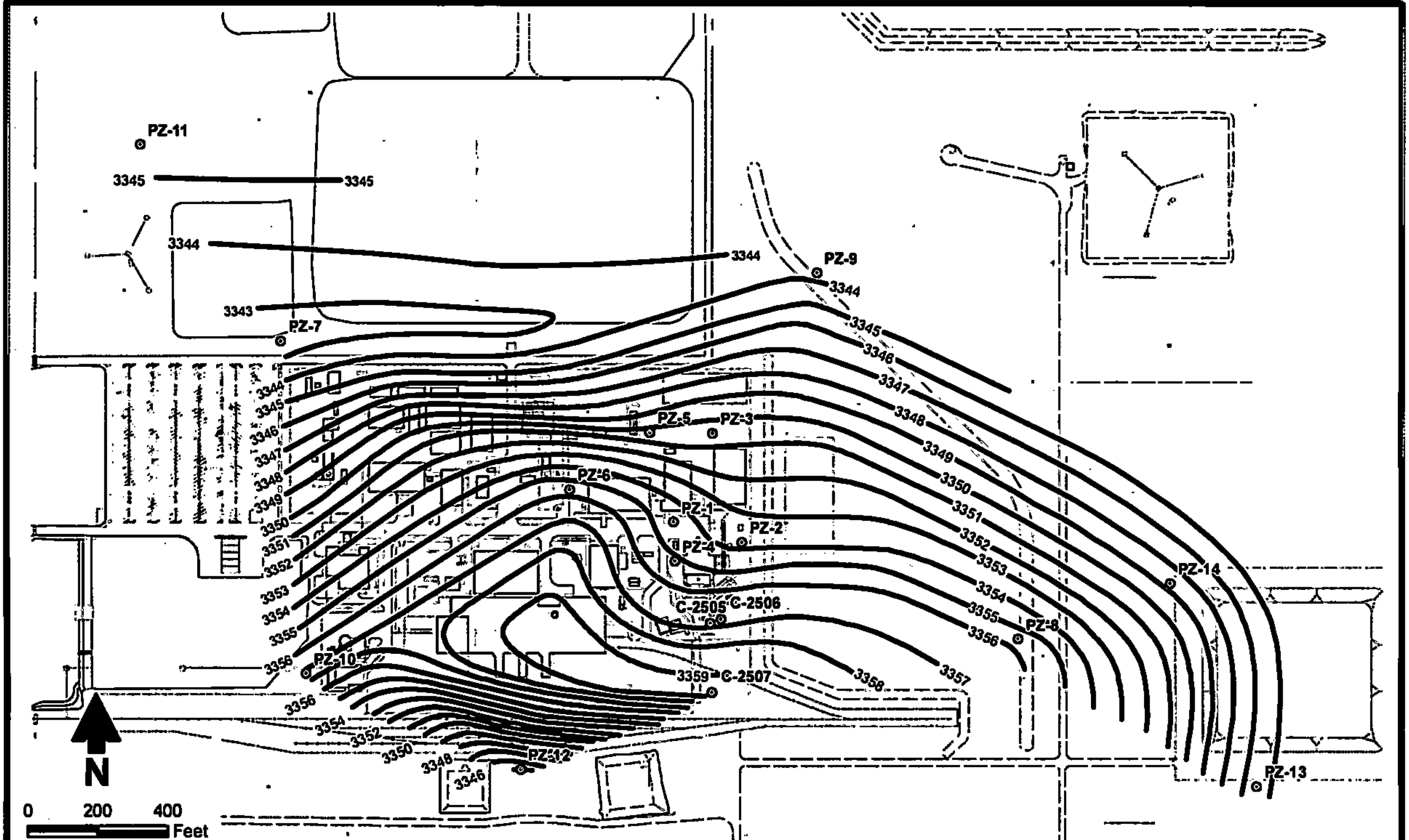
- Configuration of the irregular Santa Rosa/Dewey Lake contact that forms the perching horizon
- Other perching horizons, such as the Gatuña/Santa Rosa contact at PZ-15 and middle Santa Rosa at PZ-13
- Hydraulic conductivity of the formations where SSW occurs

The Santa Rosa/Dewey Lake contact is an erosional unconformity with an irregular surface. A contour map of the contact elevation based on contact elevations from the well logs is provided in Figure 20. The contact surface exhibits a higher ridge area between monitor wells C-2505 and PZ-10 and a lower trough area near PZ-07. The contact surface drops steeply to the south toward PZ-12. The SSW flow regime interacts with the contact surface at the top of the low-permeability Dewey Lake.

The hydraulic conductivity of the formations involved with SSW flow also influences the potentiometric surface. Pumping and slug tests performed in 1996 and 1997 indicated a lower Santa Rosa hydraulic conductivity zone in the area around PZ-01, -02, and -05 (Intera, 1996, 1997a, and 1997b). The low hydraulic conductivity in this area may play a role in the slow migration of SSW to eventually reach PZ-08 in 2007. This zone may also limit the rate of flow between the SSW and new monitor wells PZ-13 and -14 near the SPDV pile. The rate of flow to C-2811, if this well is in hydraulic connection with the SSW, is also affected by the contrasting hydraulic conductivity in the Dewey Lake potentially limiting downward flow to a saturated horizon in the upper Dewey Lake, approximately 10 feet below the Santa Rosa/Dewey Lake contact.

The water level contour map from June 2008 (Figure 19) shows that the hydraulic gradient and flow direction are variable. This variation leads to variable flow rates, with the flow rate

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/FIG20_CONTOURS_OF_SANTAROSA_DEWEYLAKE.MXD 803090



Explanation

SSW monitor well

Santa Rosa/Dewey Lake contact elevation contours (ft msl)

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Contours of Santa Rosa/Dewey Lake Contact

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Figure 20

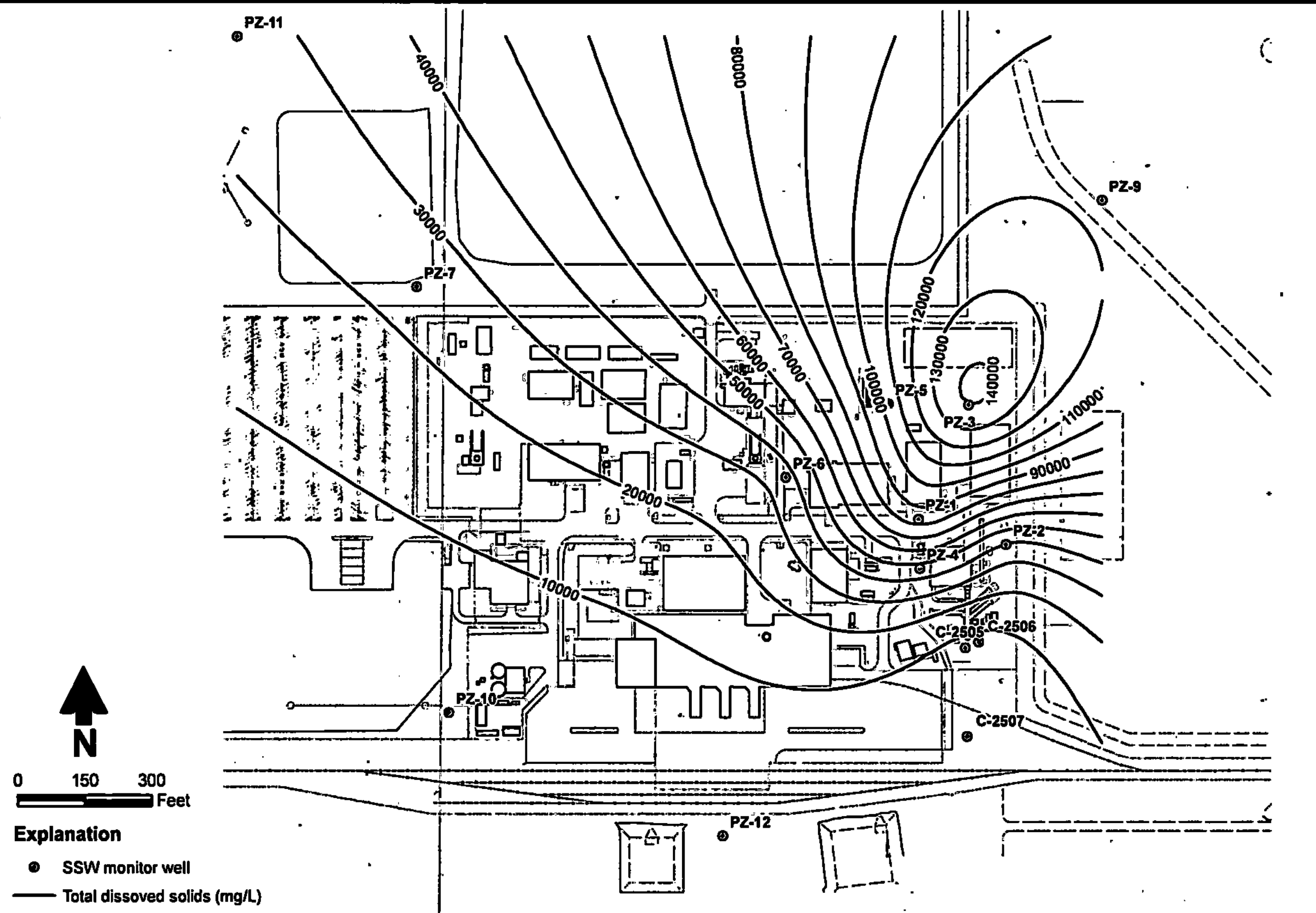
dependent on hydraulic gradient and hydraulic conductivity of the formation. Using the June 2008 contours, the typical hydraulic gradient is approximately 0.012 foot per foot (ft/ft) toward the southeast. A typical SSW seepage velocity can then be calculated using an effective porosity of 10 percent (DBS&A, 2003) and the geometric mean hydraulic conductivity (Intera, 1997a) of 1.5 feet per day (ft/d) for wells PZ-06, -07, -10, and -12 (located in the central portion of the site where a relatively uniform southeasterly gradient is observed). The resulting seepage velocity is 0.18 ft/d, which represents a typical SSW flow velocity for current conditions.

5.5 Water Quality Contour Maps

Water quality contour maps for the SSW were prepared to evaluate trends in water quality over the complete monitoring record. The water quality maps use TDS concentration as the indicator of SSW salinity because elevated salinity is the most significant water quality indicator for the SSW. The contour maps were generated using Surfer software to interpolate the data, with no additional interpretation or revisions. A series of water quality contour maps is provided in Appendix F illustrating approximately annual time steps, the same time steps illustrated in water level contour maps. This section discusses the water quality contour map preparation methods and results.

Figures 21 through 23 show the water quality contours for October 1997, June 2004, and June 2008 monitoring periods. These monitoring periods represent the start and end of the monitoring record, as well as the time in June 2004 when salinity reached peak concentrations. The time-series of maps uses the set of SSW monitor wells installed in 1996 and 1997, including C-2505, C-2506, C-2507, and PZ-01 through -12, but excluding PZ-08, which was dry until 2007, and excluding monitor wells PZ-13, PZ-14, and C-2811, which are not conclusively linked by a direct hydrologic connection with the main SSW lens. During early years of monitoring, from 1997 to 2002, all 14 of the monitor wells were monitored for TDS. Beginning in 2003, the number of wells monitored on a regular basis was reduced to 9; these wells were used in water quality contour maps from 2004 to 2008.

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_1997_OCT_FIG_21.MXD 8/2/09



WIPP SHALLOW SUBSURFACE WATER

Total Dissolved Solids, October 1997

Figure 21

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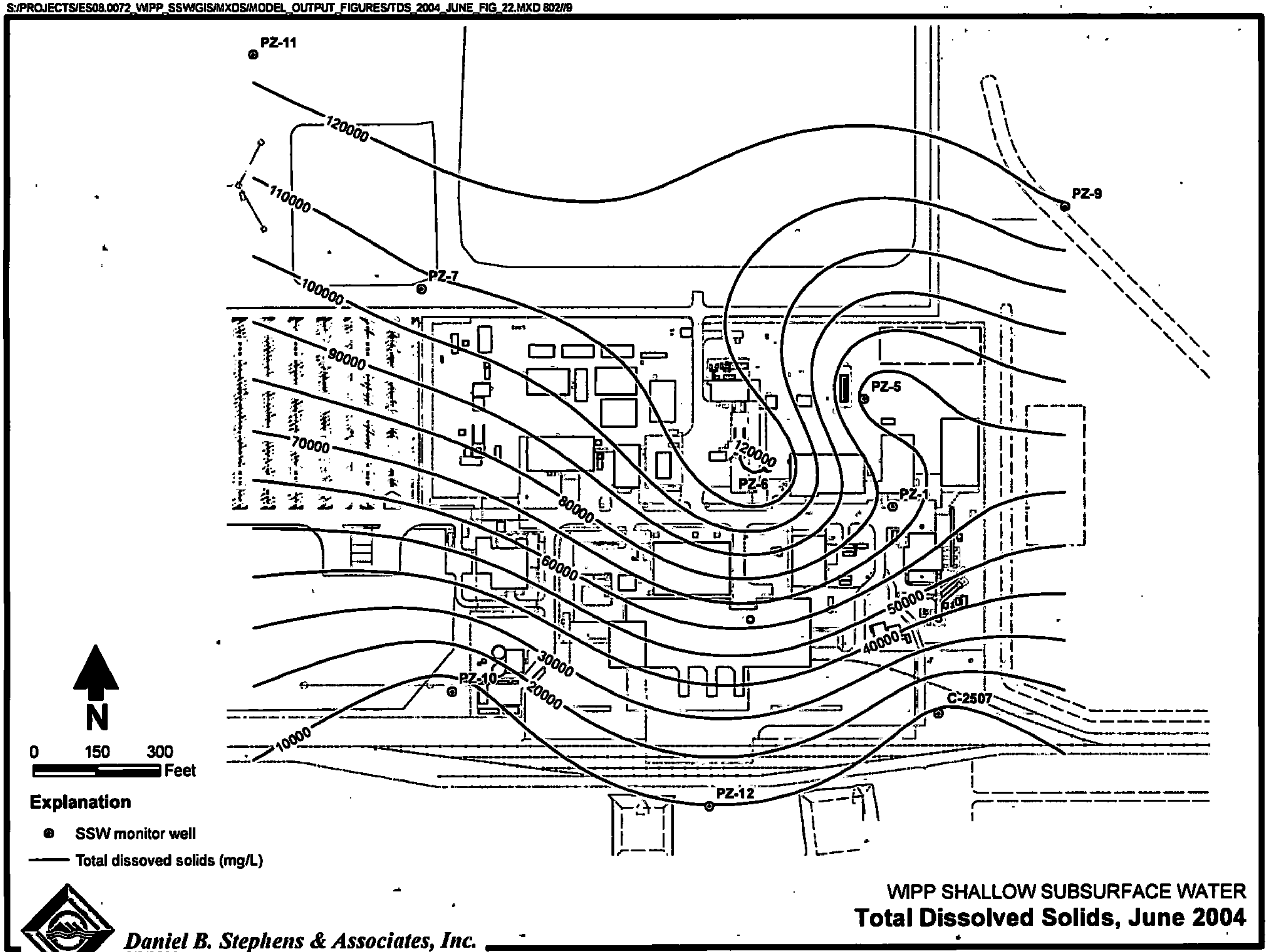

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Total Dissolved Solids, June 2004

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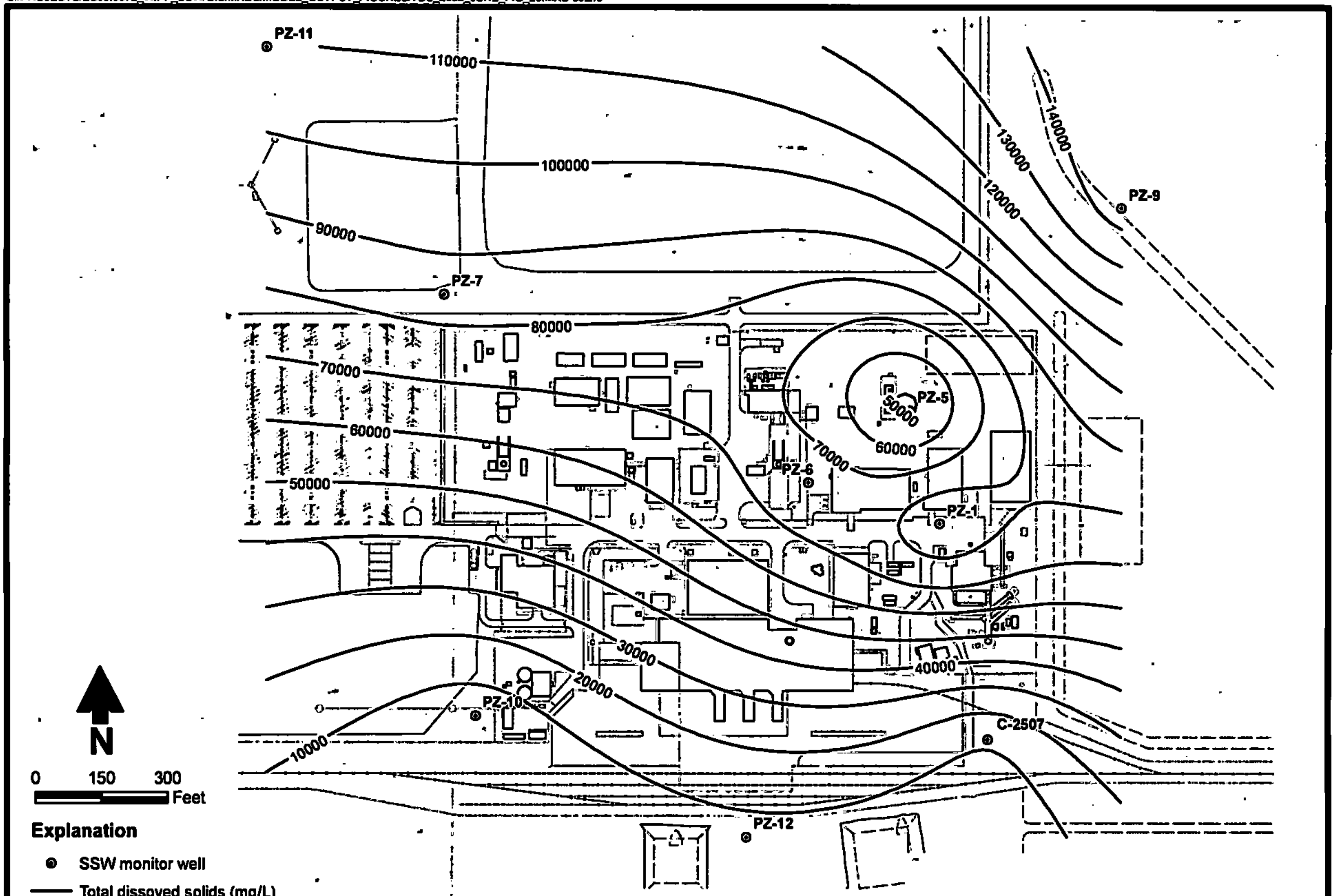
Figure 22

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_2008_JUNE_FIG_23.MXD 8/2//9



WIPP SHALLOW SUBSURFACE WATER

Total Dissolved Solids, June 2008

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Figure 23

5.5.1 Salinity Distribution

The series of water quality contour maps shows that salinity levels are highly variable in the SSW monitor wells. TDS concentrations range from less than 10,000 mg/L to more than 200,000 mg/L. All of the SSW is characterized by high salinity, ranging from water considered brackish (TDS concentration of approximately 3,000 mg/L) to water classified as brine (TDS concentration greater than the salinity of seawater, or approximately 35,000 mg/L [National Academy of Sciences, 2008]). The highest TDS concentrations are found throughout the northern half of the WIPP facilities area and near the SPDV pile, where much of the water contains TDS concentrations exceeding 50,000 mg/L. Wells near the Salt Storage Area, Salt Pile Evaporation Pond, and SPDV pile have the highest salinity. TDS concentrations are much lower in the southern part of the WIPP facilities area, where low TDS water recharges the SSW from stormwater retention ponds. Wells near Detention Basin A, Pond 1, and Pond 2 have the lowest salinity (TDS concentrations less than 10,000 mg/L).

Salinity levels were lowest during the earliest years of monitoring from 1997 to 1998 (Figure 21). Salinity levels then increased to the highest concentrations by 2004 (Figure 22). By 2008, salinity levels declined slightly from the peak (Figure 23). Over the monitoring record, higher salinity levels in the northern part of the site gradually shift southward, in the general direction of SSW flow. The observed water table mound, centered near the Salt Pile Evaporation Pond and Salt Storage Area, causes an outward radial flow from the mound's apex, with the high-salinity plume spreading radially and increasing the TDS concentrations in wells at the periphery.

Additional water quality details can be reviewed in the monitoring data tables included in Appendix B. The data include all monitoring events. The monitoring data show that high TDS concentrations exceeding 100,000 mg/L have been measured in monitor wells PZ-03, -07, -09, and -11. The highest TDS concentration within the main SSW lens was 185,000 mg/L, measured in PZ-03 in 1999. Currently, the highest TDS concentration within the main SSW lens is 150,000 mg/L in PZ-09. The highest TDS concentration in any monitor well was 245,500 mg/L, measured in PZ-13 in 2007, although this water near the SPDV pile appears to be hydrologically separated from the main SSW lens. The lowest TDS concentrations have been measured in monitor well PZ-10, in the range of 1,000 to 3,000 mg/L. The TDS concentration in monitor well PZ-08, which was sampled for the first time in October 2007, is 15,000 mg/L. As shown in the water quality data in Appendix B and hydrographs in Appendix C, the TDS concentration in individual wells fluctuates significantly over time in many of the monitor wells.

5.5.2 Salinity Sources

The SSW water quality has the signature of halite brine, containing high concentrations of sodium (Na) and chloride (Cl). U.S. DOE (2002) indicates that the composition of the Santa Rosa and overlying sediments does not provide a mechanism to produce naturally occurring water with the high salinities observed; therefore, the SSW is likely derived, at least in part, from anthropogenic saline sources. Two potential sources of SSW salinity are the Salt Storage Area and Salt Pile Evaporation Pond, which are close to the monitor wells with the highest TDS concentrations. Monitor wells PZ-13 and -14, near the SPDV pile, also exhibit high salinity. In contrast, monitor wells near the stormwater retention ponds, which are sources of freshwater recharge, exhibit the lowest TDS concentrations. Other salinity sources associated with WIPP drilling and construction activities in the 1980s could also contribute to the SSW salinity, although the quantity of water discharges at that time were a small fraction of the SSW volume (DBS&A, 2003).

The halite (NaCl) contained in the Salt Storage Area is susceptible to dissolution by precipitation leaching through the salt. Dissolution is dependent on the rate of infiltration and the area of exposed mineral surfaces. Based on a halite solubility constant from Parkhurst (1995), water saturated with halite contains 133,000 mg/L sodium and 205,000 mg/L chloride and has an approximate TDS concentration of 338,000 mg/L, depending on the exact composition of the crushed rock salt. Seepage that is near saturation with dissolved halite would have a TDS concentration approximately twice as high as the highest TDS concentration measured in the main SSW lens. Thus, seepage from the Salt Storage Area provides a potential mechanism to generate the TDS concentrations observed in the monitor wells.

The SPDV pile received mined tailings and construction debris from the drilling of two 2,150-foot shafts and the excavation of tunnels and rooms during the WIPP design validation phase (U.S.

DOE, 2008). Based on available information, the composition of the pile is expected to be predominantly halite, with small amounts of other minerals. Other minerals possibly present include dolomite, calcite, gypsum, anhydrite, sylvite, carnallite, soda niter, and other evaporites such as polyhalite that may be present as impurities in the primary materials. The mined salt extends to approximately 5 feet bgs, where the underlying caliche is undisturbed (DBS&A, 1996). Test borings in the SPDV pile encountered multiple layers of recrystallized salt (DBS&A, 1996), implying some amount of historical infiltration.

5.5.3 SPDV Monitor Wells

Water quality in new SPDV monitor wells (PZ-13, -14, and -15) is addressed in detail in the Basic Data Report for these wells (U.S. DOE, 2008). This report also provides water quality data for monitor well PZ-08, located between the main SSW lens and the SPDV pile, which was sampled for the first time in 2007.

The SPDV wells have highly variable water quality. Monitor well PZ-13 has a TDS concentration of 245,500 mg/L, higher than any previously tested monitor well. Monitor well PZ-14 also has a high TDS concentration of 106,000 mg/L. In contrast, monitor well PZ-15, which is screened in a saturated zone in the lower Gatuña, has a low TDS concentration of 2,060 mg/L.

U.S. DOE (2008) has evaluated the water quality in the SPDV monitor wells and concluded that the water encountered in PZ-13 and -14 has a geochemical association with minerals in the SPDV pile. It appears that this water is the result of infiltration through the SPDV pile and is not associated with the main SSW saturated lens. The water encountered in PZ-15 has a much lower TDS concentration and is associated with recharge that has not been significantly affected by mineral dissolution.

5.6 Water Chemistry and Monitoring

The SSW water chemistry was evaluated to determine the distinguishing characteristics of the water and to examine relationships between the monitor wells and potential salinity sources. Using Geochemist's Workbench software, the following analyses were completed:

- The cation/anion charge balance was calculated for individual samples.
- Saturation indices were calculated for major minerals.
- Durov plots were prepared to display water chemistry characteristics and variability.

5.6.1 Charge Balance

Water chemistry calculations of charge balance accounting, using the major cations and anions to examine the balance between positive and negative charges, produced results generally similar to calculations provided by WTS. The SSW monitor well water quality data produce charge balances reasonably near to neutrality; greater than 95 percent of the SSW data had deviations less than 5 percent, and all of the SSW data had deviations less than 10 percent, with the exception of a single sample from PZ-02, which was previously rejected. Monitor well WQSP-6A had multiple samples in which measured ion concentrations had large deviations from neutrality. WTS had previously employed criteria requiring charge balance within 5 percent of neutrality for screening the data; however, none of the data were rejected from consideration in the interpretations that follow.

The Geochemist's Workbench software was used to calculate a TDS concentration based on the concentrations of the individual dissolved constituents. The method adjusts the ion values to achieve charge balance before calculating the TDS concentration. Comparison of the calculated TDS values with measured TDS values showed that, on average, the measured TDS values were significantly higher, which could reflect suspended sediment in the samples. Samples collected prior to the initiation of low-flow sampling techniques around 2000 may be more susceptible to the effects of suspended sediment.

5.6.2 Saturation Indices

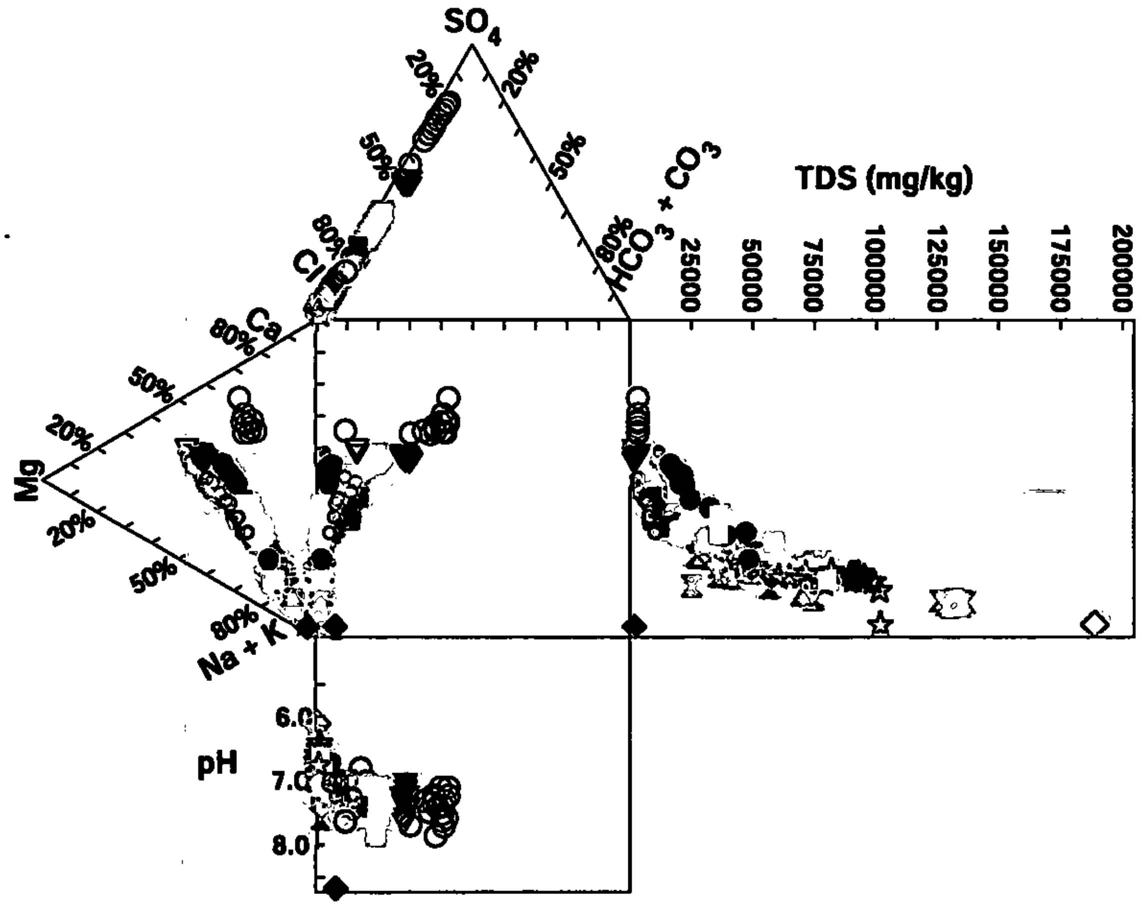
Saturation indices were calculated for the water quality at each monitor well to classify the water quality and mineral dissolution from recharge sources. Geochemist's Workbench was used to calculate saturation indices for major minerals by determining activity coefficients for each major ion in solution.

The highest TDS concentrations in the SSW are associated with high sodium and chloride concentrations indicative of halite dissolution. SSW is undersaturated with respect to halite in all of the wells. Typical halite saturation indices are 1 to 5 orders of magnitude below saturation (saturation indices –1 to –5), except in PZ-13, which is still below saturation (saturation index -0.6).

In parts of the SSW where TDS concentrations transition to lower values, the contribution of halite to the water quality becomes somewhat less dominant, and the concentrations of calcium, magnesium, and sulfate account for an increasing share of the solute load. Gypsum and anhydrite are close to saturation in places but generally undersaturated in the SSW. Calcite and dolomite are close to saturation or supersaturated in some samples.

5.6.3 Durov Plots

Durov plots were prepared to display water quality characteristics of major cations and anions, TDS, and pH. These water chemistry trends are illustrated by the Durov plots in Figures 24 and 25. Figure 24 presents all of the historical data for events where complete sets of cation and anion measurements are reported. Most of the carbonate species were reported as total inorganic carbon. Figure 25 presents "representative" data for each well for ease of comparison. The representative samples are defined as those with sulfate and chloride concentrations near the median values for each well, as these analytes capture most of the historical variability for each well. Dates are variable for the representative samples because complete datasets are available for only periodic samples.



Explanation

Symbol	Location ID
○	C-2505
□	C-2506
▢	C-2507
▽	C-2811
☆	PZ-01
■	PZ-02
⧖	PZ-03
⧗	PZ-04
☆	PZ-05
▲	PZ-06
●	PZ-07
•	PZ-08
☆	PZ-09
▼	PZ-10
□	PZ-11
○	PZ-12
◇	PZ-13
☆	PZ-14
◆	PZ-15
○	WQSP-6A

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Durov Plot of Water Chemistry (1995 - 2007)

Figure 24

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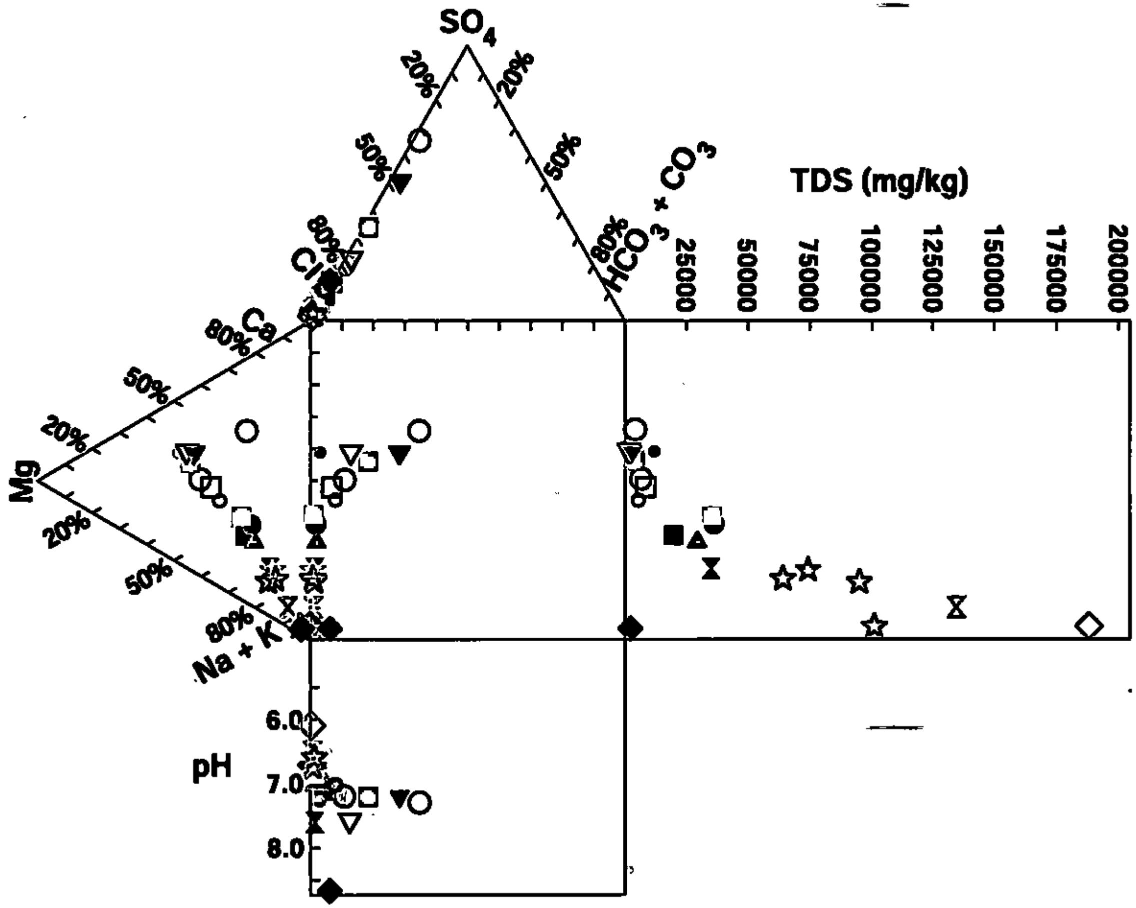

Explanation

Symbol	Location ID	Sample date
○	C-2505	2/8/1999
□	C-2506	10/12/1998
□	C-2507	10/12/1998
▽	C-2811	12/19/2001
☆	PZ-01	8/9/1999
■	PZ-02	1/13/1998
⧖	PZ-03	2/9/1999
⧗	PZ-04	10/141998
☆	PZ-05	1/14/1998
▲	PZ-06	4/13/1998
●	PZ-07	8/11/1999
•	PZ-08	10/15/2007
☆	PZ-09	8/12/1999
▼	PZ-10	7/23/1998
□	PZ-11	8/11/1999
○	PZ-12	7/23/1998
◇	PZ-13	10/10/2007
☆	PZ-14	10/15/2007
◆	PZ-15	10/15/2007
○	WQSP-6A	11/3/1998

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Durov Plot of Representative Water Chemistry

Figure 25

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8-25-08 JN ES08.0072

The data in Figures 24 and 25 plot along straight lines in the triangular cation and anion spaces. The anion data fall along the axis between chloride and sulfate, showing little relative contribution from the carbonate species (even though the SSW is saturated with respect to carbonate minerals). The cation data show varying contributions of sodium plus potassium and of a roughly 1:1 mixture of calcium and magnesium.

Monitor well WQSP-6A, a distant well screened in the middle Dewey Lake, is a notable exception to the general water quality trends. At this well, water is perched above the sulfate cementation zone in the middle Dewey Lake. The relatively high proportions of calcium and sulfate in the samples indicate that the water may have dissolved secondary sulfate minerals in the Dewey Lake, or that it may have followed a distinct pathway through a zone containing gypsum or anhydrite. The finding that WQSP-6A is distinguished by higher proportions of calcium and sulfate, as well as relatively low TDS concentrations, demonstrates the potential ability of cation and anion measurements to distinguish SSW from other sources of water or to predict characteristics of hypothetical mixtures of SSW and other waters.

On the other hand, the ion data do not distinguish monitor well C-2811 from nearby SSW wells. C-2811 is screened in the upper Dewey Lake, and it remains uncertain whether it is in direct hydrologic connection with the SSW. The consistency of C-2811 water quality with that of other SSW monitor wells suggests that the water may be connected. The TDS concentration in C-2811 does not exhibit any obvious relationship to the well hydrograph, which has been continuously rising over the period of record (Figure 14).

The central square space in the Durov plots in Figures 24 and 25 shows a trend across the site of halite-dominated water mixing with water containing a higher proportion of calcium, magnesium, and sulfate. The rectangular TDS space shows a trend across the site in the overall solute load corresponding to the compositional trend in the central space. The only exception is the sample from PZ-15, which is dominated by halite dissolution, but has relatively low TDS concentration. PZ-15 is the only well that is screened in the Gatuña; therefore, the water quality in PZ-15 is not determined by water quality elsewhere in the SSW. The PZ-15 sample also had a distinct, possibly anomalous pH that appears to have been measured in the laboratory. Degassing of carbon dioxide from a water sample during handling and holding may result in a rise in pH of roughly one-half standard unit, but PZ-15 would still have a relatively high pH after adjusting for such a shift. The sample's carbonate alkalinity was reported to be twice that of its total alkalinity, indicating unusually high uncertainty in the data. This new well will be subject to additional monitoring to confirm the water quality data.

5.7 Moisture Redistribution Calculations

It is expected that there will be some time before the construction of infiltration control systems at the former SSW recharge sources causes noticeable changes to the SSW conditions. The surficial sediment and formations that make up the vadose zone beneath the recharge sources will initially have a high moisture content that will gradually drain to lower moisture content after the source of recharge from the surface is removed. This moisture redistribution is also referred to as draindown or transient drainage. The moisture redistribution rate was calculated in order to estimate the duration and magnitude of continued moisture input to the SSW even after the infiltration controls were constructed in 2004 and 2005.

In the WIPP water budget analysis presented by DBS&A (2003), hydrologic modeling was performed to examine the effects of implementing seepage controls. This modeling assumed that moisture redistribution or transient drainage would continue for at least one year after implementing infiltration controls. Predictive modeling simulations found that implementing infiltration controls would lead to a gradual response in declining SSW water levels. The primary benefit of implementing the infiltration controls is prevention of continued recharge, which was predicted to more than double the SSW saturated volume over the WIPP operating period to 2035.

This section presents the methods used to calculate moisture redistribution in the vadose zone beneath the stormwater retention ponds and in the Salt Storage Area and underlying vadose zone following construction of infiltration controls. The calculation method presents a range of results to better understand the processes and likely duration of moisture redistribution. However, uncertainties regarding untested unsaturated flow properties of the vadose zone and salt pile materials prevent definitive quantification of results. Within the range of results, reasonable values were selected for hydraulic parameters to develop a likely best estimate for vadose zone moisture redistribution rates based on available information.

5.7.1 Calculation Method

The moisture redistribution calculation method follows the method presented by Stephens (1996) based on Mualem's equation for unsaturated flow. The calculation assumes that there is one-dimensional downward flow under a gravitational unit gradient for a uniform moisture content across the depth profile. A spreadsheet calculation was set up to calculate residual drainage at daily or hourly time steps over a 5-year duration. Details of the calculation spreadsheet and results are provided in Appendix G.

The rate of water flow in unsaturated porous media is governed by a form of Darcy's equation for unsaturated flow, as follows:

$$Q = -K_\theta \, A \, (dh/dz) \, C \tag{4}$$

where Q = volumetric discharge (gallons per minute [gal/min])

K_θ = unsaturated hydraulic conductivity (cm/s)

A = area across which flow occurs (i.e., seepage area) (acres)

dh/dz = drainage gradient, assumed equal to –1 under gravity flow (dimensionless)

C = constant for unit conversions

The results of this calculation, included in Appendix G, provide the flow rate of transient drainage, expressed in terms of gallons per minute, and the total quantity of drainage over a 5-year duration, expressed in terms of acre-feet.

In soil or rock materials, the unsaturated hydraulic conductivity (K_θ) is less than the saturated hydraulic conductivity. In the calculation spreadsheets, K_θ is recalculated at daily or hourly time steps as the moisture content decreases.

Mualem's equation calculates unsaturated hydraulic conductivity based on the change in hydraulic conductivity that occurs with changing moisture content. In this equation, the unsaturated hydraulic conductivity is expressed relative to the pressure potential of the pore water, as follows:

$$K_r(\psi) = \frac{\left\{1 - |\alpha_v \psi|^{N-1}\left[1 + |\alpha_v \psi|^N\right]^{-m}\right\}^2}{\left[1 + |\alpha_v \psi|^N\right]^{m/2}} \tag{5}$$

where K_r = relative hydraulic conductivity (cm/s)

Ψ = calculated pressure potential, negative in unsaturated zone (cm)

α_v = van Genuchten fitting parameter (cm^{-1})

N = van Genuchten fitting parameter (dimensionless)

m = 1-1/N (dimensionless)

The fitting parameters in this equation (α_v and N) are derived from moisture retention (θ–Ψ) curves from laboratory test results. Based on theoretical models of the porous medium, van Genuchten (1978 and 1980) developed a solution for calculating conductivity based on the following equation that must be fitted to the measured moisture retention curve:

$$S_e = \left[1 + |\alpha_v \psi|^N\right]^{-m} \tag{6}$$

where S_e = effective saturation (dimensionless)

The effective saturation is expressed as follows:

$$S_e = \frac{\theta - \theta_r}{\theta_s - \theta_r} \tag{7}$$

where θ = volumetric moisture content (dimensionless)

θ_r = residual moisture content, from laboratory results (dimensionless)

θ_s = saturated moisture content, from laboratory results (dimensionless)

The moisture redistribution calculation uses hydrologic parameters that are representative of the vadose zone and salt pile characteristics where unsaturated residual drainage occurs. In order to consider the sensitivity of input parameters and examine a range of possible moisture redistribution results, hydrologic parameters were selected for cases outside the expected range of most likely material properties. Hydrologic parameters for unsaturated materials were selected from standard values reported in Carsel and Parrish (1988). This reference includes a compilation of soil unsaturated flow hydrologic parameters from test results on numerous soil samples exhibiting a broad spectrum of material properties, from fine-grained to coarse-grained soils.

The moisture redistribution calculation uses van Genuchten parameters that were initially selected based on the parameters used to represent vadose zone materials in the 2003 water budget analysis (DBS&A, 2003). The vadose zone is comprised primarily of Gatuña sediments, which consists of silt, sand, and clay that is moderately hard, forming sandstone and interbedded siltstone layers. The hydrologic parameters selected as the best fit for the Gatuña are based on a sandy clay loam soil. Other materials selected for sensitivity analysis calculations include silt, clay loam, clay, and sand. These materials represent finer- and coarser-grained characteristics than the representative sandy clay loam. Table 5 provides the unsaturated flow parameters selected for each material type.

Table 5. Unsaturated Flow Parameters Used in Moisture Redistribution Calculations

Unit Parameters	Gatuña Formation	Additional Material Types			
Material Type	*Sandy clay loam*	*Silt*	*Clay loam*	*Clay*	*Sand*
K_{sat} (cm/s)	3.63×10^{-4}	6.94×10^{-5}	7.22×10^{-5}	5.56×10^{-5}	8.25×10^{-3}
α	0.059	0.016	0.019	0.008	0.145
N	1.48	1.37	1.31	1.09	2.68
θ_s (v/v)	0.39	0.46	0.41	0.38	0.43
θ_r (v/v)	0.100	0.034	0.095	0.068	0.045

K_{sat} = Saturated hydraulic conductivity
cm/s = Centimeters per second
α = Fitting parameter
N = Fitting parameter
θ_s = Saturated moisture content
v/v = Volume per volume
θ_r = Residual moisture content

The calculation spreadsheets in Appendix G were set up to account for the physical properties of moisture redistribution conditions in the vadose zone at WIPP beneath the former recharge sources after infiltration controls were implemented. The total area of the stormwater recharge ponds is approximately 10.6 acres, with the vadose zone thickness approximately 30 feet between the pond bottom and the SSW water table. The Salt Storage Area covers approximately 18.8 acres, where the salt pile is approximately 30 feet thick and the vadose zone below is approximately 35 feet thick above the SSW water table. The moisture redistribution calculation determines the residual drainage from these profiles and calculates the total drainage quantity and the quantity of water that remains in the profile after 5 years.

The initial moisture content of the vadose zone profile is a variable that has not been tested. Beneath the stormwater retention ponds, recharge rates of 1 to 30 feet per year (ft/yr) are estimated to occur (DBS&A, 2003). Therefore, a relatively wet vadose zone profile is expected. The initial moisture content beneath the ponds was set at 90 percent of saturation in the calculation. Within and beneath the Salt Storage Area, relatively high recharge rates of approximately 0.5 to 1 foot of water per year have been estimated (DBS&A, 2003). Therefore, the initial moisture content in the salt and underlying vadose zone was set at 80 percent of saturation. Residual drainage brings the moisture content toward a residual moisture content, below which moisture is retained in the porous medium and moisture movement becomes very slow. The residual moisture content is based on values published by Carsel and Parrish (1988) as shown in Table 5. As a check on the calculation sensitivity to the initial moisture condition, calculations were also performed for initial moisture contents set at 60 percent and 30 percent of saturation.

5.7.2 Calculation Results

The moisture redistribution calculation spreadsheets provided in Appendix G include the following information:

- Input parameters
- Initial water storage volume in the profile (acre-feet [ac-ft])
- Total water drainage after 5 years (ac-ft)

- Residual water storage after 5 years (ac-ft)
- Initial and final moisture content (percent)

The full spreadsheets include thousands of calculations at daily or hourly time steps. The spreadsheets in Appendix G show only the initial five time steps and the final time step. The results sum up the total outflow from the profile at the end of 5 years.

The results of the moisture redistribution calculations are summarized in Table 6, which shows all of the residual drainage results for each case of initial moisture content at 30, 60, 80, and 90 percent.

The results show a wide range of drainage responses depending on the material type and initial moisture. Many of the cases tested show significant drainage over a period of months to years. The material type controls the drainage behavior, with sand rapidly draining large quantities of water while very little drains from the clay profile. The other soil types produce intermediate results. For each case tested, Appendix G includes a graph of changes in moisture content and discharge flow rate over time. These graphs show that drainage generally begins rapidly and then slows to a low rate of drainage after a period of time. The coarser-grained materials drain rapidly, while the fine-grained materials drain very little in 5 years.

Table 6. Moisture Redistribution Calculation Results

Initial Moisture Content (%)	5-Year Residual Drainage (acre-feet)				
	Sandy Clay Loam	Silt	Clay Loam	Clay	Sand
Redistribution Beneath Stormwater Ponds					
30	1.31×10^{-5}	0.004	8.84×10^{-8}	5.93×10^{-20}	21.2
60	6.98	3.02	0.316	1.44×10^{-6}	62.2
80	29.4	20.4	9.44	2.20×10^{-2}	89.6
90	41.7	33.8	20.68	0.913	103.3
Redistribution Within and Beneath the Salt Storage Area					
30	1.31×10^{-5}	0.004	8.84×10^{-8}	5.93×10^{-20}	68.0
60	10.6	3.41	0.316	1.44×10^{-6}	225.1
80	78.7	37.3	14.8	2.20×10^{-2}	330.1
90	124.5	78.3	45.9	1.01	382.7

The following sets of conditions are likely to be representative of actual field conditions:

- Vadose zone below stormwater retention ponds
  - Sandy clay loam
  - Initial moisture 90 percent of saturation

  The initial moisture content is 0.35, which drains to a moisture content of 0.22 after 5 years. The moisture content changes very slowly after 5 years, although the moisture content is still well above the residual moisture content of 0.10 set in the equation (Carsel and Parrish, 1988). Of the initial 79.9 ac-ft of moisture available for drainage in the profile, 41.7 ac-ft drains out of the profile in 5 years.

- Salt Storage Area and underlying vadose zone
  - Sandy clay loam
  - Initial moisture 80 percent of saturation

  The initial moisture content is 0.31, which drains to a moisture content of 0.25 after 5 years. Of the initial 259 ac-ft of moisture available for drainage in the profile, 78.8 ac-ft drains out of the profile in 5 years.

Because the Salt Storage Area covers a larger area and has a thicker vadose zone profile than the stormwater ponds, the overall drainage is 2 to 3 times greater. The moisture in the profile within and below the Salt Storage Area is likely to be near saturation with respect to halite dissolution as it leaches downward through the salt. Therefore, a substantial additional input of sodium and chloride to the SSW may be expected for a period of time after the final cover was constructed over the Salt Storage Area. The amount of highly saline drainage is expected to exceed the amount of relatively fresh drainage beneath the stormwater ponds.

Although significant uncertainties exist with the moisture redistribution conditions because laboratory testing of unsaturated hydrologic properties and initial moisture content are unavailable, the calculation results frame the conditions that may be expected. Drainage is expected to occur over a period of months to years. The total drainage quantity is expected to be on the order of tens of ac-ft to more than 100 ac-ft. Based on likely parameters that are representative of field conditions, a total of approximately 120 ac-ft of drainage occurs. It has been 3 years since the infiltration controls were completed (in 2005). Under all cases tested, most of the rapid transient drainage should have occurred by this time, with drainage reaching slow rates (but continuing) beyond three years.

5.7.3 Transient Drainage Impact on SSW

The transient drainage that redistributes downward from the vadose zone beneath the infiltration controls provides a significant water addition to the SSW. The effect on the SSW was estimated based on the most likely case for drainage calculated to represent field conditions.

When water drains from beneath the former recharge areas, the water reaches the water table of the SSW, causing the water table to rise and saturating a greater volume of the previously unsaturated Santa Rosa. The amount of water level rise depends on the amount of drainage, as well as the formation hydrologic properties, including the following:

- Porosity
- Initial moisture content
- Hydraulic conductivity

DBS&A (2003) reported that few data are available on porosity and moisture content of the Santa Rosa. Porosity of the Santa Rosa in the vicinity of the WIPP site is reported from a pumping test of a supply well in the Santa Rosa (Nicholson and Clebsch, 1961), which indicated an average porosity of 13 percent. No test data are available on the Santa Rosa initial moisture content at the WIPP. Assuming this average 13 percent porosity and a residual moisture content of 3 percent (23 percent saturation), saturation in the SSW zone would be achieved when the remaining porosity of 10 percent is filled by additional water. Despite uncertainties, filling 10 percent porosity to bring the unsaturated sandstone to saturation is a reasonable assumption, regardless of the absolute value of porosity.

An estimate was calculated for the SSW water table rise based on the likely case of 120 ac-ft of water addition. The SSW volume has been previously estimated at between 108 and 315 million gallons (331 to 966 ac-ft), covering 150 to 520 acres. Thus, the transient drainage adds approximately 12 to 33 percent additional water to the SSW. The transient drainage can be expected to first affect the central portion of the SSW saturated lens, before spreading radially toward the perimeter of the lens. The estimated water table rise from 120 ac-ft of transient drainage is as follows:

- 8 feet of water table rise over the 150-acre immediate area
- 2 feet of water table rise over the 520-acre SSW lens

These estimates contain significant uncertainties, but show that based on reasonable assumptions, a significant water table rise can be expected following construction of the infiltration controls. The water table rise may take place over a period of 3 to 5 years before the transient drainage slows to low rates. Even after the transient drainage slows, water levels may continue to rise in monitor wells some distance from the former recharge sources as the water table rise in the SSW saturated lens propagates radially outward.

6. Summary and Conclusions

This hydrologic assessment of SSW at WIPP provides an update to previous SSW investigations, including recent monitoring data, and examines the effects of infiltration controls that have been implemented to halt recharge to the SSW. The purpose of the SSW hydrologic assessment is to support WIPP regulatory compliance efforts and provide a basis to understand the efficacy of actions to control and monitor the SSW.

Through an analysis of the SSW hydrology and geochemical conditions, the hydrologic assessment refines the conceptual model of the SSW hydrologic system. The hydrologic assessment considered the complete monitoring record from before and after implementation of infiltration controls to evaluate the impact of the infiltration controls with regard to SSW water quality and quantity. A comprehensive database was assembled for the hydrologic assessment to bring together all of the relevant SSW monitoring data from 1996 to 2008. The database was used to analyze trends in water quality over time and compare conditions before and after infiltration control systems were put in place in 2004 and 2005.

6.1 Infiltration Control Systems

In order to reduce or eliminate recharge to the SSW, engineered infiltration control systems have been constructed for all WIPP stormwater retention ponds and salt storage areas. The infiltration controls include the following:

- Salt Pile Evaporation Pond liner
- Detention Basin A liner
- Stormwater retention pond 1 liner
- Stormwater retention pond 2 liner
- SPDV pile cover
- Salt Storage Area cover
- SSE liner
- SSE Evaporation Pond liner

These liners and covers should be effective at halting the SSW recharge that has occurred in the past from these sources. In particular, infiltration of saline water that has contacted salt through leaching or runoff will be virtually eliminated. Past modeling of infiltration controls has shown that the infiltration controls will prevent the SSW saturated volume from more than doubling over the upcoming years of WIPP operation. However, the infiltration controls will not eliminate the existing SSW lens, which will persist in the Santa Rosa and potentially migrate laterally or downward into the Dewey Lake. The hydrologic assessment examined SSW monitoring data to consider the effects of the infiltration controls.

6.2 Time-Series Analysis of Water Level Trends

The time-series analysis completed to examine SSW water level trends shows that the water table has risen since the first monitor wells were installed in 1996. Recharge causing a rising water table is correlated with precipitation rates. Water level rises occur 6 to 9 months after periods of heavy precipitation. SSW water levels increased sharply in 1996 to 1998, during above-average precipitation years. During the ensuing years from 1999 to 2004, total annual precipitation was below average and water levels remained relatively constant in most monitor wells. Following a heavy precipitation year in 2004, when precipitation was nearly twice the annual average, a sharp water level rise was observed in many of the wells in 2005. Infiltration control systems were constructed in 2004 and 2005 to limit SSW recharge. Water levels fluctuated, but remained relatively constant in 2006 and 2007. In the most recent monitoring event in June 2008, water levels declined in most wells. This recent water level decline may indicate the first sign of a response to the infiltration controls, following a 3-year period of transient drainage beneath the former recharge sources; however, it is too early to reach a conclusion.

Monitor wells that appear to be at the fringes of the SSW saturated lens show rising water levels and increasing saturated thickness. Monitor well C-2811 has exhibited a water table rise of 12 feet since the well was installed in 2001. This trend is consistent with the conceptual model of a saturated lens spreading laterally over time. Monitor well PZ-08 may be at the fringe of the SSW saturated lens east of the WIPP facilities area. Saturation was detected for the first time in PZ-08 in March 2007, and the water level rose 4 feet during the next year. Like monitor well

C-2811, the rising water level in PZ-08 is consistent with the conceptual model of the SSW lens gradually spreading and increasing the saturated thickness at the perimeter, a phenomenon that will continue until the water table mound diminishes.

Water levels at the three new monitor wells installed in 2007 around the SPDV pile suggest that the saturation found in this area is not directly hydrologically connected to the main SSW saturated lens. The saturated zone at monitor well PZ-15 exists in the Gatuña at an elevation higher than at any of the other SSW monitor wells. The two other SPDV monitor wells, PZ-13 and -14, are distinguished from the other SSW monitor wells based on water levels, apparent gradient, and geochemistry.

6.3 Water Level Contour Maps

Water level contour maps for the SSW, prepared for approximately annual time steps, show that the SSW flow direction and gradient have remained consistent over the complete monitoring record since 1997. Each of the contour maps shows a similar pattern of contours, although water levels have consistently risen by approximately 2 to 4 feet. The water level contour maps were prepared using equivalent freshwater head elevations that were calculated based on the salinity and water density at each monitor well.

6.3.1 Water Table Conditions

The water level contour maps indicate that a water table mound exists near the Salt Pile Evaporation Pond and Salt Storage Area, with a generally radial pattern of flow outward from the high point near PZ-07. In the area where most SSW monitor wells are located, the SSW flows south and east from the apex of the water table mound. The SSW conditions are influenced by geologic controls including the irregular surface of the Santa Rosa/Dewey Lake contact and the hydraulic conductivity of the formations where SSW occurs.

Away from the central portion of the SSW saturated lens where most monitor wells are located, the hydrologic connection to monitor wells PZ-08, -13, and -14 and C-2811 remains uncertain. The increasing water level in C-2811 and detection of saturation in PZ-08 for the first time in

2007 appear consistent with a radially spreading SSW lens. In contrast, monitor wells PZ-13 and -14 exhibit higher water levels than those at PZ-08 to the west, suggesting that local recharge at the SPDV pile has resulted in a minor water level mound (although this mound may be dissipating since the SPDV pile was capped in 2000). Based on differences in water levels and water quality, the water encountered at PZ-08 appears distinct from the water at PZ-13 and -14, although between these wells, it is uncertain whether unsaturated conditions exist or whether there is a saturated zone of commingled water.

6.4 Water Quality Contour Maps

Water quality contour maps for the SSW prepared for approximately annual time steps show that the SSW water quality has become generally more saline over the monitoring record since 1997. Overall salinity reached a maximum in 2004 and has declined slightly by 2008..

The SSW water quality is dominated by highly saline brine that is representative of halite (NaCl) dissolution. In the main SSW lens, TDS concentrations range from less than 10,000 mg/L to more than 150,000 mg/L. Higher TDS concentrations are found in the northern half of the WIPP facilities area, near the Salt Storage Area and Salt Pile Evaporation Pond. Currently, the highest TDS concentration within the main SSW lens is 150,000 mg/L in PZ-09, a decline from the highest previous TDS concentration measured within the main SSW lens (185,000 mg/L in PZ-03). TDS concentrations are much lower in the southern half of the site, where low-TDS water recharged the SSW from stormwater retention ponds prior to lining the ponds and subsequent transient drainage. Relatively low TDS concentrations of 1,000 to 3,000 mg/L have been measured in monitor well PZ-10, adjacent to Detention Basin A.

New monitor wells around the SPDV pile have water quality that is chemically distinct from the SSW. SPDV monitor well PZ-13 has the highest salinity level measured thus far, with a TDS concentration of 245,500 mg/L. In contrast, SPDV monitor well PZ-15 has a low TDS concentration of 2,060 mg/L in a saturated zone in the lower Gatuña.

6.5 Moisture Redistribution Calculations

Calculations of moisture redistribution were completed to estimate the duration and magnitude of transient drainage that provides continued moisture input to the SSW even after the infiltration controls were constructed in 2004 and 2005. The initially high moisture content of the vadose zone materials beneath the recharge sources will gradually drain to lower moisture content after the source of recharge from the surface is removed. Because test results for unsaturated hydrologic properties of the vadose zone and salt pile materials are not available, moisture redistribution calculations were completed for a range of vadose zone hydrologic properties and initial moisture conditions to estimate a range of transient drainage results. Within the range of hydrologic properties used in the calculations, hydrologic parameters were selected as the likely best fit for the Gatuña and salt pile to produce a reasonable estimate of the transient drainage quantity and duration.

The hydrologic parameters selected as the best fit for the Gatuña and salt pile are based on published values for sandy clay loam soil. A broad range of additional hydrologic properties were selected for sensitivity analysis calculations, including silt, clay loam, clay, and sand. These materials represent finer- and coarser-grained characteristics than the representative sandy clay loam. Moisture redistribution calculations were completed for each material type for initial moisture conditions set at 30, 60, 80, and 90 percent saturation. The likely best fit calculations used an initial moisture content of 90 percent saturation below the stormwater retention ponds and 80 percent saturation within and beneath the salt pile.

6.5.1 Transient Drainage Results

The moisture redistribution results show a wide range of transient drainage responses depending on the material type and initial moisture. The test cases were analyzed for a period of 5 years, and the results show significant transient drainage over a period of months to years. The material type controls the drainage behavior; the sand profile rapidly drains large quantities of water within days, while very little drains from the clay profile over 5 years.

For the set of likely hydrologic parameters that is representative of actual field conditions, the calculations produce reasonable results in terms of the drainage quantity, duration, and amount of residual moisture remaining in the profile after 5 years. The results for each of the two profiles are as follows:

- Vadose zone below stormwater retention ponds
  - 41.7 ac-ft transient drainage in 5 years
  - Most of the drainage within 1 year
  - Initial moisture content of 0.35 (90 percent of saturation), drains to a moisture content of 0.22
- Salt Storage Area and underlying vadose zone
  - 78.8 ac-ft transient drainage in 5 years
  - Most of the drainage within 2 years
  - Initial moisture content of 0.31 (80 percent of saturation), drains to a moisture content of 0.25

The moisture content changes very slowly after 1 to 3 years until the end of the 5-year calculation, although the moisture content remains well above the residual moisture content of 0.10 set in the equation. Over a longer duration, additional water is available to drain from the vadose zone profile, although the rates become slow as the unsaturated hydraulic conductivity declines with decreasing moisture content.

Because the Salt Storage Area covers a larger area and has a thicker vadose zone profile than the stormwater ponds, the overall drainage is 2 to 3 times greater that the total drainage below all four stormwater retention ponds. The residual drainage below the Salt Storage Area is expected to provide substantial additional input of sodium and chloride to the SSW, exceeding the amount of relatively fresh drainage beneath the stormwater ponds.

Although the moisture redistribution calculations contain significant uncertainties, the results frame a range of conditions that can be expected. Transient drainage quantities on the order of tens of ac-ft to more than 100 ac-ft are expected over a period of months to years. Based on likely hydrologic parameters that are representative of field conditions, a total of approximately 120 ac-ft of transient drainage occurs. During the 3 years since the infiltration controls were completed in 2005, most of the rapid transient drainage should have occurred. Under all cases tested for variable hydrologic properties, transient drainage reaches slow (but continuing) rates beyond three years.

6.5.2 Transient Drainage Impact on SSW

Based on the estimated transient drainage quantities, a significant water addition to the SSW is expected following completion of the infiltration controls. The transient drainage volume of 120 ac-ft for the most likely conditions will add approximately 12 to 33 percent additional water to the SSW (based on previous SSW volume estimates of 330 to 970 ac-ft [108 and 315 million gallons], covering 150 to 520 acres).

The amount of water table rise depends on the amount of drainage, as well as the Santa Rosa sandstone hydrologic properties. Considering that the porosity within the Santa Rosa sandstone is partially filled with water when it is unsaturated, only about 10 percent moisture addition (per sandstone unit volume) is needed to reach saturation. The SSW water table rise is estimated to be between 8 feet over the 150-acre immediate area around the former recharge sources and 2 feet of water table rise over the 520-acre SSW lens.

These estimates contain significant uncertainties, but show that based on reasonable assumptions, a significant water table rise can be expected following construction of the infiltration controls. The water table rise may take place over a period of 3 to 5 years before the transient drainage slows to low rates. The water table rise can be expected to first affect the central portion of the SSW saturated lens before spreading radially toward the perimeter of the lens. Water levels may continue to rise over a longer duration in monitor wells some distance from the former recharge sources as the water table rise in the SSW saturated lens propagates radially outward.

The primary benefit of implementing the infiltration controls is prevention of continued recharge that was predicted to continue increasing the SSW saturated volume. However, the moisture redistribution process involves a period of transient drainage when SSW water levels continue to rise. The declining water levels measured in 2008 may represent the first indication that a gradual response toward declining SSW water levels is beginning; however, any conclusions regarding a trend toward water level declines will require a longer monitoring record.

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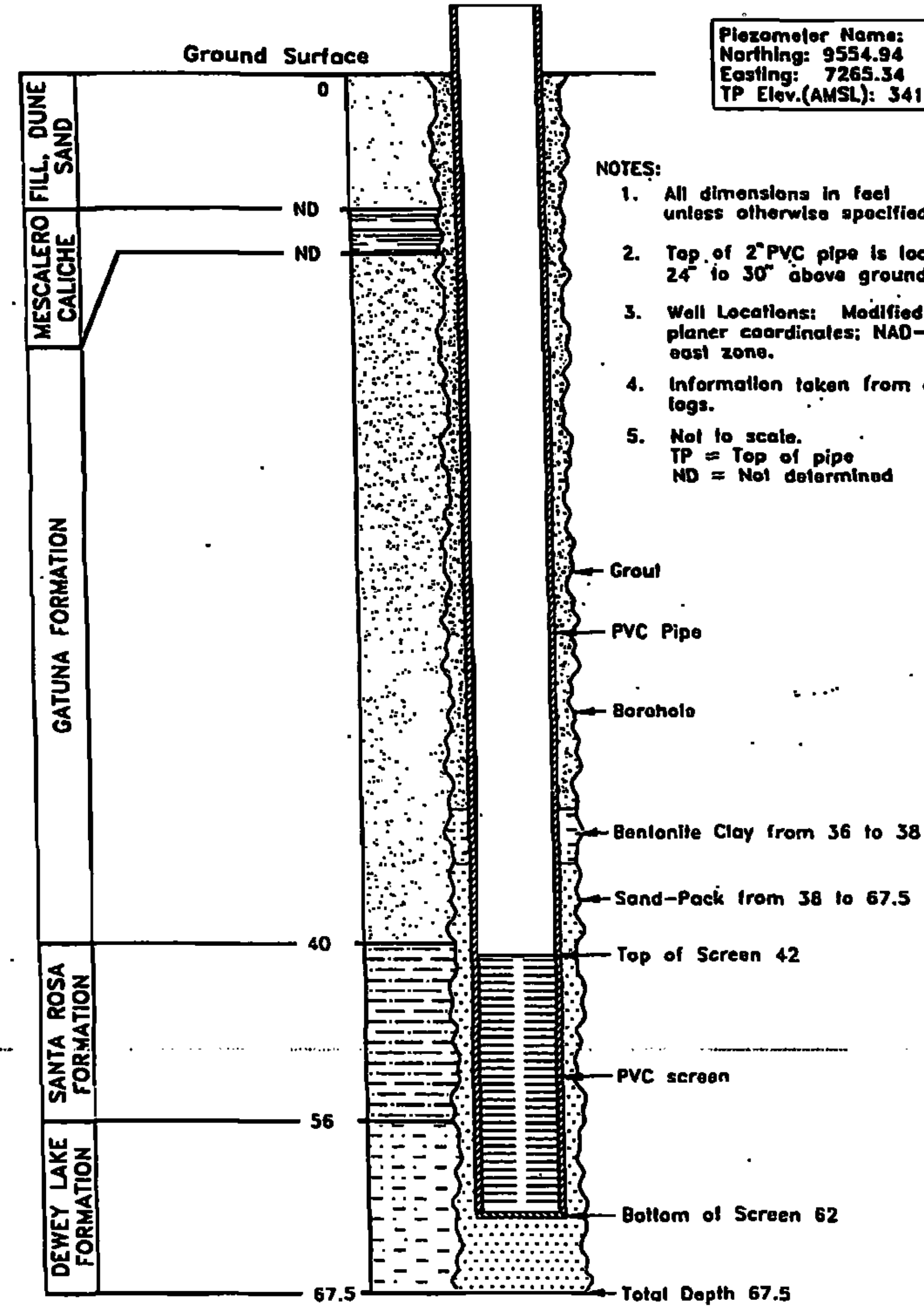
Appendix A

Well Logs
Santa Rosa/Dewey Lake
Contact Contours

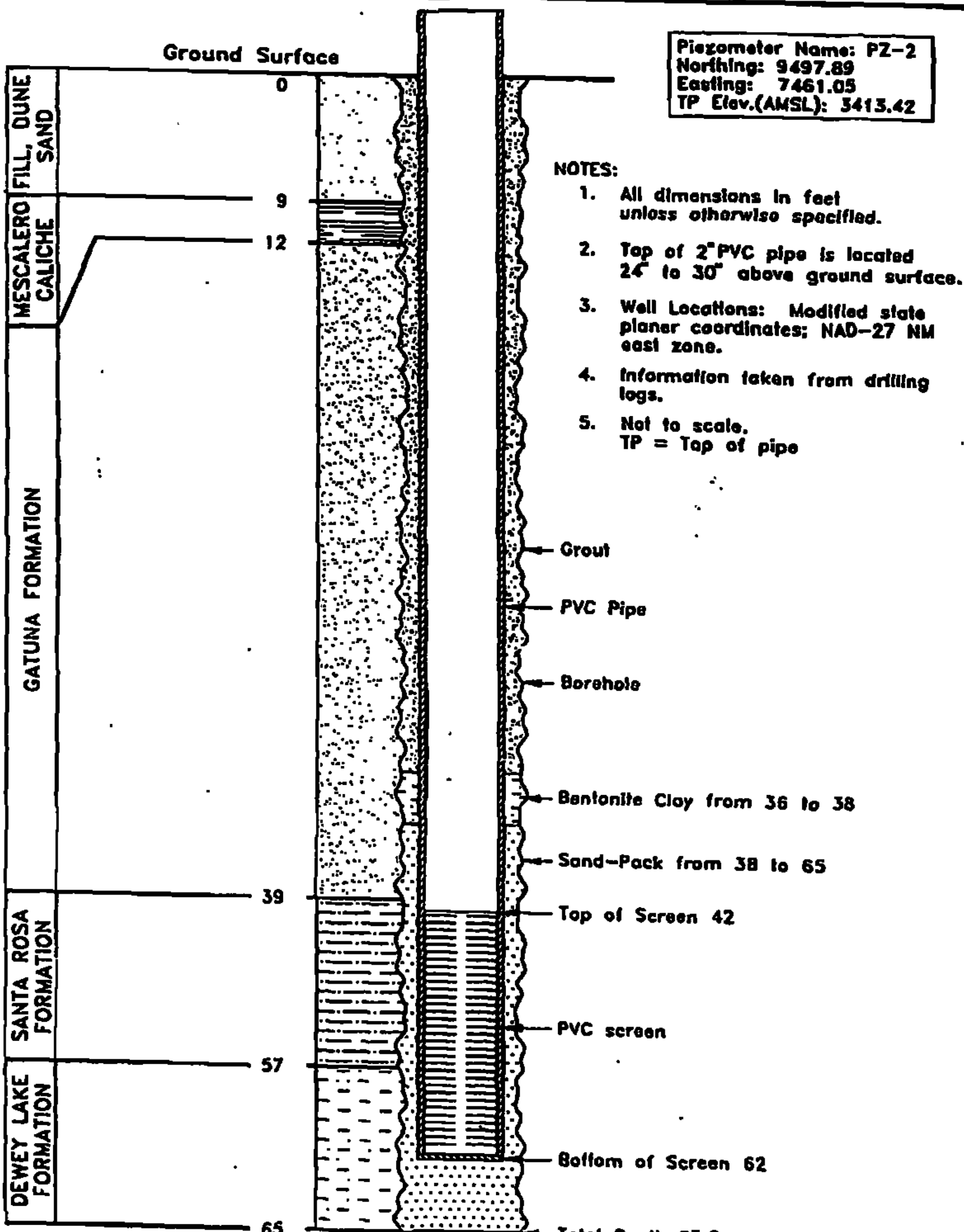


Piezometer Name: PZ-1
Northing: 9554.94
Easting: 7265.34
TP Elev.(AMSL): 3413.41

NOTES:

1. All dimensions in feet unless otherwise specified.
2. Top of 2" PVC pipe is located 24" to 30" above ground surface.
3. Well Locations: Modified state planer coordinates; NAD-27 NM east zone.
4. Information taken from drilling logs.
5. Not to scale.
   TP = Top of pipe
   ND = Not determined

INTERA	PZ-1 Piezometer Completion Diagram	DATE: 07/28/97	REV: A
		REF: JBP/PZ-1	



INTERA

PZ-2 Piezometer Completion Diagram

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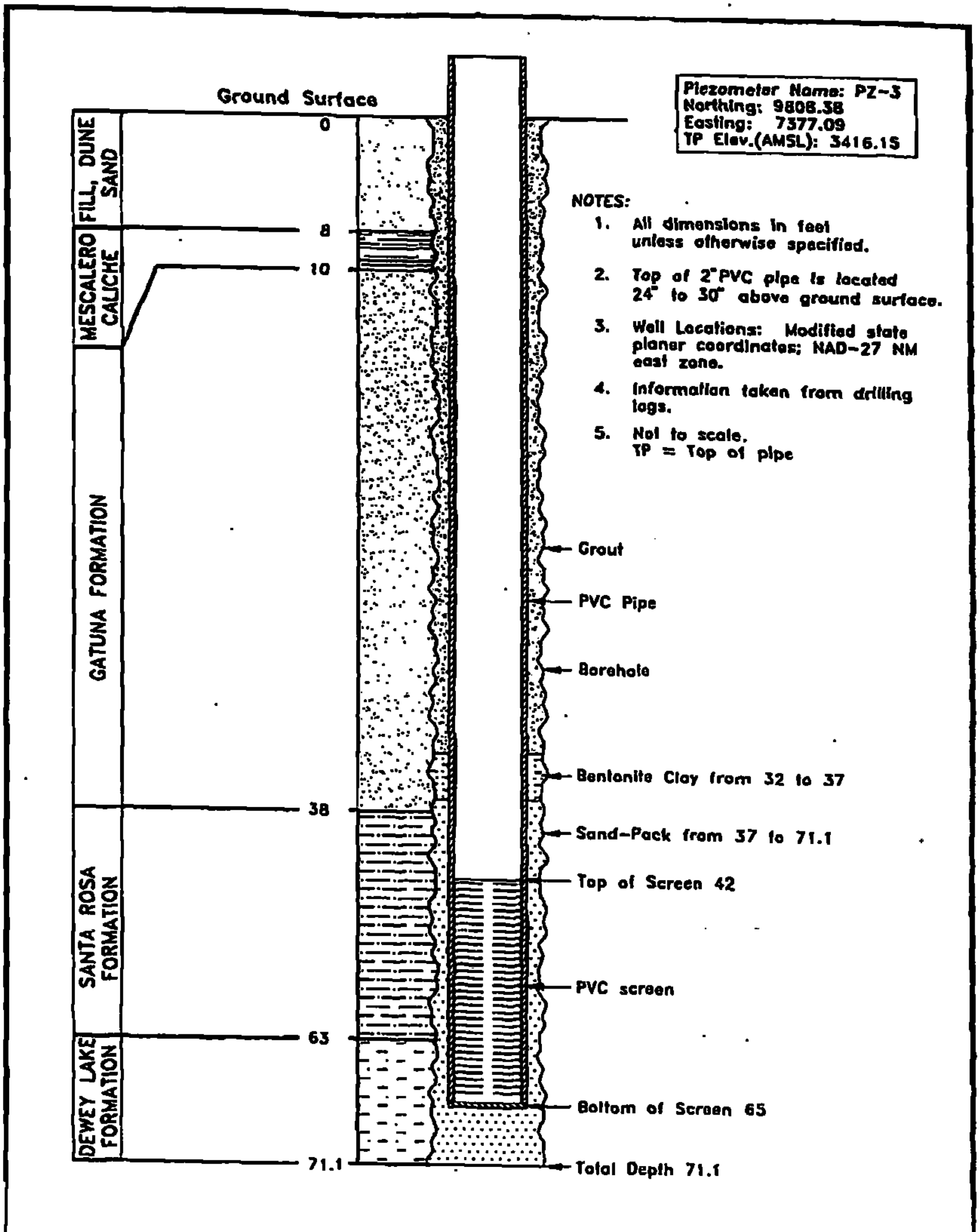
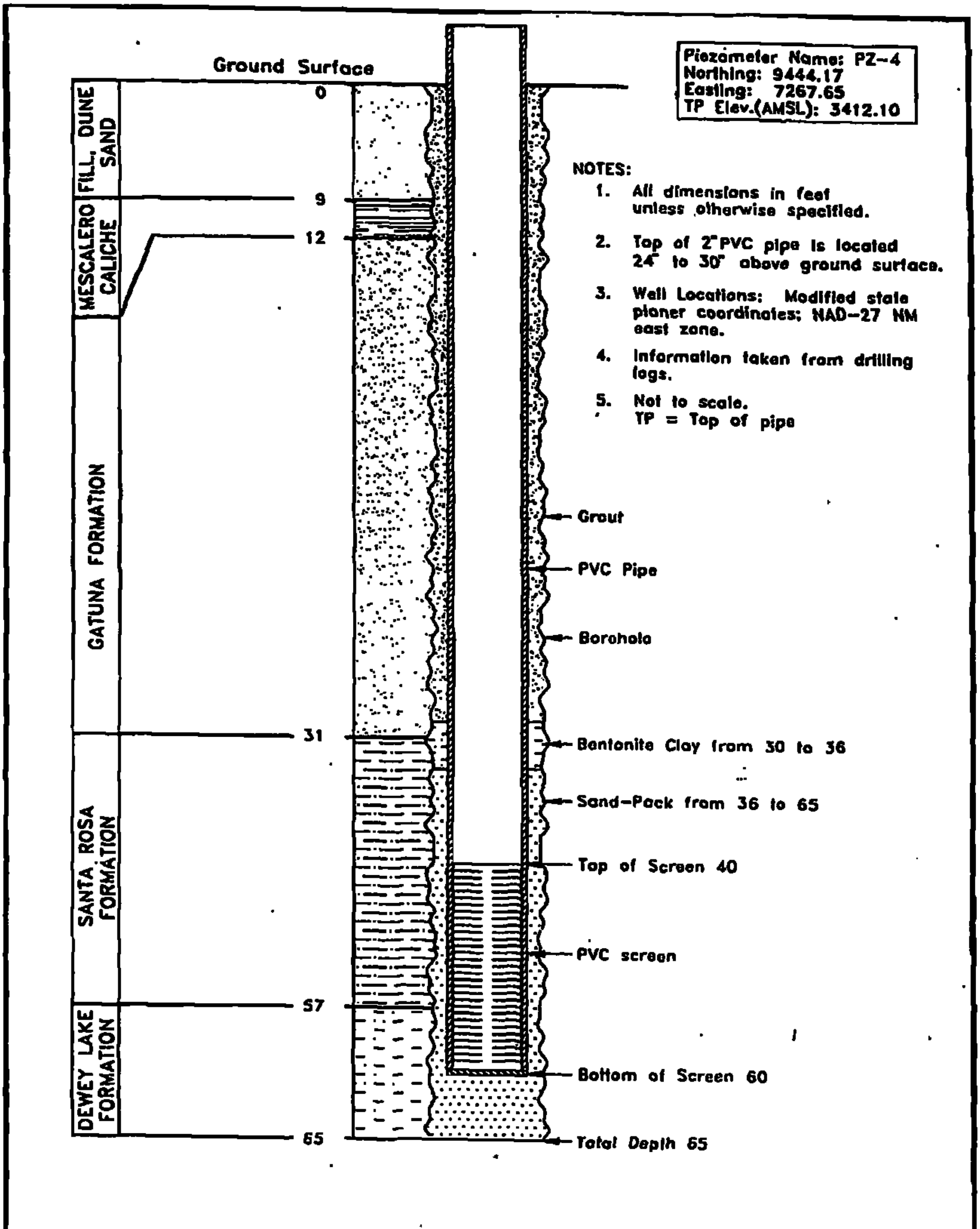
REF: JBP/PZ-2	



INTERA	PZ-3 Piezometer Completion Diagram.	DATE: 07/28/97	REV: A
		REF: JBP/PZ-3	



INTERA

PZ-4 Piezometer Completion Diagram

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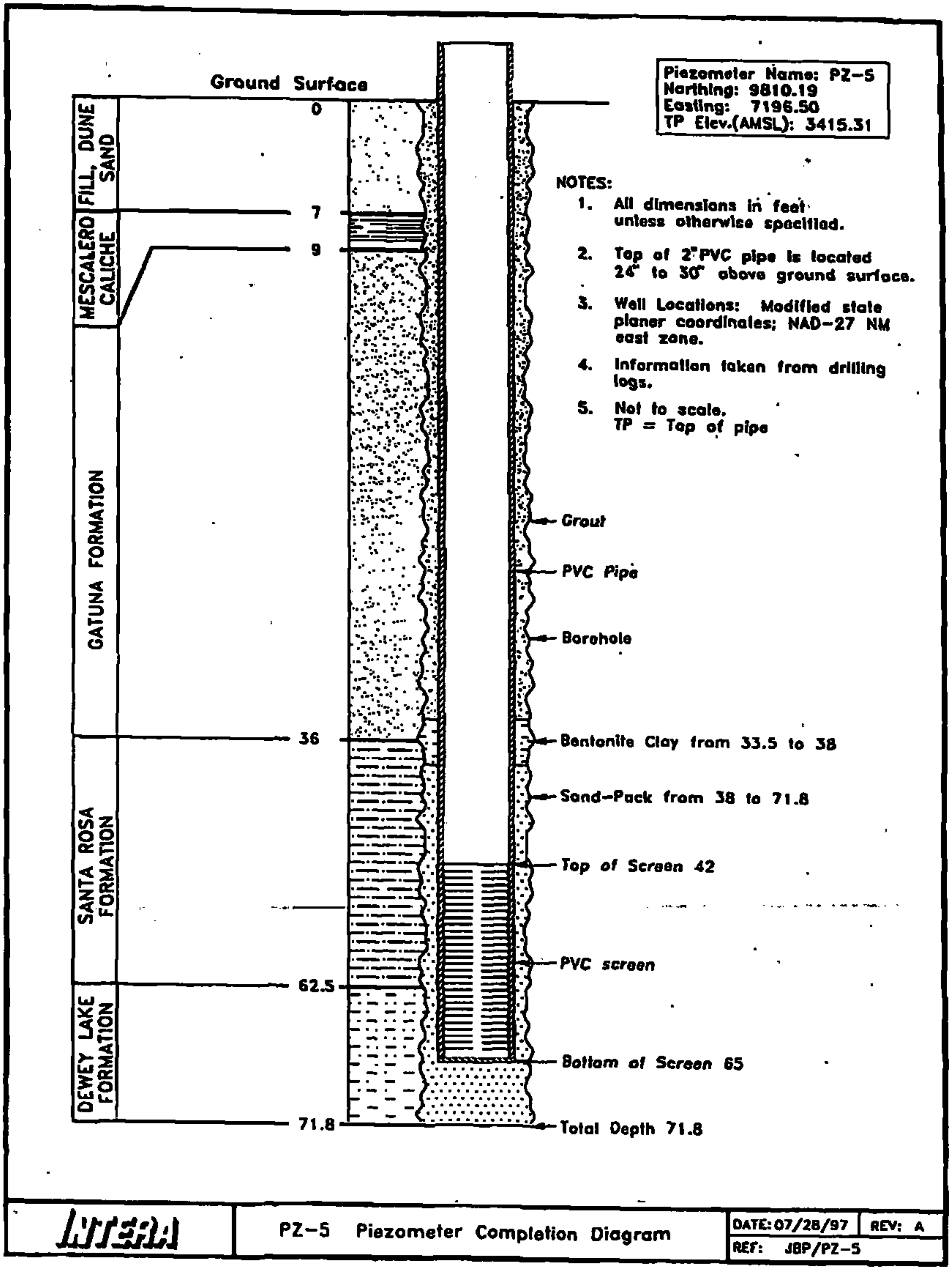
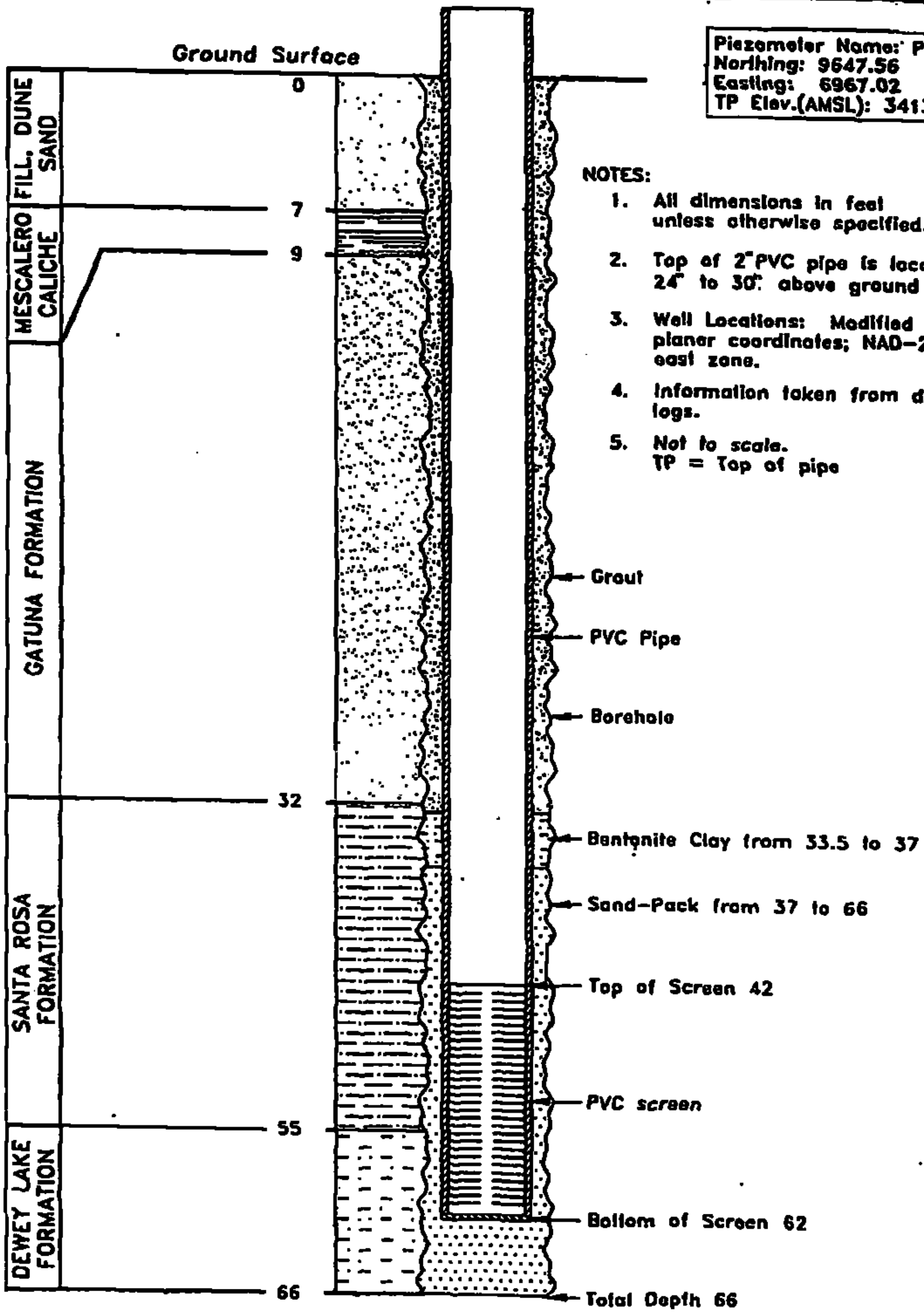

Piezometer Name: PZ-5
Northing: 9810.19
Easting: 7196.50
TP Elev.(AMSL): 3415.31
Ground Surface
FILL, DUNE SAND
MESCALERO CALICHE
GATUNA FORMATION
SANTA ROSA FORMATION
DEWEY LAKE FORMATION
0
7
9
36
62.5
71.8
NOTES:
1. All dimensions in feet unless otherwise specified.
2. Top of 2" PVC pipe is located 24" to 30" above ground surface.
3. Well Locations: Modified state planer coordinates; NAD-27 NM east zone.
4. Information taken from drilling logs.
5. Not to scale.
TP = Top of pipe
Grout
PVC Pipe
Borehole
Bentonite Clay from 33.5 to 38
Sand-Pack from 38 to 71.8
Top of Screen 42
PVC screen
Bottom of Screen 65
Total Depth 71.8
INTERA
PZ-5 Piezometer Completion Diagram
DATE: 07/28/97
REV: A
REF: JBP/PZ-5

Piezometer Name: PZ-6
Northing: 9647.56
Easting: 6967.02
TP Elev.(AMSL): 3413.49



NOTES:

1. All dimensions in feet unless otherwise specified.
2. Top of 2" PVC pipe is located 24" to 30" above ground surface.
3. Well Locations: Modified state planer coordinates; NAD-27 NM east zone.
4. Information taken from drilling logs.
5. Not to scale.
   TP = Top of pipe

INTERA	PZ-6 Piezometer Completion Diagram	DATE: 07/28/97	REV: A
		REF: JBP/PZ-6	

Piezometer Name: PZ-7
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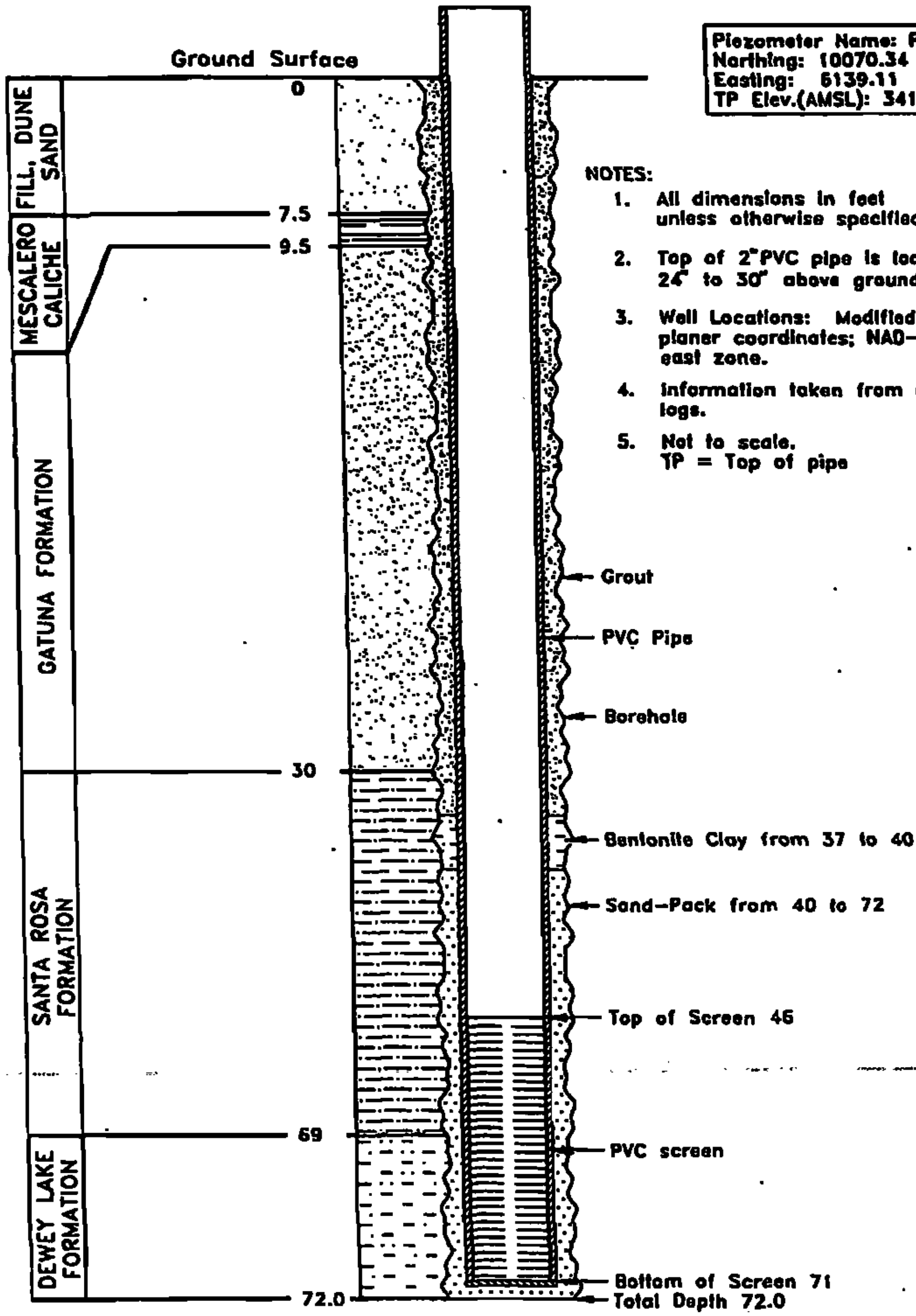
Easting: 6139.11
TP Elev.(AMSL): 3413.99



NOTES:

1. All dimensions in feet unless otherwise specified.
2. Top of 2"PVC pipe is located 24" to 30" above ground surface.
3. Well Locations: Modified state planer coordinates; NAD-27 NM east zone.
4. Information taken from drilling logs.
5. Not to scale. TP = Top of pipe

INTERA	PZ-7 Piezometer Completion Diagram	DATE: 07/28/97	REV: A
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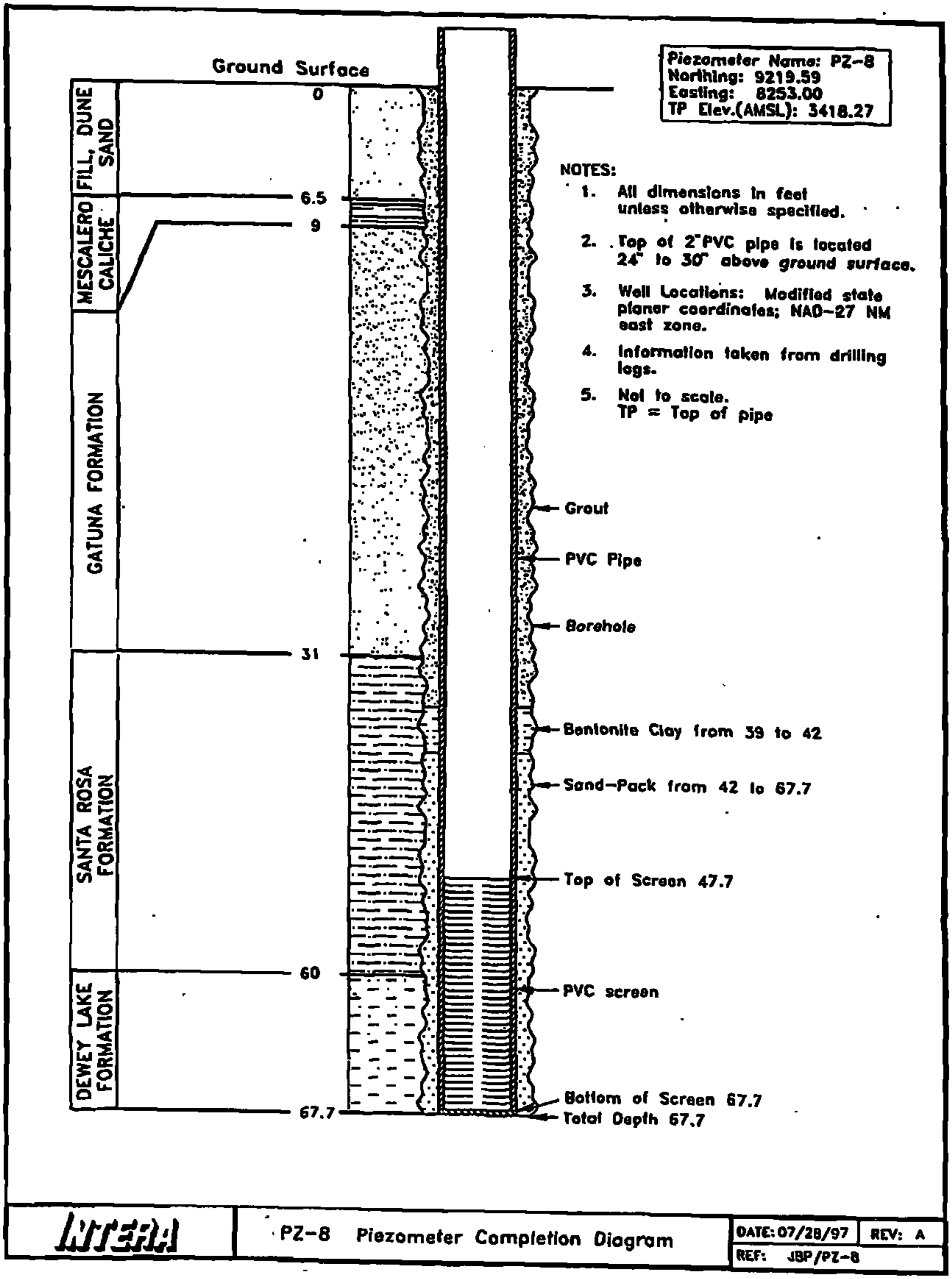
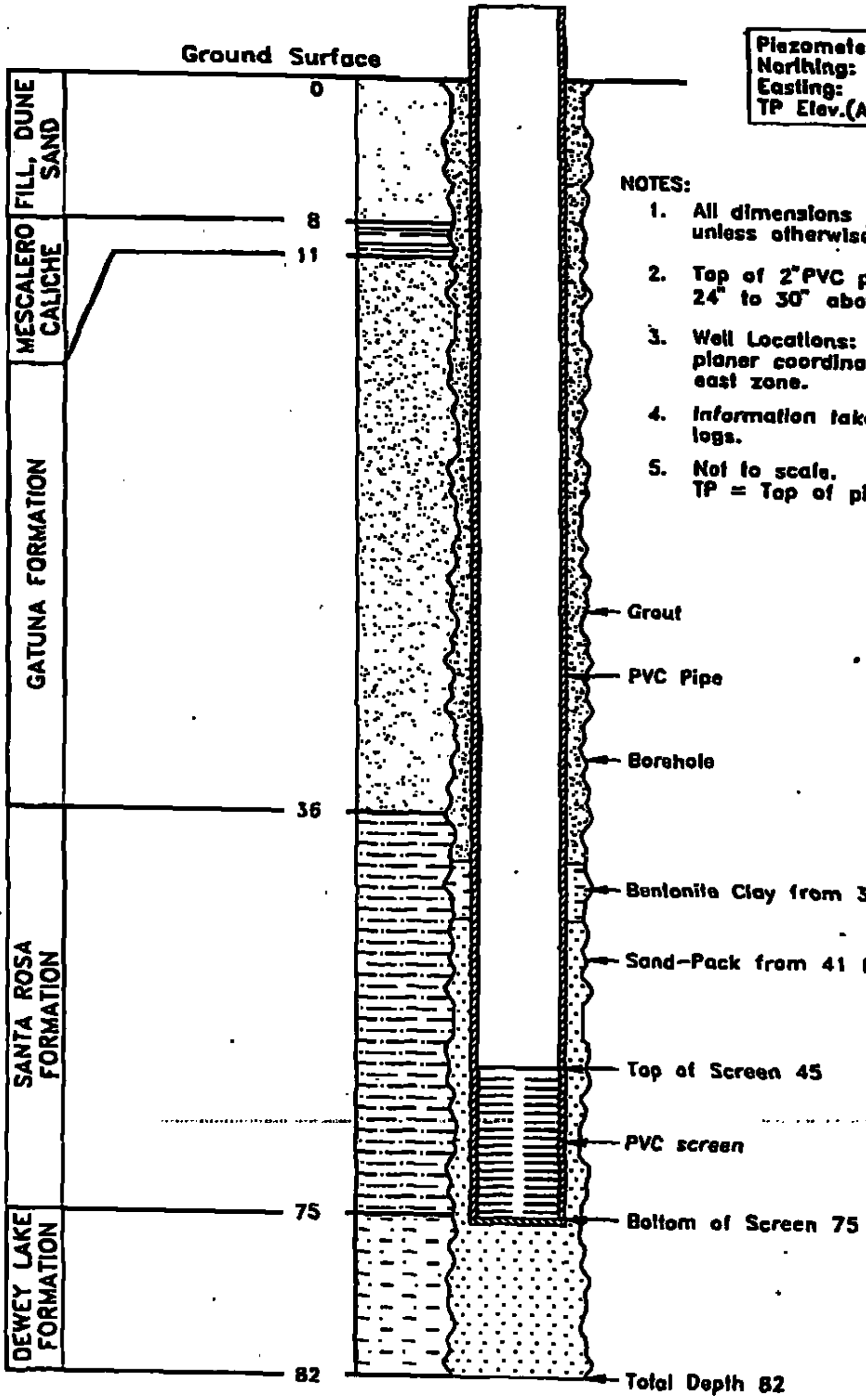

Ground Surface
Piezometer Name: PZ-8
Northing: 9219.59
Easting: 8253.00
TP Elev.(AMSL): 3418.27
FILL, DUNE SAND
MESCALERO CALICHE
GATUNA FORMATION
SANTA ROSA FORMATION
DEWEY LAKE FORMATION
0
6.5
9
31
60
67.7
NOTES:
1. All dimensions in feet unless otherwise specified.
2. Top of 2" PVC pipe is located 24" to 30" above ground surface.
3. Well Locations: Modified state planer coordinates; NAD-27 NM east zone.
4. Information taken from drilling logs.
5. Not to scale.
TP = Top of pipe
Grout
PVC Pipe
Borehole
Bentonite Clay from 39 to 42
Sand-Pack from 42 to 67.7
Top of Screen 47.7
PVC screen
Bottom of Screen 67.7
Total Depth 67.7
INTERA
PZ-8 Piezometer Completion Diagram
DATE: 07/28/97
REV: A
REF: JBP/PZ-8

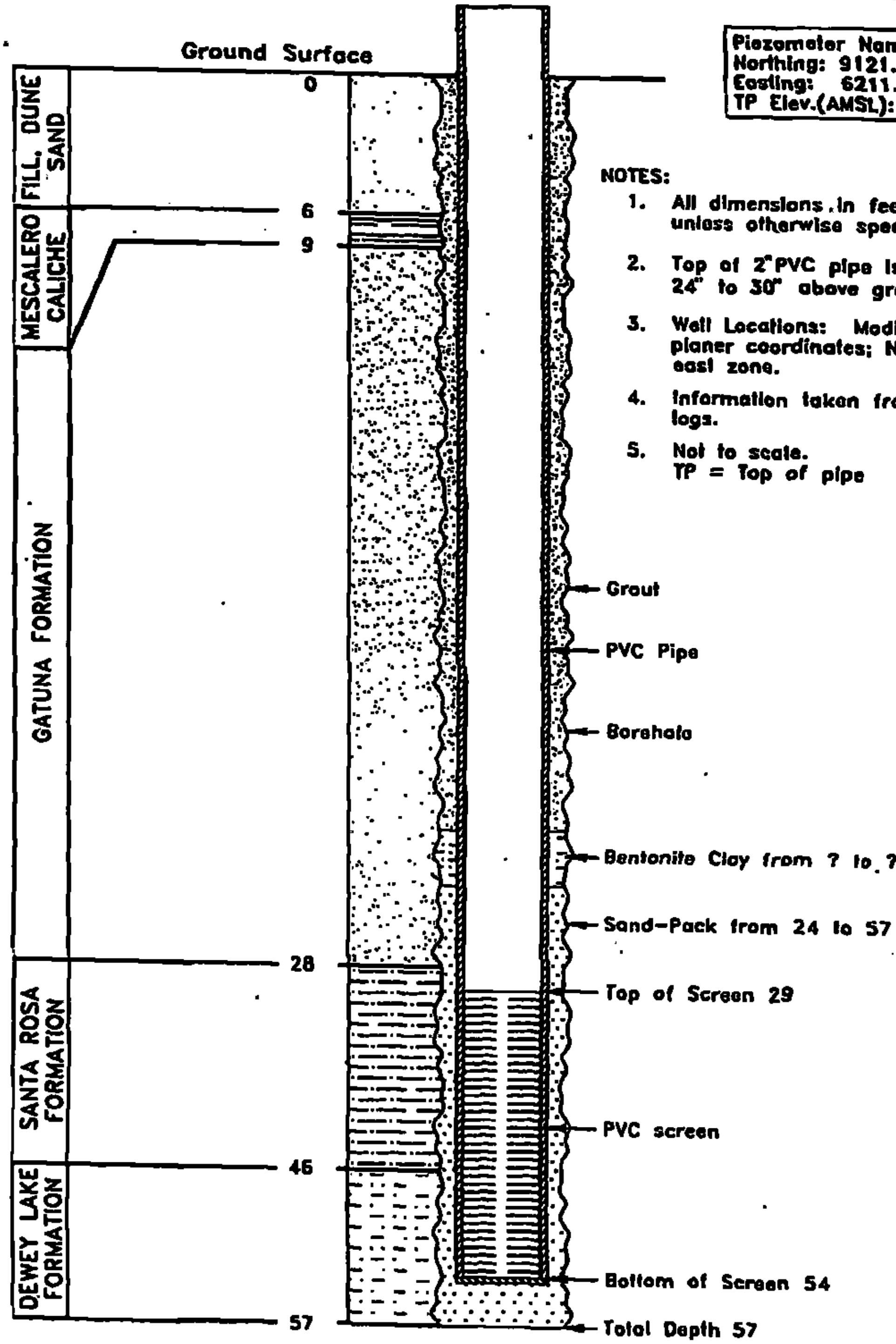


Piezometer Name: PZ-9
Northing: 10262.84
Easting: 7676.45
TP Elev.(AMSL): 3421.21

NOTES:

1. All dimensions in feet unless otherwise specified.
2. Top of 2"PVC pipe is located 24" to 30" above ground surface.
3. Well Locations: Modified state planer coordinates; NAD-27 NM east zone.
4. Information taken from drilling logs.
5. Not to scale.
   TP = Top of pipe

INTERA	PZ-9 Piezometer Completion Diagram	DATE: 07/28/97	REV: A
		REF: JBP/PZ-9	



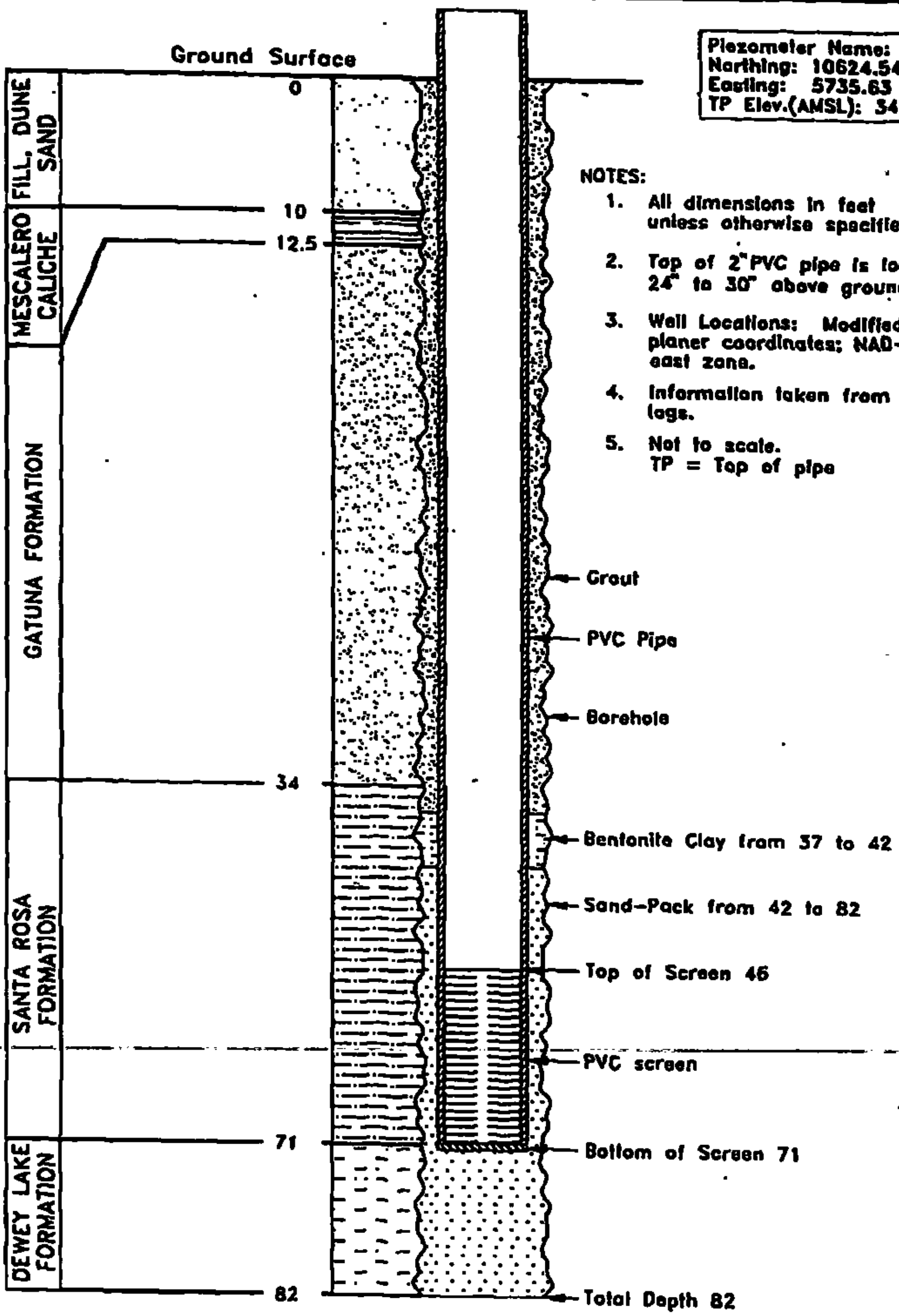
Piezometer Name: PZ-10
Northing: 9121.53
Easting: 6211.57
TP Elev.(AMSL): 3405.80

NOTES:

1. All dimensions in feet unless otherwise specified.
2. Top of 2" PVC pipe is located 24" to 30" above ground surface.
3. Well Locations: Modified state planer coordinates; NAD-27 NM east zone.
4. Information taken from drilling logs.
5. Not to scale.
   TP = Top of pipe

INTERA	PZ-10 Piezometer Completion Diagram	DATE: 07/28/97	REV: A
		REF: JBP/PZ-10	

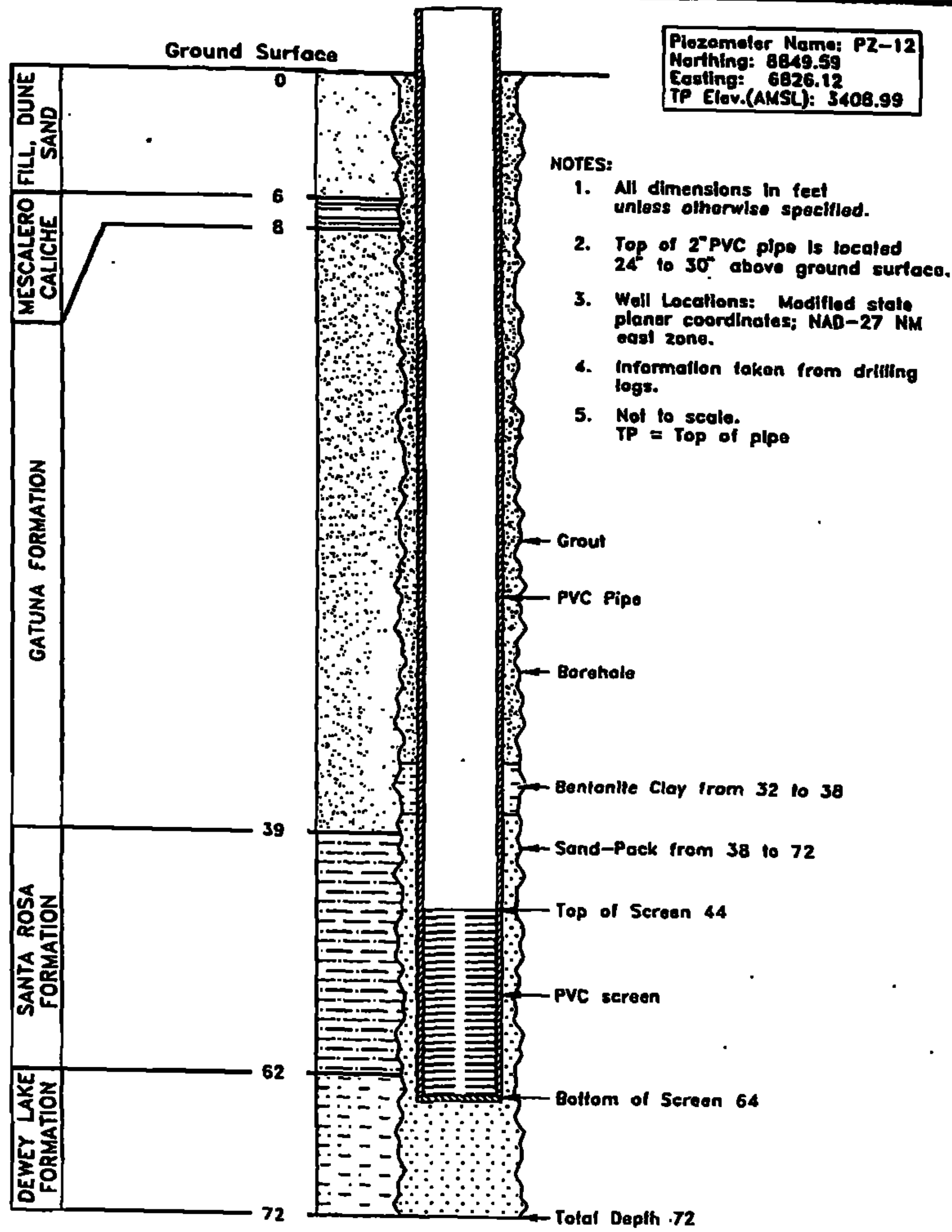
Piezometer Name: PZ-11
Northing: 10624.54
Easting: 5735.63
TP Elev.(AMSL): 3418.95



NOTES:

1. All dimensions in feet unless otherwise specified.
2. Top of 2" PVC pipe is located 24" to 30" above ground surface.
3. Well Locations: Modified state planer coordinates: NAD-27 NM east zone.
4. Information taken from drilling logs.
5. Not to scale.
   TP = Top of pipe

INTERA	PZ-11 Piezometer Completion Diagram	DATE: 07/28/97	REV: A
		REF: JBP/PZ-11	



INTERA	PZ-12 Piezometer Completion Diagram	DATE: 07/28/97	REV: A
		REF: JBP/PZ-12	

Table 2.2 Piezometer Completion Information: Piezometers 1-12

PIEZOMETERS	TOTAL DEPTH (feet bgs)	SCREENED INTERVAL (feet bgs)	SAND PACKED (feet bgs)	BENTONITE SEAL (feet bgs)
PZ-1	67.5	42-62	38-67.5	36-38
PZ-2	65.0	42-62	38-65	36-38
PZ-3	71.1	42-65	37-71.1	32-37
PZ-4	65	40-60	36-65	30-36
PZ-5	71.8	42-65	38.8-71.8	33.5-38
PZ-6	66	42-62	37-66	33.5-37
PZ-7	72	46-71	37-72	37-40
PZ-8	67.7	47.7-67.7	42-67.7	39-42
PZ-9	82	45-75	51-82	36.5-41
PZ-10	57	29-54	24-57	?
PZ-11	82	42-82	42-82	37-42
PZ-12	72	38-72	38-72	32-38

CORE LOG

Sheet 1 of 2

Hole ID: PZ-13	Location: WIPP Site - SPDV Pile

Drill Date: 8/13 to 8/21 2007	Drill Method: Hollow-Stem/Air Rotary	Drill Make/Model: CME 75
Drill Crew: Stewart Brothers Drilling Company	Hole Diameter: 9.88 - inch	Barrel Specs: 3-inch split spoon
	Hole Depth: 77 feet	Drill Fluid: NA
	Hole Orient: NA	Core Preserv: NA

Logged by: J. Maly, P.G./R.Salness, P.G.	Date: 8/13 to 8/21 2007	Scale: 1" = 10'

	Northing	Easting	Top of Casing Elevation
Survey Coordinate: (Ft)	498742.63	668947.27	3422.24

Comments:

Depth Number	Depth (feet)	% Recovered	Well Construction	Profile (Rock Type)	Description	Lithology
		100		Dune Sand	[5YR 6/4, LT Reddish Brown], sand, fine grained, loose, moist to dry, friable.	
5		80 100		Berino Soil	[2.5YR 5/8 - 4/8; Red], sandy, 3' - 6' calcareous sand, 6' - 6.5' stiff, indurated, low moisture.	
10		80		Mescalero Caliche	[5YR 8/3; Pink], sandy limestone or calcareous sandstone, low moisture, stiff with pebbles and weak laminar structure, at 7.5' to 9', 9'-10' Gatuna inclusions, chert pebbles throughout.	
15		80 100 100		Gatuna Sandstone	[5YR 7/4; Pink], Gatuna Sandstone with Mescalero Caliche overprint, dry to slightly moist, loose to very stiff clasts with caliche, altered manganese oxide throughout, more argillaceous and calcareous than above.	
20 25 30		100 100 100 100 100	Well Casing		[2.5YR 5/8; Red], Gatuna Sanstone with argillaceous matrix, chert pebbles throughout, root casts coated in manganese oxide. dry, carlcareous, less argillaceous matrix dominated by sand, increased bedding structure with depth, stiff, platy structures, dry, stiff, moderately indurated.	
		100			[2.5YR 6/6, LT Red], lighter color, more indurated slightly moist.	
35		100 100			[2.5YR 4/8, Red], Carbonate intraclasts incorporated in matrix.	
40 45 50		100 100 <5 100 100 100 100 100		Santa Rosa Sandstone	[2.5YR 4/8, Red], [10YR 7/1, LT Gray], Interbedded Red and LT Gray sanstone, dessication cracks with carbonate fill, slickensided surfaces (subhorizontal), dry, moderately indurated. Hard at 35' - 39', 39'-39.2' very hard consolidated, well indurated sandstone, dry [2.5YR 4/4; Reddish Brown] 40'-47' Moderately indurated, moist, platy. Changed over to tricone bit on hollow-stem lead auger limiting samples. Steam and condensate apparent when drilling at 55-60' 59.5-59.7 [2.5YR 4/4; Reddish Brown] , moisture content increasing with depth, fine to med sandstone	

Hole ID: PZ-13 CORE LOG (cont. sheet) Sheet 2 of 2

Logged by: J. Maly, P.G./R.Sainess, P.G. Date: 8/13 to 8/21 2007

Depth Number	Depth (ft)	% Recovered	Well Construction	Profile (Rock Type)	Description	Lithology
50		100	Well Casing	Santa Rosa Sandstone	Same as previous page	
55		100		Interbedded sandstone and siltstone In	Steam and condensate apparent when drilling at 55-60' 59.5-59.7 (2.5YR 4/4; Reddish Brown) , moisture content increasing with depth, fine to med sandstone	
60						
65		100			(5YR 8/2, Pinkish White), sandy siltstone, poorly indurated, fine to medium sand, argillaceous, (64'-65')	
					(5YR 5/6, Yellowish Red), sandy, argillaceous siltstone, poorly indurated, fine sand, calcareous, white, yellowish, and orange grains, saturated, (65'-67.5')	
70					(10YR 6/2, Light Brownish Gray), sandy siltstone, moderately indurated, fine sand, clear, greenish gray, pink, reddish brown and black grains, saturated.	
75		100			(5YR 6/6, Reddish Yellow), silty sandstone, poorly indurated, fine to medium sand, less moisture than above.	
80			Sump		(2.5YR 5/4, Reddish Brown), silty argillaceous sandstone, well indurated, fine grains, hard layer, low moisture, similar to 50'-60' interval, softer at 72'-75', possibly more argillaceous (thin interbedded clay layers between fine grained sandstone).	
				Dewey Lake Formation	(2.5YR 3/4, Dark Reddish Brown) 75'-75.5' mudstone, silty, micaceous with greenish gray reduction spots, moist.	
					(2.5YR 5/6 - 4/6, Red) 75.5'- 75.75' silty mudstone with greenish gray reduction spots, dryer than above.	
					(5Y 5/1 - 5/2, Gray to Olive Gray) 76.5' - 76.6' mudstone, silty, moist.	

Total Depth 77' terminated in the Dewey Lake Formation

CORE LOG

Sheet 1 of 2

Hole ID: PZ-14	Location: WIPP Site - SPDV Pile		
Drill Date: 8/24 to 8/25 2007	Drill Method: Hollow-Stem/Air Rotary	Drill Make/Model: CME 75	
Drill Crew: Stewart Brothers Drilling Company	Hole Diameter: 9.88 - Inch	Barrel Specs: 3-inch split spoon	
	Hole Depth: 77 feet	Drill Fluid: NA	
	Hole Orient: NA	Core Preserv: NA	
Logged by: J. Maly, P.G./R.Salness, P.G.	Date: 8/24 to 8/25 2007	Scale: 1" = 10 '	
	Northing	Easting	Elevation
Survey Coordinate: (Ft)	499335.30	668667.57	3420.58

Comments:

Depth Number	Depth (feet)	% Recovered	Well Construction	Profile (Rock Type)	Description	Lithology
		30	Well Casing	Dune Sand	(5YR 6/4, LT Reddish Brown), sand, fine grained, loose.	
				Berino Soil	? — ? — ? — ? — ? (2.5YR 5/8 - 4/8; Red), sandy, calcareous sand.	
5		100		Mescalero Caliche	(5YR 8/2-8/3; Pinkish White to Pink) sandy limestone or calcareous sandstone, low moisture, stiff with pebbles, weak laminar structure, hard surface cap	
10		100		Gatuna Sandstone	(5YR 8/4 Pink) Gatuna Sandstone with Mescalero Caliche overprint, dry, gatuna inclusions and chert pebbles throughout, more argillaceous and clacareous than above.	
		100			(2.5YR 4/8-5/8, Red); Gatuna sandstone with argillaceous calcareous matrix, chert pebbles throughout, root casts coated with manganese oxide.	
15		100				
		100			(2.5YR 7/4-8/4; Light Reddish Brown to pink interbedded), platy, moist, Gatuna sandstone sediments, calcareous cementation.	
20		100			(2.5YR 4/8-5/8, Red), Gatuna sandstone, platy, dry and moist alternating between layers, becomes harder with depth to 25'	
		100				
25		100				
		100			(2.5YR 4/8; Red), Platy Gatuna sandstone, poorly indurated, moist, fine grained, argillaceous, silica cementation, root casts with manganese oxide, chert pebbles, very hard at 30'	
		100				
		100				
30		100				
		100		Santa Rosa Sandstone	(2.5YR 7/4-8/4, Pink to Light Reddish Brown), (Gley 1 8/1; Light Greenish Gray), interbedded Reddish and LT Gray sanstone, desication cracks with carbonate fill, slickensided surfaces (subhorizontal), dry, poorly to moderately indurated. Hard at 35.5'-drilled with center bit only to 40 feet; no recovery at 40 feet; drilled with center bit only to 50 feet. (5YR 5/4-4/6; Reddish Brown), Very hard, silt sandstone, argillaceous. (50'-50.5'), pulverized by sample barrel Used center bit drilling only instead of wireline to 56 feet. Hit hard, competent Santa Rosa at 56 feet then switched to air rotary until softer Dewey Lake FM. encountered at depth. Center bit at 56 feet is dry. Assume similar geology to that seen in PZ-13	
35						
40		0%				
45						
50						

Hole ID: PZ-14 | CORE LOG (cont. sheet) | Sheet 2 of 2

Logged by: J. Maly, P.G./R.Salness, P.G. | Date: 8/24 to 8/25 2007

Depth Number	Depth (ft)	% Recovered	Well Construction	Profile (Rock Type)	Description	Lithology
50			Well Casing	Santa Rosa Sandstone		
55				Interbedded sandstone and siltstone in	Same as previous page	
60						
65						
70		80 90 90			[2.5YR 3/6, Dark Red], silty sand, very loose/unconsolidated, very argillaceous, saturated (70'-70.5'). 70.5' - 70.8 ' Saturated Gravel Lens comprised of angular claystone and siltstone fragments. Claystone: [2.5YR 3/3; Dark Reddish Brown] Siltstone: [2.5YR 5/1; Reddish Gray]	
75			Sump			
80				Dewey Lake Formation	70.8 - 71 feet [5YR 5/1 and 2.5YR 4/6; Gray and Red], siltstone, very hard, competent, platy (very coarse), dry, saturation occurs ontop of this layer. 71 - 72 feet [2.5YR 5/8 - 4/8; Red], claystone, loose/unconsolidated, argillaceous with some silt with gray to greenish spots [Gley2 8/10G, Light Greenish Gray], damp, but not saturated. 72 - 73 feet [2.5YR 5/8, Red], siltstone, very hard, dry, micaceous, platy (fine to coarse with depth), friable at 72 feet, greenish gray spots.	

Total Depth 73' terminated in the Dewey Lake Formation

CORE LOG

Sheet 1 of 1

Hole ID: PZ-15	Location: WIPP Site - SPDV Pile

Drill Date: 8/21 to 8/22 2007	Drill Method: Hollow-Stem/Air Rotary	Drill Make/Model: CME 75
Drill Crew: Stewart Brothers Drilling Company	Hole Diameter: 9.88 - Inch	Barrel Specs: 3-inch split spoon
	Hole Depth: 77 feet	Drill Fluid: NA
	Hole Orient: NA	Core Preserv: NA

Logged by: J. Maly, P.G./R.Salness, P.G.	Date: 8/21 to 8/22 2007	Scale: 1" = 10 '

	Northing	Easting	Elevation
Survey Coordinate: (Ft)	498898.39	669371.61	3430.86

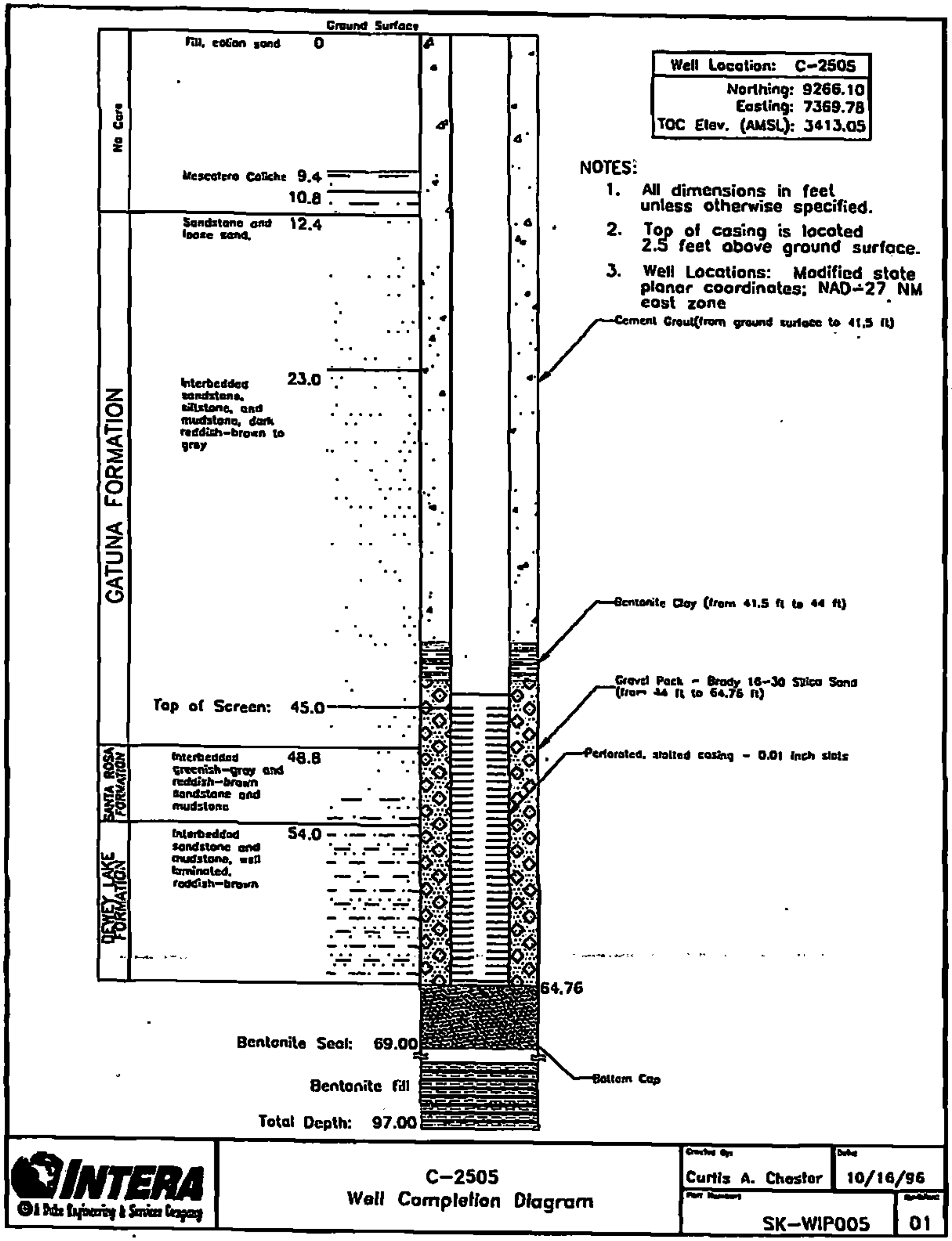
Comments:

Depth Number	% Recovered
	100
	100
5	
	80
	80
	100
10	
	100
	100
	100
15	
	100
	100
	50
20	
	80
	80
	90
25	
	100
	100
30	
	100
	100
35	
40	
	100
	100
45	
	80
	100
50	
	100
55	

Well Construction: Well Casing

Profile (Rock Type)	Description
Dune Sand	[5YR 6/4, LT Reddish Brown], sand, fine grained, loose, moist to dry, friable.
Berino Soil	[2.5YR 5/4; Reddish Brown], sandy, 7.8'-8' calcareous sand, indurated, low moisture, small roots, damp. [5YR 8/3 Pink] at 7.5'
Mescalero Caliche	[7.5YR 8/2-8/4; Pink], sandy limestone or calcareous sandstone, low moisture, stiff with chert pebbles and weak laminar structure (friable), moist in friable portions; pedogenic Gatuna interbedded identified by manganese oxide alterations
Gatuna Sandstone	[5YR 7/4; Pink], Gatuna Sandstone with Mescalero Caliche overprint, dry to slightly moist, loose to very stiff clasts with caliche, altered manganese oxide throughout, less argillaceous/loose matrix, caliche clasts throughout.
	[2.5YR 4/6; Red at 16'] [2.5YR 5/8 at 16.6'], Gatuna Sandstone, chert pebbles throughout, root casts coated in manganes oxide, dry, carcareous, less argillaceous matrix dominated by sand, increased bedding structure with depth, stiff, platy structures, dry, stiff, moderately indurated. 17.5-20' damp, loose, cabonaceous, more argillaceous 20-22.5' no bedding structure, inc. manganese oxide, damp 22.5' -27.5 platy bedding structure, bcame hard at 24' 26.1'-45' [2.5YR 4/6-4/8; Red], siliceous, friable, more argellacaous matrix interbedded with loose matrix. 45'-50.5' Saturated Gatuna Formation sitting on hard Santa Rosa Formation.
	[2.5YR 4/8, Red], [10YR 7/1, LT Gray], interbedded Red and LT Gray sandstone, dessication cracks with carbonate fill, slickensided surfaces (subhorizontal), dry, moderately indurated, Wet/saturated at top and dries with depth/perched. 51.3-51.5 soft sandier zone 51.5 Very hard Santa Rosa Sandstone, very hard consolidated, well indurated sandstone, dry [2.5YR 4/4; Reddish Brown].
Santa Rosa Sandstone	Total Depth 55 feet terminated in the Santa Rosa Sandstone

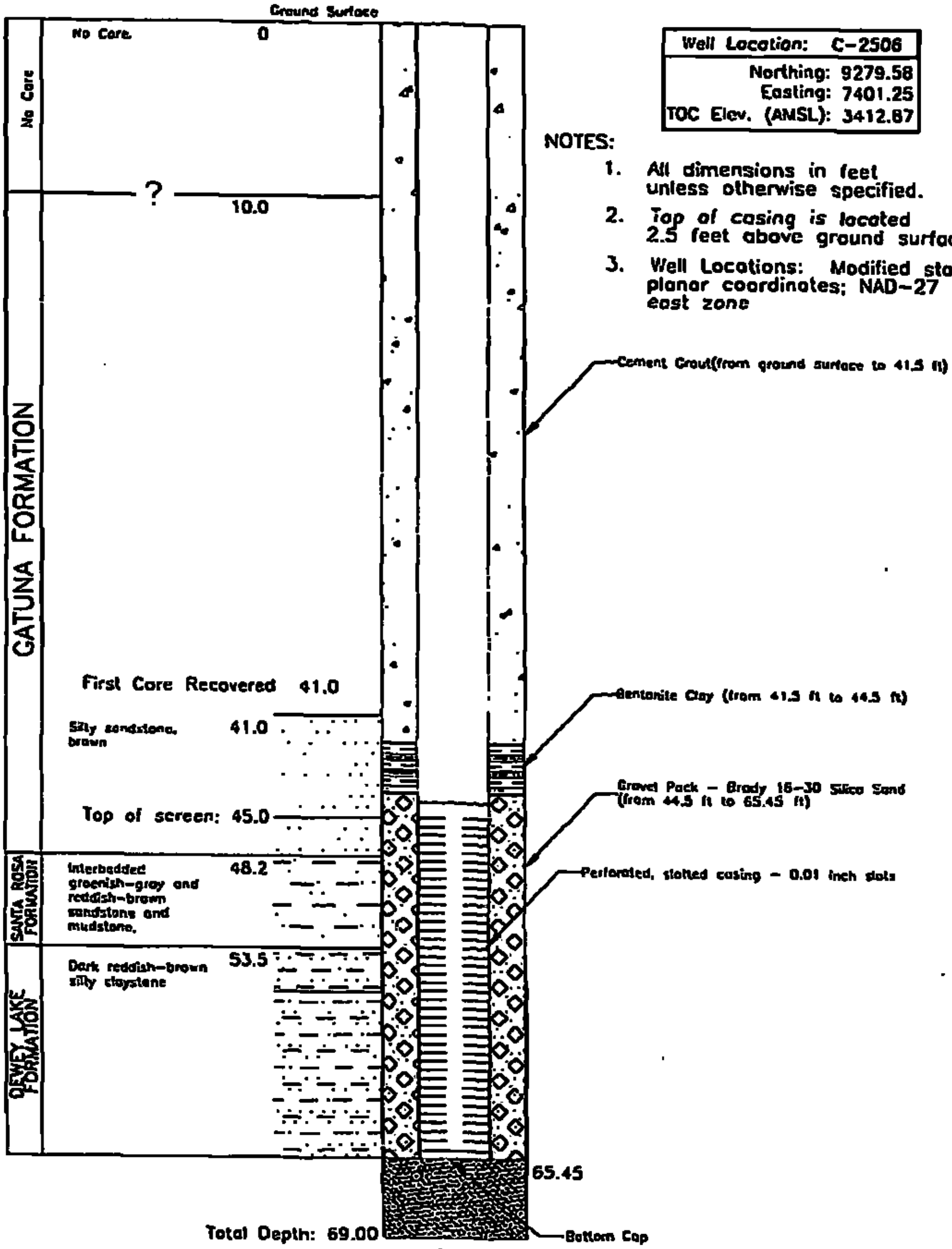
Lithology


Ground Surface
Fill, eolian sand 0
No Core
Mescalero Caliche 9.4
10.8
Sandstone and loose sand. 12.4
Interbedded sandstone, siltstone, and mudstone, dark reddish-brown to gray 23.0
GATUNA FORMATION
Top of Screen: 45.0
SANTA ROSA FORMATION
Interbedded greenish-gray and reddish-brown sandstone and mudstone 48.8
DEWEY LAKE FORMATION
Interbedded sandstone and mudstone, well laminated, reddish-brown 54.0
64.76
Bentonite Seal: 69.00
Bentonite fill
Total Depth: 97.00
Well Location: C-2505
Northing: 9266.10
Easting: 7369.78
TOC Elev. (AMSL): 3413.05
NOTES:
1. All dimensions in feet unless otherwise specified.
2. Top of casing is located 2.5 feet above ground surface.
3. Well Locations: Modified state planar coordinates; NAD-27 NM east zone
Cement Grout (from ground surface to 41.5 ft)
Bentonite Clay (from 41.5 ft to 44 ft)
Gravel Pack - Brady 16-30 Silica Sand (from 44 ft to 64.76 ft)
Perforated, slotted casing - 0.01 inch slots
Bottom Cap
INTERA
A Duke Engineering & Services Company
C-2505
Well Completion Diagram
Curtis A. Chester
10/16/96
SK-WIP005
01

Well Location:	C-2506
Northing:	9279.58
Easting:	7401.25
TOC Elev. (AMSL):	3412.87

NOTES:

1. All dimensions in feet unless otherwise specified.
2. Top of casing is located 2.5 feet above ground surface.
3. Well Locations: Modified state planar coordinates; NAD-27 NM east zone

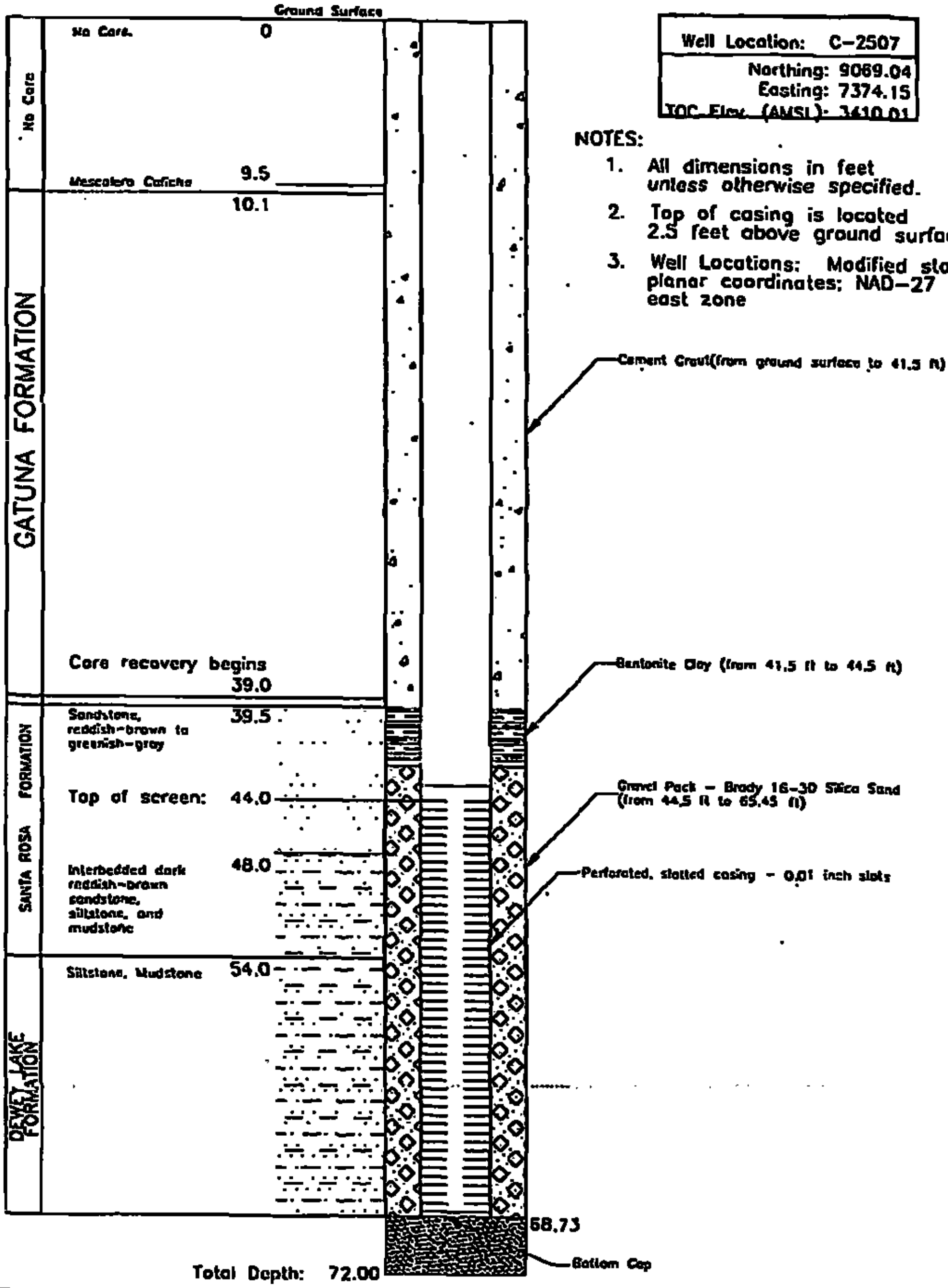


INTERA — A Duke Engineering & Services Company	C-2506 Well Completion Diagram	Drafted By: Curtis A. Chester	Date: 10/16/96
		Part Number: SK-WIP006	Revision: 01

Well Location: C-2507
Northing: 9069.04
Easting: 7374.15
TOC Elev. (AMSL): 3410.01

NOTES:

1. All dimensions in feet *unless otherwise specified.*
2. Top of casing is located 2.5 feet above ground surface.
3. Well Locations: Modified state planar coordinates; NAD-27 NM east zone



INTERA A Duke Engineering & Services Company	C-2507 Well Completion Diagram	Created By: Curtis A. Chester	Date: 10/16/98
		Part Number: SK-WIP007	Revision: 01

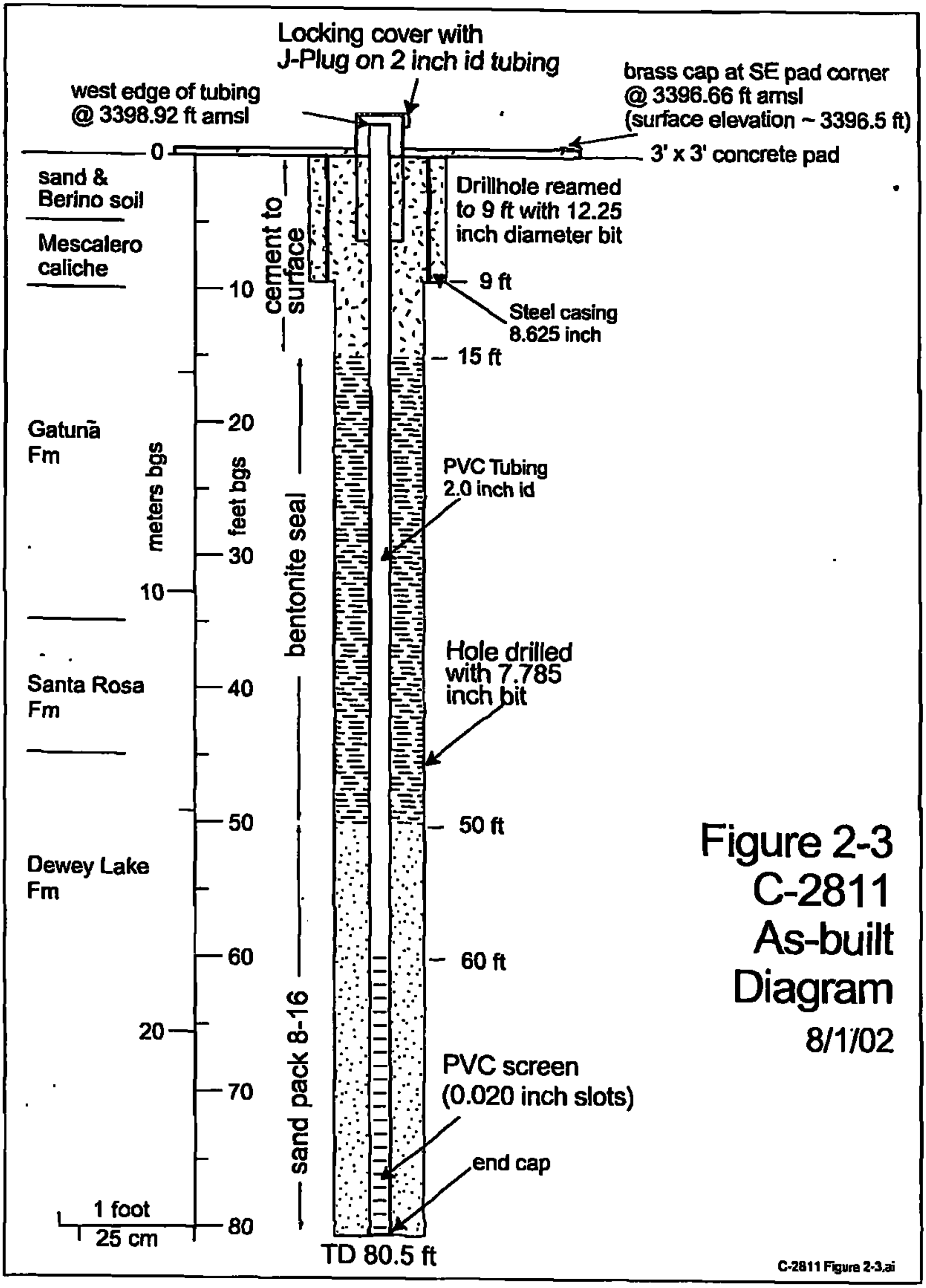


Figure 2-3
C-2811
As-built
Diagram
8/1/02

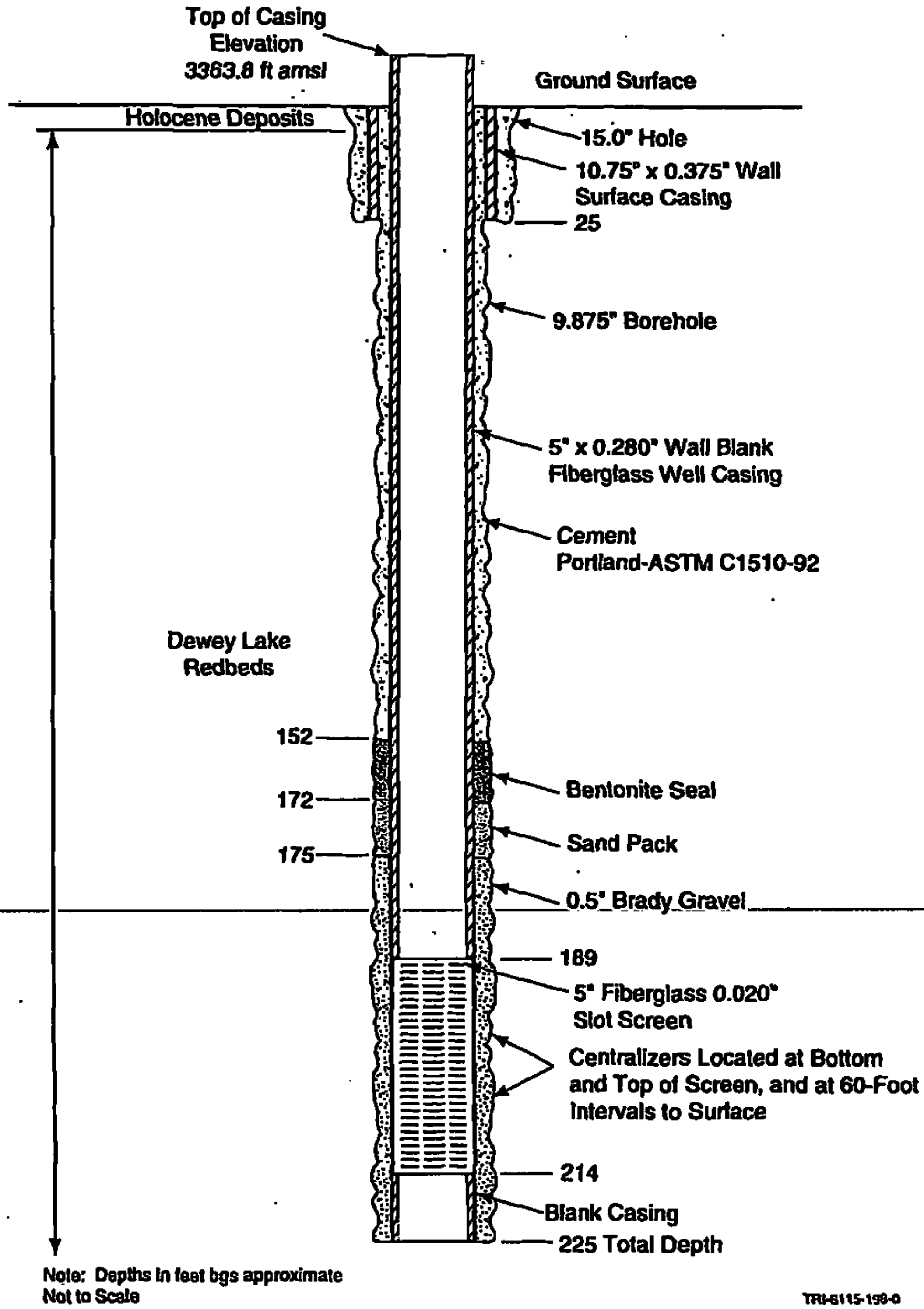
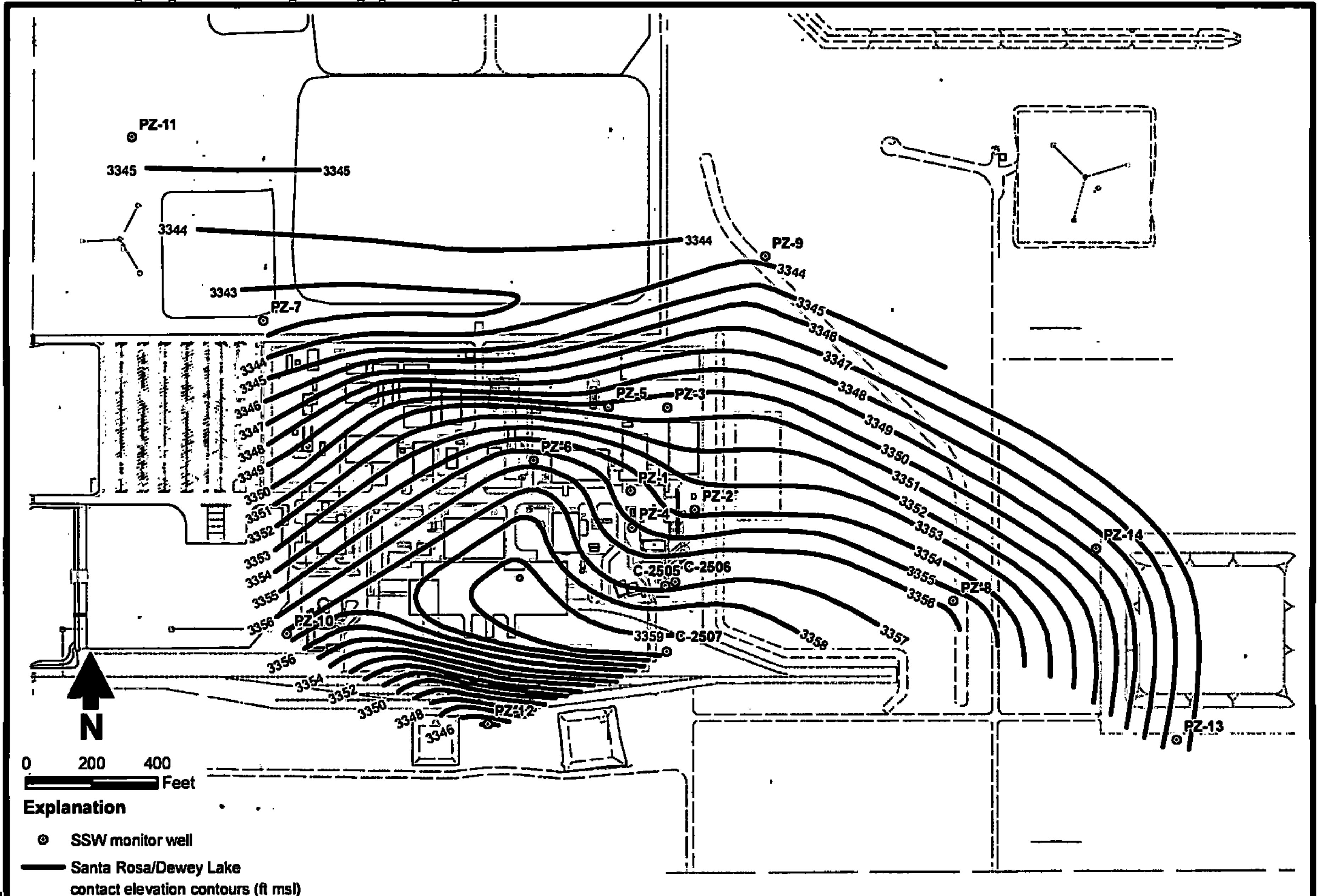


Figure 5-7. As-built configuration of well WQSP-6A.

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/FIG20_CONTOURS_OF_SANTAROSA_DEWEYLAKE.MXD 803090



WIPP SHALLOW SUBSURFACE WATER

Contours of Santa Rosa/Dewey Lake Contact

Daniel B. Stephens & Associates, Inc.
11-19-08
JN ES08.0072

Figure A-1

Appendix B. Water Quality Monitoring Data

Notes

[a] pH measured in standard units

[b] Specific conductance measured in microSiemens per centimeter (uS/cm) at 25 degrees Celsius

[c] Temperature measured in degrees Celsius

NE = Normal environmental sample
DUP = Duplicate sample
DD = Discrete depth sample
LF = Low flow sample
BLR = Bailer sample

Qualifier Definitions

<	Actual value is known to be less than the value shown.
INT	Estimated value due to interference.
J	The result is an estimated quantity (due either to the quality of the data, or the concentration of the anlayte was below the quantitation limit).
MS	Matrix spike/matrix spike duplicate sample recovery not within acceptance limits.
R	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present.
REP	Duplicate analysis not within limits.
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

C-2505 Analytical Results
Page 1 of 2

Date	Sample Type	Concentration (mg/L unless otherwise noted)															
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate	Nitrite	pH [a]
9/23/1996	NE, DD	0.3	0.00043 JMS	0.0982 J	1.2	9	<0.00056	789	3,810	0.0048 JINT	0.0146 JINTMS	0.0016 J	641	<0.0002 UMS	15.6	<0.1	7.54
9/23/1996	DUP, DD	0.38	0.00042 JMS	0.0957 J	0.2 J	9	<0.00056	772	3,800	0.018 INT	0.0937 JINTMS	0.001 J	625	<0.0002 UMS	15.3	0.15 J	7.47
9/24/1996	NE, DD	0.26	0.0012 JMS	0.0941 J	0.19 J	9.1	<0.00056	809	3,830	0.0089 JINT	0.0353 JINTMS	0.00076 J	653	<0.0002 UMS	16	0.13 J	7.47
9/24/1996	DUP, DD	0.21	0.00099 JMS	0.0945 J	0.19 J	9.2	<0.00056	812	3,840	0.0034 JINT	0.0098 JINTMS	0.001 J	653	<0.0002 UMS	16.1	0.12 J	7.43
9/26/1996	NE	0.1	—	—	—	—	—	—	—	—	—	—	—	—	17.9	1.2	—
3/6/1997	NE	1	<0.0011	0.0694 J	<1	6.6	<0.0011	508	1,400	0.0032 J	2.96	<0.0011	390	<0.0002 UMS	26.2	—	7.24
3/6/1997	DUP	1	0.0011 J	0.0705 J	<1	6.6	<0.0011	511	1,400	0.0027 J	3.98	<0.0011	392	<0.0002 UMS	26.6	—	7.46
5/14/1997	NE	0.0079 J	0.0028 J	0.0662 J	0.27 J	6.3	<0.0011	437	1,260	0.0034 J	0.0916	<0.0011	336	<0.0002 UMS	26.3	—	7.1
5/14/1997	DUP	<0.007	0.0029 J	0.0675 J	0.27 J	6.2	<0.0011	434	1,230	0.0093 J	0.0781	<0.0011	331	<0.0002 UMS	26.3	—	7.1
6/18/1997	NE	<0.007	0.0024 J	0.0676 J	0.27 J	5.9	<0.0011	446	1,370	<0.0011	0.0943 REP	<0.0011	345	<0.0002	27.6	—	7.1
6/18/1997	DUP	0.0089	0.0022 J	0.0675 J	0.26 J	5.9	<0.0011	444	1,380	<0.0011	0.0489 REP	<0.0011	348	<0.0002	28.1	—	7.2
7/16/1997	NE	0.0074 J	0.0023 J	0.0702 J	0.25 J	6.1	<0.0011	480	1,520	0.0022 J	0.0587 J	0.0021 J	362	<0.0002	25.7	—	7
7/16/1997	DUP	0.0074 J	0.0023 J	0.0734 J	0.26 J	6	<0.0011	487	1,550	0.0017 J	<0.0078	0.0018 J	372	<0.0002	25.9	—	7.1
8/25/1997	NE	0.0148 J	0.0019 J	0.0595 J	0.23 J	5.7	<0.0011	457	1,570	0.004 J	0.12	<0.0011	342	<0.0002	24	—	7.3
10/13/1997	NE	0.098 J	0.0022 J	0.0673 J	0.24 J	5.2	<0.0011	425	1,490	0.0032 J	<0.0089	<0.0011	332	<0.0002	24.8	—	7.1
1/12/1998	NE	0.0182 J	0.0024 JMS	0.0672 J	0.22 J	5.7	<0.0011	444	1,440	0.0034 J	0.0289 J	<0.0011	343	<0.0002	26.7	—	7.2
4/13/1998	NE	0.0416	0.0022 J	0.0674 J	0.23 J	7.1	<0.0011	441	1,780	0.0064 J	<0.0122	0.0023 J	341	<0.0002	27.3	—	7.3
4/13/1998	DUP	0.0812	0.0021 J	0.0622 J	0.23 J	5	<0.0011	453	1,290 R	0.0078 J	0.0139 J	<0.0011	347	0.00021 J	27.2	—	7.2
7/20/1998	NE	0.0545	0.0019 J	0.085 J	0.22 J	6.6	<0.0011	521	1,860	0.0053 J	0.013 J	0.0011 J	399	<0.0002	24.1	—	6.8
10/12/1998	NE	0.0064 J	0.0013 J	0.0992 J	0.22 J	7.1	<0.001	610	2,350	0.0064 J	<0.005	<0.001	462	<0.0002	24.4	—	7.1
2/8/1999	NE	0.0448	0.0015 J	0.109 J	0.2 J	9.1	<0.001	700	2,920	0.0022 J	0.0131 J	0.0059	545	<0.0002	23	—	7.2
2/8/1999	DUP	0.0269	0.0016 J	0.111 J	0.2 J	9.1 J	<0.001	729	3,040	0.0073 J	0.0352 J	0.0027 J	554	<0.0002	23.3	—	7.1
8/9/1999	NE	1.53	<0.005	0.119 J	<1	9.8	<0.003	871	4,070	0.0116 J	<0.132	<0.002	623	<0.001	23.1	—	7.31
2/8/2000	NE, LF	0.265 MS	<0.002	0.114 J	<1	10	<0.003	887	5,080	<0.003	<0.144	<0.002	640	<0.001	22.6	—	7.52
10/10/2000	NE, LF	0.144 MS	0.0018 J	0.133 JINT	0.13 J	9.1 J	<0.003	844	4,970	0.0463 JINT	<0.084	0.0203 JINT	593	<0.001	21.7	—	7.13
12/17/2001	NE, LF	0.097	<0.003	0.103 JINT	0.17 JINT	9.9 J	<0.001	943	6,230	0.0141 J	<0.008	0.0048 J	646	<0.0002	23.2	—	7.28
12/4/2002	NE, LF	0.359 MS	0.0018 J	0.0885 J	0.0002 JINT	10	<0.001	833	5,920	0.0201 JINT	0.0161 J	<0.001	574	<0.001	24.2	—	7.21

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Date	Sample Type	Concentration (mg/L unless otherwise noted)										
		Potassium	Selenium	Silicon	Silver	Sodium	Sulfate	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Total Suspended Solids	Zinc
9/23/1996	NE, DD	36.7 J	0.0636 MS	—	0.00036 JMS	1,100	853	8,550	45.8	9.2	16 J	<0.0033
9/23/1996	DUP, DD	23.9 J	0.0605 MS	—	0.00059 JMS	1,040	852	8,530	39.9	6.4	15 J	0.0047 J
9/24/1996	NE, DD	30.9 J	0.0635 MS	—	<0.00022 UMS	996	853	8,580	45.7	7.3	22	<0.0033
9/24/1996	DUP, DD	31.4 J	0.0672 MS	—	<0.00022 UMS	996	856	8,690	47.1	10.5	24	0.0056 J
9/26/1996	NE	—	—	—	—	—	—	—	—	—	—	—
3/6/1997	NE	6 J	0.0883	—	<0.0011	337	945	4,440	90.2	8	—	<0.02
3/6/1997	DUP	6 J	0.0807	—	<0.0011	337	944	4,510	88.7	2	—	0.0262 J
5/14/1997	NE	5.4 J	0.0829	25.3	<0.0011	292	900	3,920	94.8	6.9	—	<0.0022
5/14/1997	DUP	5.5 J	0.0807	25.4	<0.0011	294	883	3,910	95.1	7.1	—	<0.0022
6/18/1997	NE	5.8	0.0853	27.1	<0.0011	333	880	4,320	70.6	8.5	—	0.0113 J
6/18/1997	DUP	5.9	0.0811	27.1	<0.0011	334	877	4,510	88.1	9.9	—	0.0086 J
7/16/1997	NE	5.5 J	0.0877 MS	26.2	<0.0011	356	884	5,280	87.4	8	—	<0.0033
7/16/1997	DUP	6.1	0.0837 MS	26.5	<0.0011	368	865	5,290	88.9	7.6	—	<0.0033
8/25/1997	NE	5.6	0.0827	23.7	<0.0011	327	844	4,520	76.8	12.5	—	0.0082 J
10/13/1997	NE	5.9	0.0697	23.8	<0.0011	347	815	4,280	80.8	10.4	—	<0.0056
1/12/1998	NE	5.9	0.074	25.1	<0.0011	340	873	4,210	72	6.6	—	<0.00989
4/13/1998	NE	5.8	0.0638	25	<0.0011	333	1,070	3,780	75.1	0.97 JMS	—	0.014 J
4/13/1998	DUP	5.9	0.0664	24.7	<0.0011	337	768	3,800	73	<0.3 UMS	—	0.0128 J
7/20/1998	NE	6.2	0.085	25.2	<0.0062	465	934	5,060	64.2	3.7	—	<0.0199
10/12/1998	NE	6.6	0.0868	23.6	<0.001	546	934	6,360	58.3	3.5	—	0.0311
2/8/1999	NE	7.7	0.0974		<0.001	771	1,040	7,650	54	6.7	—	0.0091 J
2/8/1999	DUP	7.7	0.0939		<0.001	753	1,030	7,640	55.3	4.6	—	<0.005
8/9/1999	NE	9	0.111		<0.003	1,130	970	11,100	51.6	19.7	—	<0.046
2/8/2000	NE, LF	10	0.126	21.6	<0.003	1,430	1,200	10,600	47.3	0.49 J	—	<0.047
10/10/2000	NE, LF	10	0.0904	22.3	<0.001	1,510	1,120	10,630	51.3	33.2	—	<0.091
12/17/2001	NE, LF	11.3 J	0.112	22.7	<0.001	2,030	1,290	13,000	—	—	—	<0.05
12/4/2002	NE, LF	11 J	0.0895	23.2	<0.001	2,090	1,200	12,000	53.5	3.4	—	<0.01

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Date	Sample Type	Concentration (mg/L unless otherwise noted)															
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate	pH [a]	Potassium
9/26/1996	NE, DD	—	0.0015 JMS	0.234	0.18 J	10.2	<0.00056	1,010	5,390	0.0128 INT	0.717 INTMS	0.0018 J	744	<0.0002 UMS	—	7.29	18.3 J
2/28/1997	NE	1	<0.0014	0.0074 J	<1	6.8	<0.0011	580	2,130	<0.0028	3.11	<0.0011	434 J	<0.0002	23.9	7.08	4.7 J
2/28/1997	DUP	0.5 J	<0.0013	0.0725 J	<1	6.8	<0.0011	590	2,140	0.0032 J	3.16	<0.0011	430	<0.0002	0.8 R	7.16	5.2 J
5/13/1997	NE	0.0104 J	0.0028 J	0.0639 J	0.24 J	6.3	<0.0011	568	2,220	0.0048 J	0.0539	<0.0011	425	<0.0002	22.8	7.1	6.6
5/13/1997	DUP	0.0079 J	0.003 J	0.0641 J	0.24 J	6.2	<0.0011	566	2,180	0.0039 J	0.0594	<0.0011	425	<0.0002	22.8	7.1	6.6
6/18/1997	NE	<0.007	0.0025 J	0.0751 J	0.23 J	6.8	<0.0011	687	2,840	0.0019 J	0.0371 REP	<0.0011	496	<0.0002	22	7.1	7.2
6/18/1997	DUP	<0.007	0.0022 J	0.0731 J	0.23 J	6.7	<0.0011	682	2,860	0.0019 J	0.0848 REP	<0.0011	498	<0.0002	22.1	7	7.2
7/16/1997	NE	0.0123 J	0.0024 J	0.0808 J	0.22 J	7.4	<0.0011	772	3,240	0.0033 J	0.0277 J	0.0026 J	557	<0.0002	20.5	7	7.5
7/16/1997	DUP	0.0123 J	0.0021 J	0.0817 J	0.22 J	7.2	<0.0011	781	3,250	0.0033 J	0.024 J	0.0021 J	563	<0.0002	20.7	7	7.4
8/25/1997	NE	7.6 J	0.0023 J	0.0692 J	0.19 J	6.8	<0.0011	632	2,940	0.003 J	0.038 J	<0.0011	465	<0.0002	17	7.2	7.2
10/13/1997	NE	14.8 J	0.0023 J	0.065 J	0.2 J	5.7	<0.0011	529	2,620	0.0043 J	<0.009	<0.0011	399	<0.0002	16.8	7.1	6.9
1/12/1998	NE	0.0159 J	0.0025 JMS	0.0679 J	0.18 J	6.2	<0.0011	537	2,460	0.0044 J	<0.0056	<0.0011	403	<0.0002	17.3	7.2	7
4/13/1998	NE	0.0882	0.0024 J	0.0712 J	0.19 J	7.3	<0.0011	651	3,070	0.0123	<0.0122	<0.0011	461	0.00094	18.8	7.3	7.1
7/20/1998	NE	0.482	<0.02	0.12 J	<1	7.9	0.01 J	921	3,920	0.0344 JMSREP	0.357 J	0.001 REP	659	<0.001	19.3	7.1	6.2 J
10/12/1998	NE	0.0013 J	<0.002	0.107 J	<1	8.2 J	<0.01	910	4,480	<0.01	<0.05	<0.01	658	<0.001	22.4	7.1	9
2/8/1999	NE	0.0269	0.001 J	0.122 J	<1	10.8	<0.01	1,110	5,820	0.0276 J	0.0831 J	<0.01	785	<0.0002	21.5	7.1	10.3
8/9/1999	NE	1.65	<0.005	0.127 J	<1	10 J	<0.003	1,090	5,840	0.0094 J	<0.132	<0.002	751	<0.001	20.7	7.01	10
2/8/2000	NE, LF	0.0868 MS	<0.002	0.118 J	<1	11.6	<0.003	1,250	8,490	0.0052 J	<0.144	<0.002	848	<0.001	22.4	7.34	12.4
10/10/2000	NE, LF	0.158 MS	0.0014 J	0.122 JINT	0.17 J	9.2 J	<0.003	1,130	7,920	0.0312 JINT	<0.084	0.0041 JINT	746	<0.001	22	7.14	12
12/17/2001	NE, LF	0.0967	<0.003	0.0914 JINT	0.12 JINT	9.5 J	<0.001	1,250	9,240	0.0099 J	<0.008	<0.001	820	<0.0002	23.2	7.2	14.5 J
12/4/2002	NE, LF	0.341 MS	0.0018 J	0.0969 J	0.078 JINT	6 J	<0.001	1,150	8,870	0.0156 JINT	<0.014	<0.001	753	<0.001	25.7	7.09	14.6 J

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Date	Sample Type	Selenium	Silicon	Silver	Sodium	Sulfate	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Total Suspended Solids	Zinc
		Concentration (mg/L unless otherwise noted)									
9/26/1996	NE, DD	0.0821 MS	---	<0.00022 UMS	1,660	973	11,500	47.2	---	32	0.0138 J
2/28/1997	NE	0.0869	---	<0.0011	626	926	6,050	78	7.2	---	0.0655 J
2/28/1997	DUP	0.086	---	<0.0011	613	928	5,800	80.1	8	---	0.0837 J
5/13/1997	NE	0.0767	24.8	<0.0011	586	904	5,580	77	10.1	---	0.0023 J
5/13/1997	DUP	0.0773	24.7	<0.0011	583	894	5,590	80.4	9.3	---	<0.0022
6/18/1997	NE	0.0834	25.7	<0.0011	713	909	8,050	58.1	6.4	---	0.0043 J
6/18/1997	DUP	0.0838	25.8	<0.0011	722	907	7,560	58.3	5	---	<0.0033
7/16/1997	NE	0.0907 MS	25.3	<0.0011	839	913	8,560	69.2	6.6	---	<0.0033
7/16/1997	DUP	0.0916 MS	26.3	<0.0011	842	903	8,580	69.7	7.1	---	<0.0033
8/25/1997	NE	0.0847	22.7	<0.0011	753	825	6,870	60	4.1	---	0.0059 J
10/13/1997	NE	0.071	22.3	<0.0011	712	756	6,240	64.1	6.5	---	<0.0056
1/12/1998	NE	0.0703	23.3	<0.0011	662	776	5,700	61.7	4.8	---	<0.0089
4/13/1998	NE	0.0679	23.3	<0.0011	772	911	6,030	59.5	4.3 MSREP	---	0.0069 J
7/20/1998	NE	0.103 J	23.9	<0.01	1,080	976	10,200	54.2	4.3 J	---	0.06 J
10/12/1998	NE	0.105	22.5	<0.01	1,200	974	10,400	45.2	3.3	---	<0.06
2/8/1999	NE	0.113		<0.01	1,630	1,120	13,300	46	3.2	---	<0.05
8/9/1999	NE	0.116		<0.003	1,720	988	14,800	44.5	9.7	---	<0.046
2/8/2000	NE, LF	0.127	20.9	<0.003	2,690	1,260	17,000	42.2	0.78 J	---	<0.047
10/10/2000	NE, LF	0.0882	21.6	0.0021 J	2,730	1,070	15,920	46.4	2.3	---	<0.091
12/17/2001	NE, LF	0.0447	22.3	<0.001	3,230	1,300	18,000	---	---	---	<0.05
12/4/2002	NE, LF	0.0911	22.1	<0.001	3,240	1,280	17,700	49.1	3.3	---	<0.01

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Date	Sample Type	Concentration (mg/L unless otherwise noted)														
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate	Nitrite
10/2/1996	NE	0.05	0.0018 JMS	0.122 J	0.23 J	10.1	<0.00056	446	1,170	0.0076 JINT	4.16 INTMS	0.0019 J	340	<0.0002 UMS	9.5	7.7
5/14/1997	NE	0.0104 J	0.0029 J	0.0523 J	0.23 J	8.3	<0.0011	449	1,180	0.014	0.263	<0.0011	332	<0.0002	17.4	—
5/14/1997	DUP	0.0079 J	0.003 J	0.0541 J	0.24 J	8.4	<0.0011	449	1,160	0.0138	0.188	<0.0011	333	<0.0002	17.5	—
6/18/1997	NE	0.0112	0.0025 J	0.0508 J	0.24 J	7.8	<0.0011	436	1,160	0.013	0.378 REP	0.003 J	330	<0.0002	19	—
6/18/1997	DUP	0.0135	0.0024 J	0.0502 J	0.24 J	7.9	<0.0011	438	1,150	0.0128	0.189 REP	<0.0011	330	<0.0002	19	—
7/16/1997	NE	0.0074 J	0.0024 J	0.0453 J	0.24 J	7.8	<0.0011	436	1,130	0.0107 J	0.239	0.0019 J	319	<0.0002	18.4	—
7/16/1997	DUP	0.0074 J	0.0025 J	0.0463 J	0.23 J	7.8	<0.0011	436	1,150	0.0098 J	0.179	0.0021 J	319	<0.0002	18.3	—
8/25/1997	NE	<0.007	<0.002	0.0442 J	0.23 J	7	<0.0011	426	1,090	0.0144	0.123	<0.0011	310	<0.0002	18.8	—
8/25/1997	DUP	0.007	<0.002	0.0419 J	0.22 J	7.2	<0.0011	417	1,110	0.0123	0.0969	<0.0011	306	<0.0002	18.8	—
10/13/1997	NE	0.0073 J	0.0023 J	0.0431 J	0.24 J	7.2	<0.0011	411	1,130	0.025	0.0438 J	<0.0011	308	<0.0002	21.1	—
10/13/1997	DUP	0.0123 J	0.0022 J	0.0454 J	0.24 J	7.3	<0.0011	401	1,110	0.0261	0.185	0.0014 J	302	<0.0002	19.4	—
1/12/1998	NE	0.0182 J	0.0023 JMS	0.0489 J	0.24 J	9.6 R	<0.0011	466	1,320	0.0215	0.0334	<0.0011	338	<0.0002	18	—
1/12/1998	DUP	0.009 J	0.0025 JMS	0.0494 J	0.23 J	7.7	<0.0011	464	1,320	0.0231	0.0474 J	<0.0011	340	<0.0002	18	—
4/13/1998	NE	0.107	0.0023 J	0.0469 J	0.25 J	7.3	<0.0011	476	1,440	0.0887	0.0215 J	<0.0011	347	<0.0002	20.1	—
7/21/1998	NE	0.184	0.0016 J	0.045 J	0.25 J	6.8	<0.0011	464	1,400	0.14	0.0232 J	<0.0011	356	<0.0002	20.8	—
10/12/1998	NE	0.0064 J	0.0013 J	0.0438 J	0.46 J	6.1	<0.001	447	1,340	0.133	0.0243 J	0.003 J	343	<0.0002	21.2	—
10/12/1998	DUP	0.0064 J	0.0013 J	0.0465 J	0.26 J	6	<0.001	462	1,320	0.127	<0.005	<0.001	339	<0.0002	21.4	—
2/8/1999	NE	0.0289	0.0013 J	0.0453 J	0.26 J	7.2	<0.001	461	1,380	0.121	0.0142 J	0.0021 J	342	<0.0002	21.8	—
8/9/1999	NE	0.0216	0.0024 J	0.0483 J	0.24 J	7.3 J	<0.0003	517	1,710	0.126	<0.0132	0.0022 J	361	<0.0002	20.5	—
8/9/1999	DUP	0.0753	0.0022 J	0.0483 J	0.25 J	7.2 J	0.00033 J	522	1,690	0.131	<0.0132	0.00066 J	358	<0.0002	20.7	—
2/7/2000	NE, LF	0.0275	0.0018 J	0.0423 J	0.23 J	6.6	<0.0003	432	1,320	0.0725	<0.0144	0.00063 J	317	<0.0002	21.9	—
2/7/2000	DUP, LF	0.0196 J	0.0018 J	0.0399 J	0.3 J	6.6	<0.0003	424	1,330	0.0713	<0.0144	0.00056 J	308	<0.0002	23.4	—
10/10/2000	NE, LF	0.0242	0.0018 J	0.0504 J	0.24 J	6.4 J	<0.0003	467	1,560	0.1	<0.0084	0.00044 J	348	<0.0002	23.5	—
12/17/2001	NE, LF	<0.0042	0.0015 J	0.0386 J	0.27 JINT	5.6	<0.0001	418	1,300	0.0491	<0.0008	0.00012 J	337	<0.0002	26	—
12/4/2002	NE, LF	0.0097 JMS	0.0017 J	0.0453 J	0.27 JINT	4.4 J	0.00012 J	446	1,520	0.0421	0.0019 J	0.00052 J	338	<0.0002	25.9	—
6/21/2004	NE, LF	—	—	—	—	—	—	—	1,300	0.028	—	—	—	—	7.55	—
11/9/2004	NE, LF	—	—	—	—	—	—	—	1,380	0.014	—	—	—	—	7.58	—
5/17/2005	NE, LF	—	—	—	—	—	—	—	1,370	0.078	—	—	—	—	7.94	—
10/10/2005	NE, LF	—	—	—	—	—	—	—	1,630	0.01	—	—	—	—	6.13	—
5/16/2006	NE, LF	—	—	—	—	—	—	—	1,930	<0.01	—	—	—	—	7.37	—
10/10/2006	NE, LF	—	—	—	—	—	—	—	1,740	<0.025	—	—	—	—	2.9	—
5/9/2007	NE, LF	—	—	—	—	—	—	—	3,060	<0.025	—	—	—	—	6.62	—
10/9/2007	NE, LF	—	—	—	—	—	—	—	3,500	0.007	—	—	—	—	<1	—
6/5/2008	NE, LF	—	—	—	—	—	—	—	2,800	0.00493	—	—	—	—	6.9	—

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Date	Sample Type	Concentration (mg/L unless otherwise noted)													
		pH [a]	Potassium	Selenium	Silicon	Silver	Sodium	Specific Conductance [b]	Sulfate	Temperature [c]	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Total Suspended Solids	Zinc
10/2/1996	NE	7.55	11.9 J	0.0334 MS	—	<0.00022 UMS	268	—	994	—	4,000	57.9	5.6	125	0.0272
5/14/1997	NE	7.4	5.6	0.091	23.2	<0.0011	270	—	1,080	—	3,930	67.8	8.5	—	<0.002
5/14/1997	DUP	7.3	5.5 J	0.0924	23	<0.0011	274	—	1,060	—	3,930	66.7	7.9	—	0.0039 J
6/18/1997	NE	7.3	5.7	0.0981	24.9	<0.0011	283	—	1,050	—	4,110	52.5	7.2	—	<0.0033
6/18/1997	DUP	7.3	5.7	0.101	24.7	<0.0011	285	—	1,050	—	4,180	59.9	7.6	—	<0.0033
7/16/1997	NE	7.2	5.5 J	0.098 MS	24.6	<0.0011	278	—	1,020	—	4,940	69.6	8.2	—	0.0079 J
7/16/1997	DUP	7.2	5.3 J	0.097 MS	24.5	<0.0011	281	—	1,030	—	4,720	71.7	7.4	—	0.0045 J
8/25/1997	NE	7.3	5.4 J	0.0857	23.1	<0.0011	262	—	971	—	4,020	62.2	8.6	—	0.0215 J
8/25/1997	DUP	7.4	5.4 J	0.0827	23.2	<0.0011	259	—	984	—	4,000	68.2	13.2 R	—	0.018 J
10/13/1997	NE	7.2	5.7	0.0686	22.6	<0.0011	285	—	963	—	3,700	65.7	8.8	—	0.0071 J
10/13/1997	DUP	7.2	5.8	0.0681	22.5	<0.0011	277	—	936	—	3,580	68.8	9.7	—	0.0078 J
1/12/1998	NE	7.1	6	0.0686	24.1	<0.0011	330	—	1,060	—	4,320	69.7	10.2 R	—	<0.0089
1/12/1998	DUP	7.1	6	0.0697	24.5	<0.0011	332	—	1,060	—	4,580	80.3	7	—	<0.0089
4/13/1998	NE	7.3	5.9	0.063	24.4	<0.0011	340	—	1,080	—	3,820	72.4	4.3 MSREP	—	0.0136 J
7/21/1998	NE	7.2	6.2	0.078	24	<0.0096	351	—	1,030	—	4,230	62.8	3.6	—	<0.0092
10/12/1998	NE	7.2	5.7	0.0751	23.2	<0.001	326	—	953	—	4,570	68.7	3.7	—	0.0351
10/12/1998	DUP	7.2	5.6	0.0702	22.9	<0.001	322	—	968	—	4,525	64	3.4	—	0.02
2/8/1999	NE	7.2	6.2	0.0759	—	<0.001	337	—	994	—	4,300	57.6	7	—	<0.005
8/9/1999	NE	7.21	6.5	0.0798	—	<0.0003	467	—	948	—	6,120	57	5.3	—	0.0208
8/9/1999	DUP	7.08	6.8	0.0793	—	<0.0003	471	—	942	—	6,590	72	6.6	—	0.0225
2/7/2000	NE, LF	7.84	6.2	0.0926	22.8	<0.0003	321	—	1,000	—	3,770	59.6	4.7 REP	—	<0.0047
2/7/2000	DUP, LF	7.58	5.8	0.0921	22.4	0.00085 J	316	—	1,020	—	4,080	72	1.6 REP	—	<0.0047
10/10/2000	NE, LF	7.1	6.6	0.0702	22.9	0.00021 J	348	—	972	—	4,115	64.5	4.2	—	0.0098 J
12/17/2001	NE, LF	7.61	6.5	0.075	25	<0.0001	328	—	970	—	4,170	75.1	3	—	0.0438
12/4/2002	NE, LF	7.15	6.7	0.0646	24.6	0.00053 J	348	—	996	—	3,650	82.7	3.4	—	0.0125 J
6/21/2004	NE, LF	—	—	0.029	—	—	—	—	717	—	3,830	—	—	—	—
11/9/2004	NE, LF	—	—	0.08	—	—	—	—	824	—	3,350	—	—	—	—
5/17/2005	NE, LF	—	—	0.063	—	—	—	—	860	—	3,340	—	—	—	—
10/10/2005	NE, LF	—	—	0.047	—	—	—	—	920	—	3,240	—	—	—	—
5/16/2006	NE, LF	—	—	0.051	—	—	—	—	1,040	—	5,300	—	—	—	—
10/10/2006	NE, LF	—	—	<0.05	—	—	—	—	943	—	3,640	—	—	—	—
5/9/2007	NE, LF	—	—	<0.05	—	—	—	—	1,110	—	5,485	—	—	—	—
10/9/2007	NE, LF	6.88	—	0.055	—	—	—	9,410	1,220	20	5,540	—	—	—	—
6/5/2008	NE, LF	—	—	0.0637	—	—	—	—	990	—	5,800	—	—	—	—

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Date	Sample Type	Concentration (mg/L unless otherwise noted)													
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate
12/19/2001	NE, LF	<0.0042	0.0014 J	0.0934 J	0.17 JINT	2.8	<0.0001	283	956	0.0017 J	<0.0008	<0.0001	207	<0.0002	27.9
12/10/2002	NE, LF	0.0125 JMS	0.0021 J	0.102 J	0.17 JINT	1.9 J	<0.0001	272	899	0.003 J	<0.0014	<0.0001	206	<0.0002	27.6
6/14/2004	NE, LF	—	—	—	—	—	—	—	769	<0.005	—	—	—	—	6.06
11/8/2004	NE, LF	—	—	—	—	—	—	—	1,030	<0.01	—	—	—	—	7.63
5/16/2005	NE, LF	—	—	—	—	—	—	—	1,930	0.053	—	—	—	—	6.02
10/10/2005	NE, LF	—	—	—	—	—	—	—	2,250	<0.01	—	—	—	—	7.48
5/15/2006	NE, LF	—	—	—	—	—	—	—	1,760	<0.01	—	—	—	—	6.94
10/9/2006	NE, LF	—	—	—	—	—	—	—	1,310	<0.005	—	—	—	—	6.05
5/7/2007	NE, LF	—	—	—	—	—	—	—	1,760	0.031	—	—	—	—	5.31
10/8/2007	NE, LF	—	—	—	—	—	—	—	2,980	<0.005	—	—	—	—	<1
6/4/2008	NE, LF	—	—	—	—	—	—	—	1,300	0.035	—	—	—	—	5.7

Date	Sample Type	pH [a]	Potassium	Selenium	Silicon	Silver	Sodium	Specific Conductance [b]	Sulfate	Temperature [c]	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Zinc
		Concentration (mg/L unless otherwise noted)												
12/19/2001	NE, LF	7.56	4.6 J	0.0243	22.3	<0.0001	163	—	379	—	2,630	49.5	1.4	0.0357
12/10/2002	NE, LF	7.4	4.3 J	0.0246	21.8	<0.0001	134	—	355	—	2,400	50	1.9	<0.001
6/14/2004	NE, LF	—	—	0.047	—	—	—	—	299	—	2,022	—	—	—
11/8/2004	NE, LF	—	—	0.054	—	—	—	—	305	—	1,996	—	—	—
5/16/2005	NE, LF	—	—	0.058	—	—	—	—	524	—	3,740	—	—	—
10/10/2005	NE, LF	—	—	0.034	—	—	—	—	584	—	4,410	—	—	—
5/15/2006	NE, LF	—	—	0.031	—	—	—	—	511	—	3,740	—	—	—
10/9/2006	NE, LF	—	—	<0.01	—	—	—	—	402	—	2,100	—	—	—
5/7/2007	NE, LF	—	—	<0.02	—	—	—	—	516	—	4,205	—	—	—
10/8/2007	NE, LF	7.05	—	0.051	—	—	—	6,400	635	20.3	3,860	—	—	—
6/4/2008	NE, LF	—	—	0.0017	—	—	—	—	390	—	2,800	—	—	—

PZ-01 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)														
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate	pH [a]
9/11/1997	NE	0.96	<0.02	0.235 J	<1	17.3 J	<0.01	4,100	41,500	0.0374 J	2.51	<0.01	2,130	0.002	5.6	6.9
9/11/1997	DUP	0.525	<0.02	0.413 J	<1	17.6 J	<0.01	4,010	45,200	0.106	12.5	0.0165 J	2,080	0.0025	5.4	6.9
10/15/1997	NE	0.073 J	<0.02	0.255 J	<1	14.2 J	<0.01	4,390	58,600	0.0394 J	<0.08	0.0185 J	2,300	<0.001	5.8	6.8
10/15/1997	DUP	0.073 J	<0.02	0.244 J	<1	16.5 J	<0.01	4,340	59,400	0.0423 J	<0.08	0.0108 J	2,280	<0.001	5.9	6.8
11/13/1997	NE	0.0222	<0.02	0.219 J	<1 UMS	18.6 J	<0.01	4,300	53,900	0.0888 J	0.083 J	<0.01	2,150	0.0014 J	5.6	6.8
1/13/1998	NE	<0.007	<0.02	0.227 J	<1	16.9 J	<0.01	4,590	54,700	0.0211 J	0.546 J	0.0159 J	2,290	0.0021 MS	5.8 J	6.8
1/13/1998	DUP	<0.007	<0.02	0.233 J	<1	16.3 J	<0.01	4,800	53,700	<0.02	0.149 J	<0.01	2,400	0.0019 JMS	5.8 J	6.8
4/14/1998	NE	0.307	<0.02	0.195 J	<1	18.2 J	<0.01	4,490	48,200	0.0455 J	<0.11	<0.01	2,300	0.007	5.8	7
7/21/1998	NE	0.892	<0.02	0.203 J	<1	15.8 J	<0.01	4,700	43,500	0.0802 MSREP	0.771 J	0.01 JREP	2,280	0.001 J	8 J	6.9
10/13/1998	NE	0.0013 J	<0.002	0.211 J	<1	18.2 JMS	<0.01	4,580	53,400	0.068 J	<0.05	<0.01	2,260	<0.001	9.66 J	6.7
10/13/1998	DUP	0.097 J	<0.002	0.217 J	<1	19.2 J	<0.01	4,570	57,900	0.0774 J	<0.05	<0.01	2,240	<0.001	10.2 J	6.7
2/8/1999	NE	0.0548	<0.001	0.194 J	<1	19.6 J	<0.01	4,110	46,800	0.0195 J	0.0975 J	<0.01	2,140	0.0021	6.21 J	6.8
8/9/1999	NE	0.339	<0.005	0.2 J	<1	<30	<0.003	4,290	48,600	0.0172 J	<0.132	0.0084 J	2,220	0.003	7.2 J	6.81
2/7/2000	NE, LF	0.0264 MS	<0.002	0.132 J	<1	11.7 J	<0.003	3,610	32,400	0.01 J	<0.144	<0.002	1,940	0.001 J	4.55	7.16
10/11/2000	NE, LF	0.153 MS	<0.001	0.13 JINT	0.11 J	14.4 J	<0.003	3,450	31,400	0.0444 JINT	<0.084	0.0039 JINT	1,840	<0.001	4.68	6.96
12/17/2001	NE, LF	0.699	<0.003	0.125 JINT	0.079 JINT	19.2 J	<0.001	4,250	33,100	0.0108 J	<0.008	<0.001	2,310	0.0016	4.9	6.94
12/5/2002	NE, LF	—	0.0013 J	0.173 J	—	2.9 J	0.0014 J	—	48,500	0.0179 JINT	—	<0.001	—	0.0012 J	6.16	6.8
6/21/2004	NE, LF	—	—	—	—	—	—	—	36,300	<0.005	—	—	—	—	<10	—
11/9/2004	NE, LF	—	—	—	—	—	—	—	45,700	<0.01	—	—	—	—	1.3	—
5/17/2005	NE, LF	214 MS	—	—	<0.011 UINT	—	—	5,140	62,300	0.077	<0.014	—	2,700	—	1.47	—
10/10/2005	NE, LF	—	—	—	—	—	—	—	54,900	<0.01	—	—	—	—	2.59	—
5/16/2006	NE, LF	—	—	—	—	—	—	—	62,400	<0.01	—	—	—	—	<2.5	—
10/10/2006	NE, LF	—	—	—	—	—	—	—	55,300	<0.025	—	—	—	—	<1	—
5/9/2007	NE, LF	—	—	—	—	—	—	—	63,000	<0.025	—	—	—	—	2.7	—
10/9/2007	NE, LF	—	—	—	—	—	—	—	83,200	<0.025	—	—	—	—	<1	6.34
6/5/2008	NE, LF	—	—	—	—	—	—	—	57,000	0.00218	—	—	—	—	<2	—

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Date	Sample Type	Concentration (mg/L unless otherwise noted)											
		Potassium	Selenium	Silicon	Silver	Sodium	Specific Conductance [b]	Sulfate	Temperature [c]	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Zinc
9/11/1997	NE	44.5 J	0.0568 J	14.5	<0.01	21,800	—	1,110	—	73,400	26.5	3.6 J	0.139 J
9/11/1997	DUP	48.2 J	0.0586 J	17.3	<0.01	23,100	—	1,170	—	79,200	26.6	3.9 J	0.175 J
10/15/1997	NE	50.9	0.0668 J	13.1	<0.01	28,400	—	1,450	—	101,000	26.1	8.1 JREP	<0.05
10/15/1997	DUP	50.8	0.0632 J	13.1	<0.01	28,600	—	1,460	—	103,000	25.1	8.1 JREP	<0.05
11/13/1997	NE	42.2 J	0.0688 J	13.9	<0.01	25,600	—	1,410	—	91,900	25.5	4.6	<0.05 UREP
1/13/1998	NE	45.6 J	0.0762 J	13.8	<0.01	25,300	—	1,430	—	98,300	23.5	4.4	<0.08
1/13/1998	DUP	44.8 J	0.0734 J	14.2	<0.01	25,300	—	1,420	—	97,200	23.8	5.7	<0.08
4/14/1998	NE	39.6	0.0744 J	15	<0.01	22,800	—	1,420	—	80,900	25.2	8.4 J	<0.03
7/21/1998	NE	35.2 J	0.0854 J	15.8	<0.01	21,600	—	1,330	—	79,600	25.2	3.5 J	<0.06
10/13/1998	NE	41.8	0.0777	14.9	<0.01	24,300	—	1,600	—	98,800	22.1	2.2	0.109 J
10/13/1998	DUP	44.4	0.0735	14.6	<0.01	28,100	—	1,630	—	108,800	21.6	4.1	0.193 J
2/8/1999	NE	39.6	0.0918		<0.01	22,000	—	1,420	—	87,800	25.3	5.8	<0.05
8/9/1999	NE	39.7	0.0799		<0.003	23,300	—	1,420	—	107,000	24.2	6.7	0.234
2/7/2000	NE, LF	41.2	0.115	17.2	<0.003	13,100	—	1,440	—	60,200	26.8	6.9	<0.047
10/11/2000	NE, LF	27.2	0.0966	17.2	0.0017 J	12,300	—	1,510	—	54,000	26.2	4.1	<0.091
12/17/2001	NE, LF	32 J	0.0753	19.4	<0.001	12,700	—	1,610	—	62,200	—	—	<0.05
12/5/2002	NE, LF	—	0.0801	—	0.0029 J	—	—	1,790	—	86,700	—	—	—
6/21/2004	NE, LF	—	0.044	—	—	—	—	1,530	—	79,600	—	—	—
11/9/2004	NE, LF	—	0.106	—	—	—	—	6,530	—	85,800	—	—	—
5/17/2005	NE, LF	41.3 J	0.06	21	—	19,000	—	2,640	—	100,500	25	3.5	<0.01
10/10/2005	NE, LF	—	0.043	—	—	—	—	1,950	—	74,800	—	—	—
5/16/2006	NE, LF	—	0.051	—	—	—	—	2,490	—	113,000	—	—	—
10/10/2006	NE, LF	—	<0.05	—	—	—	—	1,390	—	70,200	—	—	—
5/9/2007	NE, LF	—	<0.05	—	—	—	—	2,220	—	107,000	—	—	—
10/9/2007	NE, LF	—	<0.1	—	—	—	113,500	2,820	22.6	99,500	—	—	—
6/5/2008	NE, LF	—	0.667	—	—	—	—	2,100	—	98,000	—	—	—

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Date	Sample Type	Concentration (mg/L unless otherwise noted)													
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate
7/17/1997	NE	0.0196 J	<0.02	0.268 J	<1	10.4 J	<0.01	2,580	16,700	0.016 J	<0.07	0.0211 J	1,730	<0.001	10.9
9/8/1997	NE	0.81	<0.02	0.47 J	<1	11.5 J	<0.01	3,580	25,100	0.0668 J	7.03	0.0677	2,290	0.0038	7.7
10/14/1997	NE	0.0073 J	<0.02	0.134 J	<1	12.5 J	<0.01	1,750	12,800	<0.01	<0.08	0.0106 J	1,180	<0.001	5
11/14/1997	NE	0.0126 J	<0.02	0.208 J	<1 UMS	11.4 J	<0.01	2,310	21,200	0.039 J	<0.08	<0.01	1,520	0.0011 J	6.5
1/13/1998	NE	0.009 J	<0.02	0.112 J	<1	12.6 J	0.0164 J	1,550	11,800	0.0232 J	0.634 J	<0.01	1,010	<0.001 UMS	6.3
4/14/1998	NE	0.0206	0.0013 J	0.039 J	0.18 J	12.3	<0.0011	858 R	3,950 R	0.0156	<0.012	<0.0011	608 R	0.00044	3.5
4/14/1998	DUP	0.505	<0.02	0.0997 J	<1	12.2 J	<0.01	1,440	3,950 R	0.0197 J	<0.11	<0.01	970	0.0012 J	4.4
7/21/1998	NE	0.514	<0.02	0.166 J	<1	11	<0.01	2,110	14,900	0.0174 JMSREP	0.13 J	<0.01 UREP	1,310	<0.001	4.9 J
10/13/1998	NE	0.0097 J	<0.02	0.0972 J	<1	12.1	<0.01	1,330	9,140	0.0162 J	<0.05	<0.01	841	<0.001	4.21
2/9/1999	NE	0.0468	<0.001	0.0452 J	<1	11.8	<0.01	869	4,470	<0.01	0.0616 J	<0.01	597	<0.0002	3.92
8/10/1999	NE	0.397	<0.005	0.165 J	<1	<15	<0.003	2,030	15,300	0.0094 J	<0.132	0.0022 J	1,230	0.0012 J	6.35 J
8/10/1999	DUP	0.428	<0.005	0.164 J	<1	<15	<0.003	2,090	16,700	0.0091 J	<0.132	<0.002	1,270	0.0023	5.78 J
2/7/2000	NE, LF	<0.005 UMS	<0.002	0.0631 J	<1	10	<0.003	983	6,910	0.0034 J	<0.144	<0.002	639	<0.001	4.32
10/11/2000	NE, LF	0.185 MS	0.0012 J	0.0476 JINT	0.18 J	9.1 J	<0.003	757	4,700	0.0368 JINT	<0.084	0.0044 JINT	504	<0.001	5.41
12/5/2002	NE, LF	0.129	0.0019 J	0.0191 J	0.13 JINT	7.4	0.00052 J	997	1,230	0.0088 J	<0.008	0.00011 J	626	<0.0002	9.68

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Date	Sample Type	Concentration (mg/L unless otherwise noted)										
		pH [a]	Potassium	Selenium	Silicon	Silver	Sodium	Sulfate	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Zinc
7/17/1997	NE	7.1	26.9 J	0.084 J	17.3	<0.01	6,840	997	33,600	52.7	5.7	<0.03
9/8/1997	NE	6.8	35.5 J	0.0802 J	16.9	<0.01	11,500	1,080	47,600	36.4	8	0.0914 J
10/14/1997	NE	7	20.2 J	0.135	17.1	<0.01	4,380	1,350	24,500	46.9	4.9 REP	<0.05
11/14/1997	NE	7	21.8 J	0.118	17.6	<0.01	6,270	1,230	38,000	39.6	6.4	<0.05 UREP
1/13/1998	NE	7.1	21.3 J	0.141	16.3	<0.01	4,560	1,560	23,700	46.3	5.4	<0.08
4/14/1998	NE	7.4	12.3	0.147	18.1	<0.0011	1,360 R	1,900	8,810 R	53.8	5.1 MSREP	0.0136 J
4/14/1998	DUP	7.2	15.4 J	0.148	17.2	<0.01	3,740	1,720	21,500	48.2	7.4 J	<0.03
7/21/1998	NE	7.2	20.3 J	0.142	19.1	<0.01	6,210	1,560	33,400	45.8	<3	<0.06
10/13/1998	NE	7	14.4	0.301 R	18.6	<0.01	3,500	1,680	20,900	45.8	5.5	<0.06
2/9/1999	NE	7.4	10.8	0.161	—	<0.01	1,710	1,700	13,700	48.7	10.6	<0.05
8/10/1999	NE	6.98	20.3	0.124	—	<0.003	6,940	1,190	36,200	43.8	6	<0.046
8/10/1999	DUP	7.2	21.3	0.124	—	<0.003	7,320	1,260	36,800	44	<0.3	<0.046
2/7/2000	NE, LF	7.34	11.6	0.153	20.2	<0.003	<3,840	1,610	14,600	49.4	0.57 J	<0.047
10/11/2000	NE, LF	7.28	10	0.129	19.5	<0.001	1,780	1,700	11,130	51.5	3.4	<0.091
12/5/2002	NE, LF	7.43	13.7 J	0.121	20.4	<0.0001	3,880	1,550	4,260	—	—	<0.05

PZ-03 Analytical Results

Date	Sample Type	Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate
		Concentration (mg/L unless otherwise noted)													
7/17/1997	NE	0.254	<0.02	0.287 J	<1	43 J	<0.01	4,030	88,200	0.0552 J	0.174 J	0.0224 J	2,850	0.0023	19.6
9/8/1997	NE	2	<0.02	0.303 J	<1	38.9 J	<0.01	3,870	89,600	0.0647 J	4.11	0.0166 J	2,770	0.0023	20.3
9/8/1997	DUP	2.82	<0.02	0.282 J	<1	42.7 J	<0.01	3,800	90,200	0.0382 J	1.82	0.0136 J	2,720	0.0023	20.2
10/14/1997	NE	0.374	<0.02	0.3 J	<1	45.8	<0.01	3,790	91,800	0.0761 J	<0.08	0.0177 J	2,770	0.001 J	20.7
11/13/1997	NE	0.197	<0.02	0.283 J	<1 UMS	41.7 J	<0.01	4,020	91,000	0.143	0.278 J	<0.01	2,790	0.0025	19.8
1/13/1998	NE	0.0963	<0.02	0.294 J	<1	44.1 J	0.0131 J	3,970	93,600	0.0781 J	0.449 J	<0.01	2,720	0.0025 MS	19.7
4/14/1998	NE	0.582	<0.02	0.263 J	<1	45.7 J	<0.01	3,670	100,000	0.0747 J	<0.11	<0.01	2,670	0.0038	19
7/22/1998	NE	1.27	<0.02	0.279 J	<1	38.9	0.0104 J	4,020	97,100	0.208 MSREP	0.215 J	<0.01 UREP	2,750	0.0023	18.7
7/22/1998	DUP	1.33	<0.02	0.277 J	<1	19.7 J	<0.01	3,930	97,700	0.202 MSREP	0.168 J	<0.01 UREP	2,700	0.0023	19.7
10/13/1998	NE	0.198	<0.002	0.254 J	<1	50.6 J	<0.01	3,680	94,900	0.111	<0.05	<0.01	2,520	<0.001	20.4
2/9/1999	NE	0.357	<0.001	0.268 J	<1	46.3 J	<0.01	3,500	91,200	0.0148 J	0.0988 J	<0.01	2,560	0.0014	19.6 J
2/9/1999	DUP	0.308	<0.001	0.268 J	<1	46.5 J	<0.01	3,580	91,500	0.0131 J	<0.05	<0.01	2,580	0.0012	19.1 J
8/10/1999	NE	0.171	<0.005	0.241 J	<1	<60	0.0066 J	3,530	90,800	0.0236 J	<0.132	0.01 J	2,360	0.0017 J	21.5 J
2/8/2000	NE, LF	0.245 MS	<0.002	0.202 J	<1	39 J	<0.003	3,300	94,800	0.0295 J	<0.144	0.0036 J	2,270	0.0023	15.3
10/11/2000	NE, LF	0.177 MS	<0.001	0.155 JINT	0.25 J	26.8 J	<0.003	2,170	48,400	0.0645 JINT	<0.084	0.0059 JINT	1,440	<0.001	14.9
12/17/2001	NE, LF	0.101	<0.003	0.0816 JINT	0.16 JINT	7.5 J	<0.001	1,230	23,500	0.0119 J	<0.008	<0.001	839	<0.0002	16.3
12/9/2002	NE, LF	0.264 MS	0.0014 J	0.0746 J	0.093 JINT	7.2 J	<0.001	933	16,100	0.0141 JINT	<0.014	<0.001	635	<0.001	14.9

PZ-03 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)										
		pH [a]	Potassium	Selenium	Silicon	Silver	Sodium	Sulfate	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Zinc
7/17/1997	NE	6.4	236	0.046 J	12	<0.01	50,100	2,330	166,000	74.4	5.6 J	0.0653 J
9/8/1997	NE	6.5	269	0.0476 J	12.1	<0.01	48,200	2,300	162,000	31.7	5.3 J	0.0533 J
9/8/1997	DUP	6.4	260	0.046 J	11.8	<0.01	47,800	2,320	164,000	32.6	5.8 J	0.0916 J
10/14/1997	NE	6.5	294	0.05 J	11.5	<0.01	50,700	2,570	158,000	32.1	3 J	<0.05
11/13/1997	NE	6.3	296	0.0458 J	11.5	<0.01	51,900	2,460	161,000	29.2	5.2	<0.05 UREP
1/13/1998	NE	6.5	316	0.0472 J	11.3	<0.01	50,300	2,560	162,000	29.8	4.2	<0.08
4/14/1998	NE	6.7	333	0.0454 J	11.4	<0.01	52,200	2,910	162,000	31.6	4.9 J	<0.03
7/22/1998	NE	6.4	356	0.0428 J	11.5	<0.01	52,800	2,790	169,000	34.4	6.5 J	<0.06
7/22/1998	DUP	6.7	345	0.0432 J	11.7	<0.01	52,200	2,790	170,000	31	4.4 J	<0.06
10/13/1998	NE	6.4	337	0.0481	11.4	<0.01	50,900	2,640	169,000	29.1	4	0.149 J
2/9/1999	NE	6.5	363	0.051	—	<0.01	52,800	2,510	167,000	30.8	<0.3	<0.05
2/9/1999	DUP	6.5	368	0.0508	—	<0.01	51,500	2,520	185,000	30.6	<0.3	<0.05
8/10/1999	NE	6.62	371	0.0523	—	0.0031 J	50,100	2,660	174,000	30.2	1	0.317
2/8/2000	NE, LF	7.19	398	0.0597	11.1	<0.003	51,000	2,730	168,000	27	1.4	<0.047
10/11/2000	NE, LF	6.93	212	0.0909	13.1	0.0035 J	26,800	1,840	88,400	36.8	3.6	<0.091
12/17/2001	NE, LF	7.23	95 J	0.102	18.3	<0.001	11,800	1,660	41,800	—	—	<0.05
12/9/2002	NE, LF	7.03	65.2 J	0.123	18.9	0.001	7,890	1,410	29,700	40.3	3.4	<0.01

PZ-04 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)													
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate
7/18/1997	NE	0.0123 J	<0.02	0.207 J	<1	8.5 J	<0.01	2,150	21,800	0.0131 J	<0.07	0.0596	1,260	0.002	22.5
9/8/1997	NE	0.126	<0.02	0.221 J	<1	8.5 J	<0.01	2,220	21,600	0.0215 J	0.529 J	<0.01	1,300	0.0028	19.2
10/14/1997	NE	0.0098 J	<0.02	0.208 J	<1	7.4 J	<0.01	1,990	22,100	0.0162 J	<0.08	<0.01	1,190	<0.001	20.2 J
10/14/1997	DUP	0.0198 J	<0.02	0.221 J	<1	8.8 J	<0.01	2,060	23,600	0.01 J	0.363 J	<0.01	1,230	0.0023	19.5
11/13/1997	NE	0.0318	<0.02	0.222 J	<1 UMS	8.4 J	<0.01	2,150	21,500	0.0543 J	0.104 J	<0.01	1,250	0.002	19.6
1/14/1998	NE	<0.007	<0.02	0.172 J	<1	6.8 J	<0.01	1,660	16,500	0.0161 J	<0.05	<0.01	960	0.0012 J	21.7
1/14/1998	DUP	0.009 J	<0.02	0.181 J	<1	7.4 J	<0.01	1,760	17,700	0.0134 J	<0.05	<0.01	1,000	0.0015 J	20.9
4/15/1998	NE	0.412	<0.02	0.175 J	<1	8.4 J	<0.01	1,980	20,400	0.022 J	0.224 J	<0.01	1,170	0.0022	18.3
7/21/1998	NE	0.955 R	<0.02	0.201 J	<1	8.1 J	<0.01	2,230	21,600	0.0482 JMSREP	0.05 J	<0.01 UREP	1,220	0.0017 J	18
7/21/1998	DUP	0.64	<0.02	0.203 J	<1	8.2 J	<0.01	2,230	22,000	0.04612 JMSREP	0.496 J	<0.01 UREP	1,230	0.0018 J	30.7 R
10/14/1998	NE	0.0013 J	<0.002	0.174 J	<1	10.1 J	<0.01	1,980	23,600	0.0338	<0.05	<0.01	1,110	<0.001	18.3
2/9/1999	NE	0.0408	<0.001	0.204 J	<1	11.9 J	<0.01	2,280	26,800	<0.01	<0.05	<0.01	1,310	0.002	18.4
8/11/1999	NE	0.228	<0.005	0.21 J	<1	<15	<0.003	2,450	28,200	0.0095 J	<0.132	0.0038 J	1,310	0.0025	16.4
2/7/2000	NE	0.0264 MS	0.002 J	0.169 J	<1	9.3 J	<0.003	1,970	27,700	0.011 J	<0.144	<0.002	1,060	<0.001	17.3
10/11/2000	NE	0.161 MS	0.001 J	0.161 JINT	0.15 J	8.4 J	<0.003	1,700	23,500	0.0408 JINT	<0.084	0.0037 JINT	908	<0.001	19.6
12/18/2001	NE	0.112	<0.003	0.151 JINT	0.15 JINT	7.1 J	<0.001	2,110	34,200	0.0134 J	<0.008	<0.001	1,090	0.0016	17.2
12/5/2002	NE	0.606 MS	0.0015 J	0.18 J	0.064 JINT	6.1 J	0.0011 J	2,370	39,300	0.0209 JINT	<0.014	<0.001	1,210	<0.001	16.3

PZ-04 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)										
		pH [a]	Potassium	Selenium	Silicon	Silver	Sodium	Sulfate	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Zinc
7/18/1997	NE	7.1	21.2 J	0.0454 J	18.8	<0.01	9,290	980	43,400	59.9	4.9	<0.03
9/8/1997	NE	7	22.3 J	0.057 J	19.2	<0.01	9,740	1,000	40,400	39.9	4.3	<0.03
10/14/1997	NE	7	22.4	0.0542 J	18.5	<0.01	9,170	1,030	38,500	42.2	4.8 REP	<0.05
10/14/1997	DUP	7	23.7 J	0.0556 J	18.7	<0.01	9,470	1,070	42,300	40.2	6.8 REP	<0.05
11/13/1997	NE	6.9	21 J	0.0628 J	19.8	<0.01	9,330	1,030	38,200	42.3	4.1	<0.05 UREP
1/14/1998	NE	7.2	19.2 J	0.053 J	21.9	<0.01	7,170	955	30,500	44.1	3.4	<0.08
1/14/1998	DUP	7.1	20.4	0.0528 J	20.7	<0.01	7,710	970	32,300	43.8	3.9	<0.08
4/15/1998	NE	7	19.8 J	0.0558 J	17.6	<0.01	9,200	1,130	34,200	43.7	<3	<0.03
7/21/1998	NE	7	20.5 J	0.0624 J	20.3	<0.0162	10,600	1,030	42,100	40	<3	<0.06
7/21/1998	DUP	7	23.9 J	0.0604 J	19.4	<0.01	10,500	1,030	41,100	41.3	<3	<0.06
10/14/1998	NE	7.6	23.2	0.0588	19.2	<0.01	10,400	1,110	45,600	30.3	2	0.187 J
2/9/1999	NE	6.9	25.4	0.0602	—	<0.01	12,900	1,100	49,700	41.2	0.31 J	<0.05
8/11/1999	NE	7.28	28.2	0.0634	—	<0.003	14,300	1,070	62,500	39	<0.3	<0.046
2/7/2000	NE	7.3	39.7	0.0627	18.7	<0.003	13,000	1,150	51,400	43	<0.3	<0.047
10/11/2000	NE	7.18	27	0.0481	19.3	<0.001	11,000	1,010	42,050	42.5	<0.3	<0.091
12/18/2001	NE	7.33	39.8 J	0.0431	20.5	<0.001	16,000	1,290	58,600	—	—	<0.05
12/5/2002	NE	7.14	47.5 J	0.0533	20.6	0.0012 J	19,000	1,420	69,000	43.7	1.9	<0.01

PZ-05 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)													
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate
7/18/1997	NE	0.105	<0.02	0.201 J	<1	23.7 J	<0.01	3,740	45,800	0.0328 J	0.618 J	0.0402	2,260	0.0016 J	15.4
7/18/1997	DUP	0.0953	<0.02	0.199 J	<1	25.6 J	<0.01	3,700	48,200	0.0358 J	1.04	0.0158	2,250	0.0017 J	15.5
9/8/1997	NE	0.386	<0.02	0.178 J	<1	26.4 J	<0.01	3,280	52,600	0.0297 J	0.75 J	<0.01	2,030	0.0022	15.6
10/14/1997	NE	0.123 J	<0.02	0.186 J	<1	26 J	<0.01	3,400	54,700	0.0507 J	<0.08	<0.01	2,170	<0.001	16
11/14/1997	NE	0.0749	<0.02	0.173 J	<1 UMS	25.8 J	<0.01	3,370	46,700	0.0885 J	<0.08	<0.01	2,080	0.002	14.9
11/14/1997	DUP	0.0821	<0.02	0.176 J	<1 UMS	26.4 J	<0.01	3,380	48,200	0.0909 J	0.169 J	<0.01	2,100	0.002	15.9
1/14/1998	NE	0.0526	<0.02	0.165 J	<1	46.6 J	<0.01	3,120	43,200	0.0203 J	<0.05	<0.01	1,850	0.0021	14.8
4/15/1998	NE	0.417	<0.02	0.122 J	<1	23.8 J	<0.01	2,810	36,300	0.0356 J	<0.11	<0.01	1,700	0.0026	12.7
4/15/1998	DUP	0.379	<0.02	0.119 J	<1	22.8 J	<0.01	2,830	36,500	0.0301 J	<0.11	0.0177 J	1,720	0.0024	12.6
7/22/1998	NE	0.042	<0.02	0.119 J	<1	18.6 J	<0.01	2,900	33,400	0.102 MSREP	0.106 J	0.0113 JREP	1,680	0.0014 J	13.5
10/14/1998	NE	0.0826	<0.002	0.121 J	<1	25.1 J	<0.01	2,730	37,900	0.0474 J	<0.05	<0.01	1,650	<0.001	13.5
2/10/1999	NE	0.0707	<0.001	0.1 J	<1	18.9 J	<0.01	2,430	24,300	<0.01	<0.05	<0.01	1,390	0.0016	13.1
8/10/1999	NE	0.266	<0.005	0.105 J	<1	<30	0.0033 J	2,580	29,000	0.0093 J	<0.132	0.0044 J	1,480	0.0012 J	15.1 J
2/8/2000	NE, LF	0.0437 MS	<0.002	0.125 J	<1	19.5 J	<0.003	2,920	38,500	0.016 J	<0.144	0.0021 J	1,700	<0.001	14.9
2/8/2000	DUP, LF	0.035 MS	<0.002	0.121 J	<1	20.6 J	<0.003	2,920	40,700	0.0114 J	<0.144	<0.002	1,700	<0.001	15.3
10/10/2000	NE, LF	0.172 MS	<0.001	0.138 JINT	<0.073	22.8 J	<0.003	3,180	48,700	0.0654 JINT	<0.084	0.0057 JINT	1,820	<0.001	14
12/18/2001	NE, LF	0.0578	<0.003	0.0977 JINT	0.1 JINT	23.1 J	<0.001	3,070	37,500	0.0117 J	<0.008	0.0018 J	1,760	0.0014	14.4
12/5/2002	NE, LF	—	0.00095 J	0.0882 J	—	15.2 J	0.0014 J	—	30,900	0.0155 JINT	—	<0.001	—	<0.001	13.2
6/21/2004	NE, LF	—	—	—	—	—	—	—	28,800	<0.005	—	—	—	—	20.7
11/9/2004	NE, LF	—	—	—	—	—	—	—	47,800	<0.01	—	—	—	—	<2.5
5/17/2005	NE, LF	—	—	—	—	—	—	—	46,000	0.093	—	—	—	—	2.96
10/10/2005	NE, LF	—	—	—	—	—	—	—	14,000	<0.01	—	—	—	—	5.14
5/16/2006	NE, LF	—	—	—	—	—	—	—	18,300	<0.01	—	—	—	—	2.56
10/10/2006	NE, LF	—	—	—	—	—	—	—	28,800	<0.025	—	—	—	—	5.04
5/9/2007	NE, LF	—	—	—	—	—	—	—	17,300	<0.025	—	—	—	—	4.6
10/9/2007	NE, LF	—	—	—	—	—	—	—	19,400	<0.005	—	—	—	—	<1
6/5/2008	NE, LF	—	—	—	—	—	—	—	19,000	0.00317	—	—	—	—	5.7

PZ-05 Analytical Results
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Date	Sample Type	Concentration (mg/L unless otherwise noted) pH [a]	Potassium	Selenium	Silicon	Silver	Sodium	Specific Conductance [b]	Sulfate	Temperature [c]	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Zinc
7/18/1997	NE	6.9	93.9	0.0676 J	17.9	<0.01	22,100	—	1,340	—	84,700	29.3	3.9 J	<0.03
7/18/1997	DUP	6.9	98.4	0.071 J	18.7	<0.01	22,600	—	1,400	—	91,800	29.8	3.4 J	<0.03
9/8/1997	NE	6.7	105	0.0688 J	16.1	<0.01	22,200	—	1,510	—	95,400	31.1	4 J	0.0583 J
10/14/1997	NE	6.8	127	0.066 J	15.7	<0.01	25,800	—	1,630	—	99,300	30.3	3.1 J	0.0591 J
11/14/1997	NE	6.7	123	0.067 J	16.3	<0.01	25,200	—	1,440	—	84,200	29.3	5.2	0.0685 JREP
11/14/1997	DUP	6.6	130	0.068 J	15.9	<0.01	26,500	—	1,480	—	87,300	30.4	4.4	<0.05 UREP
1/14/1998	NE	6.8	112	0.0766 J	16.4	<0.01	20,600	—	1,390	—	79,000	29.4	3.2	<0.08
4/15/1998	NE	6.7	75.5	0.0806 J	18.1	<0.01	15,600	—	1,370	—	53,400	30.6	12.7 R	<0.03
4/15/1998	DUP	6.7	75.3	0.083 J	17.6	<0.01	15,500	—	1,370	—	53,100	31	9.4 J	<0.03
7/22/1998	NE	6.7	76.3	0.0824 J	18.3	<0.01	15,100	—	1,360	—	60,100	31	<3	<0.06
10/14/1998	NE	7.2	98.5	0.0922	17.9	<0.01	17,000	—	1,450	—	68,100	28.7	3.4	<0.06
2/10/1999	NE	6.9	67.1	0.102	—	<0.01	11,700	—	1,120	—	48,800	31	<0.3	<0.05
8/10/1999	NE	6.92	84.6	0.0944	—	<0.003	13,600	—	1,310	—	64,700	30.9	<0.3	0.0507 J
2/8/2000	NE, LF	7	91.7	0.0966	16.6	<0.003	19,200	—	1,360	—	71,800	30.4	<0.3	<0.047
2/8/2000	DUP, LF	7.15	91.4	0.0978	16.8	<0.003	19,100	—	1,450	—	73,800	30	0.8 J	<0.047
10/10/2000	NE, LF	6.85	106	0.0716	15.3	0.0052 J	23,700	—	1,530	—	84,800	29.3	1.8 J	<0.091
12/18/2001	NE, LF	7.04	68.8 J	0.069	18.7	<0.001	16,200	—	1,510	—	65,200	—	—	<0.05
12/5/2002	NE, LF	6.88	—	0.0839	—	<0.001	—	—	1,550	—	55,200	—	—	—
6/21/2004	NE, LF	—	—	0.067	—	—	—	—	1,340	—	55,200	—	—	—
11/9/2004	NE, LF	—	—	0.094	—	—	—	—	1,820	—	86,000	—	—	—
5/17/2005	NE, LF	—	—	0.067	—	—	—	—	3,260	—	65,400	—	—	—
10/10/2005	NE, LF	—	—	0.062	—	—	—	—	769	—	32,800	—	—	—
5/16/2006	NE, LF	—	—	0.071	—	—	—	—	1,520	—	32,600	—	—	—
10/10/2006	NE, LF	—	—	<0.05	—	—	—	—	1,330	—	47,400	—	—	—
5/9/2007	NE, LF	—	—	<0.05	—	—	—	—	1,640	—	32,400	—	—	—
10/9/2007	NE, LF	6.8	—	0.071	—	—	—	37,500	1,880	21.2	28,700	—	—	—
6/5/2008	NE, LF	—	—	0.0801	—	—	—	—	1,500	—	33,000	—	—	—

PZ-06 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)													
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate
7/17/1997	NE	0.0196 J	<0.02	0.103 J	<1	12.7 J	<0.01	2,190	14,700	0.0185 J	0.112 J	0.0496	1,250	<0.001	19.8
7/17/1997	DUP	0.0245	<0.02	0.107 J	<1	12.7 J	<0.01	2,160	14,700	0.0137 J	0.145 J	0.0161 J	1,230	<0.001	19.8
8/26/1997	NE	0.107	<0.02	0.107 J	<1	12 J	<0.01	2,100	13,600	<0.01	<0.07	<0.01	1,180	<0.001	20.2
10/13/1997	NE	0.0173 J	<0.02	0.102 J	<1	13.1 J	<0.01	2,070	15,100	0.0242 J	<0.08	<0.01	1,190	0.001 J	20.8
11/13/1997	NE	0.0126 J	<0.02	0.102 J	<1 UMS	12.5 J	<0.01	2,230	15,300	0.0346 J	<0.08	<0.01	1,270	<0.001	20.9
11/13/1997	DUP	0.0102 J	<0.02	0.106 J	<1 UMS	12.6 J	<0.01	2,250	15,600	0.0338 J	<0.08	<0.01	1,270	<0.001	21.3
1/12/1998	NE	<0.007	<0.02	0.113 J	<1	12.8 J	<0.01	2,290	16,300	0.0164 J	<0.05	<0.01	1,290	<0.001 UMS	21.4
4/13/1998	NE	0.347	<0.02	0.107 J	<1	14.6 J	<0.01	2,260	19,300	0.0298 J	0.114 J	<0.01	1,310	0.0021	21
7/20/1998	NE	0.608	<0.02	0.135 J	<1	11.8	<0.01	2,460	18,300	0.0498 JMSREP	0.0582 J	<0.01 UREP	1,380	<0.001	20.9
7/20/1998	DUP	0.577	<0.02	0.126	<1	12.4 REP	<0.01	2,490	18,500	0.0475	0.357 R	<0.01 UREP	1,380	<0.001	20.6
10/12/1998	NE	0.0013 J	<0.002	0.0982 J	<1	11.5 J	<0.01	2,220	18,400	0.0284 J	<0.05	<0.01	1,250	<0.001	21.6
2/8/1999	NE	0.0428	<0.001	0.105 J	<1	15 J	<0.01	2,420	19,900	<0.01	<0.05	<0.01	1,400	0.00067	22
8/9/1999	NE	0.257	0.0062 J	0.106 J	<1	<15	<0.003	2,750	21,400	0.0112 J	<0.132	0.0036 J	1,510	0.0033	23
2/7/2000	NE, LF	0.0235 MS	<0.002	0.104 J	<1	14.4 J	<0.003	2,720	27,000	0.0076 J	<0.144	<0.002	1,530	<0.001	23.5
10/10/2000	NE, LF	0.153 MS	<0.001	0.12 JINT	0.15 J	14.3 J	<0.003	2,510	31,300	0.0461 JINT	<0.084	0.0046 JINT	1,420	<0.001	27.6
12/18/2001	NE, LF	0.0345	<0.003	0.0931 JINT	0.11 JINT	16.6 J	<0.001	2,240	36,200	0.0156 J	<0.008	0.0048 J	1,330	0.00021 J	25.2
12/5/2002	NE, LF	0.585 MS	0.00088 J	0.108 J	0.063 JINT	5.2 J	0.0018 J	2,160	47,400	0.0191 JINT	<0.014	<0.001	1,340	<0.001	25.5
6/21/2004	NE, LF	—	—	—	—	—	—	—	70,500	<0.005	—	—	—	—	21.2
11/9/2004	NE, LF	—	—	—	—	—	—	—	75,400	<0.01	—	—	—	—	4.89
5/17/2005	NE, LF	0.599 MS	—	—	0.034 JINT	—	—	2,150	109,000	0.054	<0.014	—	1,340	—	4.25
10/10/2005	NE, LF	—	—	—	—	—	—	—	83,800	<0.01	—	—	—	—	20
5/16/2006	NE, LF	—	—	—	—	—	—	—	68,800	<0.01	—	—	—	—	7.69
10/10/2006	NE, LF	—	—	—	—	—	—	—	79,800	<0.025	—	—	—	—	252
5/9/2007	NE, LF	—	—	—	—	—	—	—	73,500	<0.025	—	—	—	—	6.65
10/9/2007	NE, LF	—	—	—	—	—	—	—	81,000	<0.025	—	—	—	—	<1
6/5/2008	NE, LF	—	—	—	—	—	—	—	47,000	0.00259	—	—	—	—	6.1

PZ-06 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)												
		pH [a]	Potassium	Selenium	Silicon	Silver	Sodium	Specific Conductance [b]	Sulfate	Temperature [c]	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Zinc
7/17/1997	NE	6.9	23.1 J	0.0764 J	23.3	<0.01	5,320	—	1,000	—	30,100	43.4	3.3	<0.03
7/17/1997	DUP	6.9	21.9 J	0.0744 J	21.8	0.0413 J	5,280	—	1,000	—	29,900	43.3	4	<0.03
8/26/1997	NE	6.8	20.3 J	0.0794 J	21.1	<0.01	4,440	—	1,030	—	25,600	43.9	8.4	0.0423 J
10/13/1997	NE	7.2	25.4 J	0.0736 J	20.4	<0.01	5,220	—	1,040	—	27,700	41.6	5.7	<0.05
11/13/1997	NE	6.8	25.8 J	0.0662 J	21.3	<0.01	5,710	—	1,040	—	28,100	34.8	5.9	0.212 REP
11/13/1997	DUP	6.8	25.2 J	0.0692 J	21	<0.01	5,860	—	1,050	—	28,800	41.9	6.5	0.279 REP
1/12/1998	NE	6.9	28.2 J	0.072 J	20.4	<0.01	6,110	—	1,090	—	30,800	40.7	4.6	<0.08
4/13/1998	NE	7	30.5 J	0.0658 J	20.4	<0.01	7,350	—	1,250	—	31,300	44.1	6.6 J	0.0423 J
7/20/1998	NE	6.8	32.6 J	0.0654 J	21	0.311 R	8,080	—	1,130	—	36,600	42.2	<3	<0.06
7/20/1998	DUP	6.8	32.6	0.0668	21.1	<0.01	8,150 J	—	1,140	—	36,800	41.9	3	0.0703
10/12/1998	NE	6.8	37	0.0672	20.2	<0.01	7,670	—	1,080	—	39,400	38.4	6.2	<0.06
2/8/1999	NE	6.8	38.7	0.0727	—	<0.01	8,160	—	1,240	—	38,600	41.4	3.2	<0.05
8/9/1999	NE	6.97	41.4	0.078	—	<0.003	9,680	—	1,190	—	50,200	34.1	6	<0.046
2/7/2000	NE, LF	7.08	58.8	0.0894	18.9	<0.003	11,700	—	1,530	—	51,400	39.6	<0.3	<0.047
10/10/2000	NE, LF	6.89	65.3	0.0662	18.3	0.004 J	15,100	—	1,660	—	55,100	42.2	2.4	<0.091
12/18/2001	NE, LF	6.94	170 J	0.0607	20.3	0.0024 J	17,700	—	2,040	—	65,700	—	—	<0.05
12/5/2002	NE, LF	7.02	344 J	0.0589	20.4	0.0012 J	24,600	—	2,610	—	86,400	43.6	2.1	<0.01
6/21/2004	NE, LF	—	—	0.17	—	—	—	—	2,860	—	134,000	—	—	—
11/9/2004	NE, LF	—	—	0.06	—	—	—	—	13,000	—	113,000	—	—	—
5/17/2005	NE, LF	—	349 J	0.05	20.2	—	24,600	—	3,610	—	160,500	44.3	2.3	<0.01
10/10/2005	NE, LF	—	—	0.021	—	—	—	—	2,850	—	106,000	—	—	—
5/16/2006	NE, LF	—	—	<0.01	—	—	—	—	3,050	—	115,000	—	—	—
10/10/2006	NE, LF	—	—	<0.05	—	—	—	—	2,790	—	134,000	—	—	—
5/9/2007	NE, LF	—	—	<0.05	—	—	—	—	2,840	—	122,500	—	—	—
10/9/2007	NE, LF	6.3	—	<0.1	—	—	—	128,000	3,080	21.4	105,000	—	—	—
6/5/2008	NE, LF	—	—	0.0412	—	—	—	—	2,100	—	81,000	—	—	—

PZ-07 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)														
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate	pH [a]
7/18/1997	NE	0.0245	<0.02	0.0746 J	<1	14.3 J	<0.01	2,320	9,170	0.0161 J	0.502 J	0.0118 J	1,240	<0.001	19	7
7/18/1997	DUP	0.0123 J	<0.02	0.0743 J	<1	12.8 J	<0.01	2,300	9,080	0.0196 J	0.371 J	0.0125 J	1,220	<0.001	19	7
9/9/1997	NE	0.112	<0.02	0.0821 J	<1	13.3 J	<0.01	2,400	10,400	0.0192 J	0.484 J	<0.01	1,290	<0.001	18.8	6.8
9/9/1997	DUP	0.222	<0.02	0.0791 J	<1	13.8 J	<0.01	2,430	10,300	0.0224 J	0.347 J	<0.01	1,320	<0.001	18.7	6.7
10/15/1997	NE	0.0148 J	<0.02	0.0866 J	<1	15.7 J	<0.01	2,600	11,700	0.013 J	<0.08	<0.01	1,400	<0.001	20.3	6.8
10/15/1997	DUP	0.0123 J	<0.02	0.0957 J	<1	16 J	<0.01	2,620	11,900	0.0126 J	<0.08	<0.01	1,370	<0.001	20	6.7
11/17/1997	NE	0.0198 J	<0.02	0.0935 J	<1 UMS	14.9 J	<0.01	2,790	12,300	0.0297 J	<0.08	<0.01	1,440	<0.001	20.7	6.7
1/14/1998	NE	<0.007	<0.02	0.11 J	<1	15.5 J	<0.01	2,850	13,000	0.0108 J	<0.05	<0.01	1,420	0.001 J	21.1	6.9
4/15/1998	NE	0.386	<0.02	0.0858 J	<1	15.7 J	<0.01	2,600	12,500	0.023 J	<0.11	<0.01	1,300	<0.001	19.1	6.7
7/22/1998	NE	0.64	<0.02	0.0928 J	<1	15 J	<0.01	2,760	13,100	0.0658 JMSREP	0.136 J	0.0205 JREP	1,380	<0.001	21.8	6.8
10/14/1998	NE	0.0125 J	<0.002	0.0845 J	<1	17.3	<0.01	2,770	15,700	0.0365 J	<0.05	<0.01	1,420	<0.001	18.6	7
10/14/1998	DUP	0.0125 J	<0.002	0.0875 J	<1	17.2	<0.01	2,810	15,800	0.023 J	<0.05	<0.01	1,430	<0.001	18.5	6.9
2/10/1999	NE	0.0488	<0.001	0.0823 J	<1	17.6 J	<0.01	3,500	19,700	<0.01	<0.05	<0.01	1,740	0.0008	22.5	6.7
8/11/1999	NE	0.244	<0.005	0.0822 J	<1	16.1 J	<0.003	3,350	21,500	0.0099 J	<0.132	0.0031 J	1,770	0.0011 J	19.8	6.91
8/11/1999	DUP	0.216	<0.005	0.119 J	<1	18 J	0.0031 J	4,090	29,400	0.011 J	<0.132	0.0036 J	2,210	0.002 J	20.5	6.87
2/9/2000	NE, LF	0.0868 MS	<0.002	0.0668 J	<1	17.6 J	<0.003	3,230	26,400	0.0092 J	<0.144	<0.002	1,760	<0.001	19.3	7
2/9/2000	DUP, LF	0.035 MS	<0.002	0.0653 J	<1	16 J	<0.003	3,280	24,500	0.0082 J	<0.144	<0.002	1,800	<0.001	20.4	6.93
10/16/2000	NE, LF	0.163 MS	<0.001	0.0704 JINT	0.08 J	16.8 J	<0.003	3,110	25,600	0.0377 JINT	<0.084	0.0037 JINT	1,710	<0.001	20.3	6.86
12/19/2001	NE, LF	0.0466	<0.003	0.0598 JINT	0.064 JINT	18 J	<0.001	3,340	38,900	0.0126 J	<0.008	<0.001	2,010	0.0016	20.2	6.75
12/5/2002	NE, LF	0.378 MS	0.001 J	0.0605 J	0.054 JINT	9.1 J	0.0017 J	3,020	33,200	0.0202 JINT	<0.014	<0.001	1,760	<0.001	19.9	6.7
6/21/2004	NE, LF	—	—	—	—	—	—	—	53,000	<0.005	—	—	—	—	20.7	—
11/8/2004	NE, LF	—	—	—	—	—	—	—	43,600	<0.01	—	—	—	—	2.89	—
5/16/2005	NE, LF	—	—	—	—	—	—	—	42,100	0.082	—	—	—	—	4.02	—
10/10/2005	NE, LF	—	—	—	—	—	—	—	61,000	<0.01	—	—	—	—	6.37	—
5/15/2006	NE, LF	—	—	—	—	—	—	—	54,100	<0.01	—	—	—	—	<5.3	—
10/9/2006	NE, LF	0.399 MS	—	—	0.03 JINT	—	—	3,030	66,800	<0.005	<0.014	—	1,790	—	<1	—
5/7/2007	NE, LF	—	—	—	—	—	—	—	64,800	0.02	—	—	—	—	5.15	—
10/8/2007	NE, LF	—	—	—	—	—	—	—	45,600	<0.005	—	—	—	—	<1	6.44
6/4/2008	NE, LF	—	—	—	—	—	—	—	49,000	0.00257	—	—	—	—	5	—

PZ-07 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)											
		Potassium	Selenium	Silicon	Silver	Sodium	Specific Conductance [b]	Sulfate	Temperature [c]	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Zinc
7/18/1997	NE	14.7 J	0.115	23.1	<0.01	1,950	—	1,340	—	20,100	43.6	5.4	<0.03
7/18/1997	DUP	15.9 J	0.112	22.9	<0.01	1,920	—	1,330	—	20,100	43.4	4.5	0.0754 J
9/9/1997	NE	15.5 J	0.108	21.4	<0.01	2,200	—	1,300	—	21,700	39.2	6.2	<0.03
9/9/1997	DUP	14.5 J	0.114	21.2	<0.01	2,210	—	1,300	—	22,700	40.5	7.1	<0.03
10/15/1997	NE	17.9 J	0.111	20.5	<0.01	2,600	—	1,450	—	23,100	39.6	11.2 REP	0.326
10/15/1997	DUP	18.3 J	0.116	20.8	<0.01	2,530	—	1,510	—	24,200	41.2	10.3 REP	<0.05
11/17/1997	NE	16.8 J	0.108	20.6	<0.01	2,890	—	1,460	—	24,200	39.2	7.4	<0.05 UREP
1/14/1998	NE	18.7 J	0.116	20.3	<0.01	3,100	—	1,530	—	25,400	42.1	5.3	<0.08
4/15/1998	NE	14.7 J	0.113	21.2	<0.01	3,230	—	1,660	—	20,700	47.4	14.9	<0.03
7/22/1998	NE	16.8 J	0.108	20.1	<0.01	3,470	—	1,590	—	26,340	43.5	7.1 J	<0.06
10/14/1998	NE	17.5	0.124	20.8	<0.01	4,410	—	1,690	—	31,400	41.1	4.8	0.219 R
10/14/1998	DUP	17.8	0.119	20.8	<0.01	4,470	—	1,710	—	31,250	42.7	4.5	0.0893 J
2/10/1999	NE	24.3	0.108	—	<0.01	6,270	—	1,580	—	40,100	40.7	<0.3	<0.05
8/11/1999	NE	23.6	0.106	—	<0.003	8,030	—	1,450	—	49,800	40.1	7.5	<0.046
8/11/1999	DUP	30	0.11	—	<0.003	11,300	—	1,540	—	66,400	37	<0.3	<0.046
2/9/2000	NE, LF	33.4	0.13	19.3	<0.003	9,590	—	1,750	—	47,700	39	0.76 J	<0.047
2/9/2000	DUP, LF	33.1	0.128	19.1	<0.003	9,790	—	1,600	—	48,100	39.2	0.38 J	<0.047
10/16/2000	NE, LF	33.8	0.0981	19.5	0.001 J	9,290	—	1,710	—	48,000	33.9	2.7	<0.091
12/19/2001	NE, LF	61 J	0.0916	20	<0.001	17,000	—	2,180	—	70,200	—	—	<0.05
12/5/2002	NE, LF	57.8 J	0.0908	22.2	0.0011 J	13,600	—	2,040	—	61,000	40.4	6.2	<0.01
6/21/2004	NE, LF	—	0.041	—	—	—	—	2,620	—	109,000	—	—	—
11/8/2004	NE, LF	—	0.088	—	—	—	—	7,460	—	80,400	—	—	—
5/16/2005	NE, LF	—	0.094	—	—	—	—	2,530	—	65,900	—	—	—
10/10/2005	NE, LF	—	0.047	—	—	—	—	2,770	—	88,000	—	—	—
5/15/2006	NE, LF	—	0.068	—	—	—	—	3,190	—	139,000	—	—	—
10/9/2006	NE, LF	59 J	<0.01	22.2		13,700	—	2,890	—	81,500	39.5	6	<0.01
5/7/2007	NE, LF	—	<0.02	—	—	—	—	3,190	—	119,000	—	—	—
10/8/2007	NE, LF	—	0.064	—	—	—	78,700	2,660	22.2	65,000	—	—	—
6/4/2008	NE, LF	—	0.0635	—	—	—	—	2,300	—	86,000	—	—	—

PZ-08 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)												
		Alkalinity, Bicarbonate	Alkalinity, Carbonate	Alkalinity, Hydroxide	Alkalinity, Total	Arsenic, Dissolved	Barium, Dissolved	Cadmium, Dissolved	Calcium, Dissolved	Chloride	Chromium, Total	Fluoride	Lead, Dissolved	Magnesium, Dissolved
10/15/2007	NE, BLR	150	<1	<1	150	<0.01	0.251	<0.001	1,530	7,440	<0.005	<1	<0.01	1,260
6/6/2008	NE, LF	---	---	---	---	---	---	---	---	11,000	<0.001	---	---	---

PZ-08 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)									
		Mercury, Dissolved	Nitrate	pH [a]	Potassium, Dissolved	Selenium	Silver, Dissolved	Sodium, Dissolved	Specific Conductance [b]	Sulfate	Total Dissolved Solids
10/15/2007	NE, BLR	<0.0002	0.677	7.26	17.2	0.039	<0.002	842	18,100	500	15,000
6/6/2008	NE, LF	---	1.8	---	---	0.0655	---	---	---	630	16,000

PZ-09 Analytical Results

Date	Sample Type	Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate
		Concentration (mg/L unless otherwise noted)													
7/22/1997	NE	0.11	<0.02	0.31 J	<1	62.2 J	<0.01	4,340	61,200	0.0495 J	1.83	0.0173 J	3,650	0.0013 J	18.3
7/22/1997	DUP	0.088	<0.02	0.34 J	<1	63.7 J	<0.01	4,360	62,200	0.0755 J	4.15	0.0154 J	3,660	0.0017 J	18.4
9/10/1997	NE	1.99	<0.02	0.255 J	<1	60.3 J	<0.01	4,160	61,900	0.0465 J	2.85	0.0152 J	3,560	0.0014 J	20.3
10/15/1997	NE	0.098 J	<0.02	0.258 J	<1	62.6 J	<0.01	4,130	64,400	0.0391 J	0.153 J	<0.01	3,630	<0.001	18.9
10/15/1997	DUP	0.324	<0.02	0.294 J	<1	65.6 J	<0.01	4,130	65,300	0.0587 J	0.501 J	<0.01	3,650	<0.0017	19.1
11/17/1997	NE	0.0462	<0.02	0.311 J	<1 UMS	62.6 J	<0.01	4,280	64,300	0.107	0.219 J	<0.01	3,590	0.0026	18.1
1/15/1998	NE	0.0136 J	<0.02	0.291 J	<1	63.2 J	<0.01	4,190	62,600	0.021 J	<0.05	<0.01	3,470	0.002	18.5
4/16/1998	NE	0.458	<0.02	0.264 J	<1	55.5	<0.01	3,850	55,400	0.0464 J	<0.11	0.017 J	3,440	0.003	18
7/23/1998	NE	1.11	<0.02	0.29 J	<1	54.8	<0.01	3,990	62,300	0.141 MSREP	0.171 J	0.0136 JREP	3,490	0.0022	18.5
10/15/1998	NE	0.0181 J	<0.002	0.278 J	<1	60.4 J	<0.01	3,750	57,600	0.0805 J	<0.05	<0.01	3,320	0.0014 J	16.7
2/11/1999	NE	0.0747	<0.001	0.187 J	<1	56.7	<0.01	3,860	56,900	0.0181 J	0.148 J	<0.01	3,390	0.0009	17.5 J
8/12/1999	NE	0.12	0.0011 J	0.256	0.19 J	59.6 J	0.004 J	3,910	64,300	0.0087 J	<0.0132	0.0044	3,410	0.0023	17 J
2/24/2000	NE, LF	0.0983 MS	<0.002	0.213 J	<1	53.6 J	<0.003	3,860	66,500	0.0169 J	<0.144	0.0021 J	3,450	0.0032	15.4
10/16/2000	NE, LF	0.163 MS	<0.001	0.18 JINT	0.1 J	47.3 J	0.0031 J	3,890	70,100	0.0476 JINT	<0.084	0.0044 JINT	3,530	0.001 J	16.3
12/19/2001	NE, LF	0.267	<0.003	0.185 JINT	0.17 JINT	57.1	<0.001	3,550	72,400	0.0181 J	49.2	<0.001	3,550	0.00079	14.4
12/10/2002	NE, LF	0.159 MS	<0.0005	0.21 J	0.082 JINT	35 J	0.005 J	3,250	73,800	0.0219 JINT	<0.014	0.004 J	3,360	0.0027	14
6/21/2004	NE, LF	---	---	---	---	---	---	---	58,100	<0.005	---	---	---	---	20.8
11/9/2004	NE, LF	---	---	---	---	---	---	---	92,400	<0.01	---	---	---	---	1.4
5/17/2005	NE, LF	---	---	---	---	---	---	---	182,000	0.071	---	---	---	---	2.82
10/11/2005	NE, LF	---	---	---	---	---	---	---	85,500	<0.01	---	---	---	---	<20
5/16/2006	NE, LF	---	---	---	---	---	---	---	84,700	<0.01	---	---	---	---	3.01
10/10/2006	NE, LF	---	---	---	---	---	---	---	102,000	<0.025	---	---	---	---	<20
5/9/2007	NE, LF	---	---	---	---	---	---	---	89,600	<0.025	---	---	---	---	3.28
10/9/2007	NE, LF	---	---	---	---	---	---	---	116,000	<0.005	---	---	---	---	<20
6/5/2008	NE, LF	---	---	---	---	---	---	---	87,000	0.00492	---	---	---	---	2.2

PZ-09 Analytical Results
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Date	Sample Type	Concentration (mg/L unless otherwise noted) pH [a]	Potassium	Selenium	Silicon	Silver	Sodium	Specific Conductance [b]	Sulfate	Temperature [c]	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Zinc
7/22/1997	NE	6.7	140	0.0572 J	16.2	<0.01	29,300	—	2,250	—	117,000	41.4	5.1 J	0.0324 J
7/22/1997	DUP	6.7	145	0.0582 J	19.5	<0.01	29,100	—	2,280	—	118,000	40.6	6.1 J	0.059 J
9/10/1997	NE	6.6	139	0.0522 J	15	<0.01	28,200	—	2,260	—	110,000	37.9	10.1 J	0.0627 J
10/15/1997	NE	6.6	146	0.0516 J	11.6	<0.01	29,900	—	2,420	—	114,000	43	6.2 J	<0.05
10/15/1997	DUP	6.5	153	0.052 J	12.5	<0.01	30,600	—	2,460	—	117,000	42.8	5.7 J	<0.05
11/17/1997	NE	6.4	165	0.0552 J	12.7	<0.01	30,800	—	2,460	—	93,900	40.5	5.7	0.0515 JREP
1/15/1998	NE	6.7	176	0.0556 J	12.5	<0.01	28,800	—	2,470	—	113,000	40.4	3.6	<0.08
4/16/1998	NE	6.4	189	0.052 J	12.7	<0.01	29,300	—	2,840	—	95,700	45.4	8.8 J	<0.03
7/23/1998	NE	6.8	233	0.0498 J	13.5	<0.01	30,200	—	2,850	—	115,000	41.8	<3	<0.06
10/15/1998	NE	6.8	260	0.0564	13.2	<0.01	29,600	—	2,710	—	123,000	43.1	4.4	0.179 J
2/11/1999	NE	6.7	205	0.0547	—	<0.01	25,000	—	2,570	—	104,000	42.3	4.6	<0.05
8/12/1999	NE	6.56	316	0.0538	—	0.0031 J	31,200	—	2,770	—	132,000	43.3	3.6 REP	0.027
2/24/2000	NE, LF	7.04	308	0.0615	11.8	<0.003	31,000	—	3,000	—	118,000	24.9	0.72 J	<0.047
10/16/2000	NE, LF	6.67	367	0.0497	11.3	0.004 J	32,700	—	3,090	—	128,400	39.9	1.3 J	<0.091
12/19/2001	NE, LF	5.99	499 J	0.0516	10.6	<0.001	36,100	—	3,470	—	134,000	—	—	<0.05
12/10/2002	NE, LF	6.49	523	0.0466	14.8	0.0033 J	34,800	—	3,560	—	135,000	41.4	1.5	<0.01
6/21/2004	NE, LF	—	—	<0.01	—	—	—	—	2,220	—	123,000	—	—	—
11/9/2004	NE, LF	—	—	0.066	—	—	—	—	14,500	—	144,000	—	—	—
5/17/2005	NE, LF	—	—	0.05	—	—	—	—	5,090	—	164,000	—	—	—
10/11/2005	NE, LF	—	—	0.022	—	—	—	—	3,930	—	107,000	—	—	—
5/16/2006	NE, LF	—	—	0.023	—	—	—	—	4,350	—	153,000	—	—	—
10/10/2006	NE, LF	—	—	<0.05	—	—	—	—	3,370	—	135,000	—	—	—
5/9/2007	NE, LF	—	—	<0.05	—	—	—	—	4,320	—	164,000	—	—	—
10/9/2007	NE, LF	6.22	—	<0.02	—	—	—	155,000	4,720	20	144,000	—	—	—
6/5/2008	NE, LF	—	—	0.0351	—	—	—	—	4,400	—	150,000	—	—	—

PZ-10 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)														
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate	pH [a]
7/21/1997	NE	<0.007	0.0024 J	0.138 J	0.26 J	2.8	<0.0011	338	650	0.009 J	4.7	0.0039	230	<0.0002	31.8	7.3
7/21/1997	DUP	<0.007	0.002 J	0.118 J	0.25 J	3	<0.0011	344	670	0.008 J	3.91	0.0038	235	<0.0002	31.5	7.3
9/10/1997	NE	0.0335	0.002 J	0.0659 J	0.27 J	3.2	<0.0011	302	647	0.0035 J	0.609	<0.0011	201	<0.0002	44.2	7.2
9/10/1997	DUP	0.028	0.0019 J	0.0695 J	0.25 J	3.3	<0.0011	331	663	0.0028 J	0.137	0.002 J	226	<0.0002	37.2	7.2
10/16/1997	NE	0.0073 J	0.0019 J	0.0621 J	0.27 J	3.3 J	<0.0011	318	624	0.0016 J	0.2	0.0015 J	219	<0.0002	43.3	7.2
11/18/1997	NE	0.0102 J	0.0018 J	0.0587 J	0.28 J	2.8	<0.0011	309	588	0.0021 J	0.0174 J	<0.0011	205	<0.0002	46.6	7.2
11/18/1997	DUP	0.0078 J	0.0018 J	0.0585 J	0.28 J	2.9	<0.0011	305	583	0.0018 J	<0.0089	<0.0011	203	<0.0002	45.8	7.2
1/15/1998	NE	<0.007	0.0018 J	0.0575 J	0.26 J	2.6	<0.0011	282	525	0.0046 J	<0.0056	<0.0011	184	<0.0002	46.1	7.4
4/16/1998	NE	0.0742	0.0018 J	0.0562 J	0.25 J	3.2	<0.0011	299	604	0.0043 J	<0.0122	<0.0011	205	<0.0002	30.2	7.1
7/23/1998	NE	0.0766	0.002 J	0.0622 J	0.28 J	2.8 J	<0.0011	302	543	0.005 J	0.0194 J	<0.0011	208	0.00025 J	27.4	7.2
7/23/1998	DUP	0.0766	0.0019 J	0.0627 J	0.23 J	3.1 J	<0.0011	299	536	0.0052 J	0.124	<0.0011	206	<0.0002	27	7
10/14/1998	NE	0.0064 J	0.001	0.0552	0.26 J	3.1	0.0014 J	270	585	0.0033 J	<0.005	<0.001	196	<0.0002	22.2	7.6
2/11/1999	NE	0.0149 J	0.0014 J	0.0628 J	0.26 J	2.7	<0.001	305	549	0.006 J	0.0461 J	<0.001	204	<0.0002	22.5	7.2
2/11/1999	DUP	0.0129 J	0.0014 J	0.0658 J	0.27 J	2.8	<0.001	301	550	0.0091 J	0.0602 J	<0.001	204	<0.0002	22.4	7.2
8/12/1999	NE	0.009 J	0.0014 J	0.0537 J	0.27 J	2.5	<0.0003	271	495	0.0035 J	<0.0132	<0.0002	181	<0.0002	19.2	7.41
8/12/1999	DUP	0.0216	0.0011 J	0.054 J	0.26 J	2.5	<0.0003	278	494	0.0047 J	<0.0132	0.0003 J	188	<0.0002	19.5	7.38
2/11/2000	NE, LF	0.0302	0.0015 J	0.0555 J	0.26 J	2.3	<0.0003	245	516	<0.0003	0.024 J	0.0012 J	168	<0.0002	13.6	7.6
2/11/2000	DUP, LF	0.0328	0.0016 J	0.0555 J	0.25 J	2.2	<0.0003	252	521	<0.0003	<0.0144	<0.0002	172	<0.0002	14.1	7.51
10/16/2000	NE, LF	0.0048 J	0.0014 J	0.0563 J	0.25 J	2.3	<0.0003	272	526	0.0015 J	<0.0084	0.00027 J	180	<0.0002	12.9	7.33
12/19/2001	NE, LF	<0.0042	0.0014 J	0.0479 J	0.28 JINT	2.2	<0.0001	254	468	0.00083 J	<0.0008	<0.0001	177	<0.0002	18.3	7.45
12/9/2002	NE, LF	0.0145 JMS	0.0017 J	0.0484 J	0.29 JINT	2.2	<0.0001	242	445	0.0019 J	0.0042	<0.0001	163	<0.0002	20.9	7.37
6/14/2004	NE, LF	—	—	—	—	—	—	—	368	<0.005	—	—	—	—	3.81	—
11/8/2004	NE, LF	—	—	—	—	—	—	—	353	<0.01	—	—	—	—	3.69	—
5/16/2005	NE, LF	—	—	—	—	—	—	—	416	0.037	—	—	—	—	3.63	—
10/10/2005	NE, LF	—	—	—	—	—	—	—	318	<0.01	—	—	—	—	3.34	—
5/15/2006	NE, LF	—	—	—	—	—	—	—	460	<0.01	—	—	—	—	3.42	—
10/9/2006	NE, LF	—	—	—	—	—	—	—	350	<0.005	—	—	—	—	5.5	—
5/7/2007	NE, LF	—	—	—	—	—	—	—	274	0.02	—	—	—	—	14.8	—
10/8/2007	NE, LF	—	—	—	—	—	—	—	186	<0.005	—	—	—	—	<1	7.08
6/4/2008	NE, LF	—	—	—	—	—	—	—	300	0.00119	—	—	—	—	4.5	—

PZ-10 Analytical Results
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Date	Sample Type	Concentration (mg/L unless otherwise noted)											
		Potassium	Selenium	Silicon	Silver	Sodium	Specific Conductance [b]	Sulfate	Temperature [c]	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Zinc
7/21/1997	NE	7	0.0498 MS	27.8	<0.0011	204	—	917	—	3,080	83.2	10	0.018 J
7/21/1997	DUP	6.5	0.0511 MS	28.7	<0.0011	202	—	945	—	3,100	82.1	8.7	0.0143 J
9/10/1997	NE	4.5 J	0.0386	22.6	<0.0011	214	—	937	—	2,790	65.1	11.5	0.0317
9/10/1997	DUP	4.3 J	0.0446	20.8	<0.0011	215	—	949	—	2,700	44.9	12.2	0.0045 J
10/16/1997	NE	4.4 J	0.0428	20.9	<0.0011	219	—	960	—	2,950	70.6	8.5	<0.0056
11/18/1997	NE	4.2 J	0.0441	22.6	<0.0011	215	—	906	—	2,750	83	5.9	0.0065 J
11/18/1997	DUP	4.4 J	0.0429	22.7	<0.0011	217	—	901	—	2,760	82.8	6.1	0.01 J
1/15/1998	NE	4.6 J	0.0368	23.7	<0.0011	204	—	828	—	2,540	81.1	6.8	<0.0089
4/16/1998	NE	4 J	0.0366	22.1	<0.0011	193	—	900	—	1,840	82.1	3.9 MSREP	<0.0033
7/23/1998	NE	4 J	0.0323	22.3	<0.0011	189	—	803	—	2,655	78.5	3.1	0.0251
7/23/1998	DUP	4 J	0.0311		<0.0011	191	—	789	—	2,612	79.8	3.9	<0.0067
10/14/1998	NE	3.7 J	0.0392	21.9	<0.001	183	—	828	—	2,750	75.1	2.6	<0.006
2/11/1999	NE	4.1 J	0.0388	—	<0.001	183	—	792	—	2,640	77.9	3.8	0.0096 J
2/11/1999	DUP	4.2 J	0.0388	—	<0.001	184	—	792	—	2,600	81.7	2.7	<0.005
8/12/1999	NE	3.8 J	0.0395	—	<0.0003	186	—	718	—	2,810	85.1	<0.3 UREP	0.0065 J
8/12/1999	DUP	3.8 J	0.0388	—	<0.0003	183	—	718	—	2,840	83.8	<0.3 UREP	0.0092 J
2/11/2000	NE, LF	3.9 J	0.0391	21.3	<0.0003	177	—	730	—	2,430	82	16.7 REP	0.0202
2/11/2000	DUP, LF	4.1 J	0.0392	21.5	<0.0003	182	—	736	—	2,390	87.9	10 REP	<0.0047
10/16/2000	NE, LF	4.3 J	0.0312	21.4	<0.0001	188	—	754	—	2,467	90.4	3.4	<0.091
12/19/2001	NE, LF	4.2 J	0.031	22.3	<0.0001	188	—	730	—	2,320	93.1	2.5	0.0409
12/9/2002	NE, LF	3.9 J	0.0256	21.7	<0.0001	178	—	650	—	2,160	99	2.7	<0.001
6/14/2004	NE, LF	—	0.02	—	—	—	—	469	—	1,714	—	—	—
11/8/2004	NE, LF	—	<0.05	—	—	—	—	431	—	1,576	—	—	—
5/16/2005	NE, LF	—	0.044	—	—	—	—	572	—	1,756	—	—	—
10/10/2005	NE, LF	—	0.02	—	—	—	—	515	—	1,720	—	—	—
5/15/2006	NE, LF	—	0.014	—	—	—	—	539	—	1,830	—	—	—
10/9/2006	NE, LF	—	<0.01	—	—	—	—	549	—	1,600	—	—	—
5/7/2007	NE, LF	—	<0.02	—	—	—	—	407	—	1,504	—	—	—
10/8/2007	NE, LF	—	0.026	—	—	—	1,450	211	22.3	968	—	—	—
6/4/2008	NE, LF	—	0.0144	—	—	—	—	390	—	1,500	—	—	—

PZ-11 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)														
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate	pH [a]
7/21/1997	NE	0.0294	<0.02	0.226 J	<1	8.1 J	<0.01	2,870	16,000	0.0313 J	7.71	0.0143 J	1,490	<0.001	22.9	6.9
7/21/1997	DUP	0.044	<0.02	0.221 J	<1	8.3 J	<0.01	2,890	16,200	0.0322 J	8.36	0.014 J	1,510	<0.001	22.8	6.9
9/9/1997	NE	0.112	<0.02	0.191 J	<1	5.7 J	<0.01	1,890	13,200	0.0228 J	1.59	<0.01	958	<0.001	16.4	6.9
10/16/1997	NE	0.0098 J	<0.02	0.148 J	<1	5.3 J	<0.01	1,870	13,800	0.015 J	<0.08	0.0179 J	948	<0.001	17.6	6.9
10/16/1997	DUP	0.0073 J	<0.02	0.158 J	1 J	4.4 J	<0.01	1,910	13,900	0.0108 J	<0.08	0.0198 J	965	<0.001	17.5	6.9
11/17/1997	NE	<0.007	<0.02	0.141 J	<1 UMS	5.2 J	<0.01	1,740	12,800	0.0346 J	0.113 J	<0.01	868	<0.001	16.4	6.9
11/17/1997	DUP	0.0078 J	<0.02	0.148 J	<1 UMS	5 J	<0.01	1,740	12,700	0.032 J	0.107 J	<0.01	867	<0.001	16.4	6.9
1/14/1998	NE	0.0365	<0.02	0.143 J	<1	5.6 J	<0.01	1,680	12,400	0.0103 J	<0.05	<0.01	840	<0.001	17	7
1/14/1998	DUP	0.0388	<0.02	0.14 J	<1	5 J	<0.01	1,700	12,500	0.0112 J	<0.05	<0.01	840	<0.001	17	7
4/16/1998	NE	0.503	<0.02	0.137 J	<1	5.4 J	<0.01	1,930	14,200	0.0176 J	0.222 J	<0.01	981	<0.001	36.8 R	6.8
7/22/1998	NE	0.482	<0.02	0.155 J	<1	5.9 J	<0.01	2,230	15,000	0.0605 JMSREP	0.104 J	0.122 REP	1,140	<0.001	19.1	6.8
10/14/1998	NE	0.0125 J	<0.002	0.158 J	<1	9.4 J	<0.01	2,370	15,900	0.0244 J	<0.05	<0.01	1,240	<0.001	20.1	7.1
2/10/1999	NE	0.0548	<0.001	0.186 J	<1	9.9 J	<0.01	2,900	17,600	<0.01	<0.05	<0.01	1,530	0.00061	22.4	6.8
2/10/1999	DUP	0.0548	<0.001	0.198 J	<1	8.9 J	<0.01	2,990	17,500	<0.01	<0.05	<0.01	1,580	0.00061	23.8	6.8
8/11/1999	NE	0.424	<0.005	0.194 J	<1	<15	<0.003	3,640	23,000	0.0086 J	<0.132	0.0027 J	2,020	0.0011 J	23.3	6.85
2/23/2000	NE, LF	0.0811 MS	<0.002	0.26 J	<1	17.6 J	<0.003	4,450	37,400	0.0126 J	<0.144	<0.002	2,760	<0.001	25.5	7.03
10/16/2000	NE, LF	0.123 MS	<0.001	0.166 JINT	0.1 J	9.6 J	<0.003	3,020	25,100	0.038 JINT	<0.084	0.0038 JINT	1,750	<0.001	19.8	6.95
12/19/2001	NE, LF	0.142	<0.003	0.246 JINT	0.062 JINT	21.4 J	<0.001	3,980	56,700	0.0112 J	<0.008	<0.001	2,950	0.0022	28.2	6.62
12/9/2002	NE, LF	0.116 MS	0.00088 J	0.229 J	<0.011 UINT	17 J	0.0047 J	3,430	55,800	0.0217 JINT	<0.014	0.0014 J	2,720	0.0034	28.2	6.62
6/21/2004	NE, LF	—	—	—	—	—	—	—	58,100	<0.005	—	—	—	—	20.8	—
11/8/2004	NE, LF	—	—	—	—	—	—	—	84,100	<0.01	—	—	—	—	3.15	—
5/16/2005	NE, LF	—	—	—	—	—	—	—	66,000	<0.01	—	—	—	—	4.63	—
10/10/2005	NE, LF	—	—	—	—	—	—	—	84,300	<0.01	—	—	—	—	<10	—
5/15/2006	NE, LF	—	—	—	—	—	—	—	71,000	<0.01	—	<0.01	—	—	<5.3	—
10/9/2006	NE, LF	—	—	—	—	—	—	—	85,800	<0.005	—	—	—	—	<1	—
5/7/2007	NE, LF	—	—	—	—	—	—	—	68,700	<0.01	—	—	—	—	3.84	—
10/8/2007	NE, LF	—	—	—	—	—	—	—	94,400	<0.005	—	—	—	—	<1	6.34
6/4/2008	NE, LF	—	—	—	—	—	—	—	65,000	0.00216	—	—	—	—	3.9	—

PZ-11 Analytical Results
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Date	Sample Type	Potassium	Selenium	Silicon	Silver	Sodium	Specific Conductance [b]	Sulfate	Temperature [c]	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Zinc
		Concentration (mg/L unless otherwise noted)											
7/21/1997	NE	25.6 J	0.025 J	28.7	<0.01	5,190	—	1,070	—	33,000	44.6	6.1	0.0427 J
7/21/1997	DUP	25.6 J	0.027 J	32.1	<0.01	5,110	—	1,080	—	34,300	43.8	5	<0.03
9/9/1997	NE	16.6 J	<0.02	19.7	<0.01	4,900	—	703	—	25,400	44.6	8	<0.03
10/16/1997	NE	18.1 J	<0.02	18.5	<0.01	5,160	—	763	—	25,600	43.7	8.3	<0.05
10/16/1997	DUP	25.9 J	<0.02	18.2	<0.01	5,180	—	777	—	25,100	44.8	10.8	<0.05
11/17/1997	NE	17.3 J	<0.02	19.2	<0.01	4,990	—	736	—	24,800	46.8	4.6	<0.05 UREP
11/17/1997	DUP	16.9 J	<0.02	19	<0.01	4,980	—	734	—	24,600	46.8	4.8	<0.05 UREP
1/14/1998	NE	18.9 J	<0.02	19	<0.01	4,510	—	756	—	23,300	47.4	3.4	<0.08
1/14/1998	DUP	18.5 J	<0.02	19	<0.01	4,600	—	756	—	22,900	47.6	3.8	<0.08
4/16/1998	NE	16 J	<0.02	18.8	<0.01	5,400	—	893	—	22,900	50.4	8.2 J	0.0302 J
7/22/1998	NE	17.6 J	<0.02	19.2	<0.01	5,240	—	1,000	—	28,420	45.4	3.4 J	0.0602 J
10/14/1998	NE	18	0.0217	19.2	<0.01	5,280	—	1,070	—	30,400	39.4	2.4	<0.06
2/10/1999	NE	20.6	0.0269 J	—	<0.01	6,200	—	1,040	—	34,500	39.8	<0.3	<0.05
2/10/1999	DUP	21	0.0269 J	—	<0.01	5,990	—	1,030	—	34,800	39.8	2.1	<0.05
8/11/1999	NE	23.6	0.033	—	<0.003	7,540	—	1,200	—	53,600	37.8	<0.3	<0.046
2/23/2000	NE, LF	32.5	0.0373	14.5	<0.003	15,200	—	1,790	—	72,000	29.2	0.65 J	<0.047
10/16/2000	NE, LF	27.6	0.0264	17	<0.001	8,660	—	1,290	—	44,250	35	<0.3	<0.091
12/19/2001	NE, LF	62.9 J	0.0289	12.5	<0.001	24,300	—	2,380	—	99,000	—	—	<0.05
12/9/2002	NE, LF	73.3 J	0.0264	18.2	<0.0022	26,200	—	2,410	—	104,000	34.5	1.7	<0.01
6/21/2004	NE, LF	—	<0.01	—	—	—	—	2,220	—	123,000	—	—	—
11/8/2004	NE, LF	—	<0.05	—	—	—	—	13,000	—	119,000	—	—	—
5/16/2005	NE, LF	—	<0.01	—	—	—	—	2,890	—	100,000	—	—	—
10/10/2005	NE, LF	—	0.013	—	—	—	—	2,950	—	129,000	—	—	—
5/15/2006	NE, LF	—	<0.01	—	—	—	—	3,090	—	133,000	—	—	—
10/9/2006	NE, LF	—	<0.01	—	—	—	—	2,550	—	123,000	—	—	—
5/7/2007	NE, LF	—	<0.02	—	—	—	—	2,620	—	135,000	—	—	—
10/8/2007	NE, LF	—	<0.02	—	—	—	127,100	2,970	23.4	108,000	—	—	—
6/4/2008	NE, LF	—	0.0149	—	—	—	—	2,100	—	110,000	—	—	—

PZ-12 Analytical Results
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Date	Sample Type	Concentration (mg/L unless otherwise noted)													
		Ammonium	Arsenic	Barium	Boron	Bromide	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nitrate
7/21/1997	NE	<0.007	0.0029 J	0.269	0.23 J	3.6 J	<0.0011	356	1,540	0.0083 J	3.8	0.0036	278	<0.0002	21
7/21/1997	DUP	<0.007	0.0028 J	0.249	0.23 J	3.7 J	<0.0011	359	1,550	0.0061 J	2	0.0027 J	280	<0.0002	21
9/10/1997	NE	0.0335	0.0022 J	0.135	0.21 J	3.2	<0.0011	325	1,430	0.0039 J	0.0933 J	<0.0011	237	<0.0002	14.9
10/16/1997	NE	<0.007	0.0019 J	0.127 J	0.21 J	4.4	<0.0011	313	1,420	0.0029 J	0.0213 J	<0.0011	233	<0.0002	13.9
10/16/1997	DUP	<0.007	0.0024 J	0.134 J	0.22 J	4.3	<0.0011	316	1,420	0.0034 J	0.138	<0.0011	233	<0.0002	13.8
11/18/1997	NE	0.0102 J	0.002 J	0.127 J	0.22 J	3.8	<0.0011	303	1,250	0.002 J	<0.0089	<0.0011	223	<0.0002	13.4
1/15/1998	NE	0.009 J	0.002 J	0.137 J	0.21 J	3.8	0.0012 J	320	1,370	0.0035 J	<0.0056	<0.0011	229	<0.0002	15.7
1/15/1998	DUP	0.0136 J	0.002 J	0.138 J	0.2 J	4	<0.0011	325	1,380	0.0047 J	<0.0056	<0.0011	230	<0.0002	15.5
4/16/1998	NE	0.08435	0.0018 J	0.121 J	0.21 J	4.3	<0.0011	376	1,720	0.0076 J	<0.0122	<0.0011	271	<0.0002	20
4/16/1998	DUP	0.0719	0.002 J	0.118 J	0.21 J	4.2	<0.0011	378	1,790	0.0075 J	<0.0122	0.0021 J	271	<0.0002	20
7/23/1998	NE	0.42	0.0018 J	0.148 J	0.22 J	14.6 R	<0.0011	497	2,620	0.0101 J	0.0176 J	<0.0011	357	<0.0002	24.8
10/15/1998	NE	0.0064 J	0.0011 J	0.151 J	0.23 J	6.1	<0.001	557	3,320	0.0054 J	<0.005	0.0015 J	406	<0.0002	25.6
10/15/1998	DUP	0.0064 J	0.0012 J	0.152 J	0.22 J	6.2	<0.001	566	3,340	0.0079 J	<0.005	<0.001	414	<0.0002	25.6
2/11/1999	NE	0.0488	0.0016 J	0.183 J	<1	5.7	<0.001	728	3,810	0.0057 J	0.0486 J	<0.001	510	<0.0002	30.8
8/12/1999	NE	0.342	<0.005	0.138 J	<1	5.5	<0.003	717	3,870	0.01 J	<0.132	<0.002	496	<0.001	28.2
2/11/2000	NE, LF	0.369 MS	<0.002	0.142 J	<1	5.9 J	<0.003	804	5,150	0.0061 J	<0.144	<0.002	564	<0.001	31.7
10/16/2000	NE, LF	<0.0047	0.0015 J	0.118 J	0 2 J	5.2	<0.0003	684	4,400	0.005 J	<0.0084	0.00026 J	469	<0.0002	29.4
12/19/2001	NE, LF	0.124	<0.003	0.115 JINT	0.21 JINT	4.9 J	<0.001	868	6,560	0.0114 J	<0.008	<0.001	608	<0.0002	29.5
12/10/2002	NE, LF	0.826 MS	0.0012 J	0.116 J	0.13 JINT	4.1 J	<0.001	771	6,300	0.0166 JINT	<0.014	<0.001	549	<0.001	30.9
6/14/2004	NE, LF	—	—	—	—	—	—	—	5,320	<0.005	—	—	—	—	11.2
11/8/2004	NE, LF	—	—	—	—	—	—	—	7,170	<0.001	—	—	—	—	19.8
5/16/2005	NE, LF	—	—	—	—	—	—	—	3,730	0.054	—	—	—	—	8.85
10/10/2005	NE, LF	—	—	—	—	—	—	—	318	<0.01	—	—	—	—	3.34
5/15/2006	NE, LF	—	—	—	—	—	—	—	4,510	<0.01	—	—	—	—	20.6
10/9/2006	NE, LF	—	—	—	—	—	—	—	5,340	<0.005	—	—	—	—	13.2
5/7/2007	NE, LF	—	—	—	—	—	—	—	3,780	0.024	—	—	—	—	10.8
10/8/2007	NE, LF	—	—	—	—	—	—	—	4,310	<0.005	—	—	—	—	<1
6/4/2008	NE, LF	—	—	—	—	—	—	—	3,300	0.00132	—	—	—	—	11

PZ-12 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)												
		pH [a]	Potassium	Selenium	Silicon	Silver	Sodium	Specific Conductance [b]	Sulfate	Temperature [c]	Total Dissolved Solids	Total Inorganic Carbon	Total Organic Carbon	Zinc
7/21/1997	NE	7.3	7.4	0.0256 MS	22.2	<0.0011	386	—	404	—	4,060	56.9	1.9	0.0154 J
7/21/1997	DUP	7.3	6.4	0.026 MS	22.1	<0.0011	388	—	404	—	3,860	55.4	2.1	0.0101 J
9/10/1997	NE	7.2	6.3	0.0262	20.3	<0.0011	436	—	448	—	3,290	61.4	5.7	<0.0033
10/16/1997	NE	7.3	6.4	0.0315	20.2	<0.0011	410	—	483	—	3,400	53.5	6.4	<0.0056
10/16/1997	DUP	7.2	6.2	0.0304	20.3	<0.0011	408	—	481	—	3,440	58.4	8.4	<0.0056
11/18/1997	NE	7.2	5.7	0.0314	21.3	<0.0011	354	—	469	—	3,140	62.8	4.3	0.0066 J
1/15/1998	NE	7.5	6.3	0.0332	21.3	<0.0011	409	—	500	—	3,460	62.9	3.2	0.0143 J
1/15/1998	DUP	7.4	6.7	0.0323	21.3	<0.0011	409	—	497	—	3,510	64.2	3.3	0.0104 J
4/16/1998	NE	7	7.3	0.031	21.1	<0.0011	544	—	578	—	3,610	68.9	0.68 JMS	<0.0033
4/16/1998	DUP	7	7.4	0.0313	21	<0.0011	549	—	577	—	4,960	68.8	<0.3 UMS	<0.0033
7/23/1998	NE	7	9.5	0.0294	21.2	<0.0011	812	—	595	—	5,965	67.5	2.3	<0.0067
10/15/1998	NE	7.4	10.8	0.038	20.6	<0.001	926	—	686	—	7,430	63.8	2.4	<0.006
10/15/1998	DUP	7.4	10.8	0.0391	20.4	<0.001	953	—	694	—	7,340	64.2	2.1	<0.006
2/11/1999	NE	7	13.5	0.0388	—	<0.001	1,190	—	700	—	8,500	69.2	4	<0.005
8/12/1999	NE	7.23	13.8	0.0418	—	<0.003	1,280	—	685	—	10,000	73.4	6.3 REP	<0.046
2/11/2000	NE, LF	7.31	18.4	0.0478	20.7	<0.003	<3,840	—	826	—	10,700	70.4	0.79 J	<0.047
10/16/2000	NE, LF	7.06	17.1	0.0361	20.4	0.00015 J	1,500	—	740	—	9,650	70.9	3.8	<0.0091
12/19/2001	NE, LF	7.28	24.5 J	0.0378	20.2	<0.001	2,290	—	843	—	12,800	—	—	<0.05
12/10/2002	NE, LF	6.97	24.8 J	0.0372	21.2	<0.001	2,260	—	809	—	12,500	71.6	2.9	<0.01
6/14/2004	NE, LF	—	—	0.077	—	—	—	—	773	—	9,700	—	—	—
11/8/2004	NE, LF	—	—	0.066	—	—	—	—	879	—	9,540	—	—	—
5/16/2005	NE, LF	—	—	0.051	—	—	—	—	679	—	5,890	—	—	—
10/10/2005	NE, LF	—	—	0.02	—	—	—	—	515	—	7,740	—	—	—
5/15/2006	NE, LF	—	—	0.019	—	—	—	—	866	—	8,790	—	—	—
10/9/2006	NE, LF	—	—	<0.01	—	—	—	—	795	—	9,150	—	—	—
5/7/2007	NE, LF	—	—	<0.02	—	—	—	—	831	—	7,010	—	—	—
10/8/2007	NE, LF	6.85	—	0.026	—	—	—	10,760	958	20.7	6,200	—	—	—
6/4/2008	NE, LF	—	—	0.0291	—	—	—	—	760	—	6,800	—	—	—

PZ-13 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)												
		Alkalinity, Bicarbonate	Alkalinity, Carbonate	Alkalinity, Hydroxide	Alkalinity, Total	Arsenic, Dissolved	Barium, Dissolved	Cadmium, Dissolved	Calcium, Dissolved	Chloride	Chromium, Total	Fluoride	Lead, Dissolved	Magnesium, Dissolved
10/10/2007	NE, LF	144	<1	<1	144	<0.01	0.116	<0.001	2,220	150,000	0.005	22.2	0.25	1,250
6/6/2008	NE, LF	—	—	—	—	—	—	—	—	170,000	0.00316	—	—	—

Date	Sample Type	Concentration (mg/L unless otherwise noted)										
		Mercury, Dissolved	Nitrate	pH [a]	Potassium, Dissolved	Selenium	Silver, Dissolved	Sodium, Dissolved	Specific Conductance [b]	Sulfate	Temperature [c]	Total Dissolved Solids
10/10/2007	NE, LF	<0.0002	12.4	6.09	618	0.1	<0.002	86,100	200,000 >	2,670	22.8	245,500
6/6/2008	NE, LF	—	<200	—	—	0.0118	—	—	—	2,600	—	240,000

PZ-14 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)												
		Alkalinity, Bicarbonate	Alkalinity, Carbonate	Alkalinity, Hydroxide	Alkalinity, Total	Arsenic, Dissolved	Barium, Dissolved	Cadmium, Dissolved	Calcium, Dissolved	Chloride	Chromium, Total	Fluoride	Lead, Dissolved	Magnesium, Dissolved
10/15/2007	NE, BLR	146	<1	<1	146	<0.01	0.298	<0.001	1,060	71,500	<0.005	<1	<0.01	696
6/7/2008	NE, LF	---	---	---	---	---	---	---	---	130,000	0.00168	---	---	---

PZ-14 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)									
		Mercury, Dissolved	Nitrate	pH [a]	Potassium, Dissolved	Selenium	Silver, Dissolved	Sodium, Dissolved	Specific Conductance [b]	Sulfate	Total Dissolved Solids
10/15/2007	NE, BLR	<0.0002	1.41	6.74	649	<0.01	<0.002	41,500	184,000	2,140	106,000
6/7/2008	NE, LF	—	<100	—	—	0.0201	—	—	—	3,300	180,000

PZ-15 Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)												
		Alkalinity, Bicarbonate	Alkalinity, Carbonate	Alkalinity, Hydroxide	Alkalinity, Total	Arsenic, Dissolved	Barium, Dissolved	Cadmium, Dissolved	Calcium, Dissolved	Chloride	Chromium, Total	Fluoride	Lead, Dissolved	Magnesium, Dissolved
10/15/2007	NE, BLR	<4	1,100	<1	550	<0.01	0.051	<0.001	14.2	764	<0.05	9.01	<0.01	10.1
6/7/2008	NE, LF	---	---	---	---	---	---	---	---	460	<0.001	---	---	---

PZ-15 Analytical Results

		Concentration (mg/L unless otherwise noted)									
Date	Sample Type	Mercury, Dissolved	Nitrate	pH [a]	Potassium, Dissolved	Selenium	Silver, Dissolved	Sodium, Dissolved	Specific Conductance [b]	Sulfate	Total Dissolved Solids
10/15/2007	NE, BLR	<0.0002	2.97	8.66	7.15	0.022	<0.002	779	3,380	169	2,060
6/7/2008	NE, LF	—	12	—	—	0.00372	—	—	—	160	1,600

WQSP-6A Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted)													
		Alkalinity, Total	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chloride	Chromium, Total	Iron	Lead	Magnesium	Mercury	Nickel
7/13/1995	NE	111	—	<0.006	<0.02	<0.01	<0.0013	681	1,040	<0.0025	<0.4	<0.0125	181	<0.0002	—
3/28/1996	NE	101	—	—	—	—	—	564	507	—	0.145	—	155	—	—
7/11/1996	NE	104.2	<0.013	<0.013	0.01	<0.003	<0.003	645	6,748	<0.025	<0.5	0.017	155	<0.002	<0.025
10/31/1996	NE	—	<0.013	—	—	—	—	—	—	—	—	—	—	—	—
11/1/1996	NE	—	—	<0.013	—	—	—	—	—	—	—	—	—	—	—
11/2/1996	NE	—	—	—	0.009	—	—	—	—	—	—	—	—	—	—
11/3/1996	NE	—	—	—	—	<0.0025	—	—	—	—	—	—	—	—	—
11/4/1996	NE	—	—	—	—	—	<0.0025	—	—	—	—	—	—	—	—
11/5/1996	NE	—	—	—	—	—	—	—	—	<0.025	—	—	—	—	—
11/8/1996	NE	—	—	—	—	—	—	—	—	—	—	<0.013	—	—	—
11/9/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	<0.002	—
11/10/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	<0.025
11/11/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11/12/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11/13/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11/15/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4/10/1997	NE	106	<0.013	<0.013	<0.005	<0.0025	<0.0025	563	675	<0.025	0.261	<0.013	150	<0.002	<0.025
7/10/1997	NE	102	<0.05	<0.05	<0.02	<0.01	<0.01	675	660	<0.1	<1	<0.05	173	<0.002	<0.1
6/10/1998	NE	103	<0.001	<0.001	0.007	<0.001	<0.001	649	644	0.0015	0.019	<0.001	173	<0.0002	<0.019
11/3/1998	NE	100	<0.05	<0.5	<1	<0.01	<0.05	646	770	<0.5	<0.3	<0.05	166	<0.001	<0.1
5/26/1999	NE	102	0.14	0.08	<1	<0.01	<0.05	654	540	<0.05	<1	<0.05	172	<0.0002	<0.5
11/10/1999	NE	100	0.48	0.187	<0.1	<0.01	<0.01	613	540	<0.05	0.511	<0.02	167	<0.0002	0.284
5/24/2000	NE	108	<0.01	<0.01	<0.008	<0.004	<0.005	681	530	<0.02	0.0037	<0.005	167	<0.0002	<0.02
11/30/2000	NE	—	<0.013	0.01	<0.02	—	<0.01	655	480	<0.025	<0.5	<0.02	187	<0.0002	<0.025
12/5/2000	NE	108	—	—	—	—	—	—	—	—	—	—	—	—	—
6/6/2001	NE	104	<0.013	<0.05	<0.02	<0.01	<0.01	570	536	<0.025	<0.5	<0.02	150	<0.0002	<0.025
11/14/2001	NE	102	<0.025	<0.01	<0.1	<0.0025	<0.005	622	414	<0.01	<0.05	<0.01	186	<0.0002	<0.025
11/30/2001	NE	—	—	—	—	<0.01	—	—	—	—	—	—	—	—	—
5/22/2002	NE	106	<0.025	<0.05	<0.1	<0.0025	<0.005	573	487	<0.01	—	<0.01	151	<0.0002	<0.025
11/20/2002	NE	100	<0.025	<0.05	<0.1	<0.0025	<0.005	588	419	<0.01	<0.05	<0.01	170	<0.0002	<0.025
5/21/2003	NE	104	<0.124	<0.249	<0.05	<0.0125	<0.025	588	384	<0.05	<0.25	<0.075	159	<0.0002	<0.125
11/19/2003	NE	106	<0.25	<0.1	<0.1	<0.01	<0.01	616	391	<0.025	<0.5	<0.05	164	<0.0002	<0.05
5/26/2004	NE	104	<0.25	<0.1	<0.1	<0.01	<0.01	590	416	<0.025	<0.5	<0.05	156	<0.0002	<0.05
11/17/2004	NE	106	<0.25	<0.1	<0.1	<0.01	<0.01	575	491	<0.025	<0.5	<0.05	166	<0.0002	<0.05
4/20/2005	NE	104	<0.013	<0.1	<0.02	<0.01	<0.01	628	432	<0.025	<0.5	<0.02	173	<0.0002	<0.025
10/19/2005	NE	106	<0.013	<0.1	<0.02	<0.01	<0.01	580	360	<0.025	<0.5	<0.02	156	<0.0002	<0.025
5/3/2006	NE	106	<0.013	<0.1	<0.02	<0.01	<0.01	510	450	<0.025	<0.5	<0.02	151	<0.0002	<0.025
9/20/2006	NE	108	<0.013	<0.1	<0.02	<0.01	<0.01	635	360	<0.025	<0.5	<0.02	171	<0.0002	<0.025
3/7/2007	NE	102	<0.013	<0.1	<0.02	<0.01	<0.01	606	484	<0.025	<0.5	<0.02	148	<0.0002	0.031
9/12/2007	NE	112	<0.013	<0.1	<0.02	<0.01	<0.01	606	350	<0.025	<0.5	<0.02	158	<0.0002	0.033

WQSP-6A Analytical Results

Date	Sample Type	Concentration (mg/L unless otherwise noted) Nitrate	pH [a]	Potassium	Selenium	Silver	Sodium	Specific Conductance [b]	Sulfate	Thallium	Total Dissolved Solids	Total Organic Carbon	Total Organic Halides (TOX)	Total Suspended Solids	Vanadium
7/13/1995	NE	33.73	7.66	4.82	<0.006	0.0028	347	4,968	1,905	—	11,000	1.1	0.088	91	—
3/28/1996	NE	17.62	7.24	3.93	—	—	282	4,306	1,810	—	3,920	1.73	0.0665	<10	—
7/11/1996	NE	12.17	7.63	5	0.02	<0.013	314	4,512.60	1,970.50	<0.013	4,500	1.14	0.0443	<10	0.053
10/31/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11/1/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11/2/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11/3/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11/4/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11/5/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11/8/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11/9/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11/10/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
11/11/1996	NE	—	—	—	<0.013	—	—	—	—	—	—	—	—	—	—
11/12/1996	NE	—	—	—	—	<0.013	—	—	—	—	—	—	—	—	—
11/13/1996	NE	—	—	—	—	—	—	—	—	<0.013	—	—	—	—	—
11/15/1996	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	0.05
4/10/1997	NE	20.54	7.325	4.24	0.017	<0.013	292	4,634	2,240	<0.013	3,960	15.6	<0.01	<10	0.05
7/10/1997	NE	17.88	7.835	4.49	<0.05	<0.05	311	4,450	2,560	<0.05	3,840	0.8855	0.1814	<10	<0.1
6/10/1998	NE	27.40	7.47	4.49	0.016	<0.001	335	4,770	1,950	<0.001	4,120	<0.1	—	<10	0.053
11/3/1998	NE	48.69	7.3	7.5	0.22	<0.5	313	4,600	2,100	<0.1	4,100	<5	0.054	<1	<0.5
5/26/1999	NE	30.99	7.2	10	<0.1	<0.5	291	5,000	1,900	<0.01	3,800	<1	0.1	<1	<0.01
11/10/1999	NE	41.61	7.2	<10	<0.05	0.08	269	4,400	1,900	0.058	3,800	3.1	0.076	<1	<0.1
5/24/2000	NE	33.20	7.39	5.2	0.0129	<0.01	279	4,500	2,100	0.0176	3,800	<1	0.046	<1	0.0411
11/30/2000	NE	29.66	7.8	3.28	<0.013	<0.013	258	4,300	1,900	<0.013	3,700	<1	0.054	<1	<0.025
12/5/2000	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6/6/2001	NE	28.20	7.4	7.2	0.0385	<0.013	260	4,400	1,900	<0.013	3,680	1.28	0.029	<1	0.052
11/14/2001	NE	16.25	7.52	7.55	<0.05	<0.0125	302	4,160	1,900	<0.05	4,600	<1	0.039	<1	0.046
11/30/2001	NE	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5/22/2002	NE	24.44	7.4	7.27	<0.05	<0.0125	253	4,210	1,930	<0.05	3,540	<1	0.44	<1	<0.025
11/20/2002	NE	24.83	7.7	6.15	<0.05	<0.0125	279	4,050	2,090	<0.05	3,685	1.59	2.3	<1	0.0482
5/21/2003	NE	20.98	7.3	5.71	<0.123	<0.0625	290	4,060	1,950	<0.229	3,650	<1	0.12	<1	<0.125
11/19/2003	NE	<0.044	7.3	6.16	<0.219	<0.025	231	4,070	1,950	<0.025	3,955	<1	4	<1	0.065
5/26/2004	NE	42.54	7.4	5.43	<0.025	<0.025	193	4,080	1,970	<0.025	3,646	<1	1.1	<1	<0.05
11/17/2004	NE	29.75	7.42	7.85	<0.025	<0.025	215	4,227	1,960	<0.025	3,655	<1	<0.03	<1	<0.05
4/20/2005	NE	26.47	7.62	6.21	0.057	<0.013	205	3,970	1,920	<0.025	3,700	<1	<0.15	<1	<0.05
10/19/2005	NE	<0.044	7.57	8.99	<0.025	<0.013	226	3,710	1,940	<0.025	3,430	<1	<0.06	<1	<0.05
5/3/2006	NE	11.07	7.55	6.35	<0.025	<0.013	212	3,870	2,210	<0.025	3,200	2.9	<0.077	18	<0.05
9/20/2006	NE	26.56	7.22	4.98	<0.025	<0.013	127	3,960	2,120	<0.025	3,515	<1	<0.06	<1	0.056
3/7/2007	NE	25.59	7.09	3.77	<0.025	<0.013	243	4,100	2,170	0.04	3,355	<1	<0.06	<1	0.056
9/12/2007	NE	24.21	7.09	4.58	<0.025	<0.013	241	4,000	1,950	<0.025	3,400	<1	<0.06	<1	<0.05

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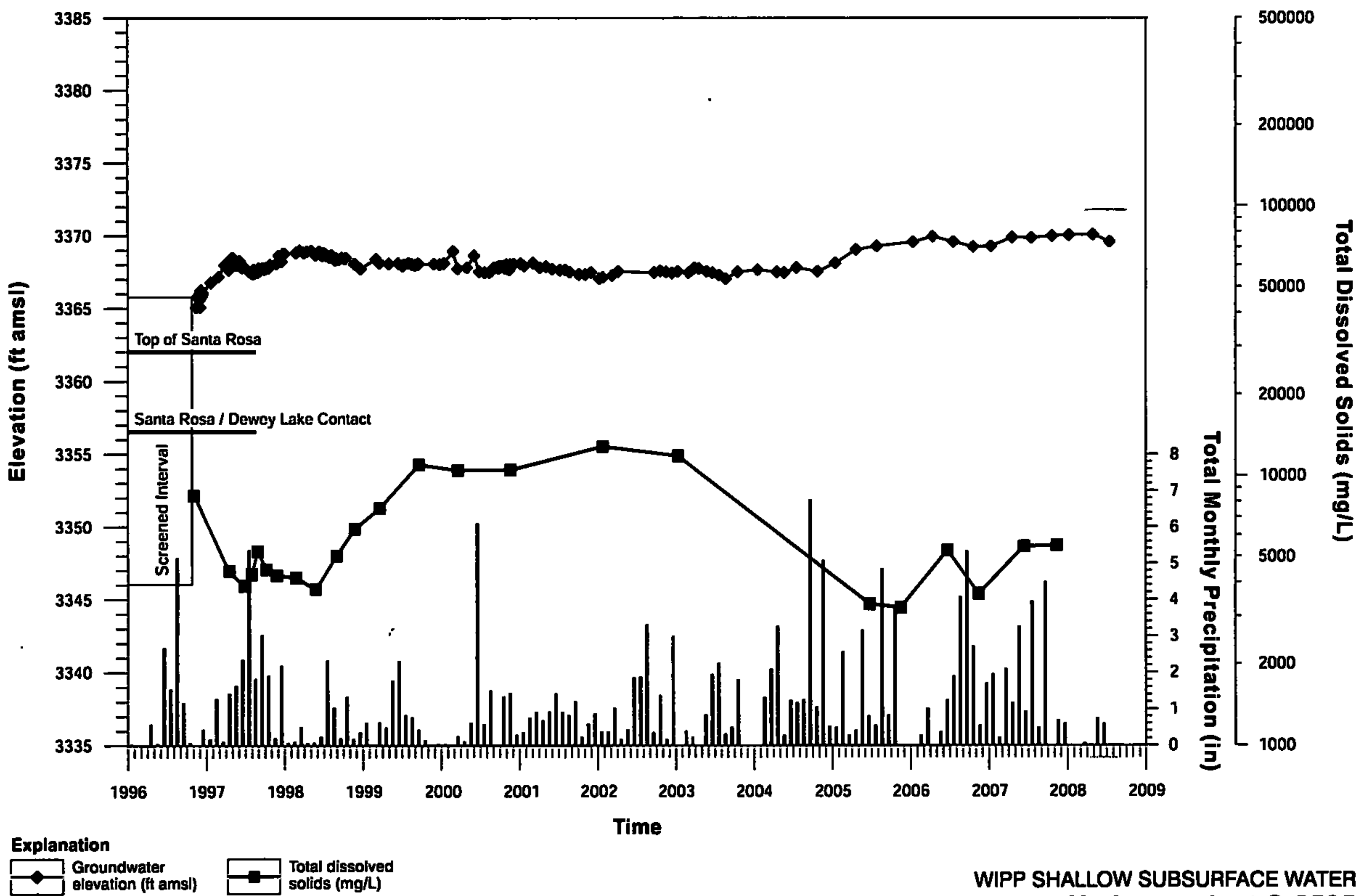


WIPP SHALLOW SUBSURFACE WATER

Hydrograph at C-2505

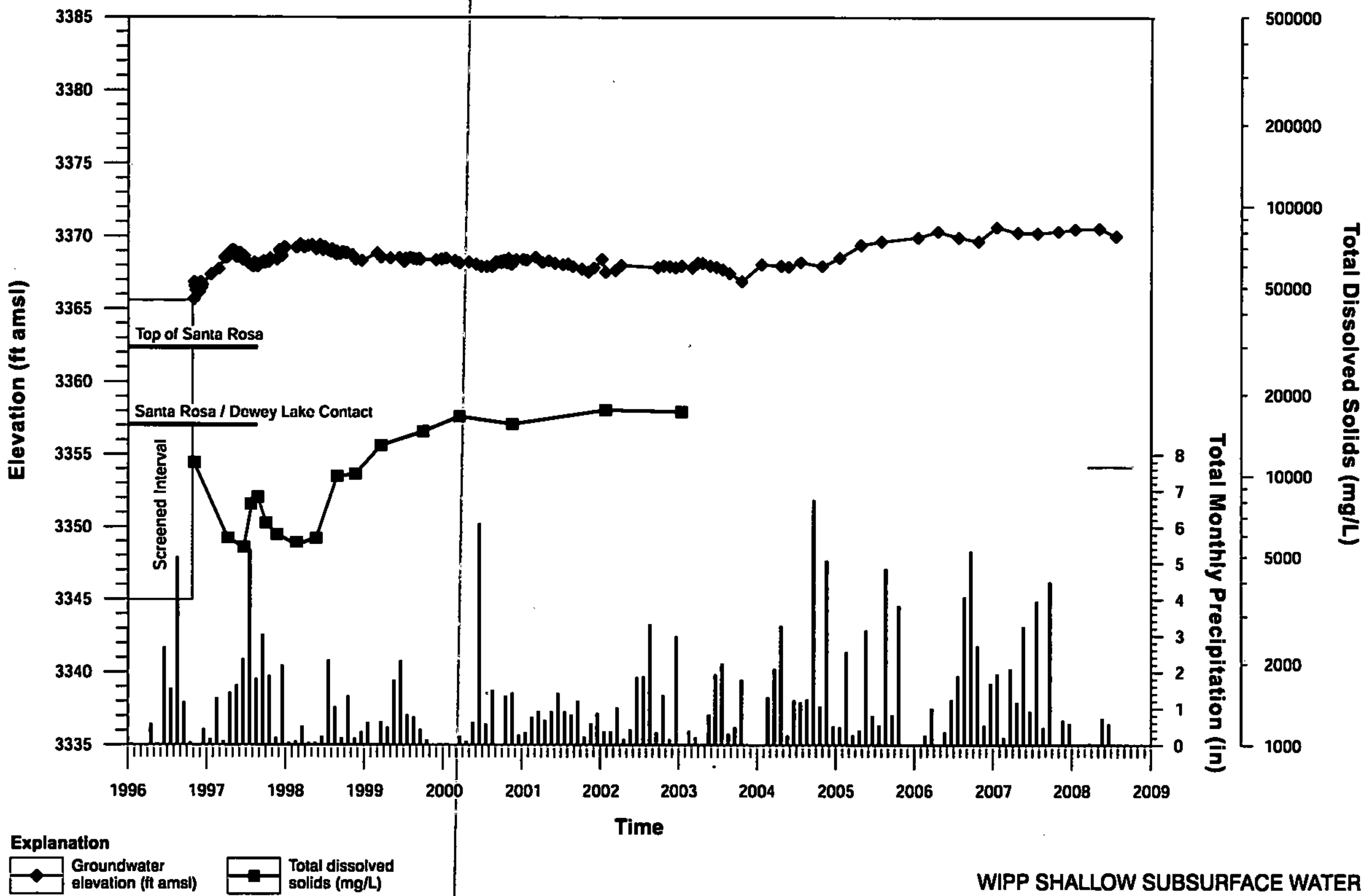
Monthly Precipitation and Total Dissolved Solids

Figure C-1

Daniel B. Stephens & Associates, Inc.

8-28-08

JN ES08.0072



WIPP SHALLOW SUBSURFACE WATER

Hydrograph at C-2506

Monthly Precipitation and Total Dissolved Solids

Figure C-2

Daniel B. Stephens & Associates, Inc.

3-28-08 JN ES08.0072

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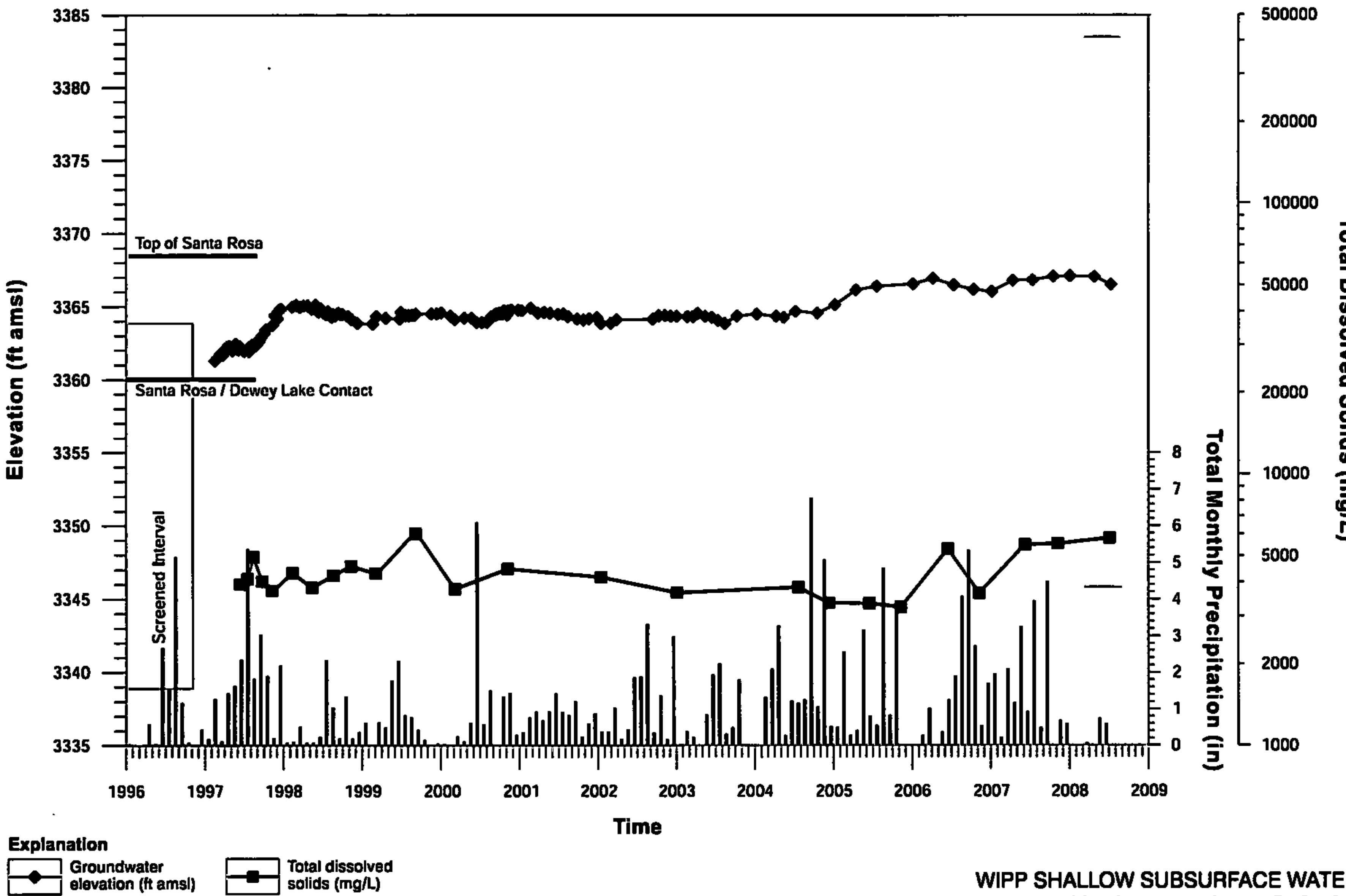


WIPP SHALLOW SUBSURFACE WATER

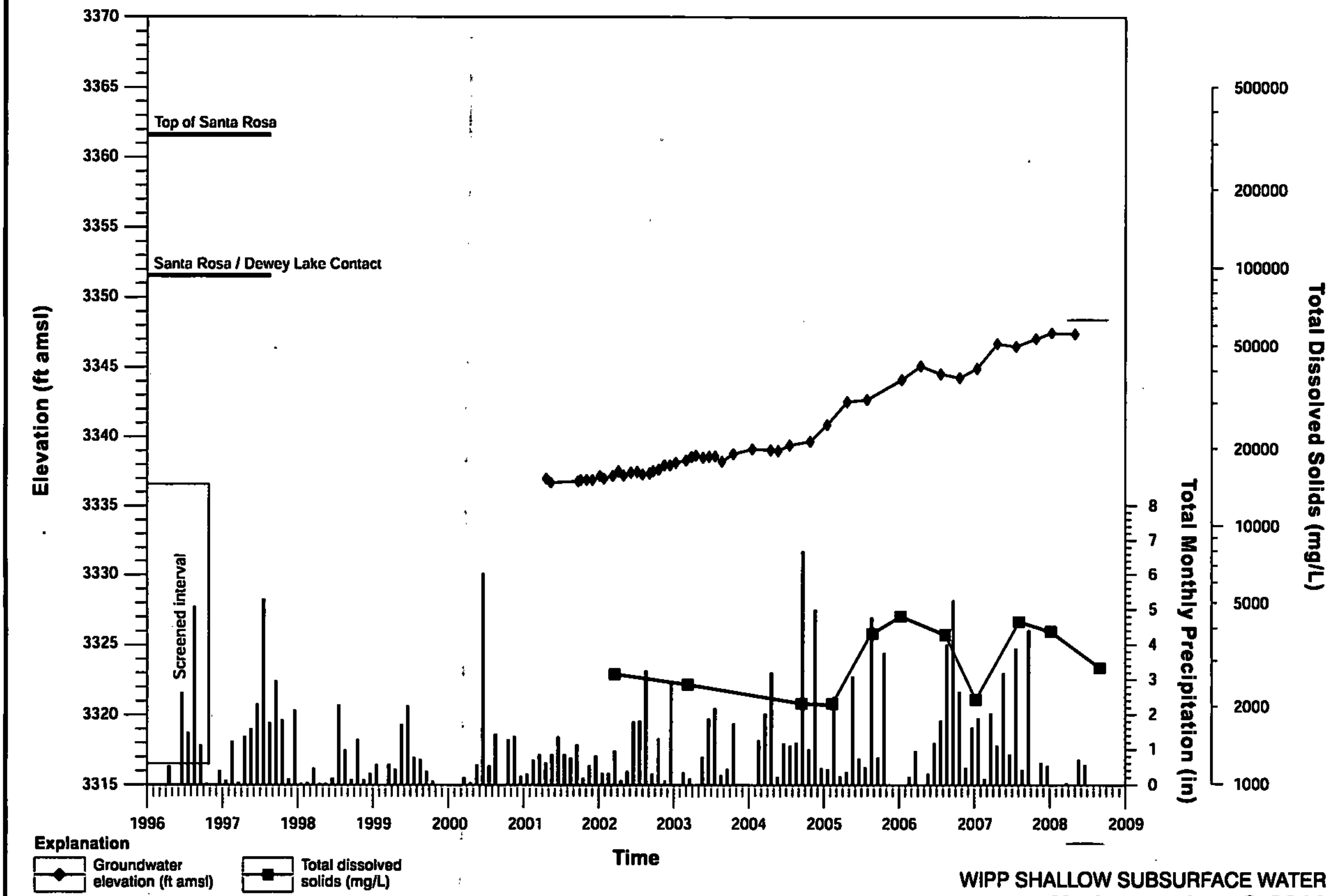
Hydrograph at C-2507

Monthly Precipitation and Total Dissolved Solids

Figure C-3

Daniel B. Stephens & Associates, Inc.

8-28-08 JN ES08.0072



WIPP SHALLOW SUBSURFACE WATER

Hydrograph at C-2811

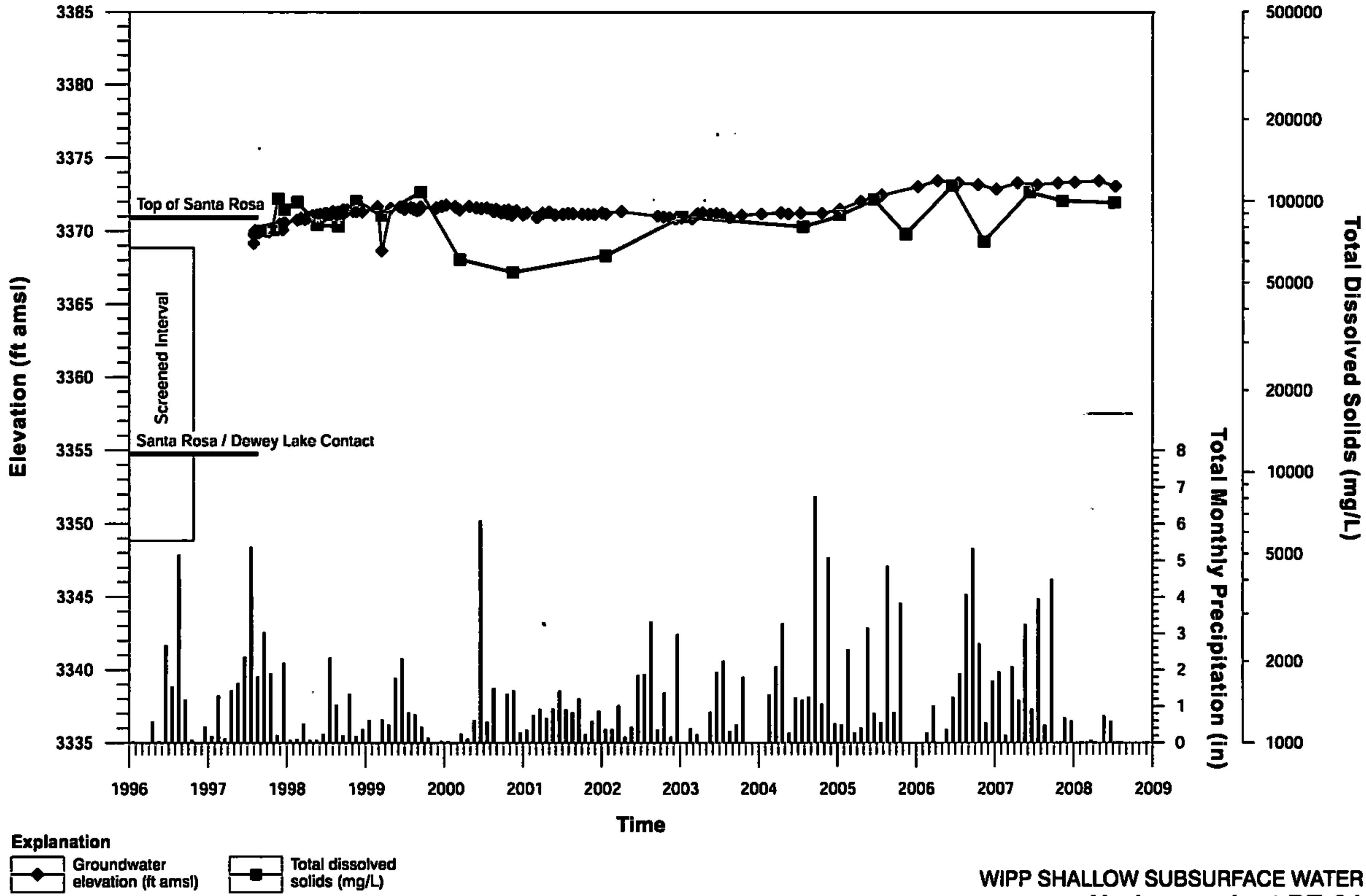
Monthly Precipitation and Total Dissolved Solids

Figure C-4

Daniel B. Stephens & Associates, Inc.

3-28-08

JN ES08.0072



WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-01

Monthly Precipitation and Total Dissolved Solids

Figure C-5

Daniel B. Stephens & Associates, Inc.

8-28-08

JN ES08.0072

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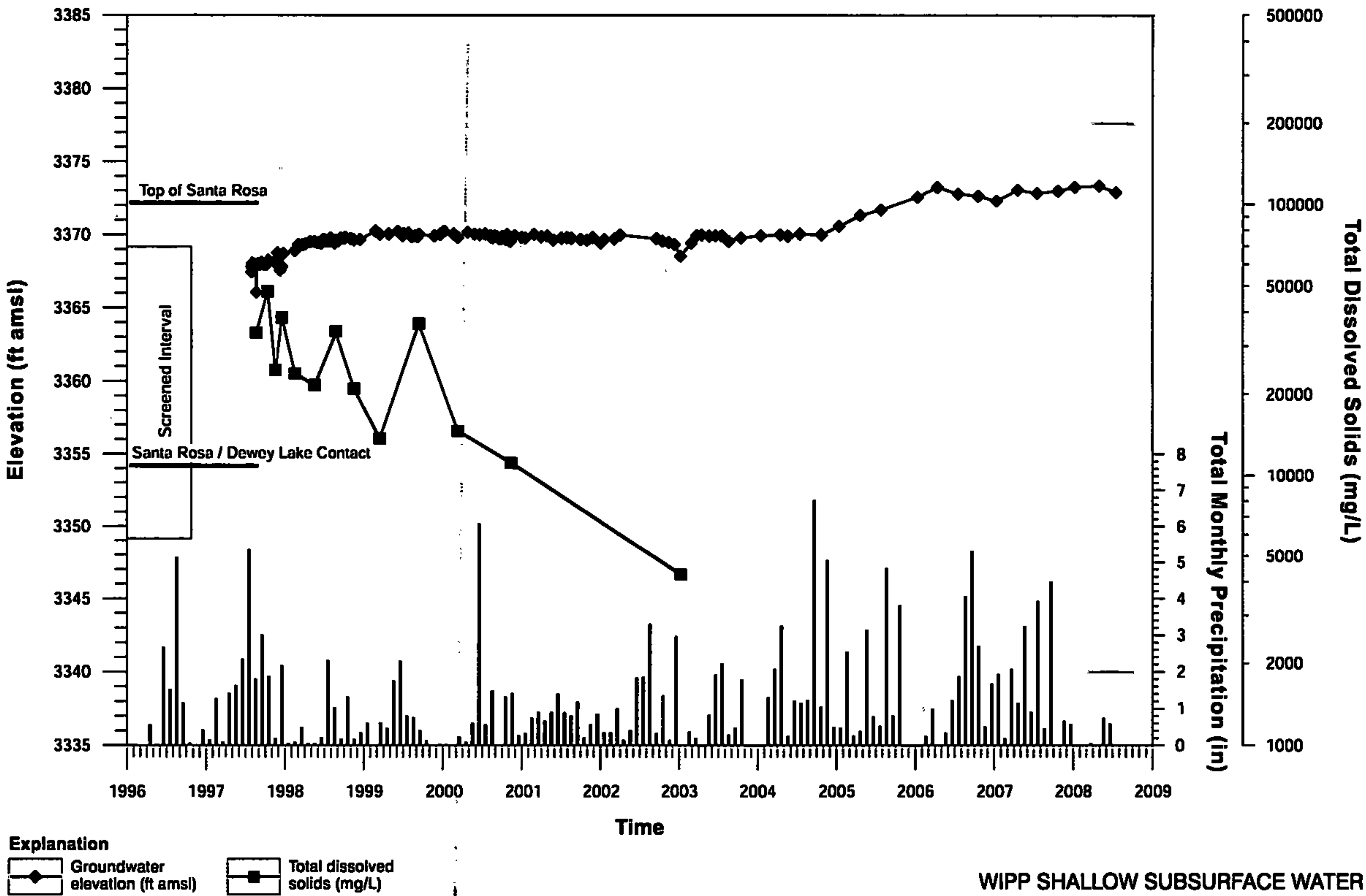

WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-02

Monthly Precipitation and Total Dissolved Solids

Figure C-6

Daniel B. Stephens & Associates, Inc.

1-28-08

JN ES08.0072

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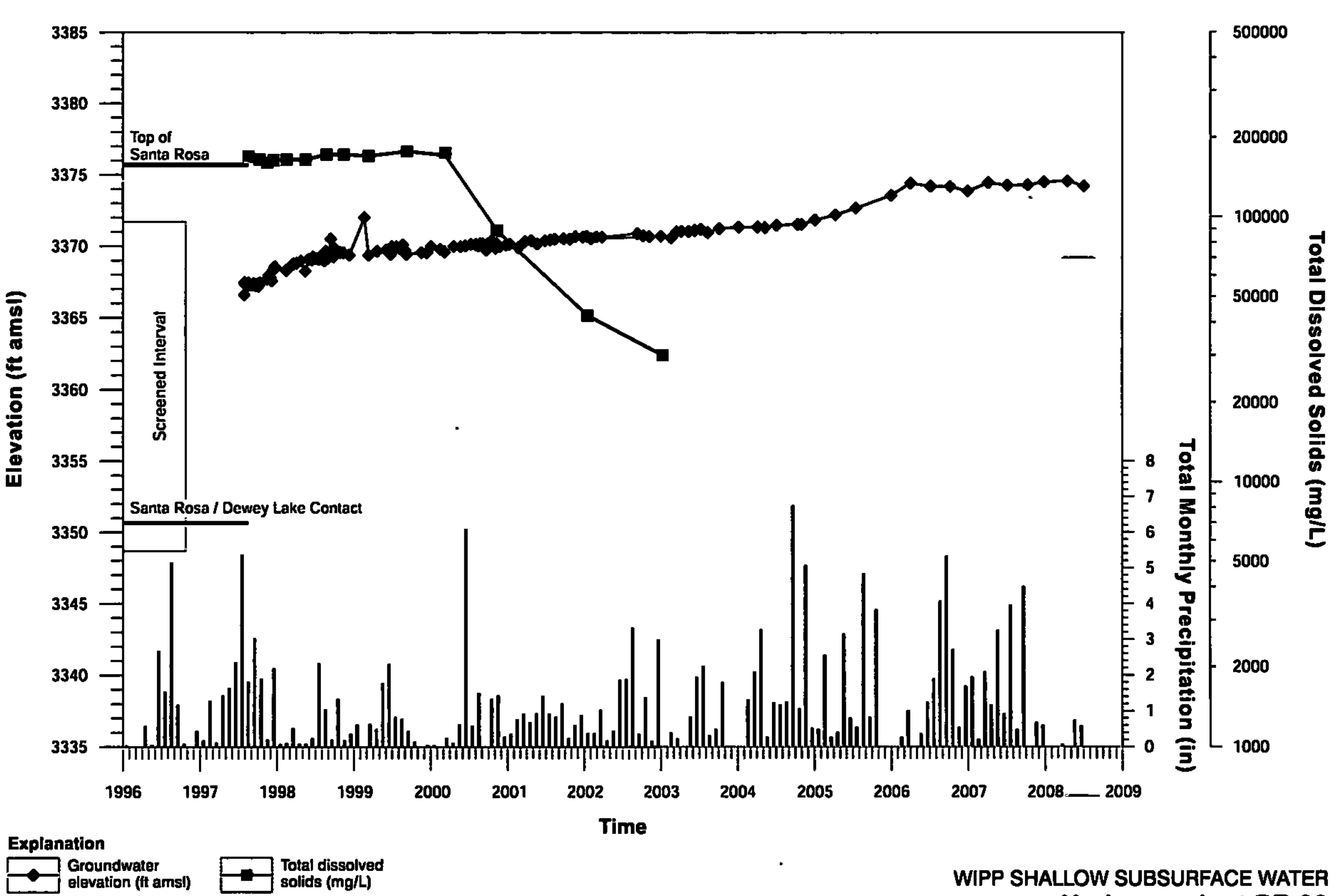

WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-03

Monthly Precipitation and Total Dissolved Solids

Figure C-7

Daniel B. Stephens & Associates, Inc.

8-28-08

JN ES08.0072

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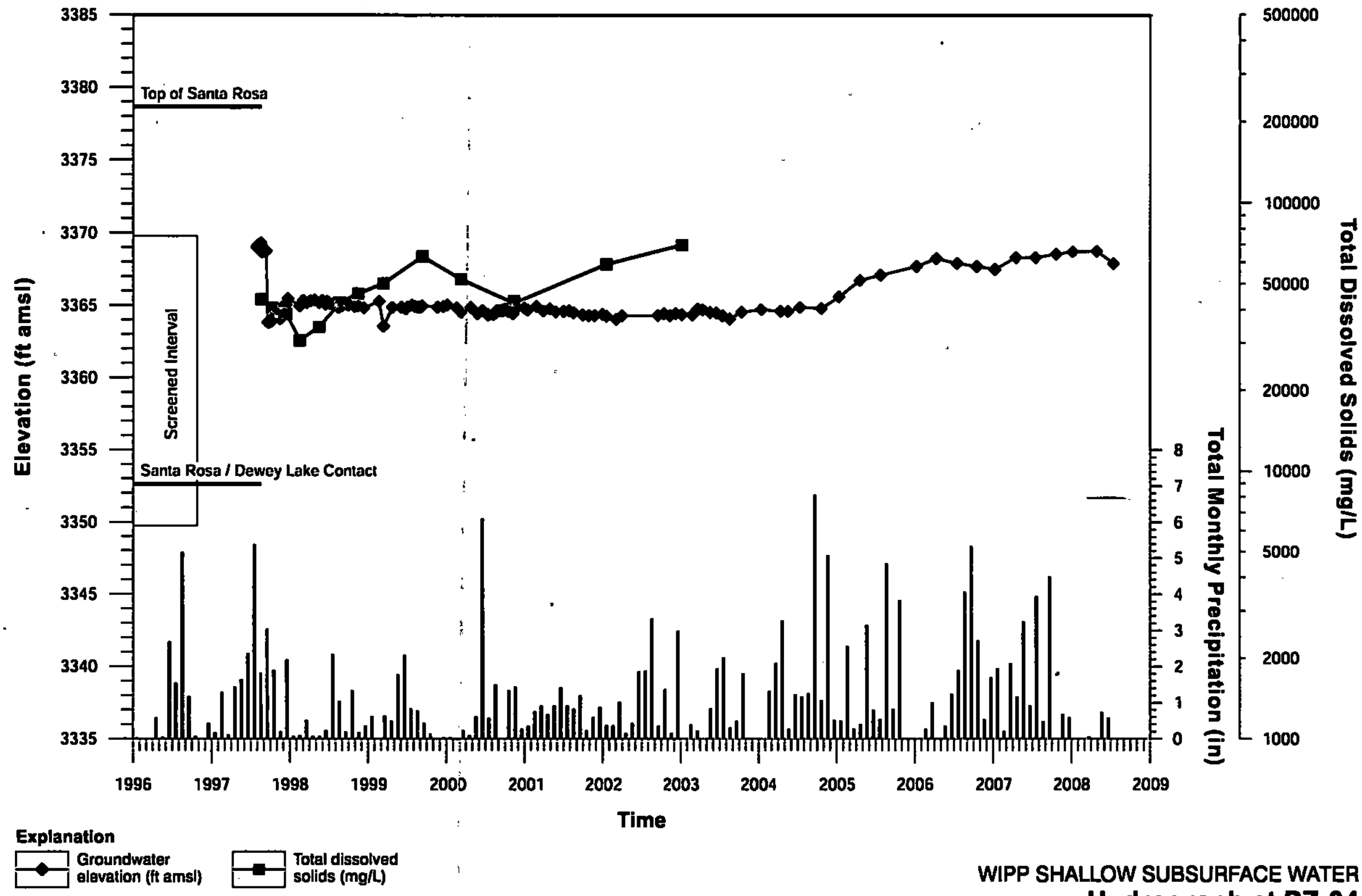

Figure C-8

Daniel B. Stephens & Associates, Inc.
1-28-08 JN ES08.0072

WIPP SHALLOW SUBSURFACE WATER
Hydrograph at PZ-04
Monthly Precipitation and Total Dissolved Solids

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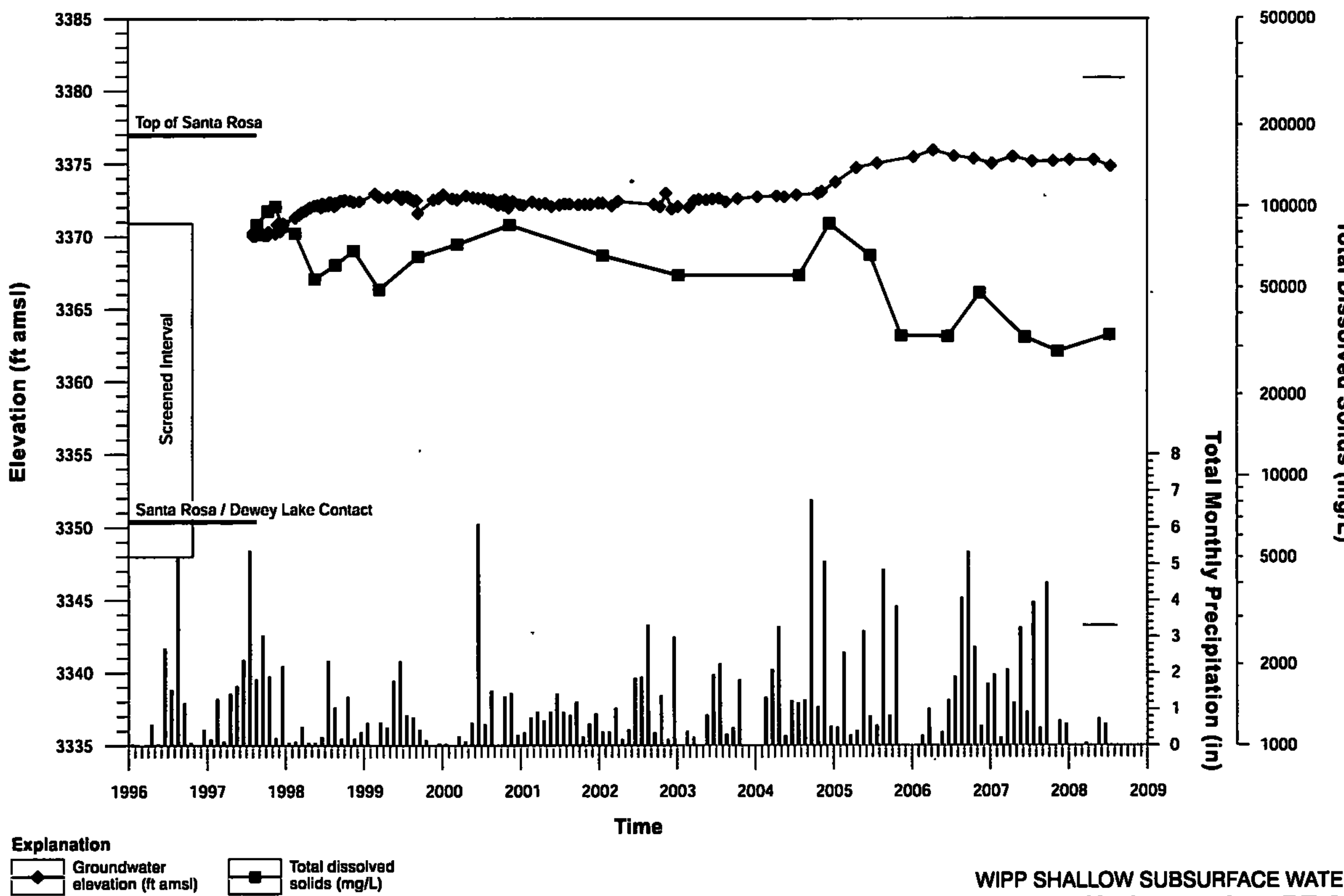

WIPP SHALLOW SUBSURFACE WATER
Hydrograph at PZ-05
Monthly Precipitation and Total Dissolved Solids

Figure C-9

Daniel B. Stephens & Associates, Inc.
8-28-08
JN ES08.0072

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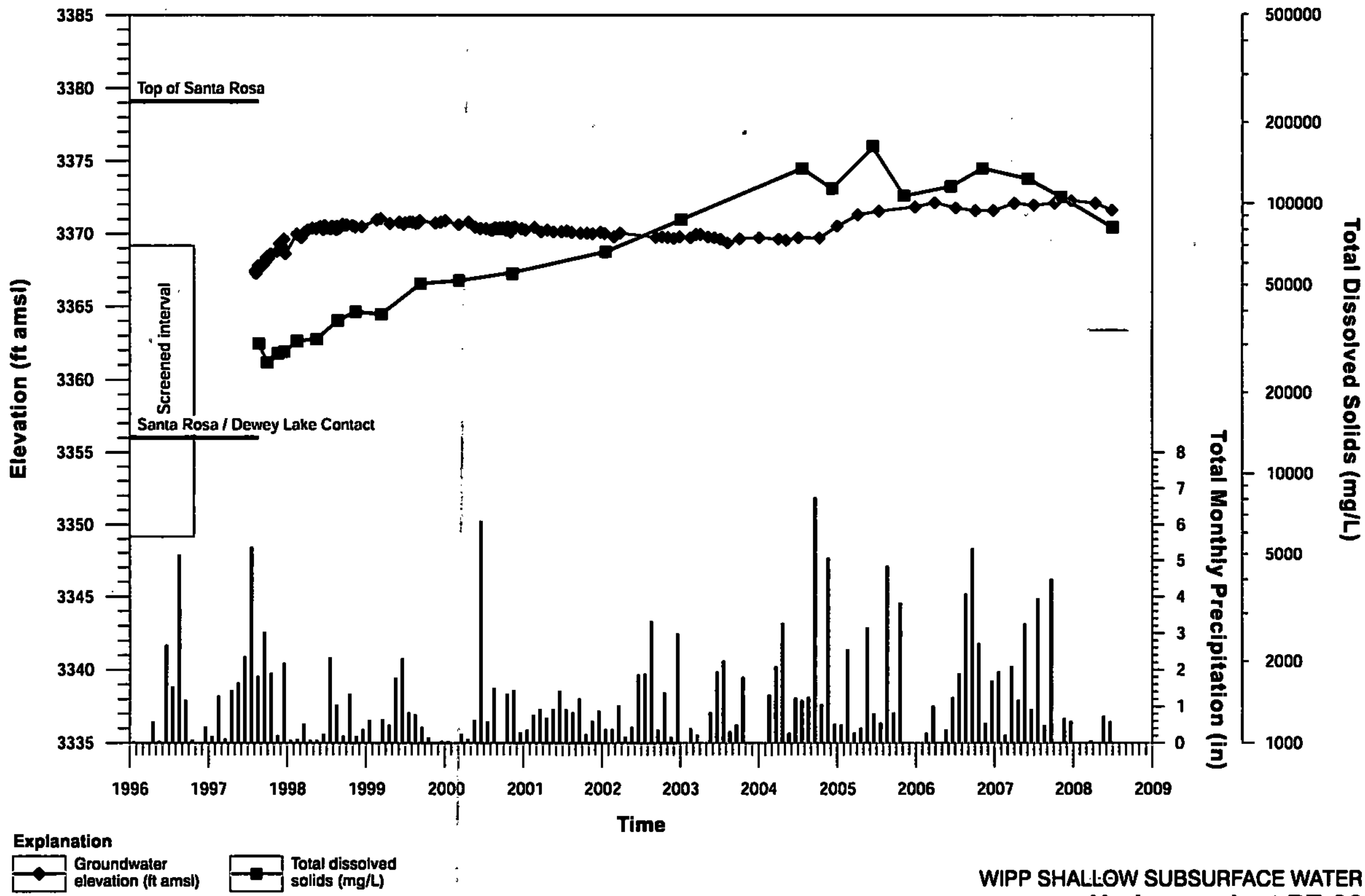

WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-06

Monthly Precipitation and Total Dissolved Solids

Daniel B. Stephens & Associates, Inc.

1-28-08

JN ES08.0072

Figure C-10

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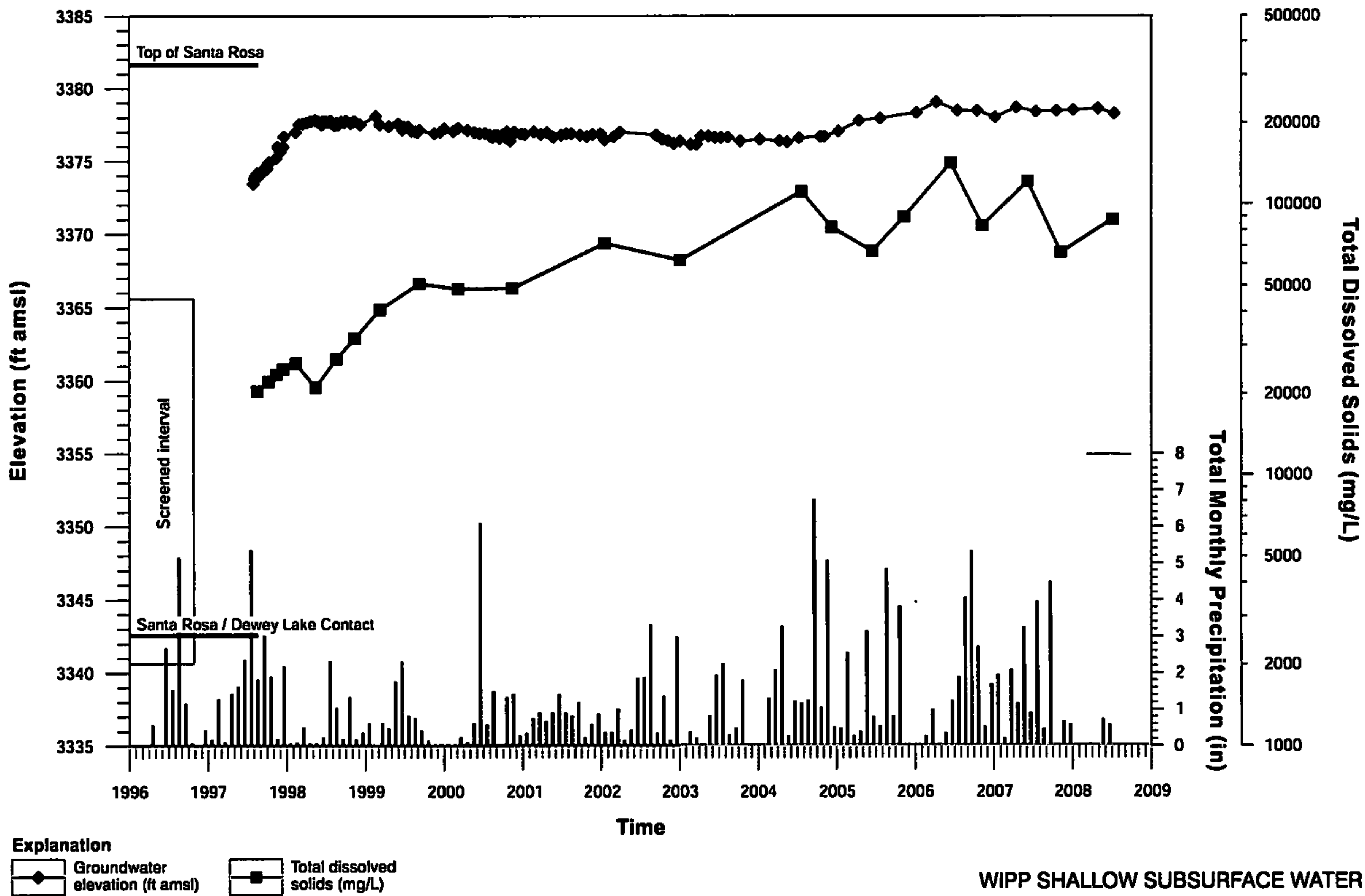

WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-07

Monthly Precipitation and Total Dissolved Solids

Figure C-11

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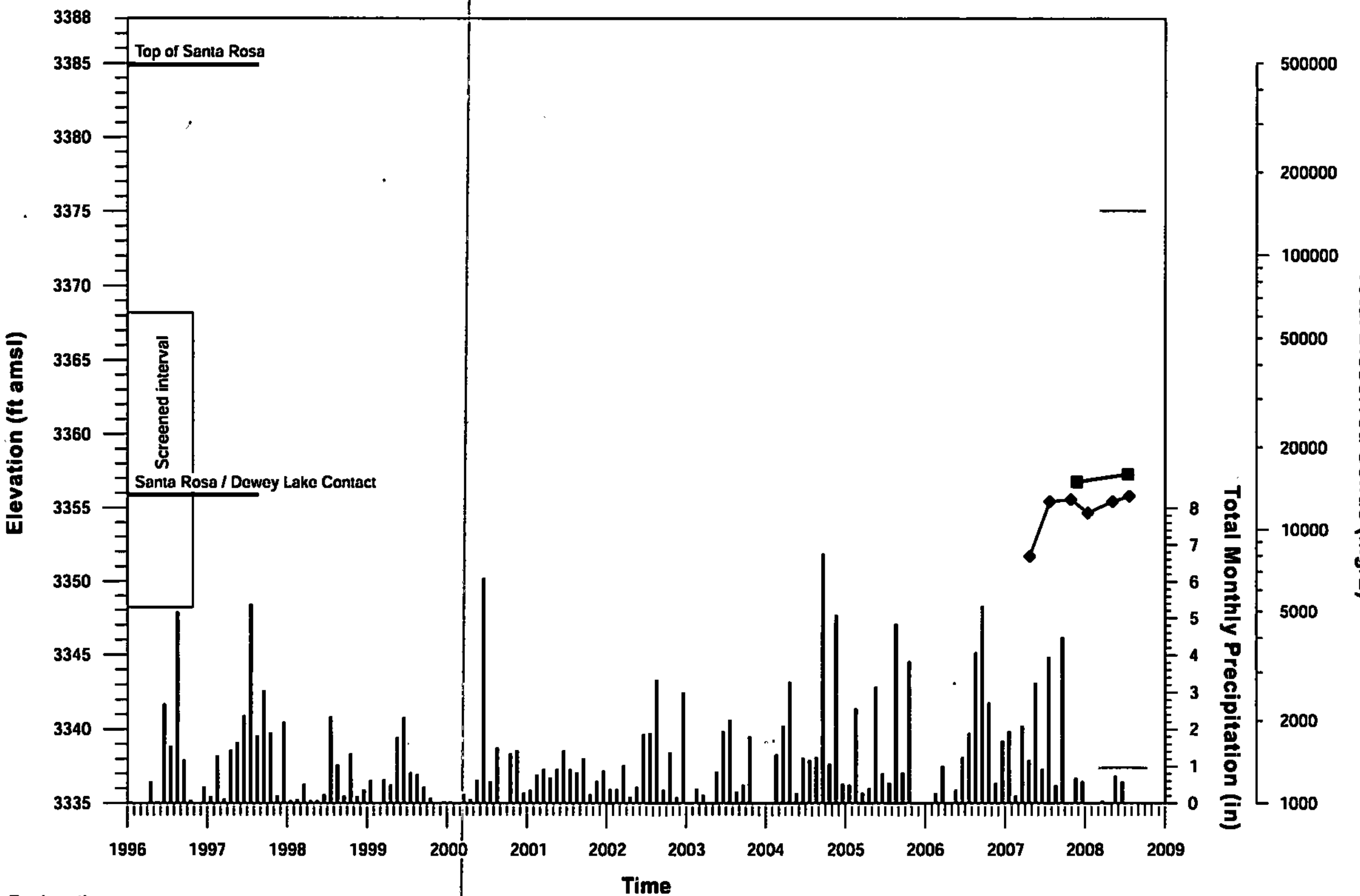
8-28-08

JN ES08.0072



WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-08

Monthly Precipitation and Total Dissolved Solids

Figure C-12

Daniel B. Stephens & Associates, Inc.

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JN ES08.0072

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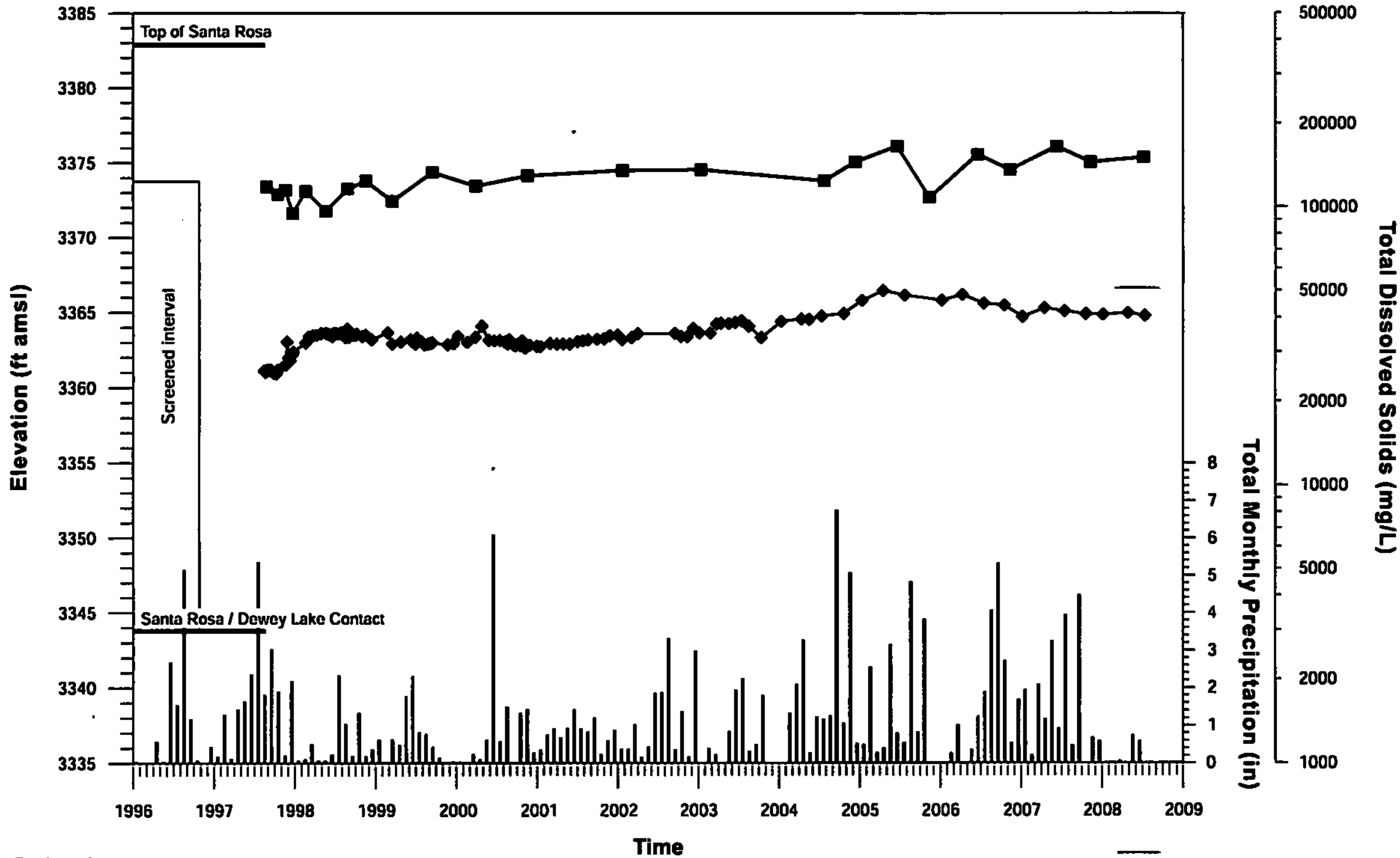


Explanation

Groundwater elevation (ft amsl)

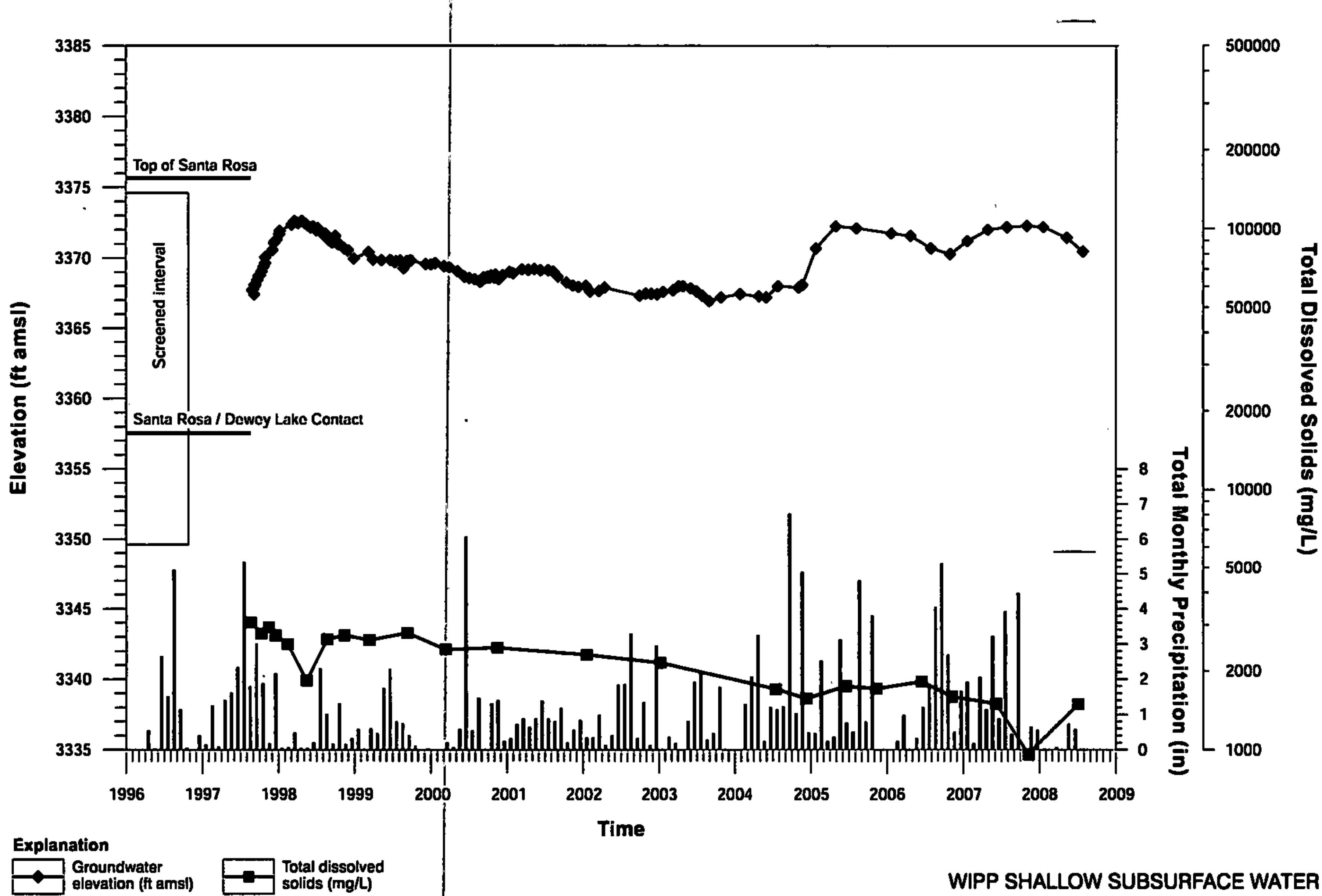
Total dissolved solids (mg/L)

WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-09
Monthly Precipitation and Total Dissolved Solids

Daniel B. Stephens & Associates, Inc.
8-28-08
JN ES08.0072

Figure C-13



WIPP SHALLOW SUBSURFACE WATER
Hydrograph at PZ-10
Monthly Precipitation and Total Dissolved Solids

Daniel B. Stephens & Associates, Inc.
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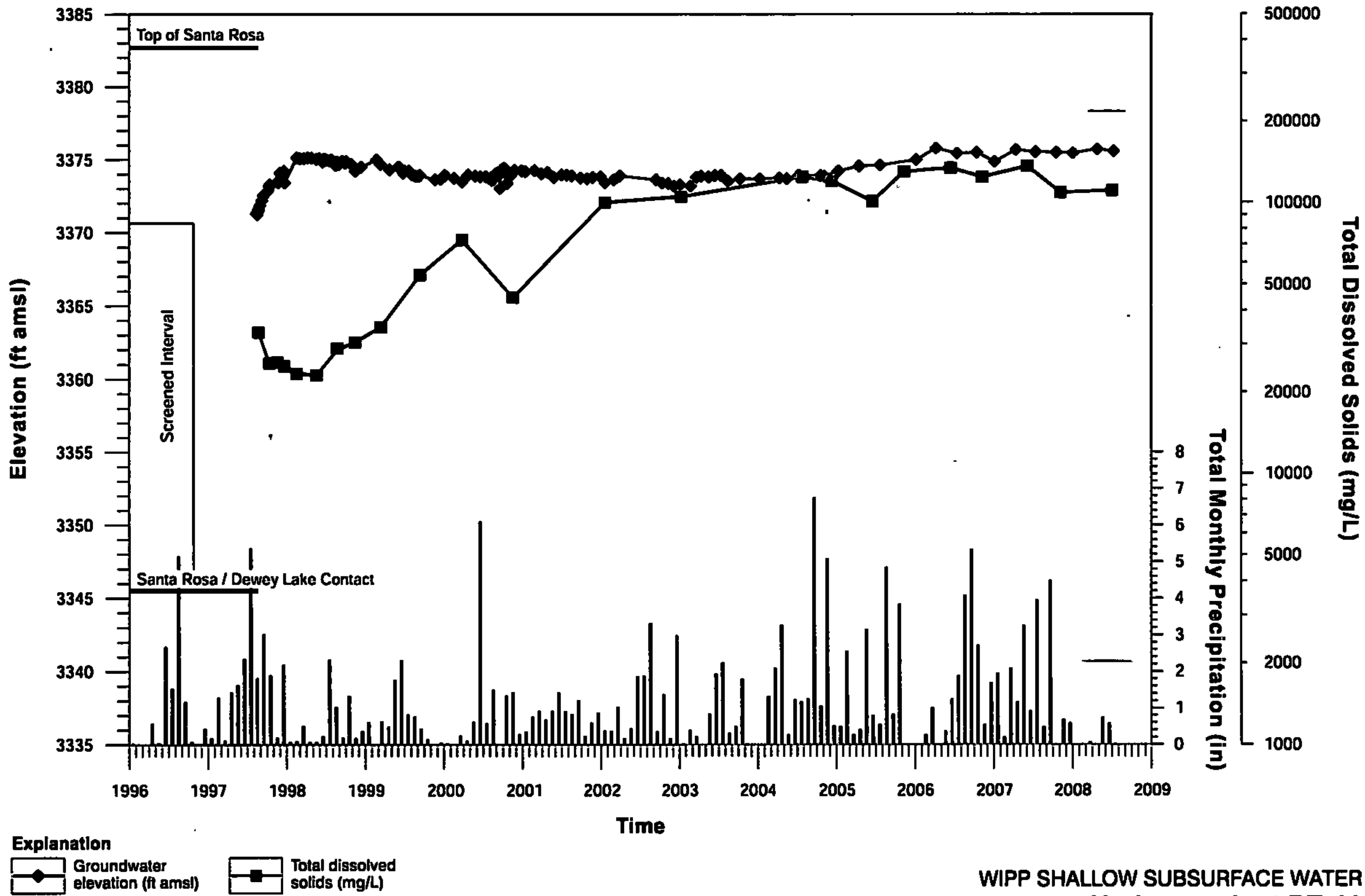
JN ES08.0072

Figure C-14



WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-11

Monthly Precipitation and Total Dissolved Solids

Figure C-15

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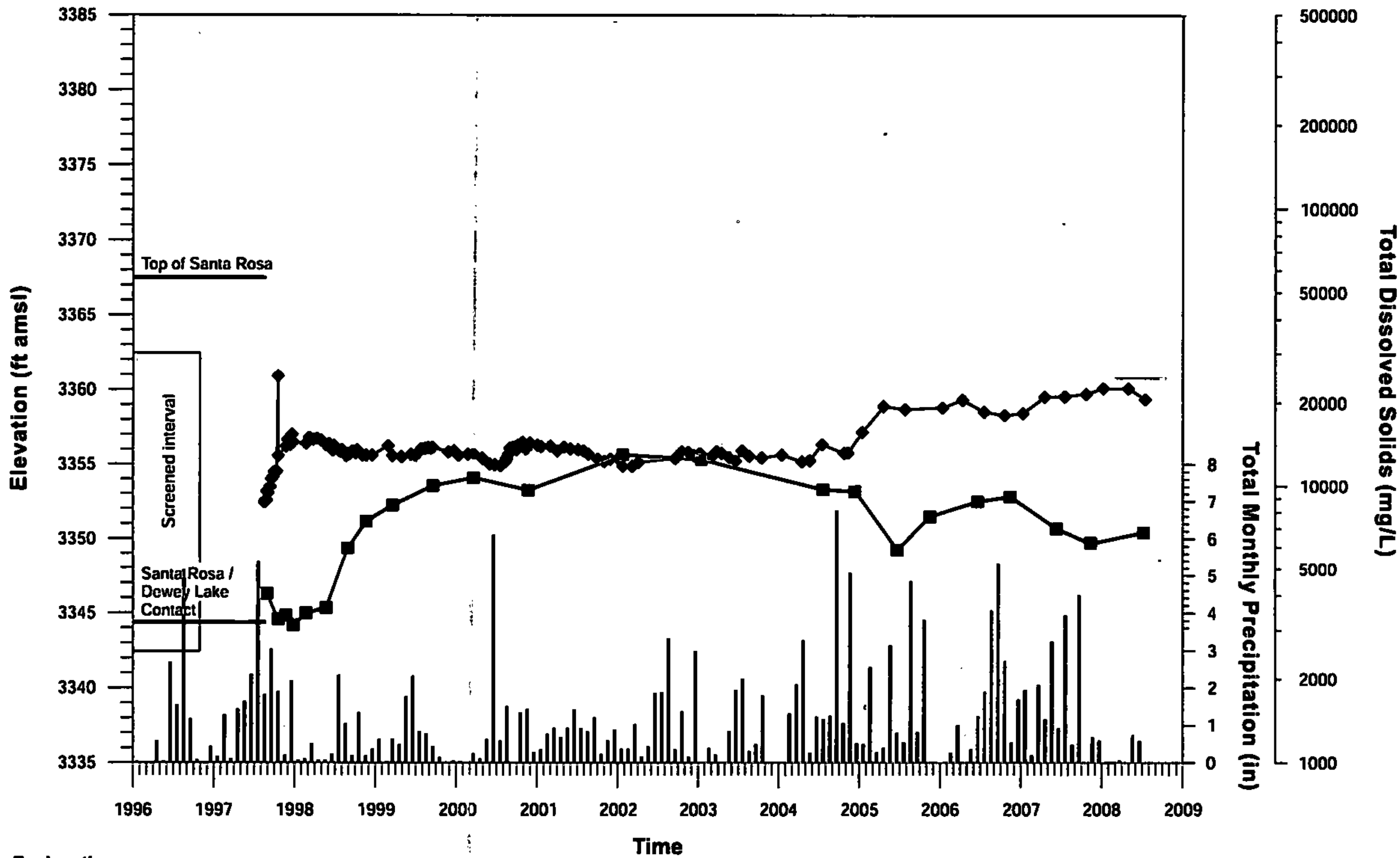

WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-12

Monthly Precipitation and Total Dissolved Solids

Daniel B. Stephens & Associates, Inc.

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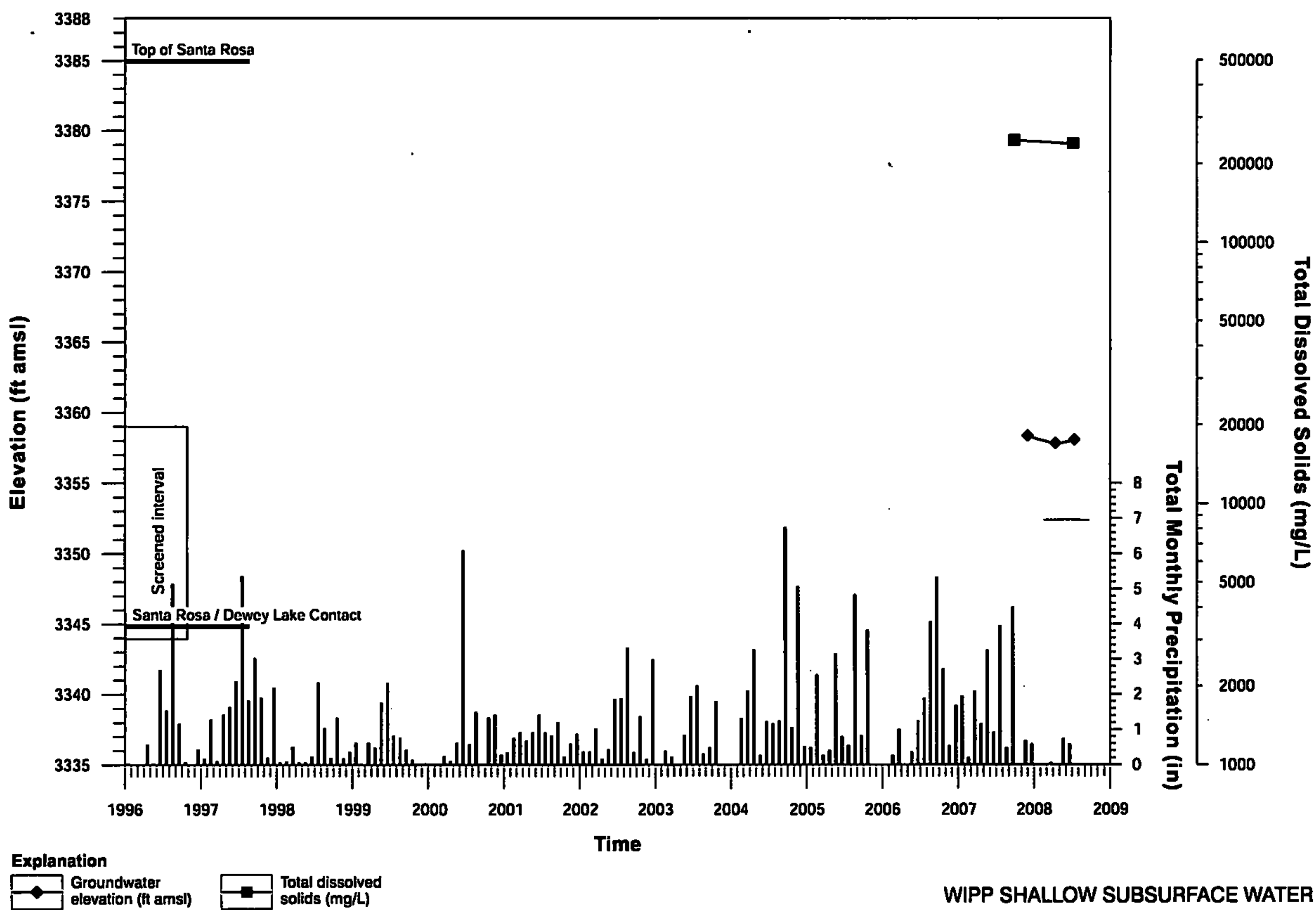
JN ES08.0072

Figure C-16

S:\PROJECTS\ES08.0072_WIPP_SSW\VR_DRAWINGS\ES08_0072_01W.CDR (PG 17)



WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-13

Monthly Precipitation and Total Dissolved Solids

Daniel B. Stephens & Associates, Inc.

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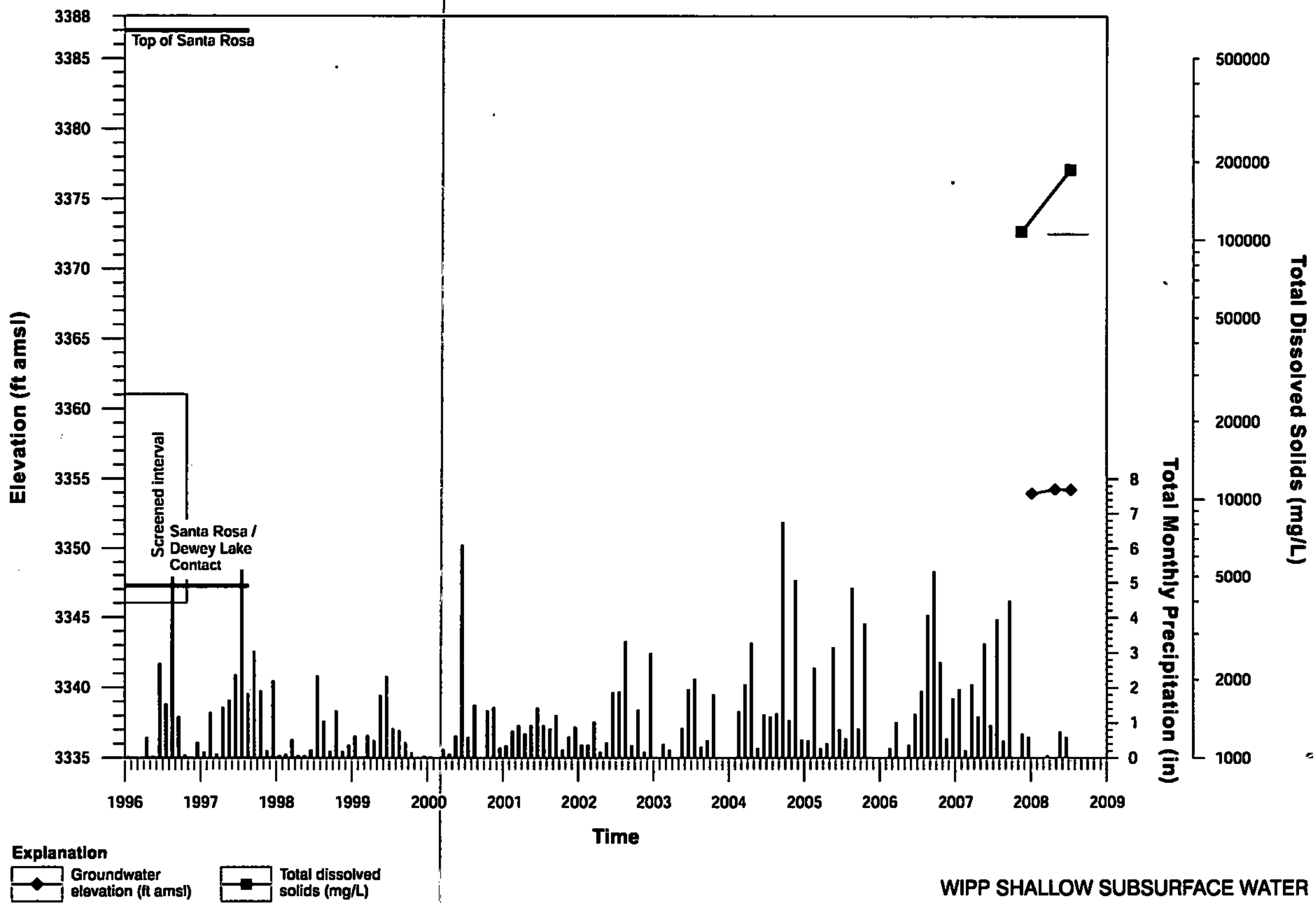
Figure C-17

S:\PROJECTS\ES08.0072_WIPP_SSW\VR_DRAWINGS\ES08_0072_01W.CDR (PG 18)



WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-14

Monthly Precipitation and Total Dissolved Solids

Figure C-18

Daniel B. Stephens & Associates, Inc.

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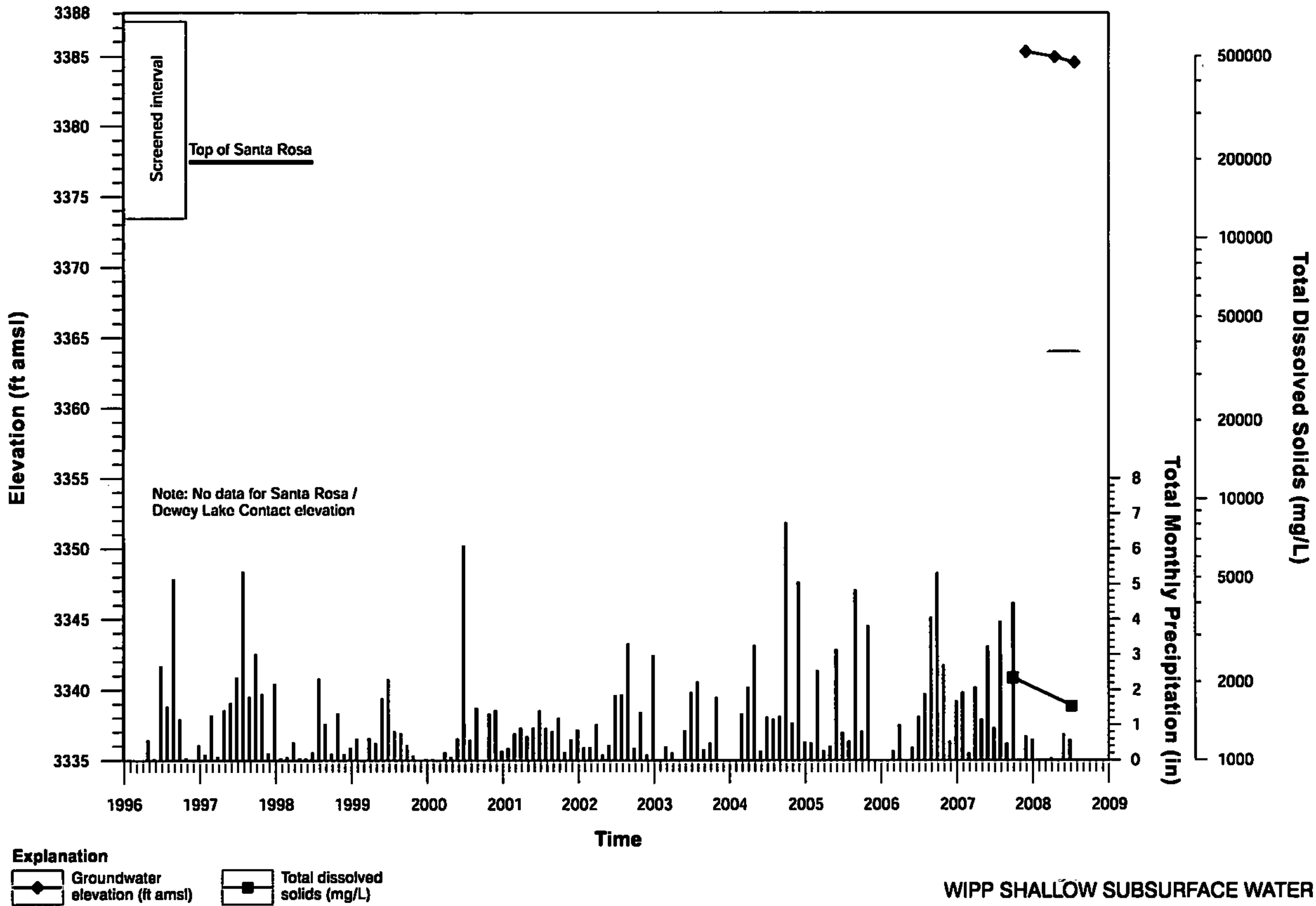


WIPP SHALLOW SUBSURFACE WATER

Hydrograph at PZ-15

Monthly Precipitation and Total Dissolved Solids

Figure C-19

Daniel B. Stephens & Associates, Inc.

8-28-08 JN ES08.0072

Calculation Sheet - Time Series Analysis

Location: Piezometer PZ-07
Time Range: 09/1997 - 06/2004 (UnLined)

Objective

Perform correlation analyses to qualitatively assess the response of water levels in wells to precipitation.

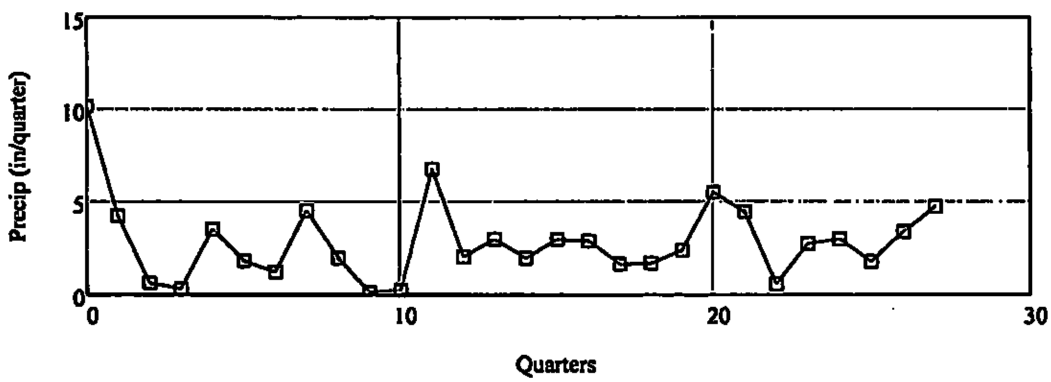
Methods

Auto-Correlation: Qualitatively shows the dependence of water-level or precipitation on time. Data series where this is no relation between measurements will show a sharply peaked graph of autocorrelation over lag (common for precipitation). Data series that are dependent to some degree on the previous measurement will have a more gradual (exponential) slope (common for water-level).

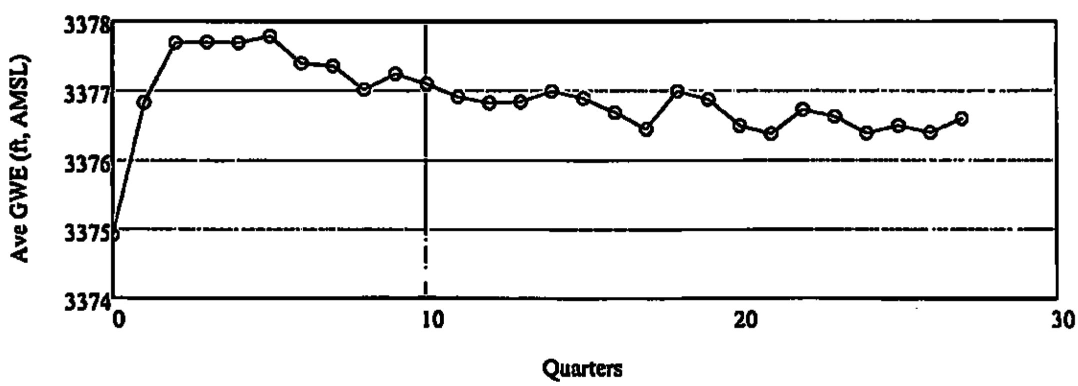
Cross-Correlation: Qualitatively shows the inter-dependence of water-level and precipitation. The lag distance from 0 to the peak is the approximate delay between precipitation and water-level response. The height of the peak qualitatively indicates the degree of "connection" between precipitation and water-level response.

Input Data

Total precipitation per quarter (in/quarter).



Quarterly average water level elevation (ft, AMSL).



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01975

Summary Statistics

Precipitation (in/quarter)

Mean: $\mu_x := \text{mean}(x)$ $\mu_x = 2.86$

Variance: $\sigma 2_x := \text{var}(x)$ $\sigma 2_x = 4.565$

Count: $N = 28$

Maximum: $\max(x) = 10.15$

Minimum: $\min(x) = 0.14$

Quarterly Average Water Elevation (ft, AMSL)

Mean: $\mu_y := \text{mean}(y)$ $\mu_y = 3376.87$

Variance: $\sigma 2_y := \text{var}(y)$ $\sigma 2_y = 0.313$

Count: $N = 28$

Maximum: $\max(y) = 3377.78$

Minimum: $\min(y) = 3374.92$

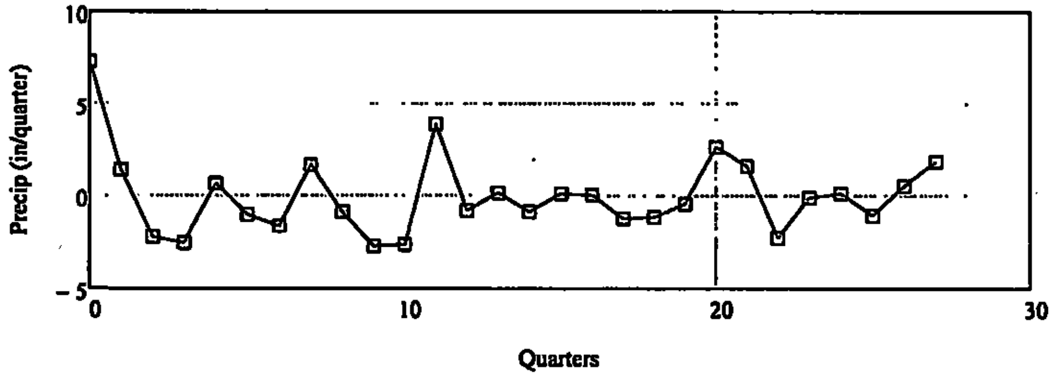
Zero-Mean Perturbation

Remove mean from data to obtain zero-mean perturbation for calculations.

Precipitation

Remove mean: $x0_i := x_i - \mu_x$

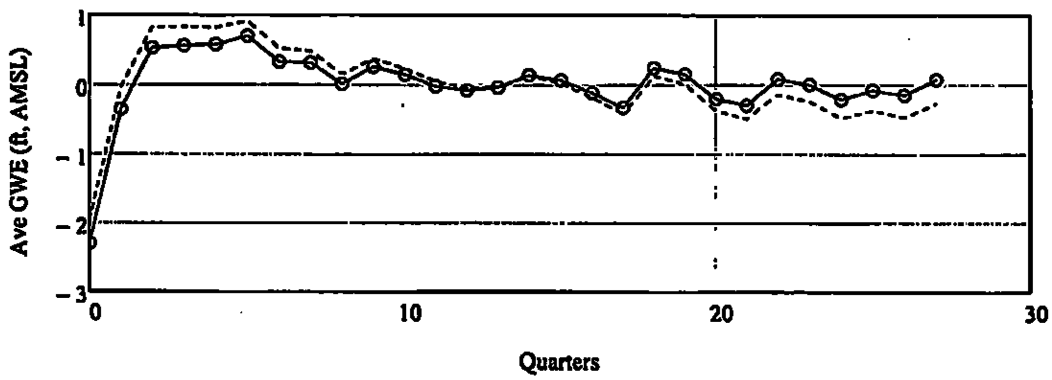
Zero-mean perturbation of total precipitation per quarter (in/quarter).



Quarterly Average Water Elevation

Remove mean: $y1_i := y_i - \mu_y$ Remove trend: $I_i := i \cdot 1$ $y0_i := y1_i - (\text{slope}(I, y1) \cdot i + \text{intercept}(I, y1))$

Zero-mean perturbation of quarterly average water level elevation (ft, AMSL).



Global Correlation Parameters

Count: $N = 28$

Maximum Lag: $MaxLag := 5$

Autocorrelation

Fast Fourier Transform Method for Discrete Covariance Estimate (Press et al., 1992)

<u>Autocorrelation of Precipitation</u>

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

$\Xi := CFFT(x0)$

Calculate the product of the transform with its complex conjugate

$j := 0 .. rows(\Xi) - 1 \qquad Z_j := \Xi_j \cdot \overline{\Xi_j}$

The inverse gives the Autocovariance. Correlation = covariance / variance

$Corr := ICFFT(Z) \qquad r := 0 .. MaxLag \qquad Rx_{est_r} := Corr_r$

<u>Autocorrelation of Average Quarterly Water Level</u>

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

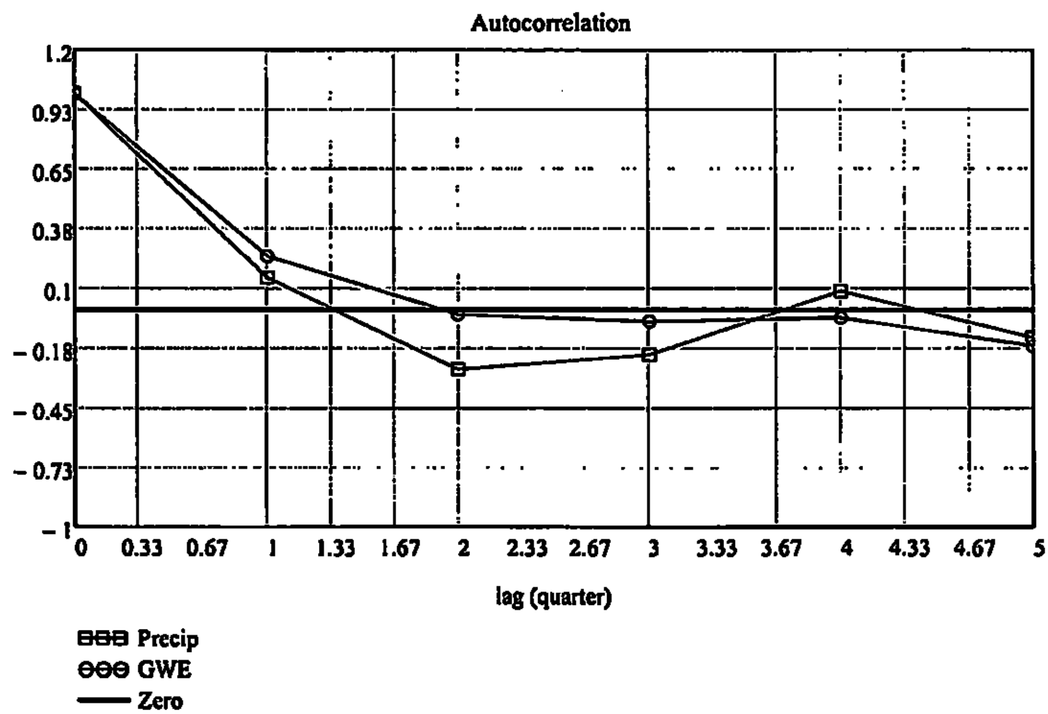
$\Psi := CFFT(y0)$

Calculate the product of the transform with its complex conjugate

$j := 0 .. rows(\Psi) - 1 \qquad Z_j := \Psi_j \cdot \overline{\Psi_j}$

The inverse gives the Autocovariance

$Corr := ICFFT(Z) \qquad MaxLag = 5 \qquad r := 0 .. MaxLag \qquad Ry_{est_r} := Corr_r$



 PZ07_UnLined_edit1.xmcd

Cross-Correlation

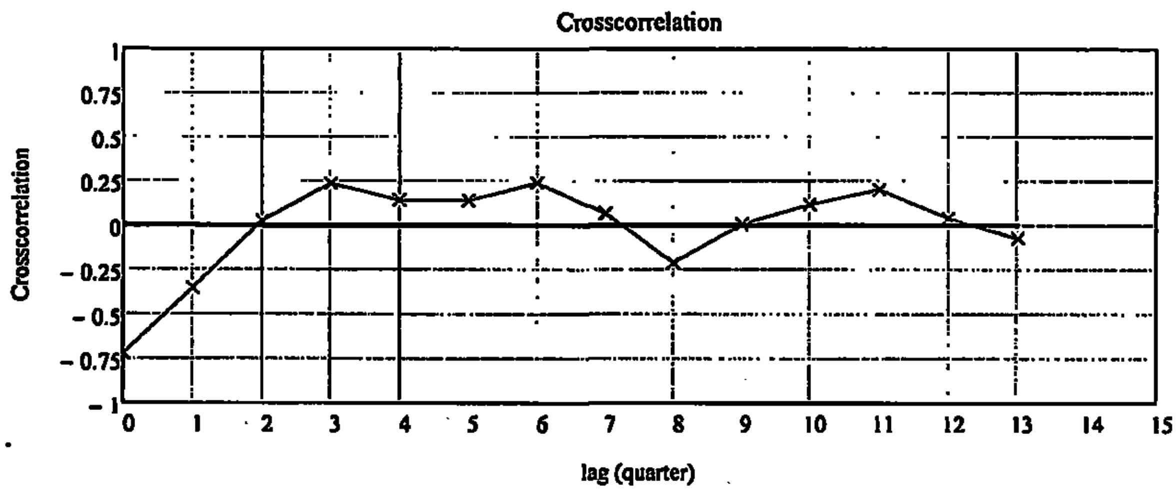
Use Complex Fast Fourier Transforms from above. Calculate the product of the x transform with the complex conjugate of the y transform (x leads y)

$j := 0 .. \mathrm{rows}(\Xi) - 1 \qquad Z_j := \Psi_j \cdot \overline{\Xi_j}$

The inverse gives the Cross-covariance (Not necessarily symmetrical so index r must be adjusted to show negative lags. CrossCorr array contains positive lag results from 0 to N/2 and negative lag results from N to N/2 [in reverse]. CrossCorr results are then mapped into the Rxy array from 0 to N-1)

$\mathrm{CrossCorr} := \mathrm{ICFFT}(Z) \qquad r := 0 .. \frac{N}{2} - 1 \qquad Rxy_{est_r} := \mathrm{CrossCorr}_{\frac{N}{2}+r}$

$r := \frac{N}{2} .. N - 1 \qquad Rxy_{est_r} := \mathrm{CrossCorr}_{r-\frac{N}{2}}$



References

Press, W. H., S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, Numerical Recipes in C, 2n edition (revised 1995), Cambridge Univ. Press, New York, N. Y., 1992

DATA :=

	0	1
0	$3.375 \cdot 10^3$	10.15
1	$3.377 \cdot 10^3$	4.22
2	$3.378 \cdot 10^3$	0.62
3	$3.378 \cdot 10^3$	0.31
4	$3.378 \cdot 10^3$	3.5
5	$3.378 \cdot 10^3$	1.82
6	$3.377 \cdot 10^3$	1.21
7	$3.377 \cdot 10^3$	4.51
8	$3.377 \cdot 10^3$	1.97
9	$3.377 \cdot 10^3$	0.14
10	$3.377 \cdot 10^3$	0.23
11	$3.377 \cdot 10^3$	6.75
12	$3.377 \cdot 10^3$	2.04
13	$3.377 \cdot 10^3$	2.99
14	$3.377 \cdot 10^3$	1.97
15	$3.377 \cdot 10^3$	...

$N := \text{rows}(DATA)$ $\quad N = 28 \quad i := 0..\text{rows}(DATA) - 1$

$x_i := DATA_{i,1}$ $\quad y_i := DATA_{i,0}$

$f(X) := X \cdot 0$

Calculation Sheet - Time Series Analysis

Location: Piezometer PZ-07
Time Range: 06/2005 - 03/2008 (Lined)

Objective

Perform correlation analyses to qualitatively assess the response of water levels in wells to precipitation.

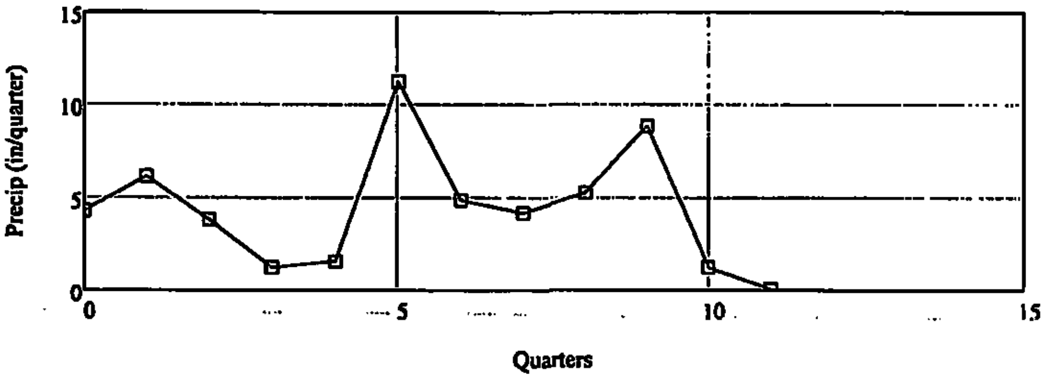
Methods

Auto-Correlation: Qualitatively shows the dependence of water-level or precipitation on time. Data series where this is no relation between measurements will show a sharply peaked graph of autocorrelation over lag (common for precipitation). Data series that are dependent to some degree on the previous measurement will have a more gradual (exponential) slope (common for water-level).

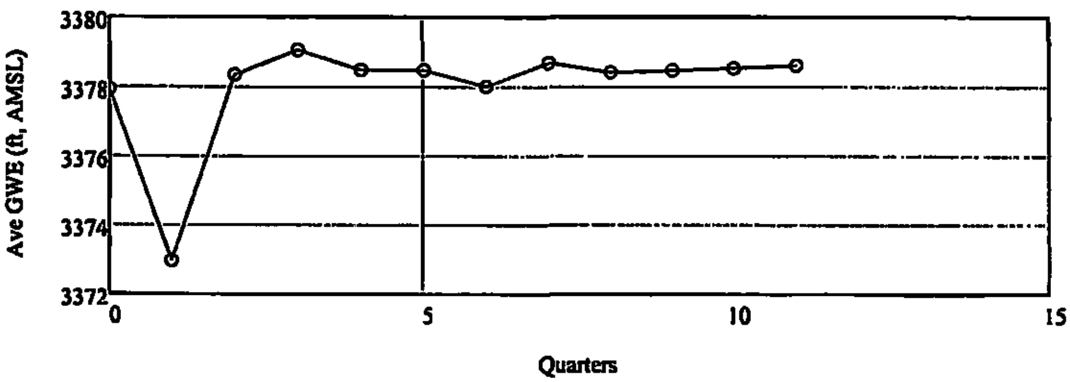
Cross-Correlation: Qualitatively shows the inter-dependence of water-level and precipitation. The lag distance from 0 to the peak is the approximate delay between precipitation and water-level response. The height of the peak qualitatively indicates the degree of "connection" between precipitation and water-level response.

Input Data

Total precipitation per quarter (in/quarter).



Quarterly average water level elevation (ft, AMSL).



Summary Statistics

<u>Precipitation</u> (in/quarter)

Mean: $\mu_x := \text{mean}(x)$ $\mu_x = 4.399$

Variance: $\sigma 2_x := \text{var}(x)$ $\sigma 2_x = 9.815$

Count: $N = 12$

Maximum: $\max(x) = 11.23$

Minimum: $\min(x) = 0.07$

<u>Quarterly Average Water Elevation</u> (ft, AMSL)

Mean: $\mu_y := \text{mean}(y)$ $\mu_y = 3378$

Variance: $\sigma 2_y := \text{var}(y)$ $\sigma 2_y = 2.384$

Count: $N = 12$

Maximum: $\max(y) = 3379.06$

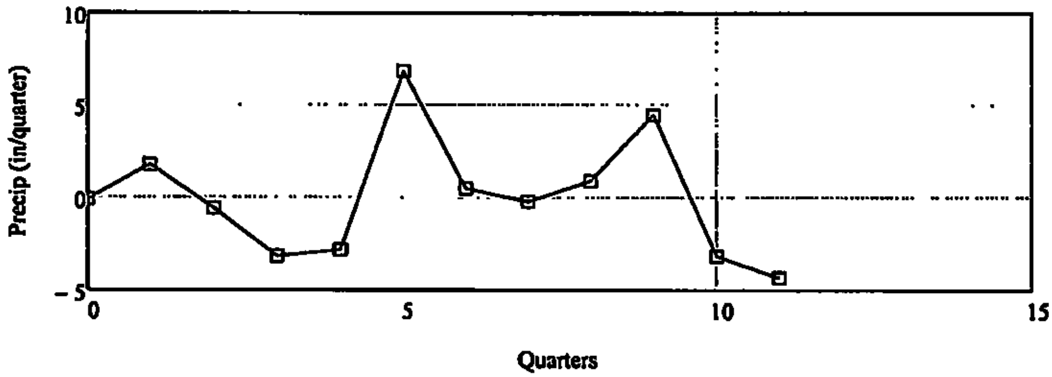
Minimum: $\min(y) = 3372.97$

Zero-Mean Perturbation
Remove mean from data to obtain zero-mean perturbation for calculations.

<u>Precipitation</u>

Remove mean: $x0_i := x_i - \mu_x$

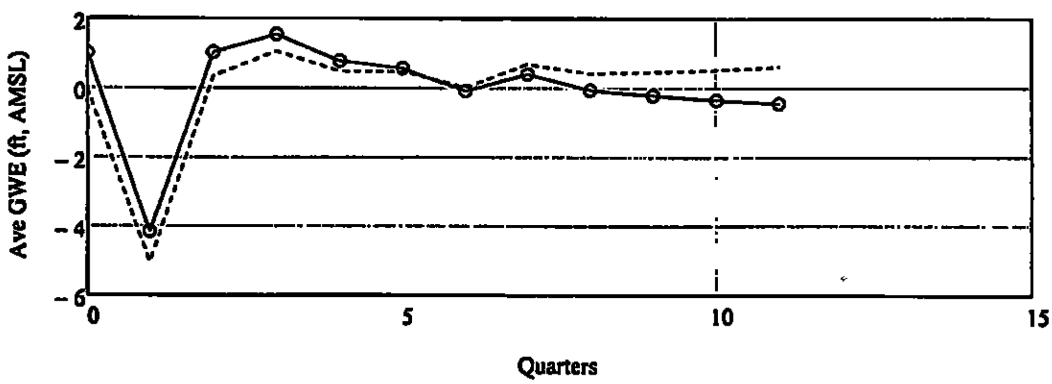
Zero-mean perturbation of total precipitation per quarter (in/quarter).



<u>Quarterly Average Water Elevation</u>

Remove mean: $y1_i := y_i - \mu_y$ Remove trend: $I_i := i \cdot 1$ $y0_i := y1_i - (\text{slope}(I, y1) \cdot i + \text{intercept}(I, y1))$

Zero-mean perturbation of quarterly average water level elevation (ft, AMSL).



Global Correlation Parameters

Count: $N = 12$

Maximum Lag: $MaxLag := 5$

Autocorrelation

Fast Fourier Transform Method for Discrete Covariance Estimate (Press et al., 1992)

Autocorrelation of Precipitation

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

$\Xi := CFFT(x0)$

Calculate the product of the transform with its complex conjugate

$j := 0 .. rows(\Xi) - 1$ $\quad Z_j := \Xi_j \cdot \overline{\Xi_j}$

The inverse gives the Autocovariance. Correlation = covariance / variance

$Corr := ICFFT(Z)$ $\quad r := 0 .. MaxLag$ $\quad Rx_{est_r} := Corr_r$

Autocorrelation of Average Quarterly Water Level

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

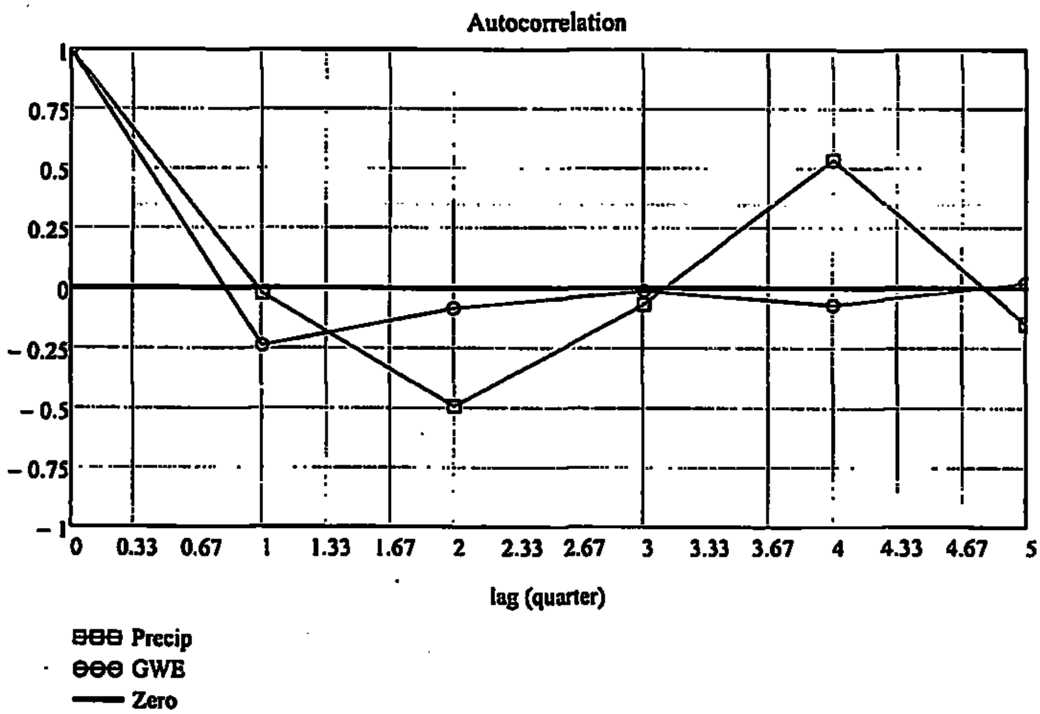
$\Psi := CFFT(y0)$

Calculate the product of the transform with its complex conjugate

$j := 0 .. rows(\Psi) - 1$ $\quad Z_j := \Psi_j \cdot \overline{\Psi_j}$

The inverse gives the Autocovariance

$Corr := ICFFT(Z)$ $\quad MaxLag = 5$ $\quad r := 0 .. MaxLag$ $\quad Ry_{est_r} := Corr_r$



 PZ07_Lined_edit1.xmcd

Cross-Correlation

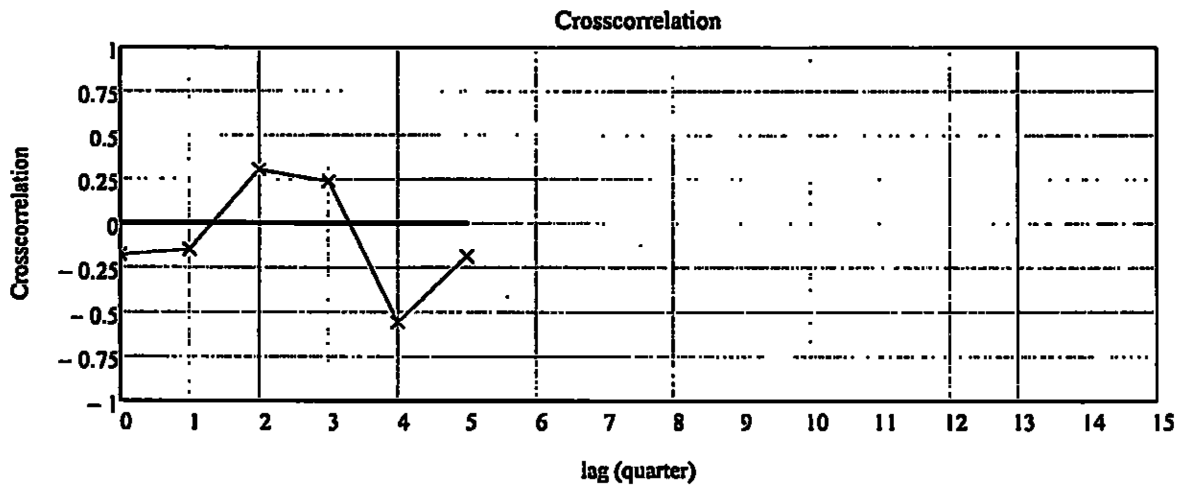
Use Complex Fast Fourier Transforms from above. Calculate the product of the x transform with the complex conjugate of the y transform (x leads y)

$j := 0 .. \mathrm{rows}(\Xi) - 1$ $\qquad Z_j := \Psi_j \cdot \overline{\Xi_j}$

The inverse gives the Cross-covariance (Not necessarily symmetrical so index r must be adjusted to show negative lags. CrossCorr array contains positive lag results from 0 to N/2 and negative lag results from N to N/2 [in reverse]. CrossCorr results are then mapped into the Rxy array from 0 to N-1)

$\mathrm{CrossCorr} := \mathrm{ICFFT}(Z)$ $\qquad r := 0 .. \frac{N}{2} - 1$ $\qquad Rxy_{est_r} := \mathrm{CrossCorr}_{\frac{N}{2}+r}$

$r := \frac{N}{2} .. N - 1$ $\qquad Rxy_{est_r} := \mathrm{CrossCorr}_{r-\frac{N}{2}}$



References

Press, W. H., S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, Numerical Recipes in C, 2n edition (revised 1995), Cambridge Univ. Press, New York, N. Y., 1992

DATA :=

	0	1
0	$3.378 \cdot 10^3$	4.29
1	$3.373 \cdot 10^3$	6.15
2	$3.378 \cdot 10^3$	3.81
3	$3.379 \cdot 10^3$	1.24
4	$3.378 \cdot 10^3$	1.56
5	$3.378 \cdot 10^3$	11.23
6	$3.378 \cdot 10^3$	4.888
7	$3.379 \cdot 10^3$	4.19
8	$3.378 \cdot 10^3$	5.28
9	$3.378 \cdot 10^3$	8.85
10	$3.379 \cdot 10^3$	1.23
11	$3.379 \cdot 10^3$	0.07

$N := \mathrm{rows}(DATA)$ $\qquad N = 12 \qquad i := 0..\mathrm{rows}(DATA) - 1$

$x_i := DATA_{i,1} \qquad y_i := DATA_{i,0}$

$f(X) := X \cdot 0$

Calculation Sheet - Time Series Analysis

Location: Piezometer PZ-09
Time Range: 09/1997 - 06/2004 (UnLined)

Objective

Perform correlation analyses to qualitatively assess the response of water levels in wells to precipitation.

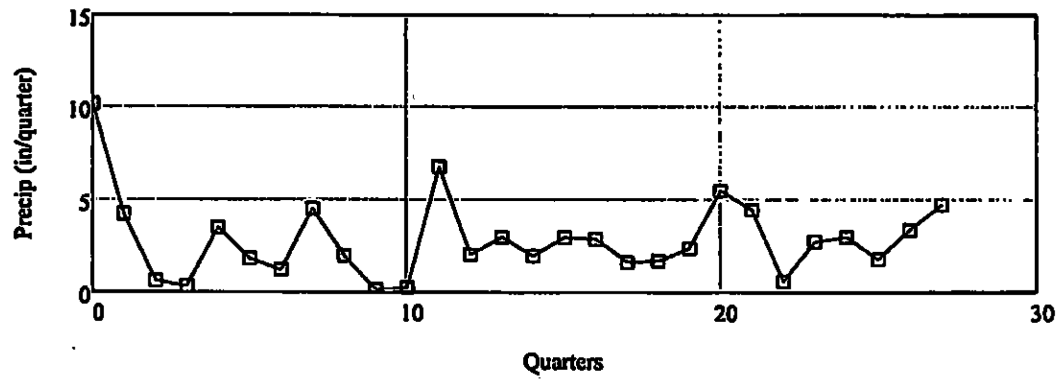
Methods

Auto-Correlation: Qualitatively shows the dependence of water-level or precipitation on time. Data series where this is no relation between measurements will show a sharply peaked graph of autocorrelation over lag (common for precipitation). Data series that are dependent to some degree on the previous measurement will have a more gradual (exponential) slope (common for water-level).

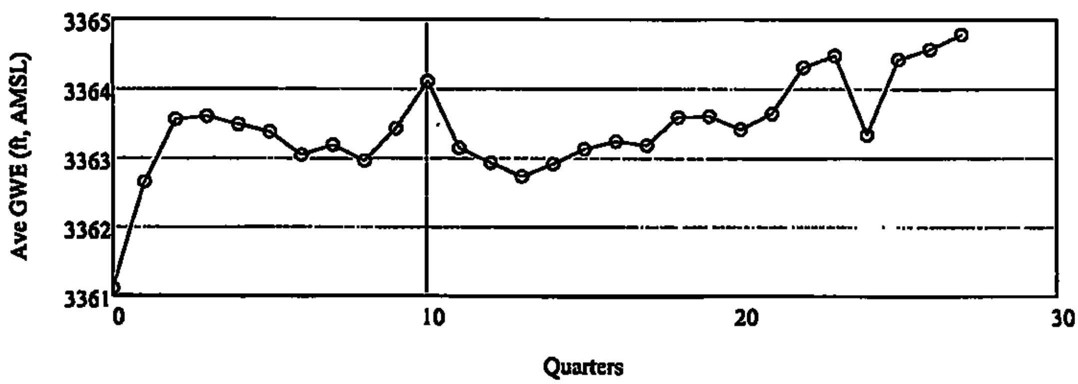
Cross-Correlation: Qualitatively shows the inter-dependence of water-level and precipitation. The lag distance from 0 to the peak is the approximate delay between precipitation and water-level response. The height of the peak qualitatively indicates the degree of "connection" between precipitation and water-level response.

Input Data

Total precipitation per quarter (in/quarter).



Quarterly average water level elevation (ft, AMSL).



Summary Statistics

Precipitation (in/quarter)

Mean: $\mu_x := \text{mean}(x)$ $\mu_x = 2.86$

Variance: $\sigma2_x := \text{var}(x)$ $\sigma2_x = 4.565$

Count: $N = 28$

Maximum: $\max(x) = 10.15$

Minimum: $\min(x) = 0.14$

Quarterly Average Water Elevation (ft, AMSL)

Mean: $\mu_y := \text{mean}(y)$ $\mu_y = 3363.43$

Variance: $\sigma2_y := \text{var}(y)$ $\sigma2_y = 0.509$

Count: $N = 28$

Maximum: $\max(y) = 3364.78$

Minimum: $\min(y) = 3361.11$

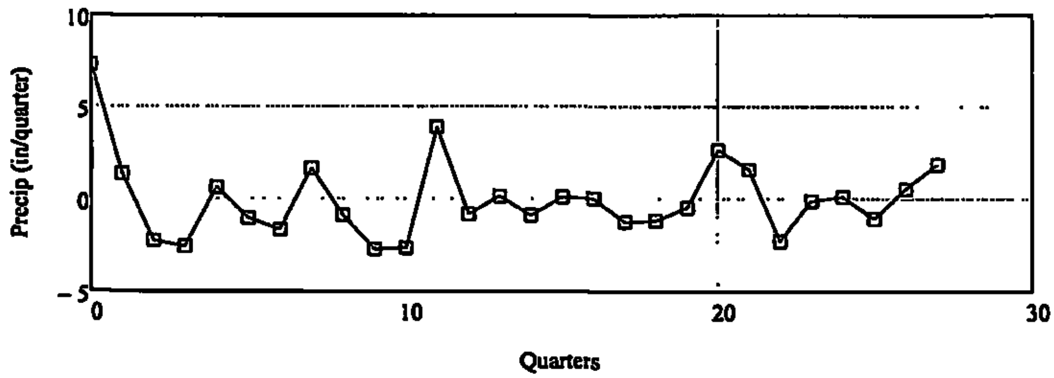
Zero-Mean Perturbation

Remove mean from data to obtain zero-mean perturbation for calculations.

Precipitation

Remove mean: $x0_i := x_i - \mu_x$

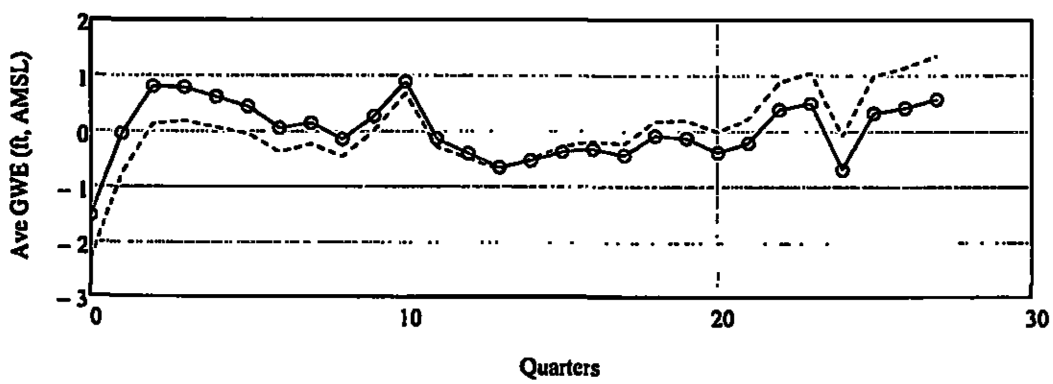
Zero-mean perturbation of total precipitation per quarter (in/quarter).



Quarterly Average Water Elevation

Remove mean: $y1_i := y_i - \mu_y$ Remove trend: $I_i := i \cdot 1$ $y0_i := y1_i - (\text{slope}(I, y1) \cdot i + \text{intercept}(I, y1))$

Zero-mean perturbation of quarterly average water level elevation (ft, AMSL).



Global Correlation Parameters

Count: $N = 28$

Maximum Lag: $MaxLag := 5$

Autocorrelation

Fast Fourier Transform Method for Discrete Covariance Estimate (Press et al., 1992)

Autocorrelation of Precipitation

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

$\Xi := CFFT(x0)$

Calculate the product of the transform with its complex conjugate

$j := 0 .. rows(\Xi) - 1 \qquad Z_j := \Xi_j \cdot \overline{\Xi_j}$

The inverse gives the Autocovariance. Correlation = covariance / variance

$Corr := ICFFT(Z) \qquad r := 0 .. MaxLag \qquad Rx_{est_r} := Corr_r$

Autocorrelation of Average Quarterly Water Level

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

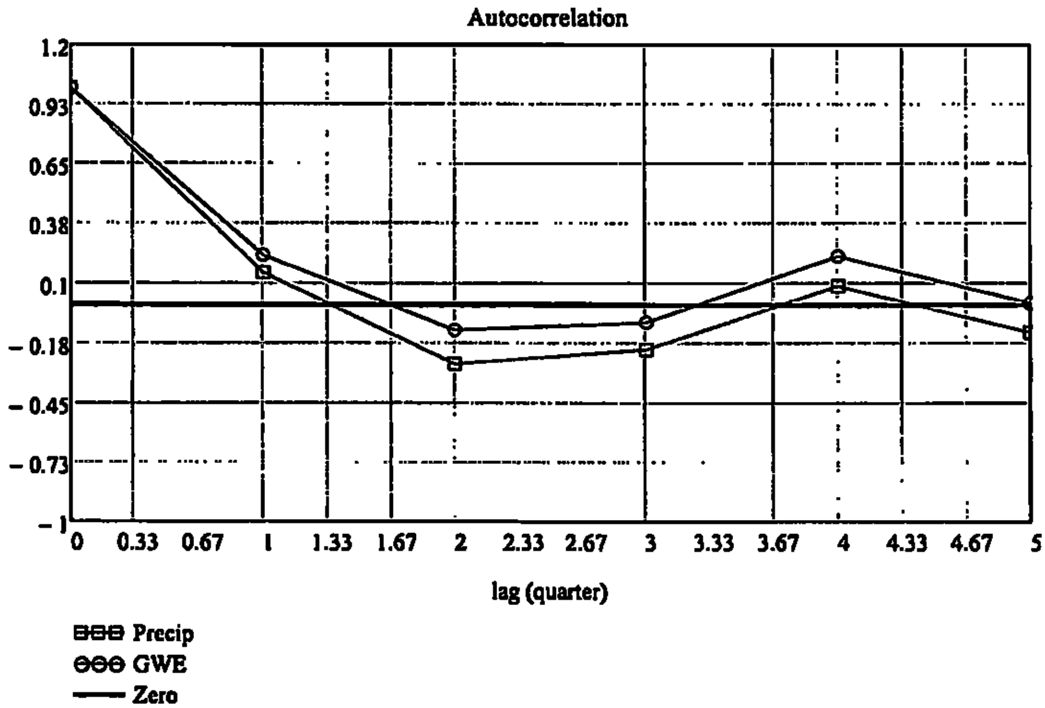
$\Psi := CFFT(y0)$

Calculate the product of the transform with its complex conjugate

$j := 0 .. rows(\Psi) - 1 \qquad Z_j := \Psi_j \cdot \overline{\Psi_j}$

The inverse gives the Autocovariance

$Corr := ICFFT(Z) \qquad MaxLag = 5 \qquad r := 0 .. MaxLag \qquad Ry_{est_r} := Corr_r$



Cross-Correlation

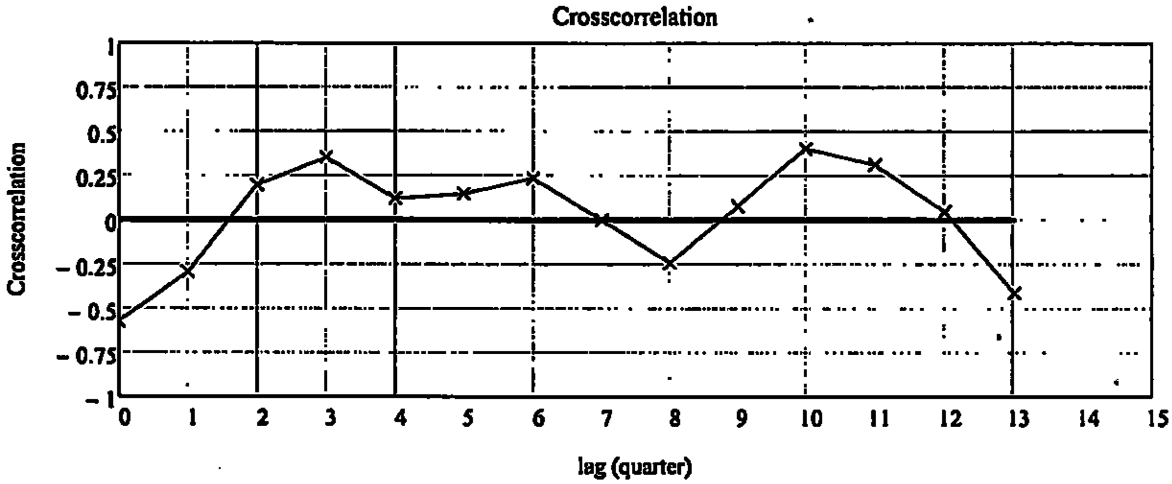
Use Complex Fast Fourier Transforms from above. Calculate the product of the x transform with the complex conjugate of the y transform (x leads y)

$j := 0..\text{rows}(\Xi) - 1 \qquad Z_j := \Psi_j \cdot \overline{\Xi_j}$

The inverse gives the Cross-covariance (Not necessarily symmetrical so index r must be adjusted to show negative lags. CrossCorr array contains positive lag results from 0 to N/2 and negative lag results from N to N/2 [in reverse]. CrossCorr results are then mapped into the Rxy array from 0 to N-1)

$\text{CrossCorr} := \text{ICFFT}(Z) \qquad r := 0..\frac{N}{2} - 1 \qquad Rxy_{est_r} := \text{CrossCorr}_{\frac{N}{2}+r}$

$r := \frac{N}{2}..N - 1 \qquad Rxy_{est_r} := \text{CrossCorr}_{r-\frac{N}{2}}$



References

Press, W. H., S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, Numerical Recipes in C, 2n edition (revised 1995), Cambridge Univ. Press, New York, N. Y., 1992

DATA :=

	0	1
0	$3.361\cdot10^3$	10.15
1	$3.363\cdot10^3$	4.22
2	$3.364\cdot10^3$	0.62
3	$3.364\cdot10^3$	0.31
4	$3.363\cdot10^3$	3.5
5	$3.363\cdot10^3$	1.82
6	$3.363\cdot10^3$	1.21
7	$3.363\cdot10^3$	4.51
8	$3.363\cdot10^3$	1.97
9	$3.363\cdot10^3$	0.14
10	$3.364\cdot10^3$	0.23
11	$3.363\cdot10^3$	6.75
12	$3.363\cdot10^3$	2.04
13	$3.363\cdot10^3$	2.99
14	$3.363\cdot10^3$	1.97
15	$3.363\cdot10^3$	...

$N := \mathrm{rows}(DATA)$ $\quad N = 28 \quad i := 0..\mathrm{rows}(DATA) - 1$

$x_i := DATA_{i,1}$ $\quad y_i := DATA_{i,0}$

$f(X) := X\cdot 0$

Calculation Sheet - Time Series Analysis

Location: Piezometer PZ-09
Time Range: 06/2005 - 03/2008 (Lined)

Objective

Perform correlation analyses to qualitatively assess the response of water levels in wells to precipitation.

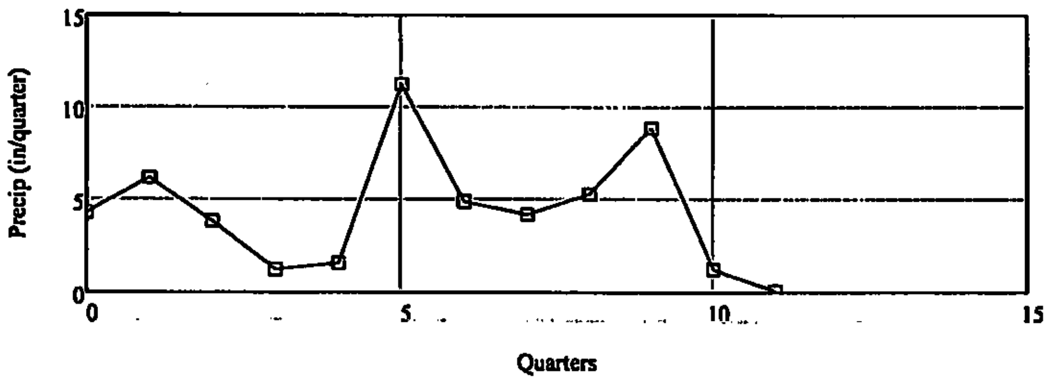
Methods

Auto-Correlation: Qualitatively shows the dependence of water-level or precipitation on time. Data series where this is no relation between measurements will show a sharply peaked graph of autocorrelation over lag (common for precipitation). Data series that are dependent to some degree on the previous measurement will have a more gradual (exponential) slope (common for water-level).

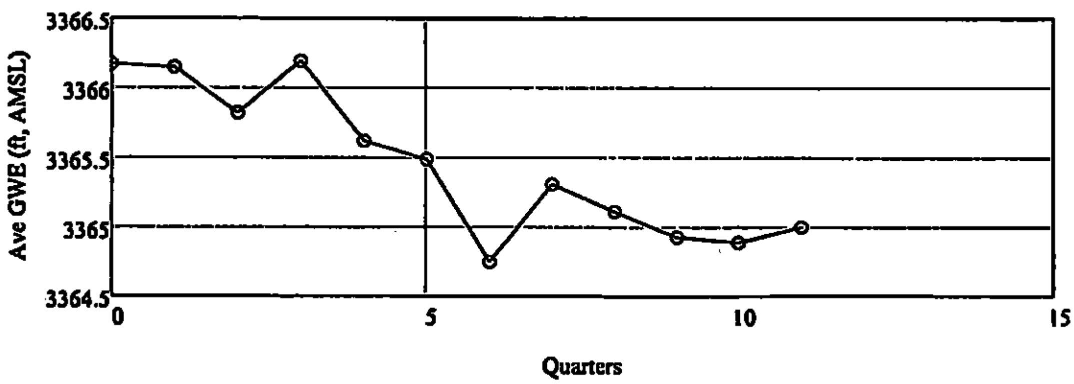
Cross-Correlation: Qualitatively shows the inter-dependence of water-level and precipitation. The lag distance from 0 to the peak is the approximate delay between precipitation and water-level response. The height of the peak qualitatively indicates the degree of "connection" between precipitation and water-level response.

Input Data

Total precipitation per quarter (in/quarter).



Quarterly average water level elevation (ft, AMSL).



Summary Statistics

<u>Precipitation</u> (in/quarter)

Mean: $\mu_x := \text{mean}(x)$ $\mu_x = 4.399$

Variance: $\sigma2_x := \text{var}(x)$ $\sigma2_x = 9.815$

Count: $N = 12$

Maximum: $\max(x) = 11.23$

Minimum: $\min(x) = 0.07$

<u>Quarterly Average Water Elevation</u> (ft, AMSL)

Mean: $\mu_y := \text{mean}(y)$ $\mu_y = 3365.45$

Variance: $\sigma2_y := \text{var}(y)$ $\sigma2_y = 0.261$

Count: $N = 12$

Maximum: $\max(y) = 3366.19$

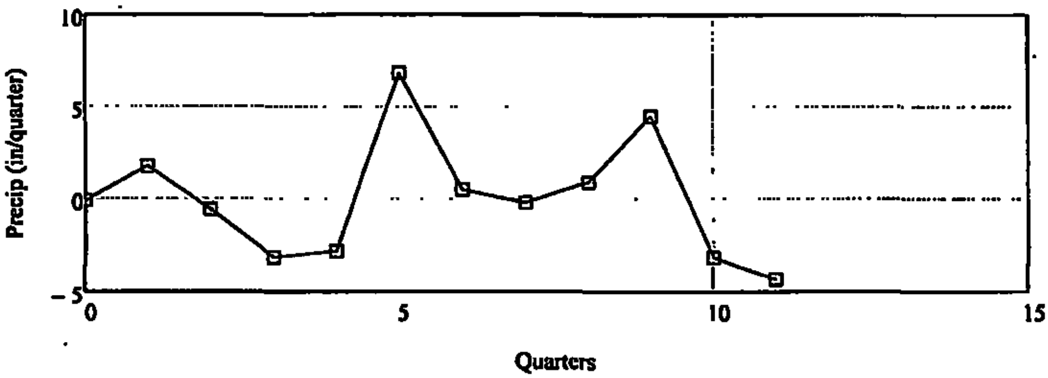
Minimum: $\min(y) = 3364.75$

Zero-Mean Perturbation
Remove mean from data to obtain zero-mean perturbation for calculations.

<u>Precipitation</u>

Remove mean: $x0_i := x_i - \mu_x$

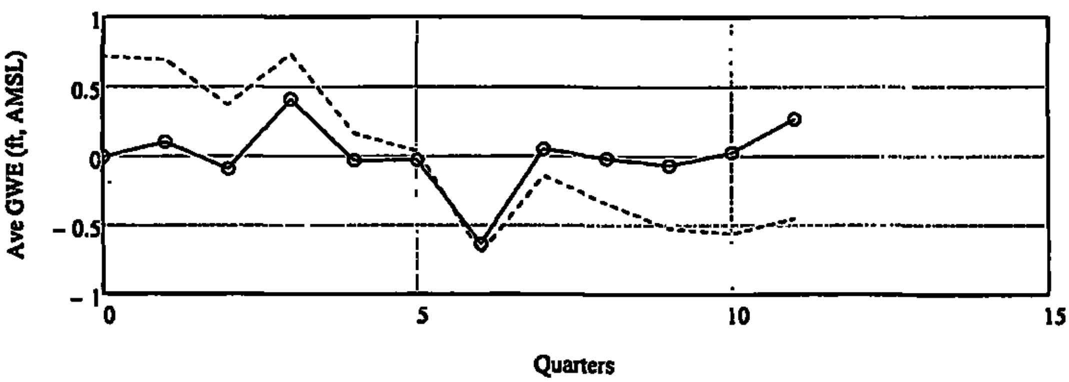
Zero-mean perturbation of total precipitation per quarter (in/quarter).



<u>Quarterly Average Water Elevation</u>

Remove mean: $y1_i := y_i - \mu_y$ Remove trend: $I_i := i \cdot 1$ $y0_i := y1_i - (\text{slope}(I, y1) \cdot i + \text{intercept}(I, y1))$

Zero-mean perturbation of quarterly average water level elevation (ft, AMSL).



Global Correlation Parameters

Count: $N = 12$

Maximum Lag: $MaxLag := 5$

Autocorrelation

Fast Fourier Transform Method for Discrete Covariance Estimate (Press et al., 1992)

Autocorrelation of Precipitation

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

$\Xi := CFFT(x0)$

Calculate the product of the transform with its complex conjugate

$j := 0..rows(\Xi) - 1 \qquad Z_j := \Xi_j \cdot \overline{\Xi_j}$

The inverse gives the Autocovariance. Correlation = covariance / variance

$Corr := ICFFT(Z) \qquad r := 0..MaxLag \qquad Rx_{est_r} := Corr_r$

Autocorrelation of Average Quarterly Water Level

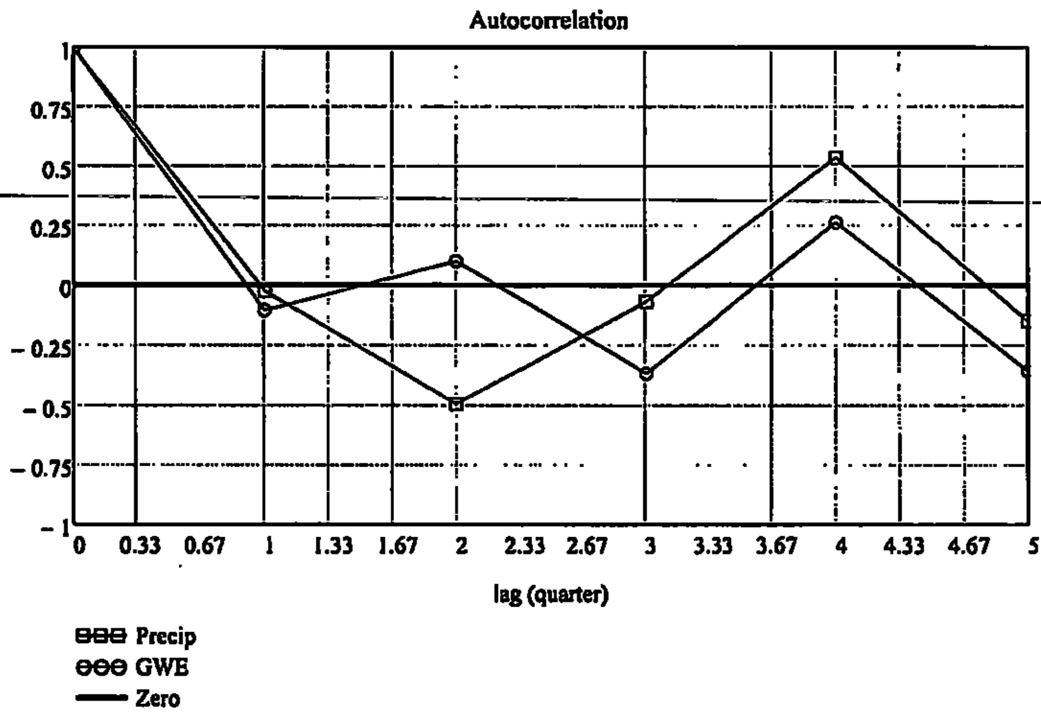
Calculate the Complex Fast Fourier Transform (doesn't require zero padding)
$\Psi := CFFT(y0)$

Calculate the product of the transform with its complex conjugate

$j := 0..rows(\Psi) - 1 \qquad Z_j := \Psi_j \cdot \overline{\Psi_j}$

The inverse gives the Autocovariance

$Corr := ICFFT(Z) \qquad MaxLag = 5 \qquad r := 0..MaxLag \qquad Ry_{est_r} := Corr_r$



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Cross-Correlation

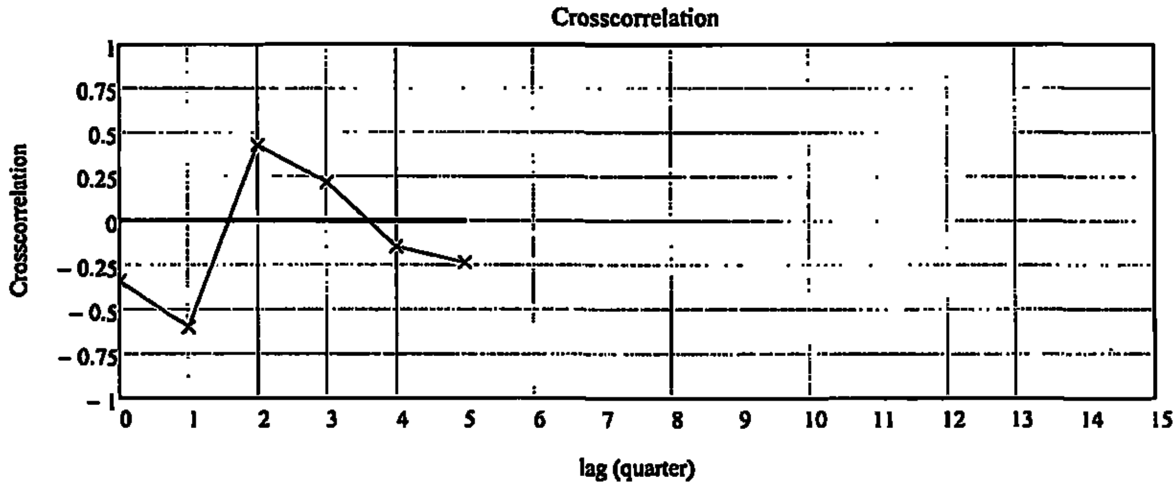
Use Complex Fast Fourier Transforms from above. Calculate the product of the x transform with the complex conjugate of the y transform (x leads y)

$j := 0..\mathrm{rows}(\Xi) - 1 \qquad Z_j := \Psi_j \cdot \overline{\Xi_j}$

The inverse gives the Cross-covariance (Not necessarily symmetrical so index r must be adjusted to show negative lags. CrossCorr array contains positive lag results from 0 to N/2 and negative lag results from N to N/2 [in reverse]. CrossCorr results are then mapped into the Rxy array from 0 to N-1)

$\mathrm{CrossCorr} := \mathrm{ICFFT}(Z) \qquad r := 0..\frac{N}{2} - 1 \qquad \mathrm{Rxy_{est}}_r := \mathrm{CrossCorr}_{\frac{N}{2}+r}$

$r := \frac{N}{2}..N - 1 \qquad \mathrm{Rxy_{est}}_r := \mathrm{CrossCorr}_{r-\frac{N}{2}}$



References

Press, W. H., S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, Numerical Recipes in C, 2n edition (revised 1995), Cambridge Univ. Press, New York, N. Y., 1992

DATA :=

	0	1
0	$3.366 \cdot 10^3$	4.29
1	$3.366 \cdot 10^3$	6.15
2	$3.366 \cdot 10^3$	3.81
3	$3.366 \cdot 10^3$	1.24
4	$3.366 \cdot 10^3$	1.56
5	$3.365 \cdot 10^3$	11.23
6	$3.365 \cdot 10^3$	4.888
7	$3.365 \cdot 10^3$	4.19
8	$3.365 \cdot 10^3$	5.28
9	$3.365 \cdot 10^3$	8.85
10	$3.365 \cdot 10^3$	1.23
11	$3.365 \cdot 10^3$	0.07

$N := \text{rows}(DATA)$ $N = 12$ $i := 0..\text{rows}(DATA) - 1$

$x_i := DATA_{i,1}$ $y_i := DATA_{i,0}$

$f(X) := X \cdot 0$

Calculation Sheet - Time Series Analysis

Location: Piezometer PZ-10
Time Range: 09/1997 - 06/2004 (UnLined)

Objective

Perform correlation analyses to qualitatively assess the response of water levels in wells to precipitation.

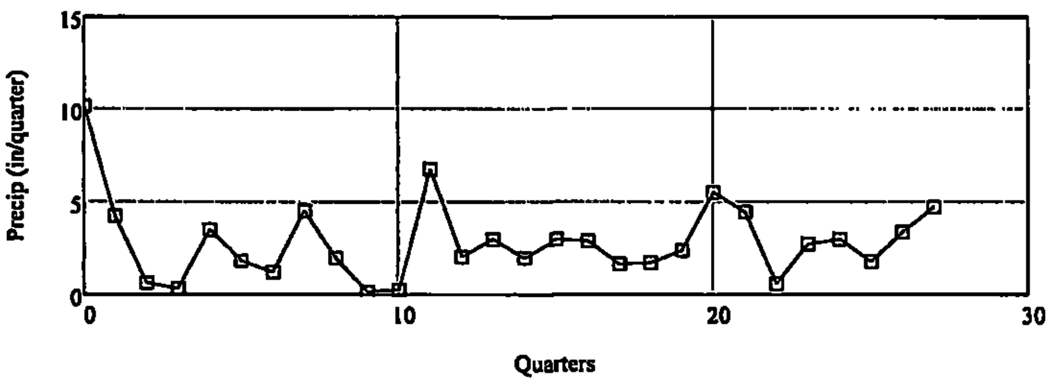
Methods

Auto-Correlation: Qualitatively shows the dependence of water-level or precipitation on time. Data series where this is no relation between measurements will show a sharply peaked graph of autocorrelation over lag (common for precipitation). Data series that are dependent to some degree on the previous measurement will have a more gradual (exponential) slope (common for water-level).

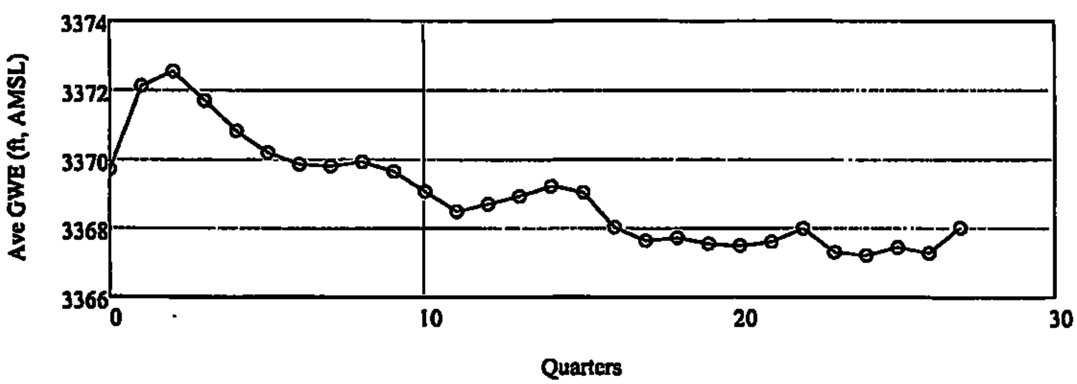
Cross-Correlation: Qualitatively shows the inter-dependence of water-level and precipitation. The lag distance from 0 to the peak is the approximate delay between precipitation and water-level response. The height of the peak qualitatively indicates the degree of "connection" between precipitation and water-level response.

Input Data

Total precipitation per quarter (in/quarter).



Quarterly average water level elevation (ft, AMSL).



Summary Statistics

Precipitation (in/quarter)

Mean: $\mu_x := \text{mean}(x)$ $\mu_x = 2.86$

Variance: $\sigma2_x := \text{var}(x)$ $\sigma2_x = 4.565$

Count: $N = 28$

Maximum: $\max(x) = 10.15$

Minimum: $\min(x) = 0.14$

Quarterly Average Water Elevation (ft, AMSL)

Mean: $\mu_y := \text{mean}(y)$ $\mu_y = 3368.97$

Variance: $\sigma2_y := \text{var}(y)$ $\sigma2_y = 2.22$

Count: $N = 28$

Maximum: $\max(y) = 3372.54$

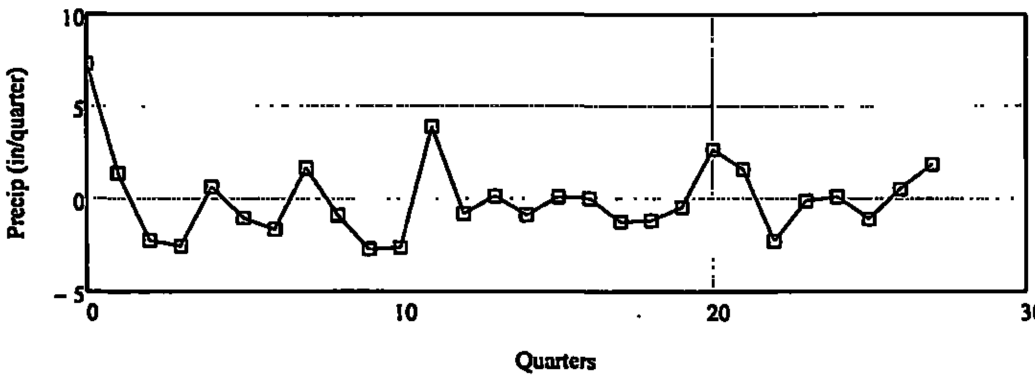
Minimum: $\min(y) = 3367.22$

Zero-Mean Perturbation
Remove mean from data to obtain zero-mean perturbation for calculations.

Precipitation

Remove mean: $x0_i := x_i - \mu_x$

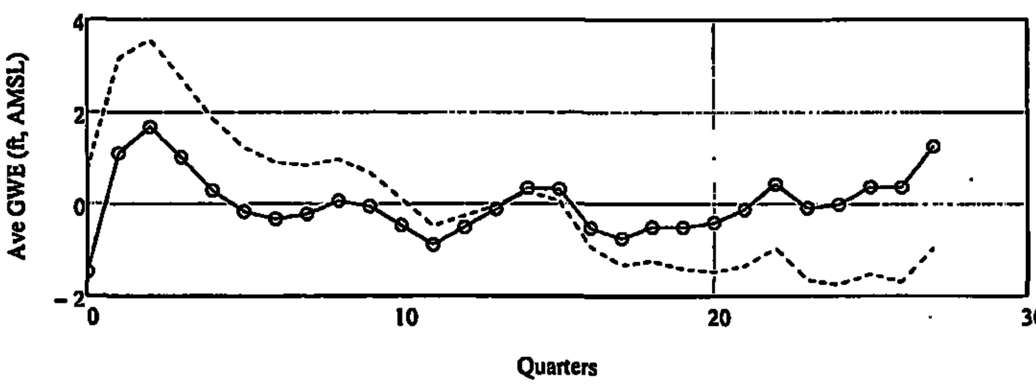
Zero-mean perturbation of total precipitation per quarter (in/quarter).



Quarterly Average Water Elevation

Remove mean: $y1_i := y_i - \mu_y$ Remove trend: $I_i := i \cdot 1$ $y0_i := y1_i - (\text{slope}(I, y1) \cdot i + \text{intercept}(I, y1))$

Zero-mean perturbation of quarterly average water level elevation (ft, AMSL).



Global Correlation Parameters

Count: $N = 28$

Maximum Lag: $MaxLag := 5$

Autocorrelation

Fast Fourier Transform Method for Discrete Covariance Estimate (Press et al., 1992)

Autocorrelation of Precipitation

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

$\Xi := CFFT(x0)$

Calculate the product of the transform with its complex conjugate

$j := 0..rows(\Xi) - 1$ $\quad Z_j := \Xi_j \cdot \overline{\Xi_j}$

The inverse gives the Autocovariance. Correlation = covariance / variance

$Corr := ICFFT(Z)$ $\quad r := 0..MaxLag$ $\quad Rx_{est_r} := Corr_r$

Autocorrelation of Average Quarterly Water Level

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

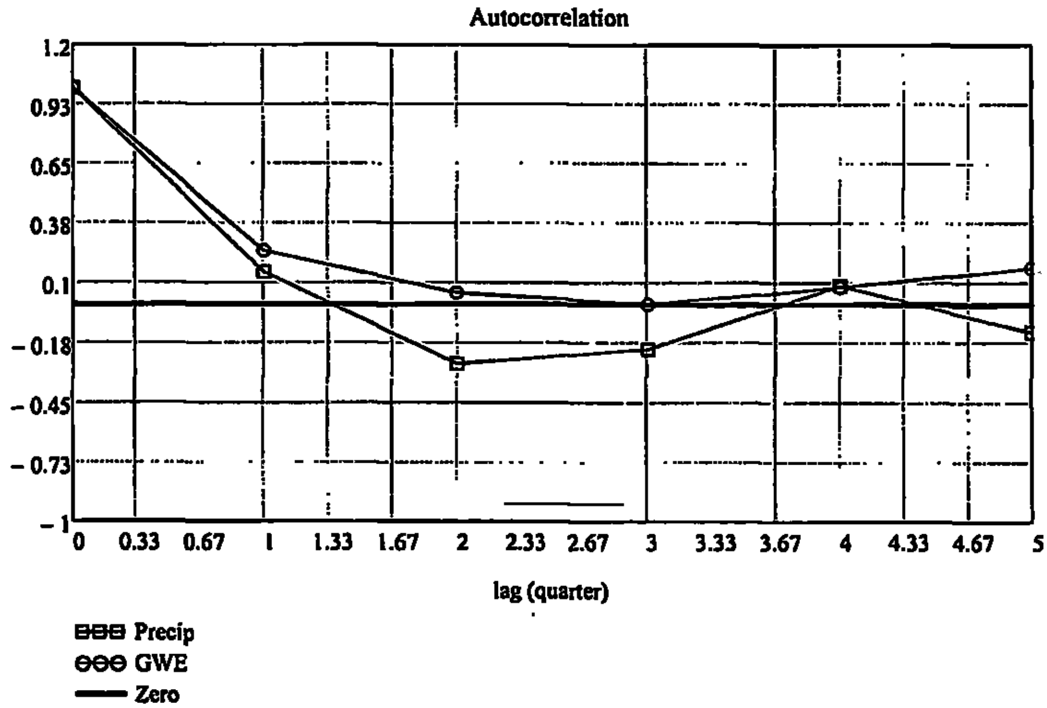
$\Psi := CFFT(y0)$

Calculate the product of the transform with its complex conjugate

$j := 0..rows(\Psi) - 1$ $\quad Z_j := \Psi_j \cdot \overline{\Psi_j}$

The inverse gives the Autocovariance

$Corr := ICFFT(Z)$ $\quad MaxLag = 5$ $\quad r := 0..MaxLag$ $\quad Ry_{est_r} := Corr_r$



Cross-Correlation

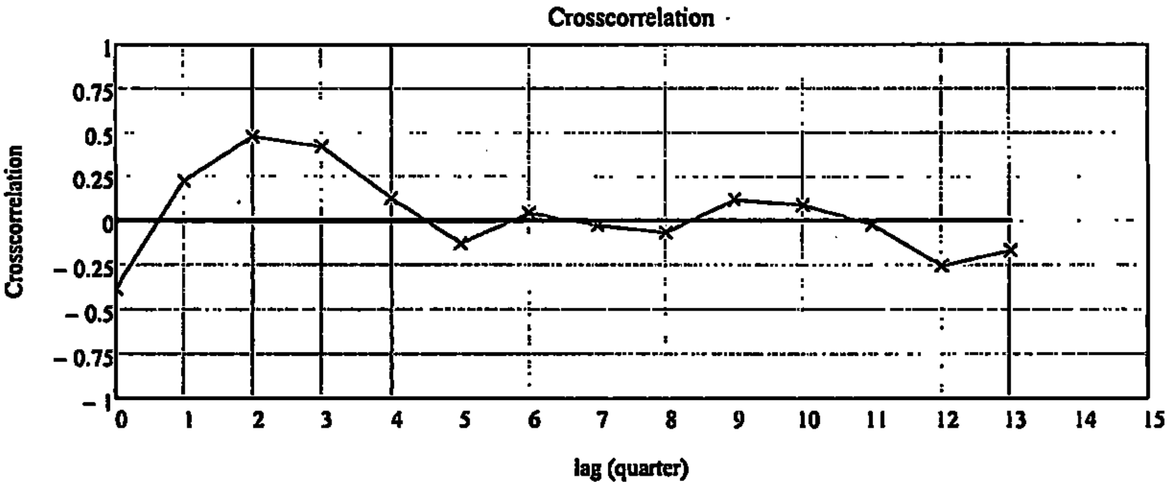
Use Complex Fast Fourier Transforms from above. Calculate the product of the x transform with the complex conjugate of the y transform (x leads y)

$j := 0 .. \mathrm{rows}(\Xi) - 1 \qquad Z_j := \Psi_j \cdot \overline{\Xi_j}$

The inverse gives the Cross-covariance (Not necessarily symmetrical so index r must be adjusted to show negative lags. CrossCorr array contains positive lag results from 0 to N/2 and negative lag results from N to N/2 [in reverse]. CrossCorr results are then mapped into the Rxy array from 0 to N-1)

$\mathrm{CrossCorr} := \mathrm{ICFFT}(Z) \qquad r := 0 .. \frac{N}{2} - 1 \qquad Rxy_{est_r} := \mathrm{CrossCorr}_{\frac{N}{2}+r}$

$r := \frac{N}{2} .. N - 1 \qquad Rxy_{est_r} := \mathrm{CrossCorr}_{r-\frac{N}{2}}$



References

Press, W. H., S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, Numerical Recipes in C, 2n edition (revised 1995), Cambridge Univ. Press, New York, N. Y., 1992

DATA :=

	0	1
0	$3.37 \cdot 10^3$	10.15
1	$3.372 \cdot 10^3$	4.22
2	$3.373 \cdot 10^3$	0.62
3	$3.372 \cdot 10^3$	0.31
4	$3.371 \cdot 10^3$	3.5
5	$3.37 \cdot 10^3$	1.82
6	$3.37 \cdot 10^3$	1.21
7	$3.37 \cdot 10^3$	4.51
8	$3.37 \cdot 10^3$	1.97
9	$3.37 \cdot 10^3$	0.14
10	$3.369 \cdot 10^3$	0.23
11	$3.368 \cdot 10^3$	6.75
12	$3.369 \cdot 10^3$	2.04
13	$3.369 \cdot 10^3$	2.99
14	$3.369 \cdot 10^3$	1.97
15	$3.369 \cdot 10^3$	...

$N := \text{rows}(DATA)$ $\quad N = 28$ $\quad i := 0 .. \text{rows}(DATA) - 1$

$x_i := DATA_{i,1}$ $\quad y_i := DATA_{i,0}$

$f(X) := X \cdot 0$

Calculation Sheet - Time Series Analysis

Location: Piezometer PZ-10
Time Range: 06/2005 - 03/2008 (Lined)

Objective

Perform correlation analyses to qualitatively assess the response of water levels in wells to precipitation.

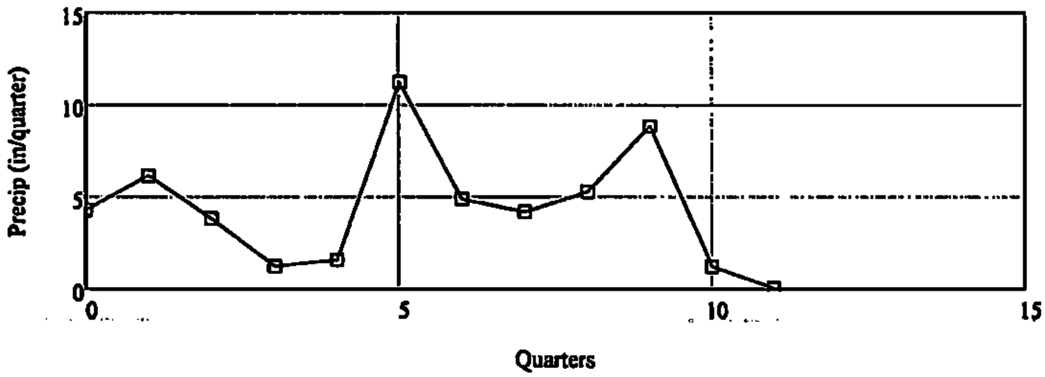
Methods

Auto-Correlation: Qualitatively shows the dependence of water-level or precipitation on time. Data series where this is no relation between measurements will show a sharply peaked graph of autocorrelation over lag (common for precipitation). Data series that are dependent to some degree on the previous measurement will have a more gradual (exponential) slope (common for water-level).

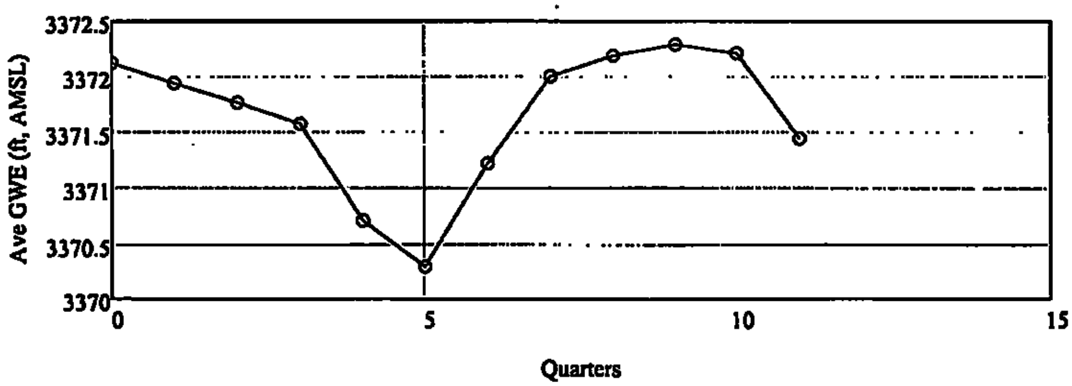
Cross-Correlation: Qualitatively shows the inter-dependence of water-level and precipitation. The lag distance from 0 to the peak is the approximate delay between precipitation and water-level response. The height of the peak qualitatively indicates the degree of "connection" between precipitation and water-level response.

Input Data

Total precipitation per quarter (in/quarter).



Quarterly average water level elevation (ft, AMSL).



Summary Statistics

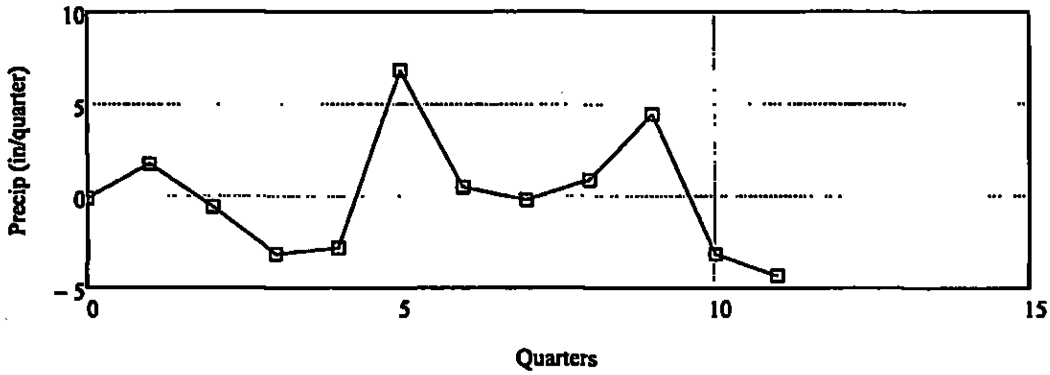
Precipitation (in/quarter)			Quarterly Average Water Elevation (ft, AMSL)		
Mean:	$\mu_x := \text{mean}(x)$	$\mu_x = 4.399$	Mean:	$\mu_y := \text{mean}(y)$	$\mu_y = 3371.64$
Variance:	$\sigma2_x := \text{var}(x)$	$\sigma2_x = 9.815$	Variance:	$\sigma2_y := \text{var}(y)$	$\sigma2_y = 0.371$
Count:	$N = 12$		Count:	$N = 12$	
Maximum:	$\max(x) = 11.23$		Maximum:	$\max(y) = 3372.29$	
Minimum:	$\min(x) = 0.07$		Minimum:	$\min(y) = 3370.29$	

Zero-Mean Perturbation
Remove mean from data to obtain zero-mean perturbation for calculations.

Precipitation

Remove mean: $x0_i := x_i - \mu_x$

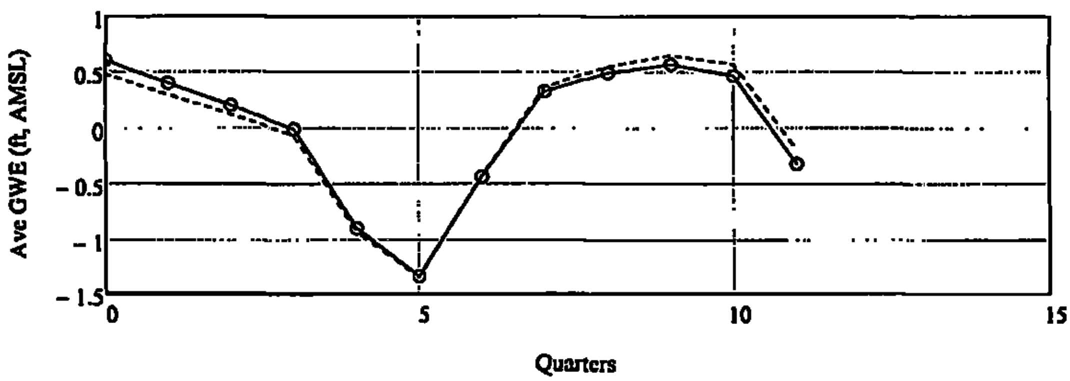
Zero-mean perturbation of total precipitation per quarter (in/quarter).



Quarterly Average Water Elevation

Remove mean: $y1_i := y_i - \mu_y$ Remove trend: $I_i := i \cdot 1$ $y0_i := y1_i - (\text{slope}(I, y1) \cdot i + \text{intercept}(I, y1))$

Zero-mean perturbation of quarterly average water level elevation (ft, AMSL).



Global Correlation Parameters

Count: $N = 12$

Maximum Lag: $MaxLag := 5$

Autocorrelation

Fast Fourier Transform Method for Discrete Covariance Estimate (Press et al., 1992)

Autocorrelation of Precipitation

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

$\Xi := CFFT(x0)$

Calculate the product of the transform with its complex conjugate

$j := 0 .. rows(\Xi) - 1$ $\quad Z_j := \Xi_j \cdot \overline{\Xi_j}$

The inverse gives the Autocovariance. Correlation = covariance / variance

$Corr := ICFFT(Z)$ $\quad r := 0 .. MaxLag$ $\quad Rx_{est_r} := Corr_r$

Autocorrelation of Average Quarterly Water Level

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

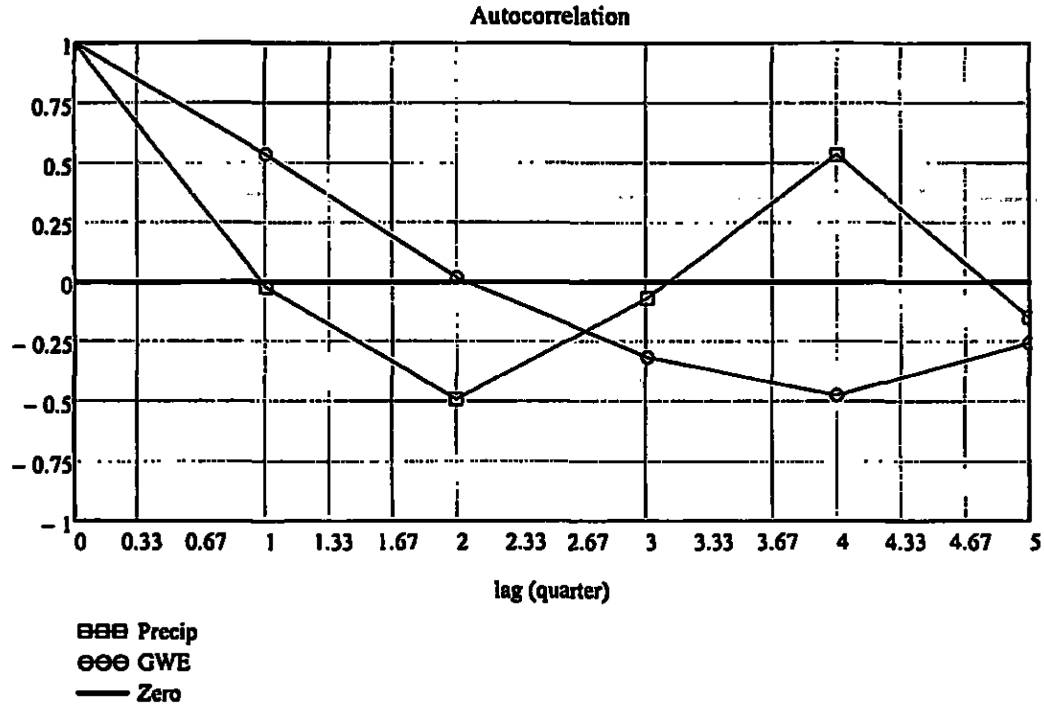
$\Psi := CFFT(y0)$

Calculate the product of the transform with its complex conjugate

$j := 0 .. rows(\Psi) - 1$ $\quad Z_j := \Psi_j \cdot \overline{\Psi_j}$

The inverse gives the Autocovariance

$Corr := ICFFT(Z)$ $\quad MaxLag = 5$ $\quad r := 0 .. MaxLag$ $\quad Ry_{est_r} := Corr_r$



Cross-Correlation

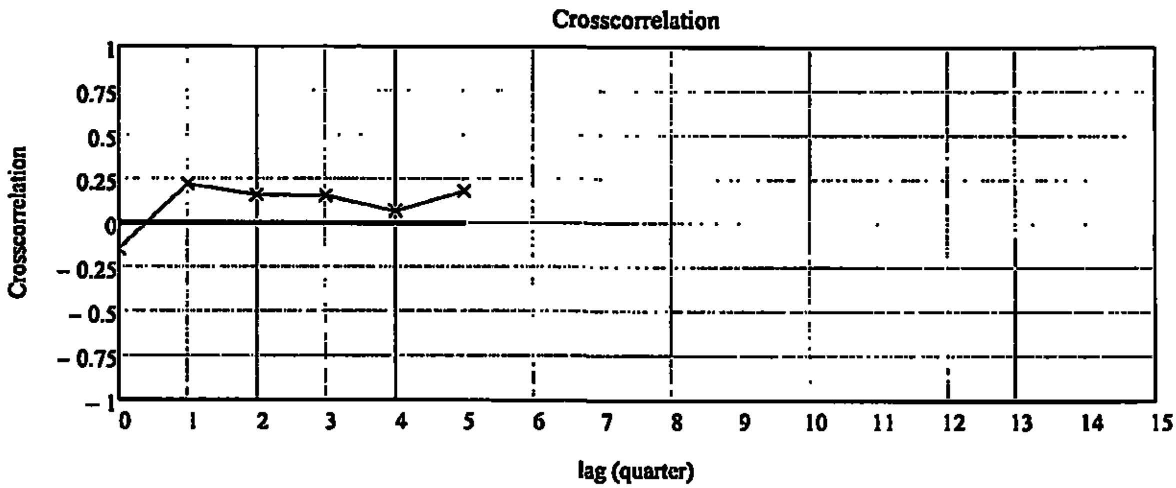
Use Complex Fast Fourier Transforms from above. Calculate the product of the x transform with the complex conjugate of the y transform (x leads y)

$j := 0..\text{rows}(\Xi) - 1$ $\quad Z_j := \Psi_j \cdot \overline{\Xi_j}$

The inverse gives the Cross-covariance (Not necessarily symmetrical so index r must be adjusted to show negative lags. CrossCorr array contains positive lag results from 0 to N/2 and negative lag results from N to N/2 [in reverse]. CrossCorr results are then mapped into the Rxy array from 0 to N-1)

$\text{CrossCorr} := \text{ICFFT}(Z)$ $\quad r := 0..\frac{N}{2} - 1$ $\quad Rxy_{est_r} := \text{CrossCorr}_{\frac{N}{2}+r}$

$r := \frac{N}{2}..N - 1$ $\quad Rxy_{est_r} := \text{CrossCorr}_{r-\frac{N}{2}}$



References

Press, W. H., S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, Numerical Recipes in C, 2n edition (revised 1995), Cambridge Univ. Press, New York, N. Y., 1992

DATA :=

	0	1
0	$3.372 \cdot 10^3$	4.29
1	$3.372 \cdot 10^3$	6.15
2	$3.372 \cdot 10^3$	3.81
3	$3.372 \cdot 10^3$	1.24
4	$3.371 \cdot 10^3$	1.56
5	$3.37 \cdot 10^3$	11.23
6	$3.371 \cdot 10^3$	4.888
7	$3.372 \cdot 10^3$	4.19
8	$3.372 \cdot 10^3$	5.28
9	$3.372 \cdot 10^3$	8.85
10	$3.372 \cdot 10^3$	1.23
11	$3.371 \cdot 10^3$	0.07

$N := \text{rows}(DATA)$ $\quad N = 12 \quad i := 0..\text{rows}(DATA) - 1$

$x_i := DATA_{i,1}$ $\quad y_i := DATA_{i,0}$

$f(X) := X \cdot 0$

Calculation Sheet - Time Series Analysis

Location: Piezometer PZ-12
Time Range: 09/1997 - 06/2004 (UnLined)

Objective

Perform correlation analyses to qualitatively assess the response of water levels in wells to precipitation.

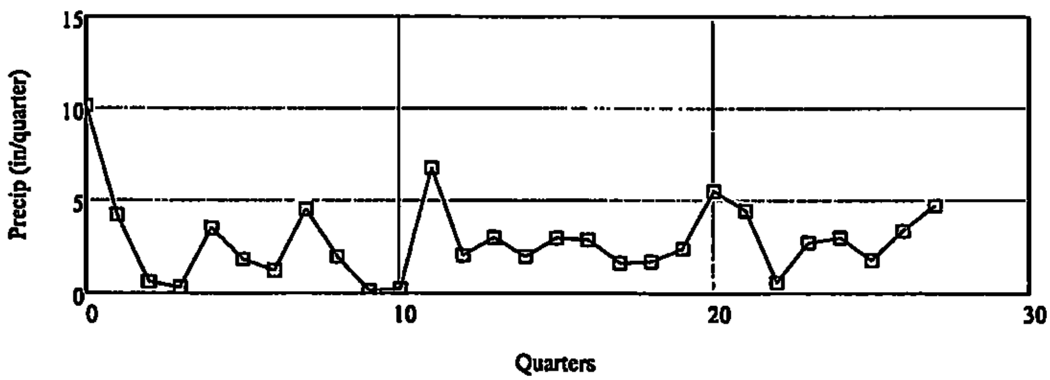
Methods

Auto-Correlation: Qualitatively shows the dependence of water-level or precipitation on time. Data series where this is no relation between measurements will show a sharply peaked graph of autocorrelation over lag (common for precipitation). Data series that are dependent to some degree on the previous measurement will have a more gradual (exponential) slope (common for water-level).

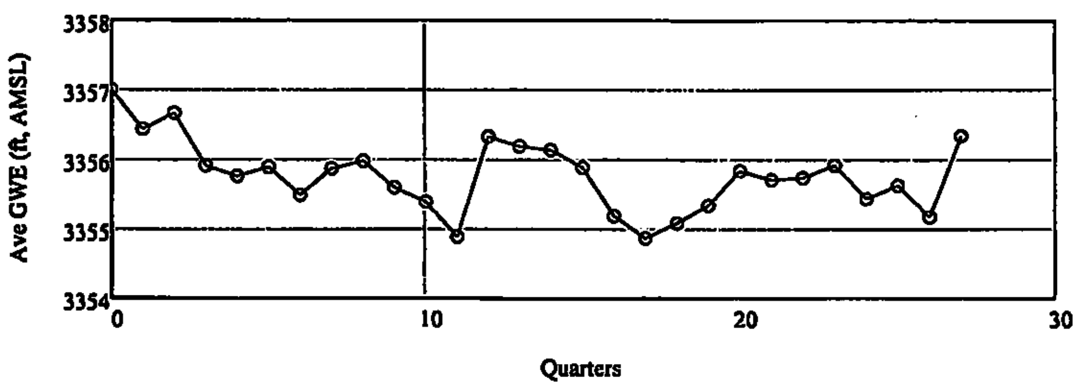
Cross-Correlation: Qualitatively shows the inter-dependence of water-level and precipitation. The lag distance from 0 to the peak is the approximate delay between precipitation and water-level response. The height of the peak qualitatively indicates the degree of "connection" between precipitation and water-level response.

Input Data

Total precipitation per quarter (in/quarter).



Quarterly average water level elevation (ft, AMSL).



Summary Statistics

Precipitation (in/quarter)

Mean: $\mu_x := \text{mean}(x)$ $\mu_x = 2.86$

Variance: $\sigma 2_x := \text{var}(x)$ $\sigma 2_x = 4.565$

Count: $N = 28$

Maximum: $\max(x) = 10.15$

Minimum: $\min(x) = 0.14$

Quarterly Average Water Elevation (ft, AMSL)

Mean: $\mu_y := \text{mean}(y)$ $\mu_y = 3355.78$

Variance: $\sigma 2_y := \text{var}(y)$ $\sigma 2_y = 0.255$

Count: $N = 28$

Maximum: $\max(y) = 3357$

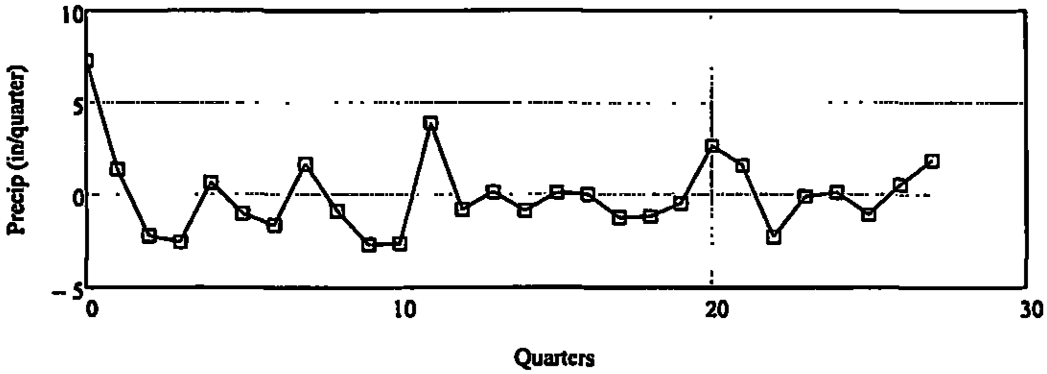
Minimum: $\min(y) = 3354.87$

Zero-Mean Perturbation
Remove mean from data to obtain zero-mean perturbation for calculations.

Precipitation

Remove mean: $x0_i := x_i - \mu_x$

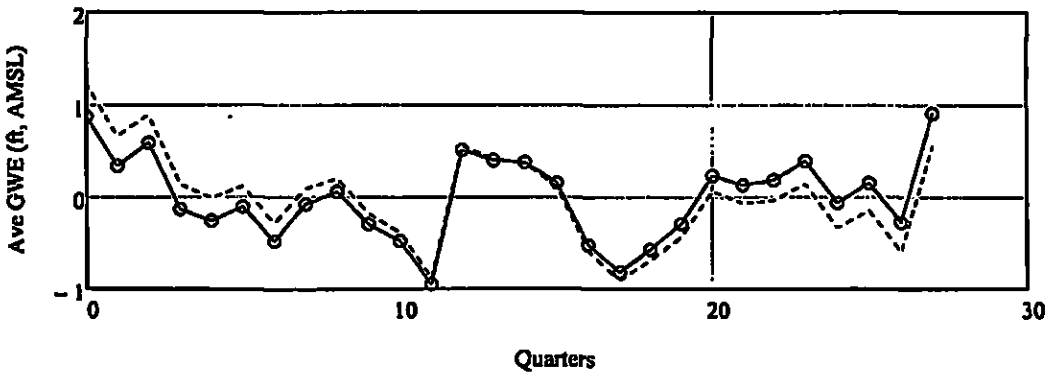
Zero-mean perturbation of total precipitation per quarter (in/quarter).



Quarterly Average Water Elevation

Remove mean: $yl_i := y_i - \mu_y$ Remove trend: $I_i := i \cdot 1$ $y0_i := yl_i - (\text{slope}(I, yl) \cdot i + \text{intercept}(I, yl))$

Zero-mean perturbation of quarterly average water level elevation (ft, AMSL).



Global Correlation Parameters

Count: $N = 28$

Maximum Lag: $MaxLag := 5$

Autocorrelation

Fast Fourier Transform Method for Discrete Covariance Estimate (Press et al., 1992)

Autocorrelation of Precipitation

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

$\Xi := CFFT(x0)$

Calculate the product of the transform with its complex conjugate

$j := 0..rows(\Xi) - 1$ $\quad Z_j := \Xi_j \cdot \overline{\Xi_j}$

The inverse gives the Autocovariance. Correlation = *covariance / variance*

$Corr := ICFFT(Z)$ $\quad r := 0..MaxLag$ $\quad Rx_{est_r} := Corr_r$

Autocorrelation of Average Quarterly Water Level

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

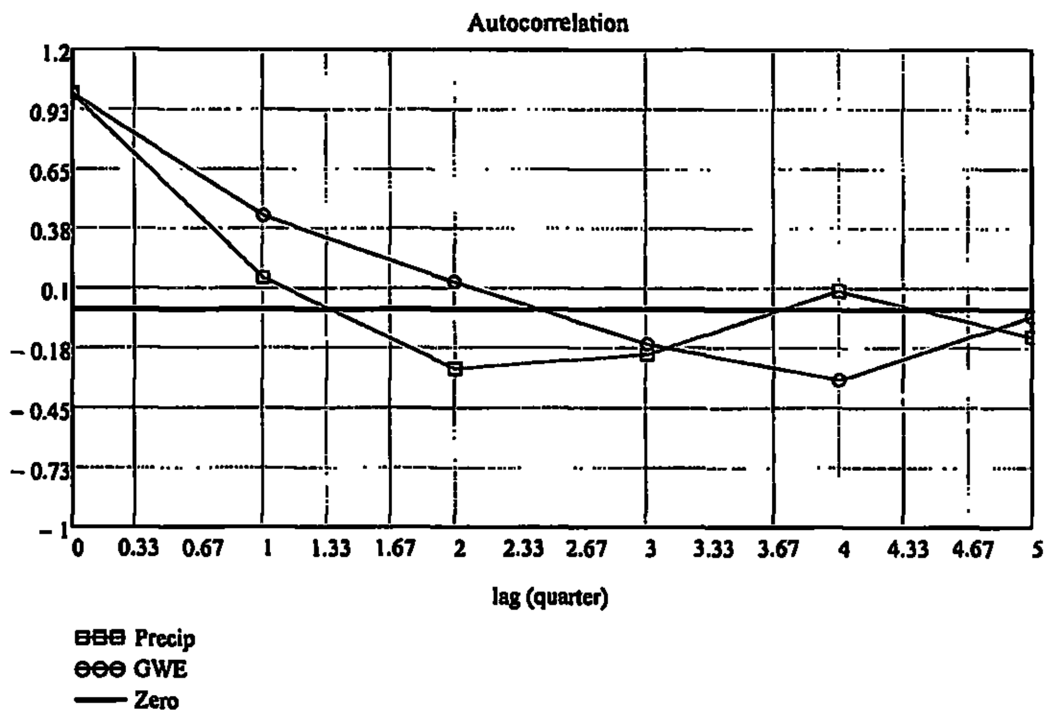
$\Psi := CFFT(y0)$

Calculate the product of the transform with its complex conjugate

$j := 0..rows(\Psi) - 1$ $\quad Z_j := \Psi_j \cdot \overline{\Psi_j}$

The inverse gives the Autocovariance

$Corr := ICFFT(Z)$ $\quad MaxLag = 5$ $\quad r := 0..MaxLag$ $\quad Ry_{est_r} := Corr_r$



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Cross-Correlation

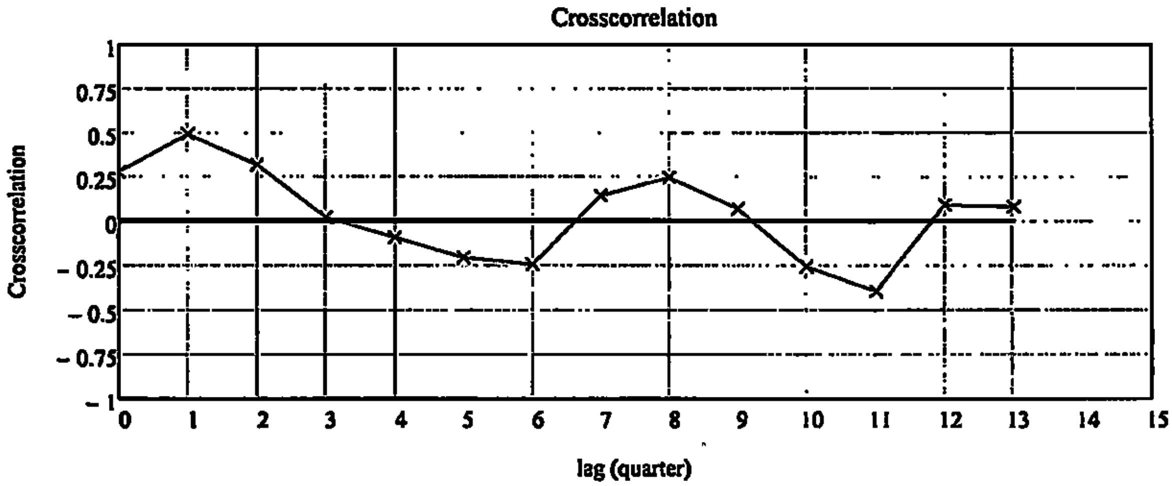
Use Complex Fast Fourier Transforms from above. Calculate the product of the x transform with the complex conjugate of the y transform (x leads y)

$j := 0 .. \mathrm{rows}(\Xi) - 1 \qquad Z_j := \Psi_j \cdot \overline{\Xi_j}$

The inverse gives the Cross-covariance (Not necessarily symmetrical so index r must be adjusted to show negative lags. CrossCorr array contains positive lag results from 0 to N/2 and negative lag results from N to N/2 [in reverse]. CrossCorr results are then mapped into the Rxy array from 0 to N-1)

$\mathrm{CrossCorr} := \mathrm{ICFFT}(Z) \qquad r := 0 .. \frac{N}{2} - 1 \qquad Rxy_{est_r} := \mathrm{CrossCorr}_{\frac{N}{2}+r}$

$r := \frac{N}{2} .. N - 1 \qquad Rxy_{est_r} := \mathrm{CrossCorr}_{r-\frac{N}{2}}$



References

Press, W. H., S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, Numerical Recipes in C, 2n edition (revised 1995), Cambridge Univ. Press, New York, N. Y., 1992

DATA :=

	0	1
0	$3.357\cdot10^3$	10.15
1	$3.356\cdot10^3$	4.22
2	$3.357\cdot10^3$	0.62
3	$3.356\cdot10^3$	0.31
4	$3.356\cdot10^3$	3.5
5	$3.356\cdot10^3$	1.82
6	$3.355\cdot10^3$	1.21
7	$3.356\cdot10^3$	4.51
8	$3.356\cdot10^3$	1.97
9	$3.356\cdot10^3$	0.14
10	$3.355\cdot10^3$	0.23
11	$3.355\cdot10^3$	6.75
12	$3.356\cdot10^3$	2.04
13	$3.356\cdot10^3$	2.99
14	$3.356\cdot10^3$	1.97
15	$3.356\cdot10^3$	...

$N := \text{rows(DATA)}$ $N = 28$ $i := 0..\text{rows(DATA)} - 1$

$x_i := \text{DATA}_{i,1}$ $y_i := \text{DATA}_{i,0}$

$f(X) := X\cdot0$

Calculation Sheet - Time Series Analysis

Location: Piezometer PZ-12
Time Range: 06/2005 - 03/2008 (Lined)

Objective

Perform correlation analyses to qualitatively assess the response of water levels in wells to precipitation.

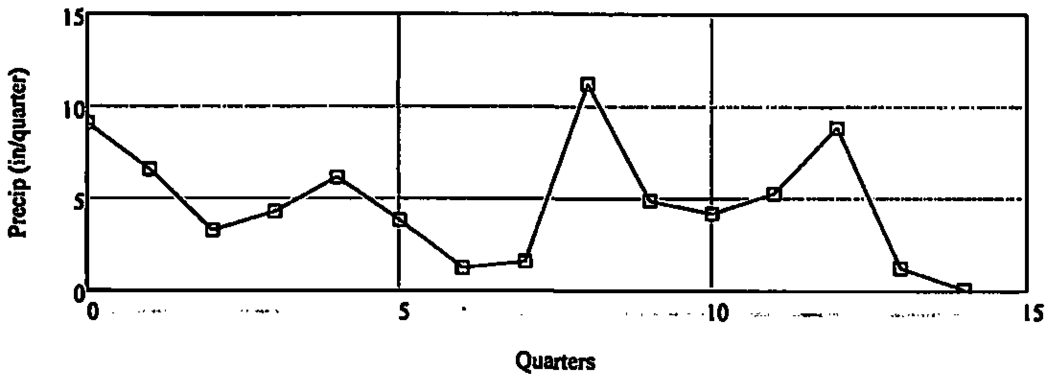
Methods

Auto-Correlation: *Qualitatively shows the dependence of water-level or precipitation on time.* Data series where this is no relation between measurements will show a sharply peaked graph of autocorrelation over lag (common for precipitation). Data series that are dependent to some degree on the previous measurement will have a more gradual (exponential) slope (common for water-level).

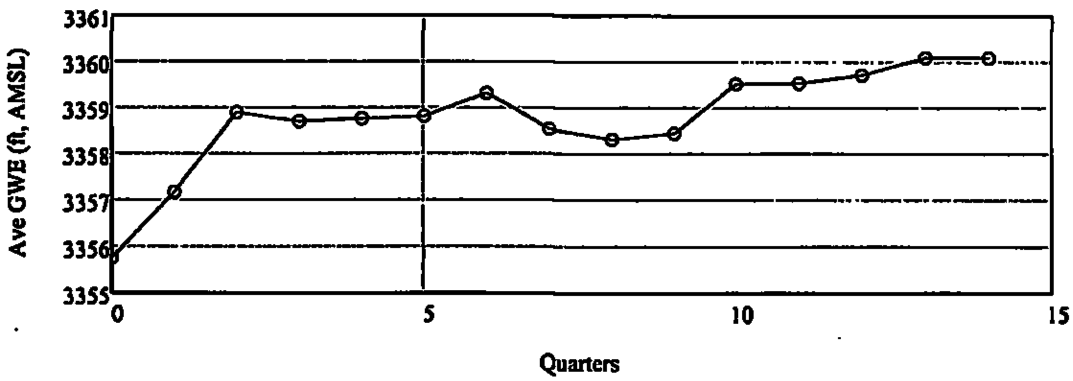
Cross-Correlation: Qualitatively shows the inter-dependence of water-level and precipitation. The lag distance from 0 to the peak is the approximate delay between precipitation and water-level response. The height of the peak qualitatively indicates the degree of "connection" between precipitation and water-level response.

Input Data

Total precipitation per quarter (in/quarter).



Quarterly average water level elevation (ft, AMSL).



Summary Statistics

Precipitation (in/quarter)

Mean: $\mu_x := \text{mean}(x)$ $\mu_x = 4.784$

Variance: $\sigma2_x := \text{var}(x)$ $\sigma2_x = 9.588$

Count: $N = 15$

Maximum: $\max(x) = 11.23$

Minimum: $\min(x) = 0.07$

Quarterly Average Water Elevation (ft, AMSL)

Mean: $\mu_y := \text{mean}(y)$ $\mu_y = 3358.77$

Variance: $\sigma2_y := \text{var}(y)$ $\sigma2_y = 1.201$

Count: $N = 15$

Maximum: $\max(y) = 3360.09$

Minimum: $\min(y) = 3355.74$

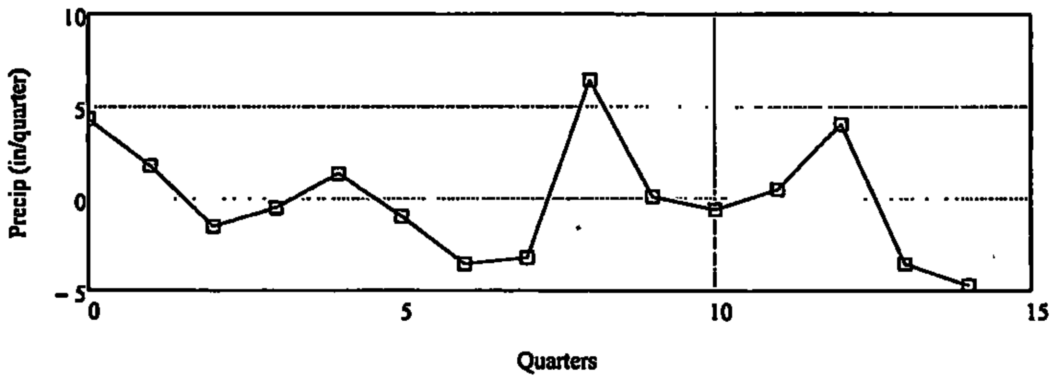
Zero-Mean Perturbation

Remove mean from data to obtain zero-mean perturbation for calculations.

Precipitation

Remove mean: $x0_i := x_i - \mu_x$

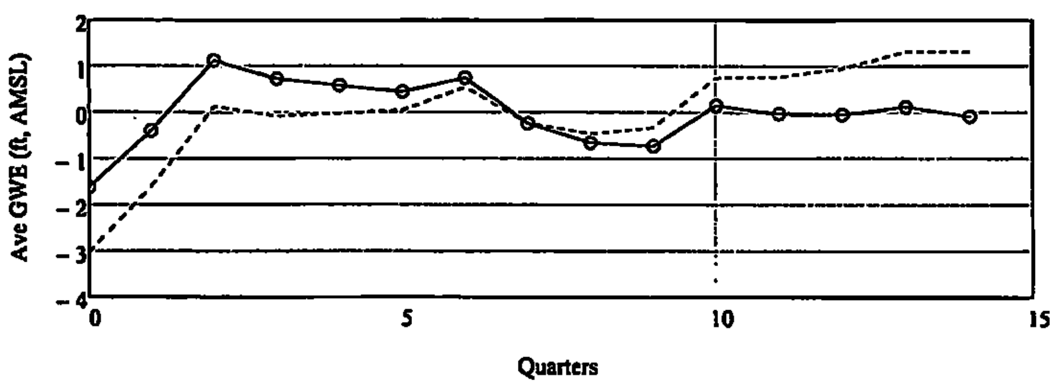
Zero-mean perturbation of total precipitation per quarter (in/quarter).



Quarterly Average Water Elevation

Remove mean: $y1_i := y_i - \mu_y$ Remove trend: $I_i := i \cdot 1$ $y0_i := y1_i - (\text{slope}(I, y1) \cdot i + \text{intercept}(I, y1))$

Zero-mean perturbation of quarterly average water level elevation (ft, AMSL).



Global Correlation Parameters

Count: $N = 15$

Maximum Lag: $MaxLag := 5$

Autocorrelation

Fast Fourier Transform Method for Discrete Covariance Estimate (Press et al., 1992)

Autocorrelation of Precipitation

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

$\Xi := CFFT(x0)$

Calculate the product of the transform with its complex conjugate

$j := 0 .. rows(\Xi) - 1$ $\quad Z_j := \Xi_j \cdot \overline{\Xi_j}$

The inverse gives the Autocovariance. Correlation = covariance / variance

$Corr := ICFFT(Z)$ $\quad r := 0 .. MaxLag$ $\quad Rx_{est_r} := Corr_r$

Autocorrelation of Average Quarterly Water Level

Calculate the Complex Fast Fourier Transform (doesn't require zero padding)

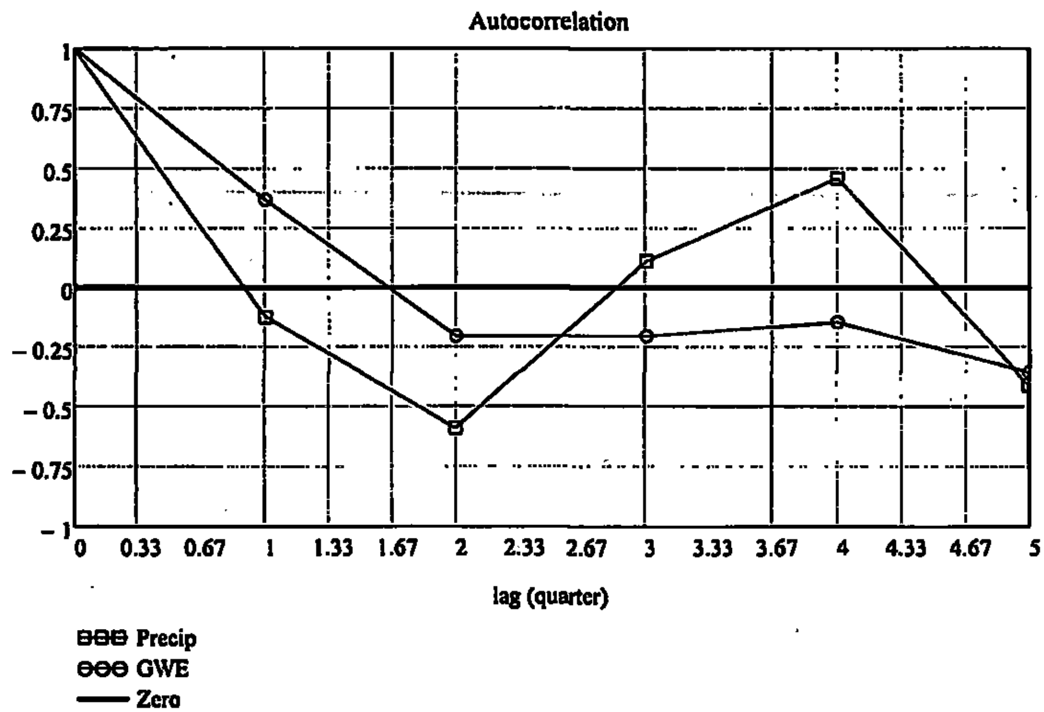
$\Psi := CFFT(y0)$

Calculate the product of the transform with its complex conjugate

$j := 0 .. rows(\Psi) - 1$ $\quad Z_j := \Psi_j \cdot \overline{\Psi_j}$

The inverse gives the Autocovariance

$Corr := ICFFT(Z)$ $\quad MaxLag = 5$ $\quad r := 0 .. MaxLag$ $\quad Ry_{est_r} := Corr_r$



Cross-Correlation

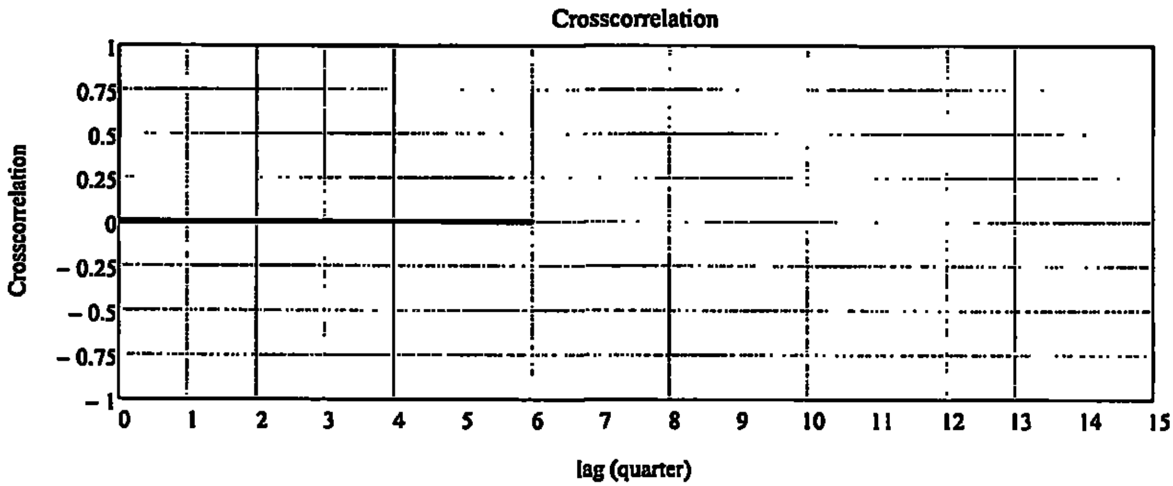
Use Complex Fast Fourier Transforms from above. Calculate the product of the x transform with the complex conjugate of the y transform (x leads y)

$j := 0 .. \mathrm{rows}(\Xi) - 1 \qquad Z_j := \Psi_j \cdot \overline{\Xi_j}$

The inverse gives the Cross-covariance (Not necessarily symmetrical so index r must be adjusted to show negative lags. CrossCorr array contains positive lag results from 0 to N/2 and negative lag results from N to N/2 [in reverse]. CrossCorr results are then mapped into the Rxy array from 0 to N-1)

$\mathrm{CrossCorr} := \mathrm{ICFFT}(Z) \qquad r := 0 .. \frac{N}{2} - 1 \qquad Rxy_{est_r} := \mathrm{CrossCorr}_{\frac{N}{2}+r}$

$r := \frac{N}{2} .. N - 1 \qquad Rxy_{est_r} := \mathrm{CrossCorr}_{r-\frac{N}{2}}$



References

Press, W. H., S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, Numerical Recipes in C, 2n edition (revised 1995), Cambridge Univ. Press, New York, N. Y., 1992

DATA :=

	0	1
0	$3.356 \cdot 10^3$	9.11
1	$3.357 \cdot 10^3$	6.59
2	$3.359 \cdot 10^3$	3.27
3	$3.359 \cdot 10^3$	4.29
4	$3.359 \cdot 10^3$	6.15
5	$3.359 \cdot 10^3$	3.81
6	$3.359 \cdot 10^3$	1.24
7	$3.359 \cdot 10^3$	1.56
8	$3.358 \cdot 10^3$	11.23
9	$3.358 \cdot 10^3$	4.888
10	$3.36 \cdot 10^3$	4.19
11	$3.36 \cdot 10^3$	5.28
12	$3.36 \cdot 10^3$	8.85
13	$3.36 \cdot 10^3$	1.23
14	$3.36 \cdot 10^3$	0.07

$N := \text{rows(DATA)}$ $N = 15$ $i := 0 .. \text{rows(DATA)} - 1$

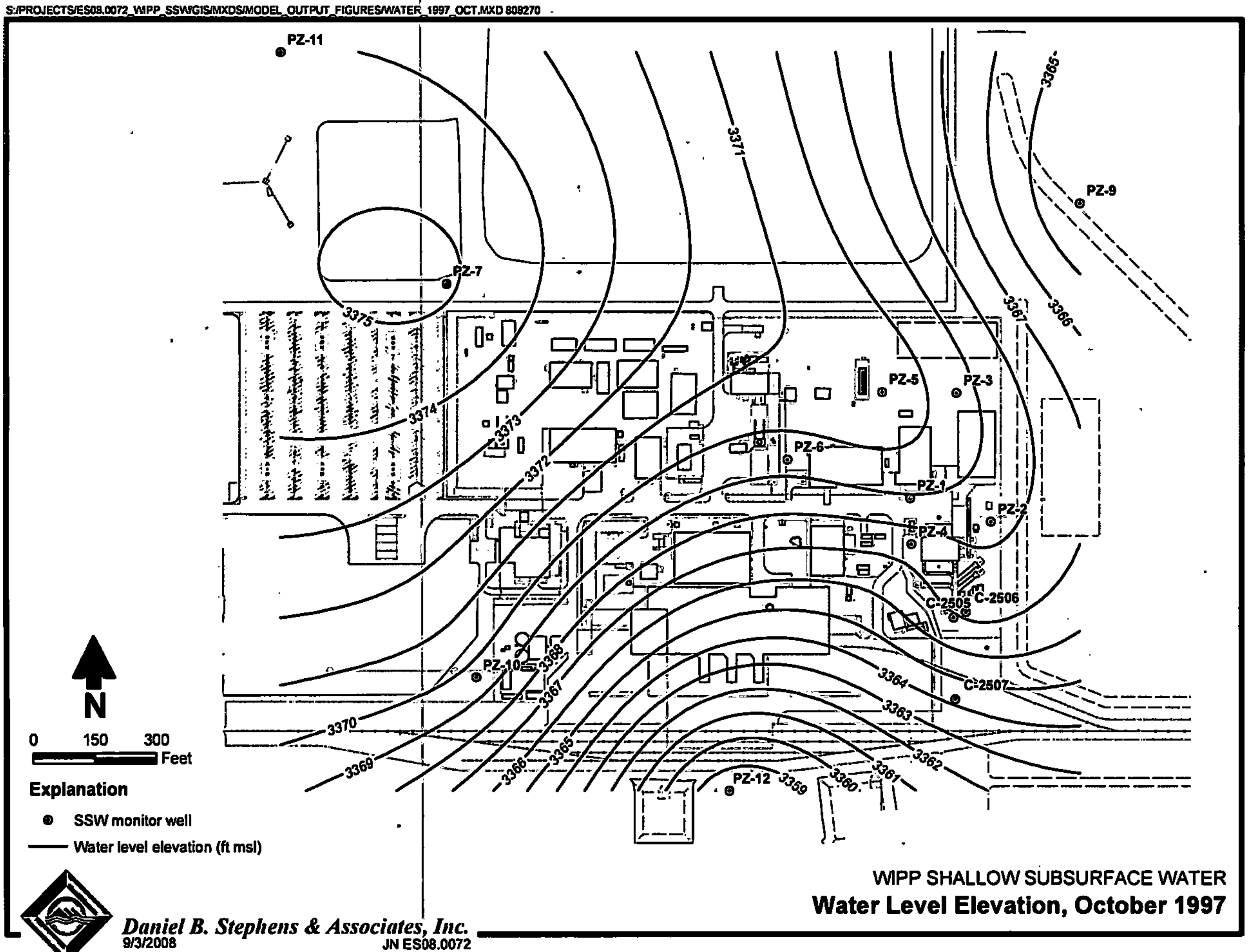
$x_i := \text{DATA}_{i,1}$ $y_i := \text{DATA}_{i,0}$

$f(X) := X \cdot 0$

Appendix E

Water Level Contour Maps

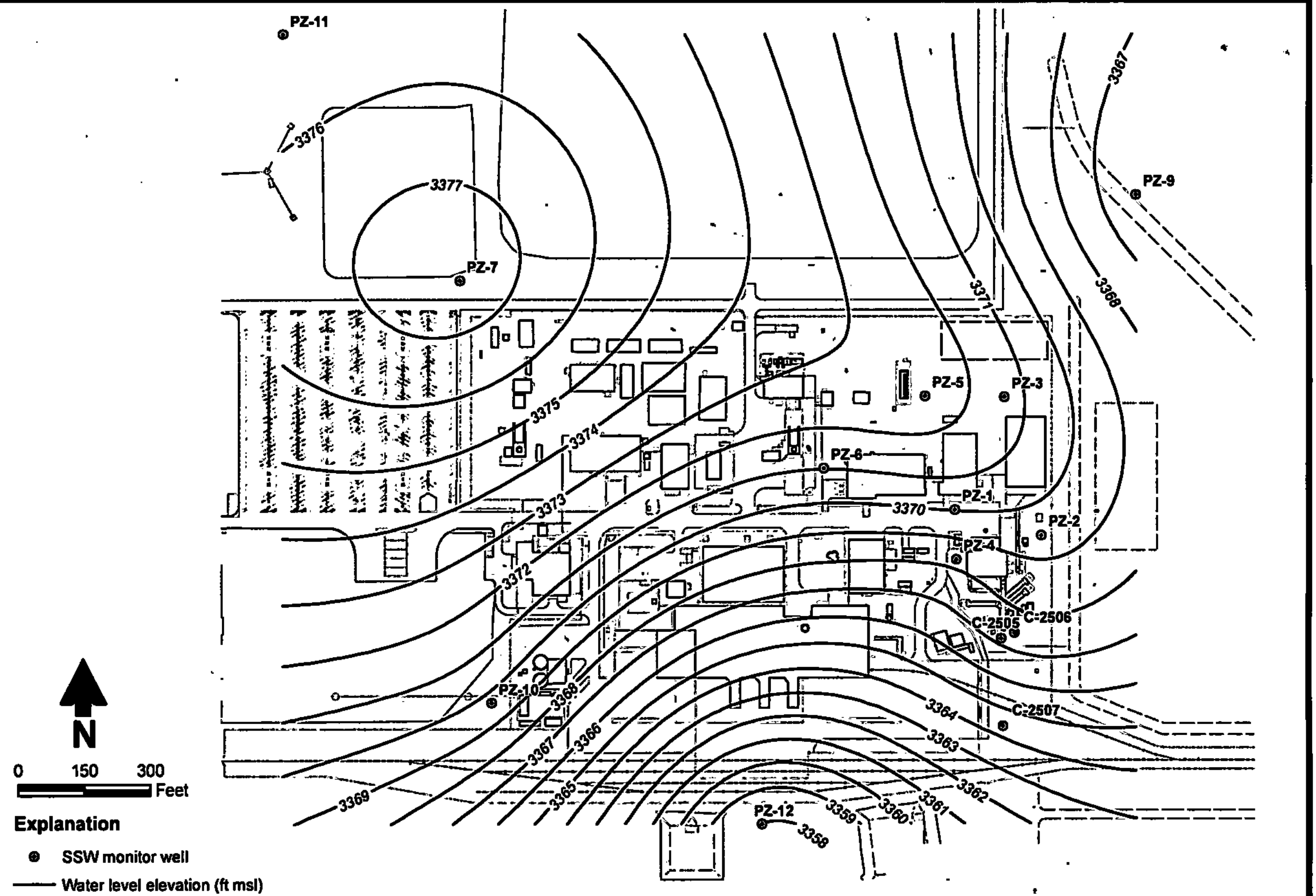
Figure E-1



WIPP SHALLOW SUBSURFACE WATER

Water Level Elevation, October 1997

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/WATER_1998_OCT.MXD 808270



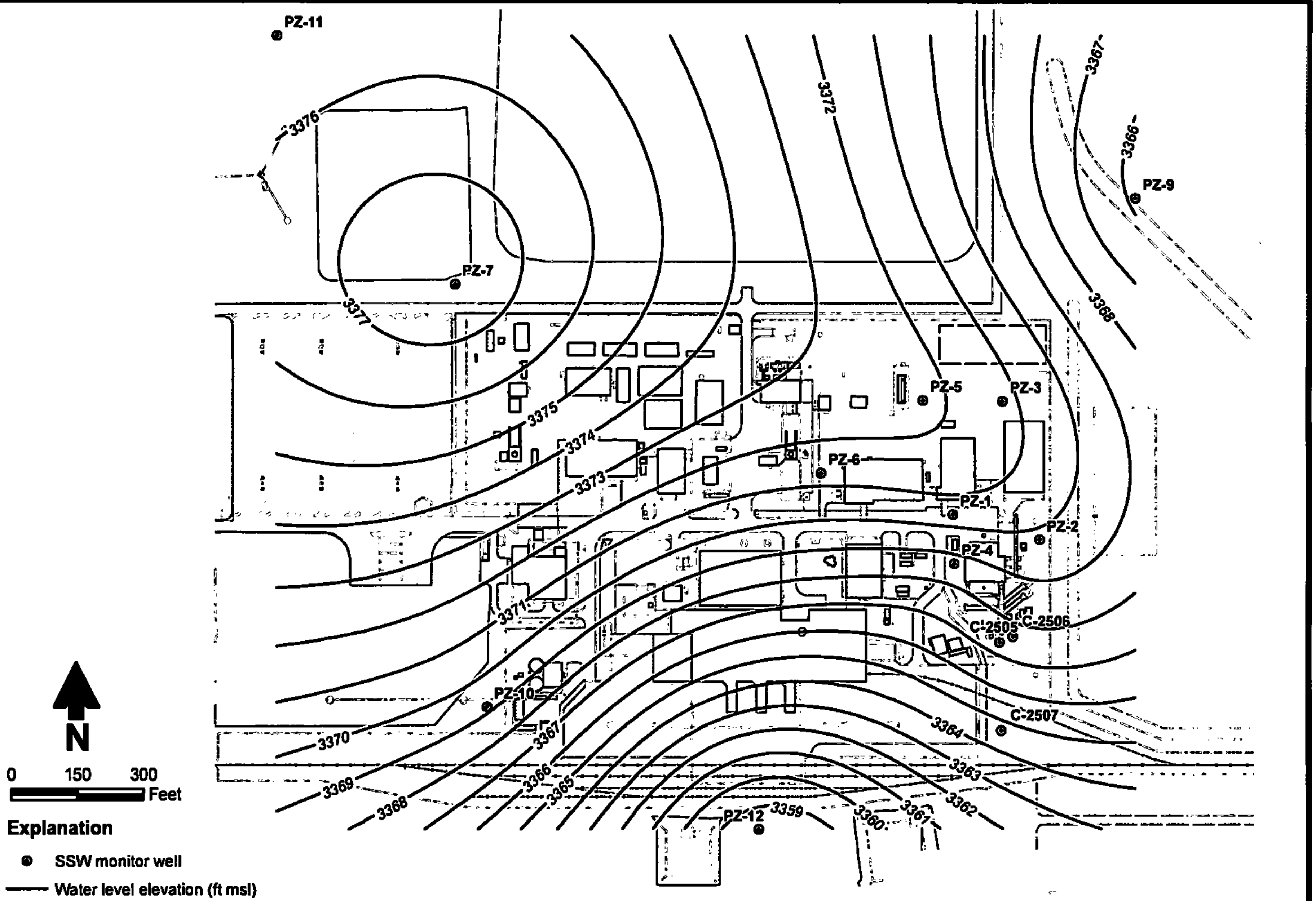
WIPP SHALLOW SUBSURFACE WATER

Water Level Elevation, October 1998

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure E-2

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/WATER_1999_AUG.MXD 808270



Explanation

- SSW monitor well
- Water level elevation (ft msl)

WIPP SHALLOW SUBSURFACE WATER

Water Level Elevation, August 1999

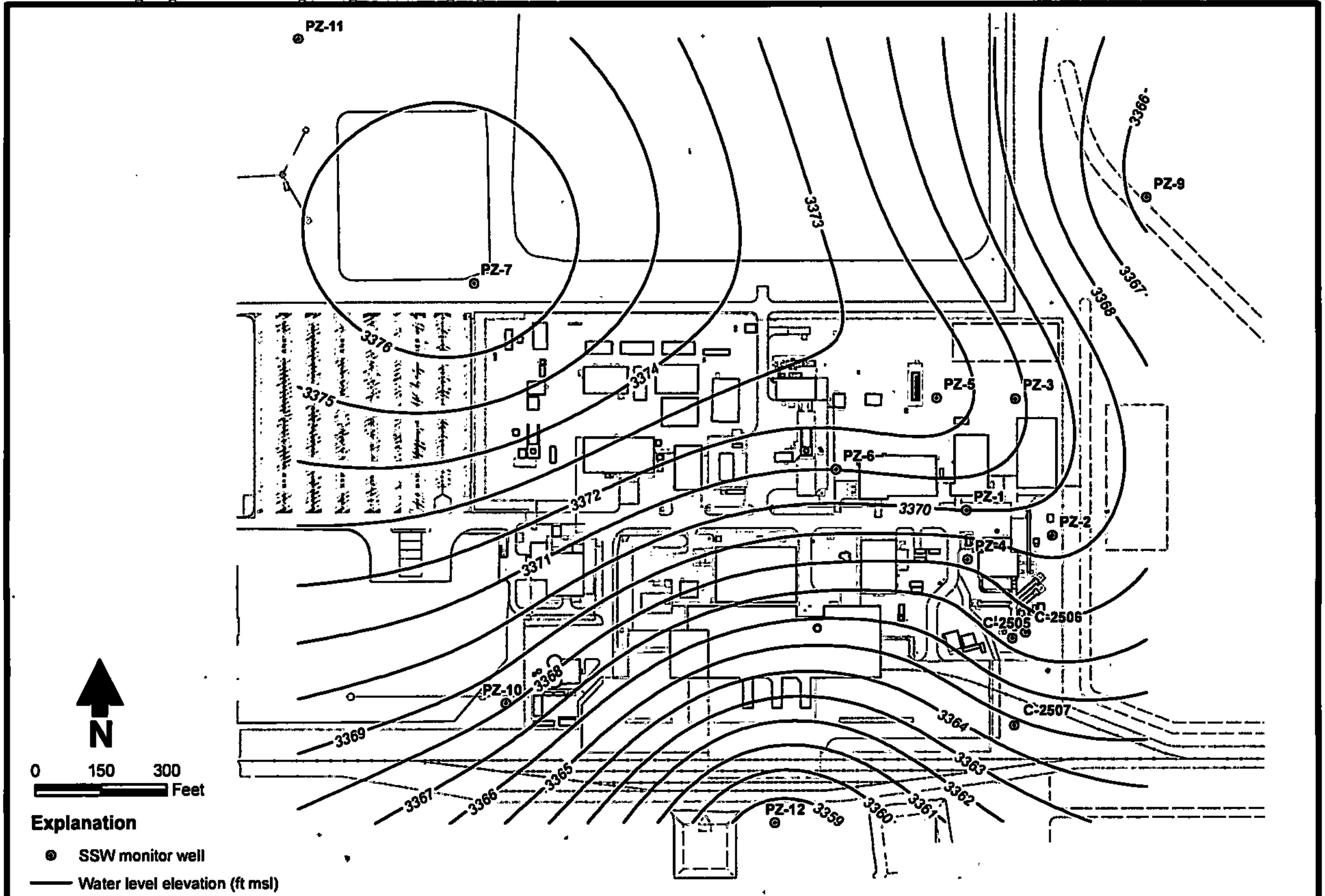
Figure E-3

Daniel B. Stephens & Associates, Inc.

9/3/2008

JN ES08.0072

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/WATER_2000_OCT.MXD 808270

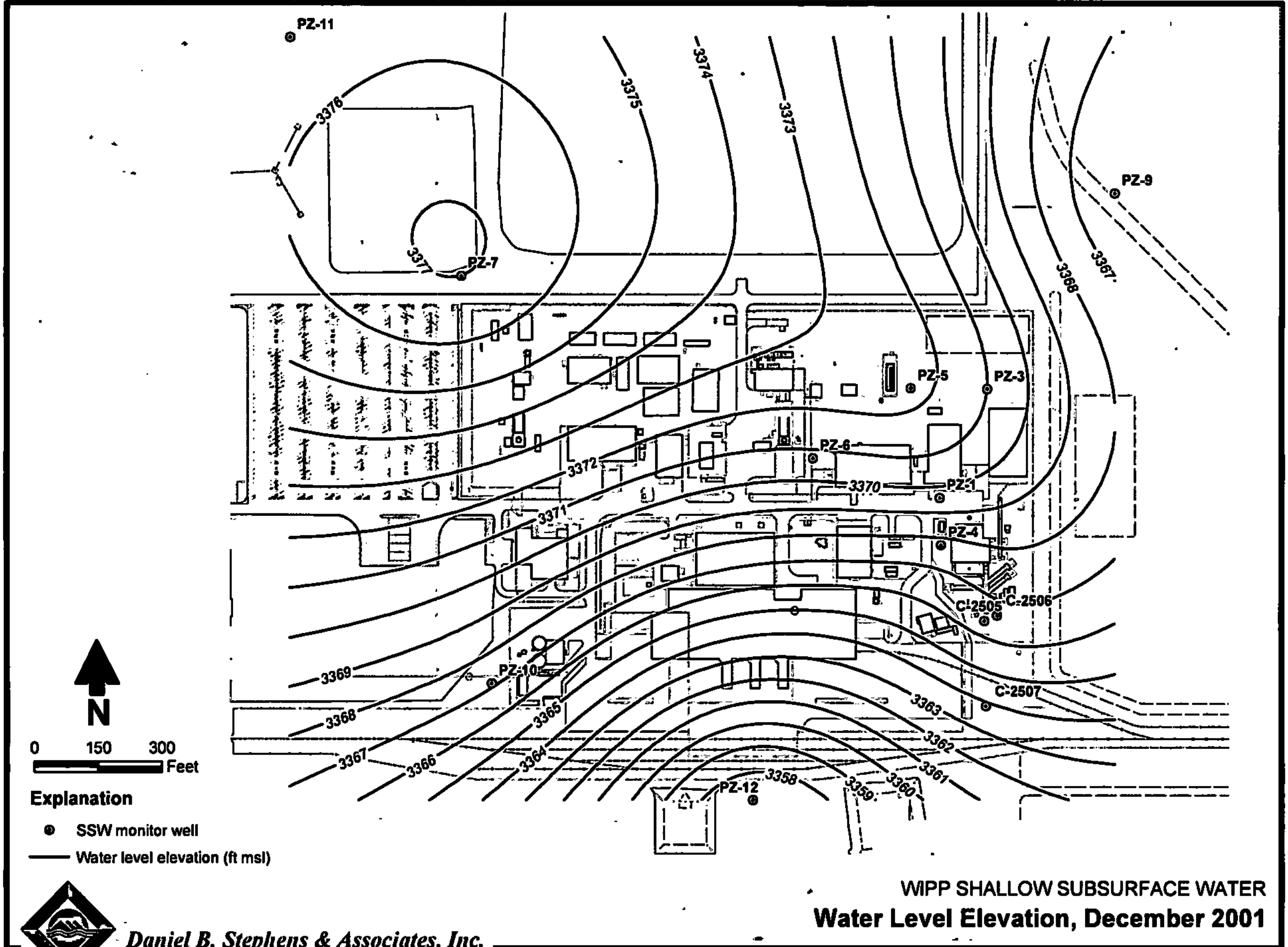


WIPP SHALLOW SUBSURFACE WATER

Water Level Elevation, October 2000

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure E-4



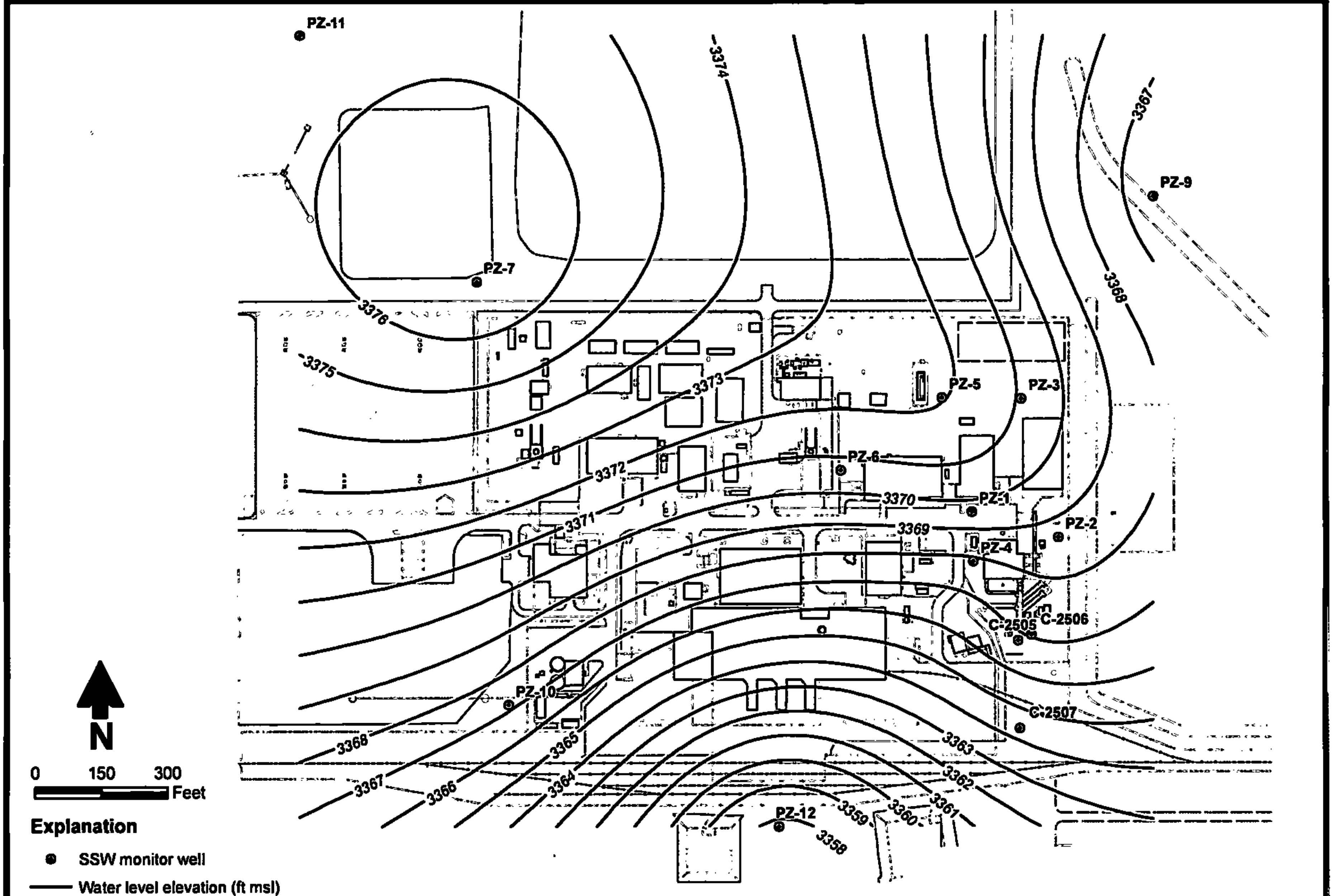
WIPP SHALLOW SUBSURFACE WATER

Water Level Elevation, December 2001

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure E-5

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/WATER_2002_DEC.MXD 808270



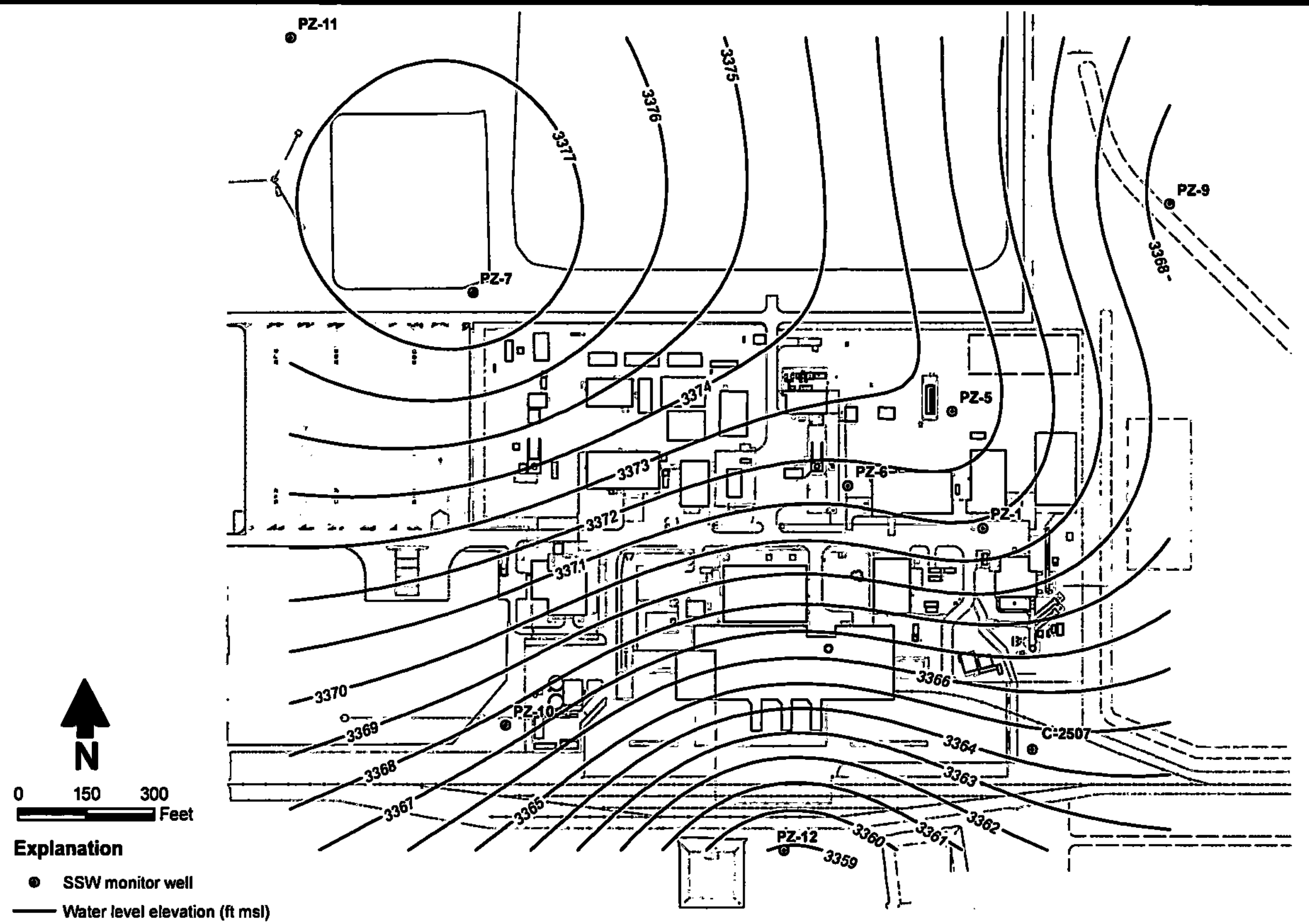
WIPP SHALLOW SUBSURFACE WATER

Water Level Elevation, December 2002

Figure E-6

Daniel B. Stephens & Associates, Inc.
9/3/2008 JN ES08.0072

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/WATER_2004_JUNE.MXD 808270



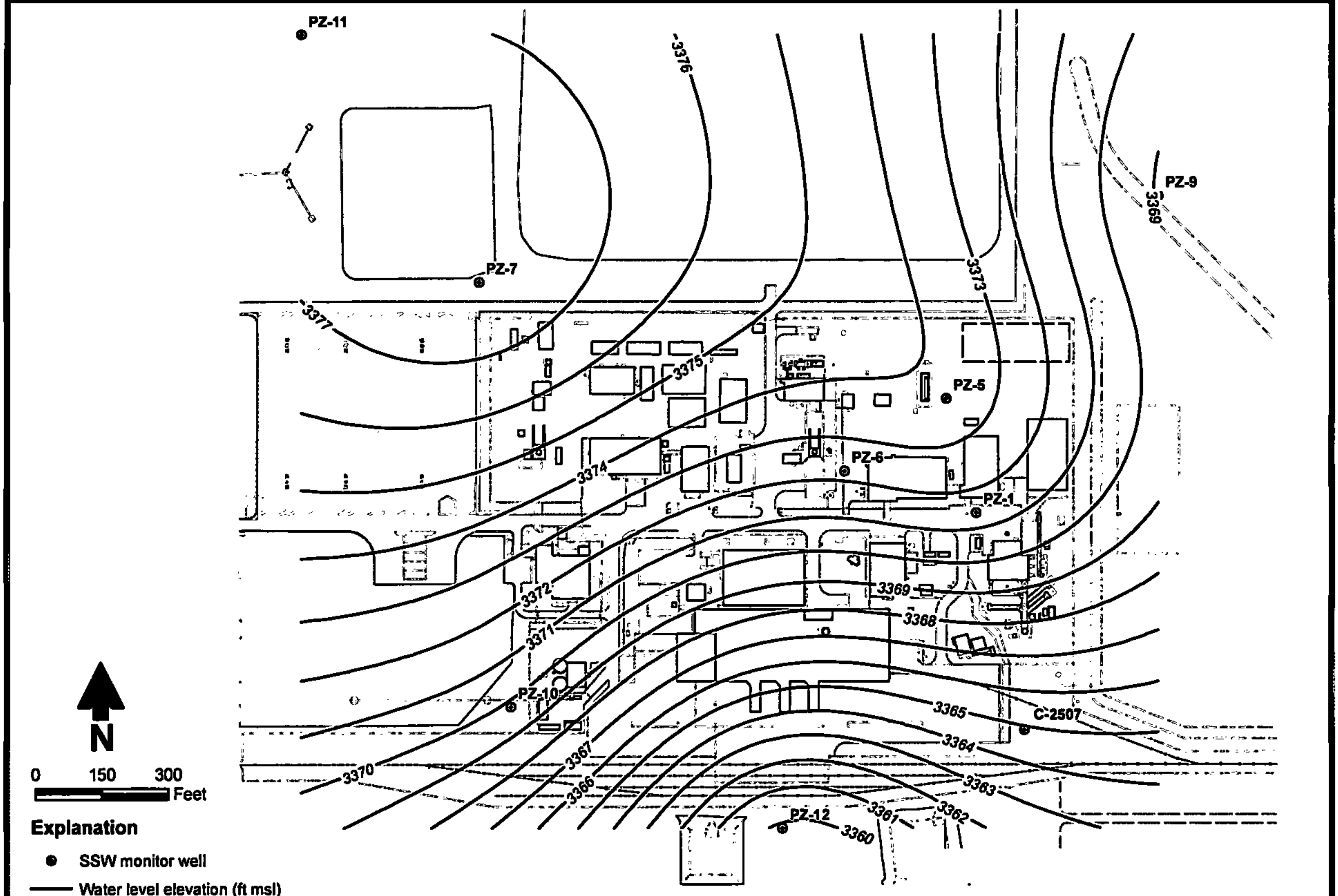
WIPP SHALLOW SUBSURFACE WATER

Water Level Elevation, June 2004

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure E-7

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/WATER_2004_NOV.MXD 608270



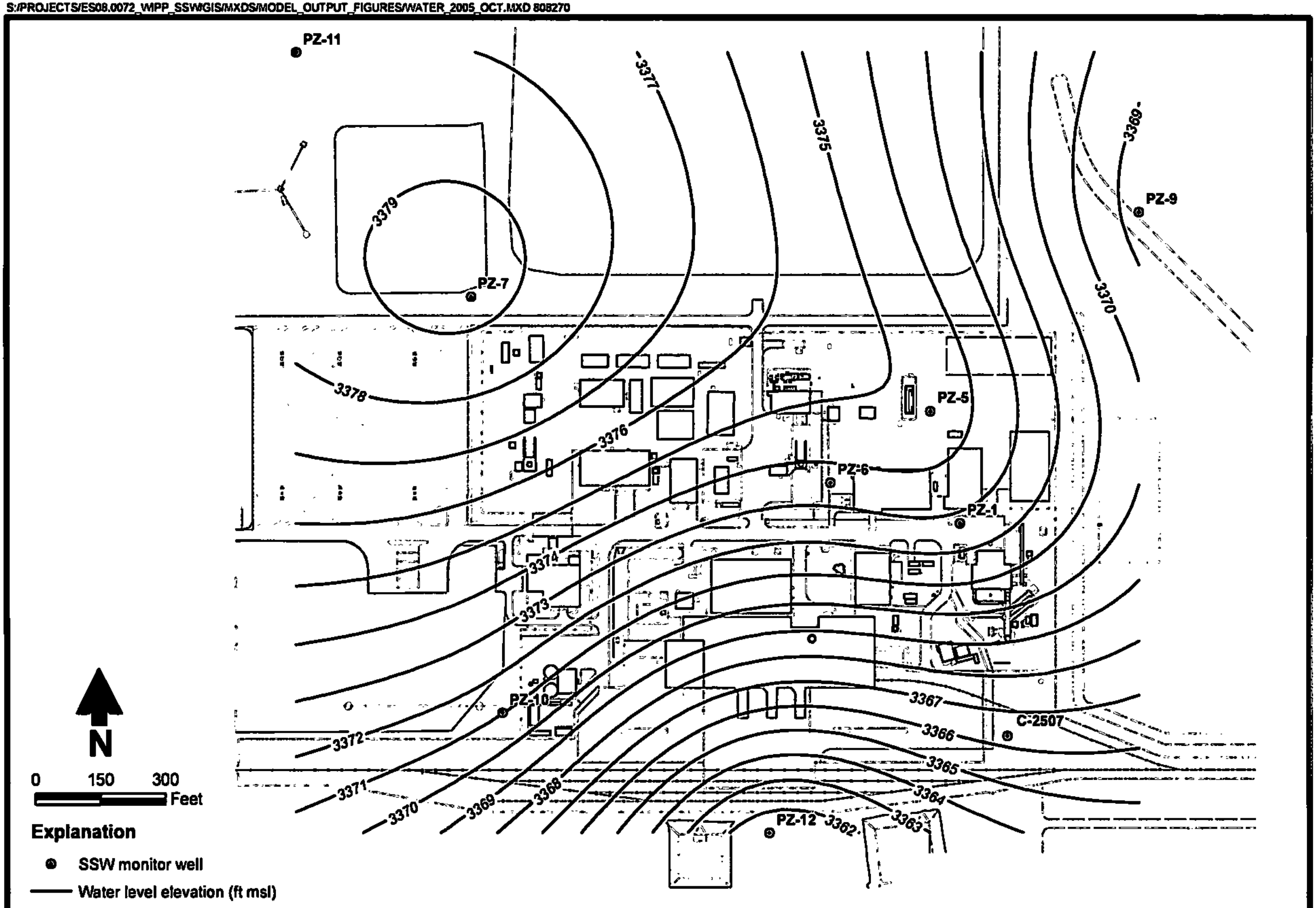
WIPP SHALLOW SUBSURFACE WATER

Water Level Elevation, November 2004

Figure E-8

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

S:/PROJECTS/ES08.0072_WIPP_SSWGIS/MXDS/MODEL_OUTPUT_FIGURES/WATER_2005_OCT.MXD 808270



WIPP SHALLOW SUBSURFACE WATER

Water Level Elevation, October 2005

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure E-9

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/WATER_2006_OCT.MXD 808270

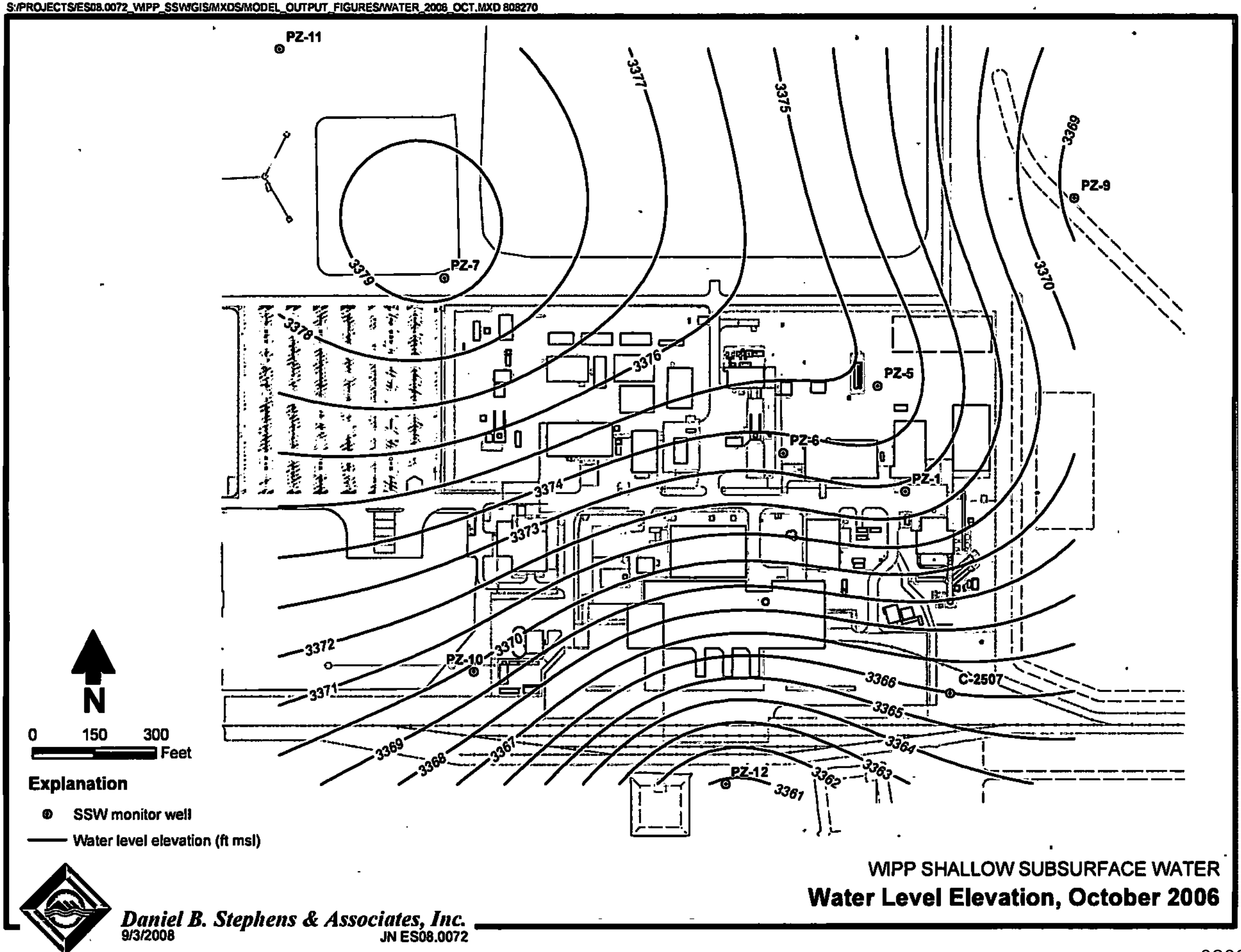
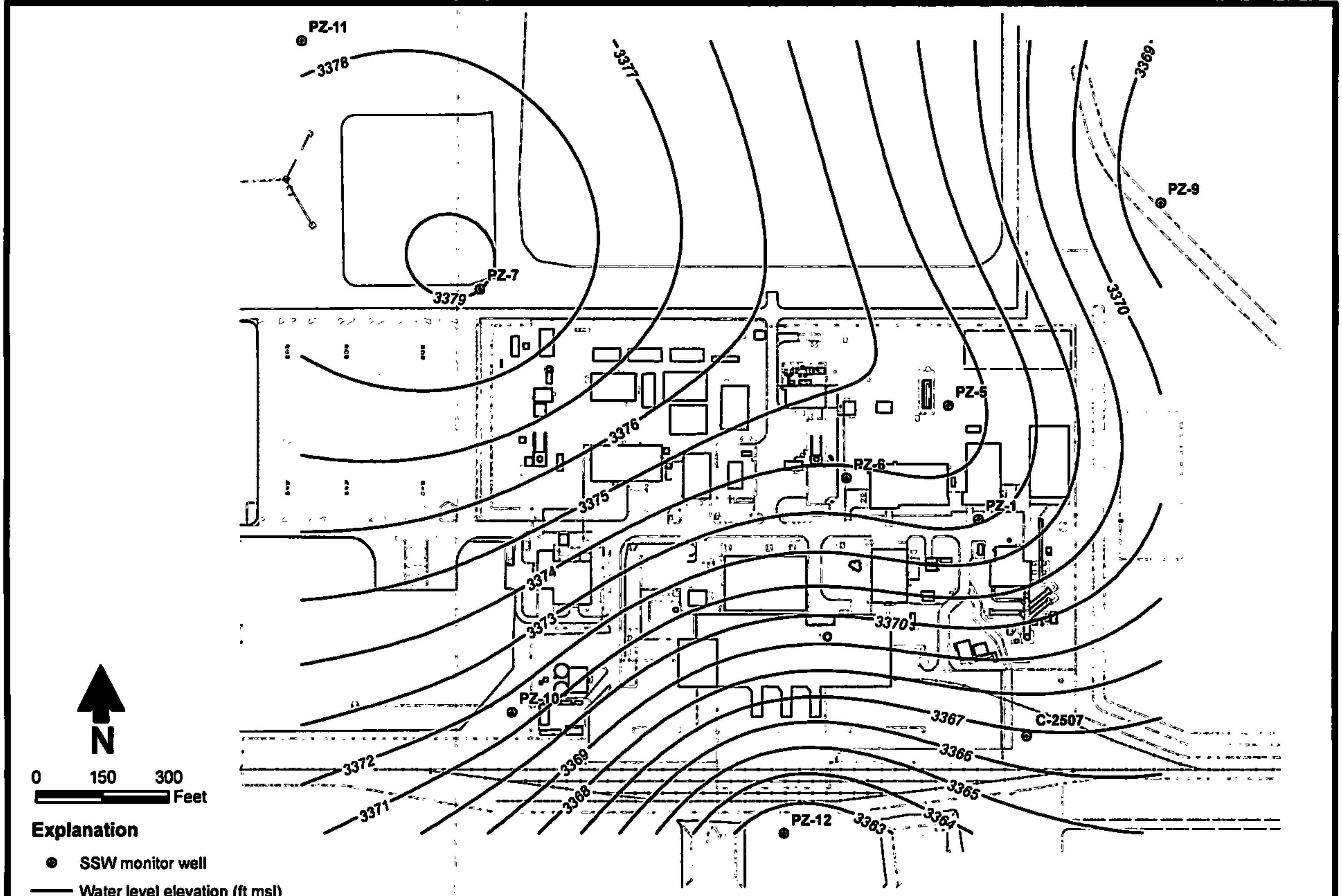


Figure E-10

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/WATER_2007_OCT.MXD



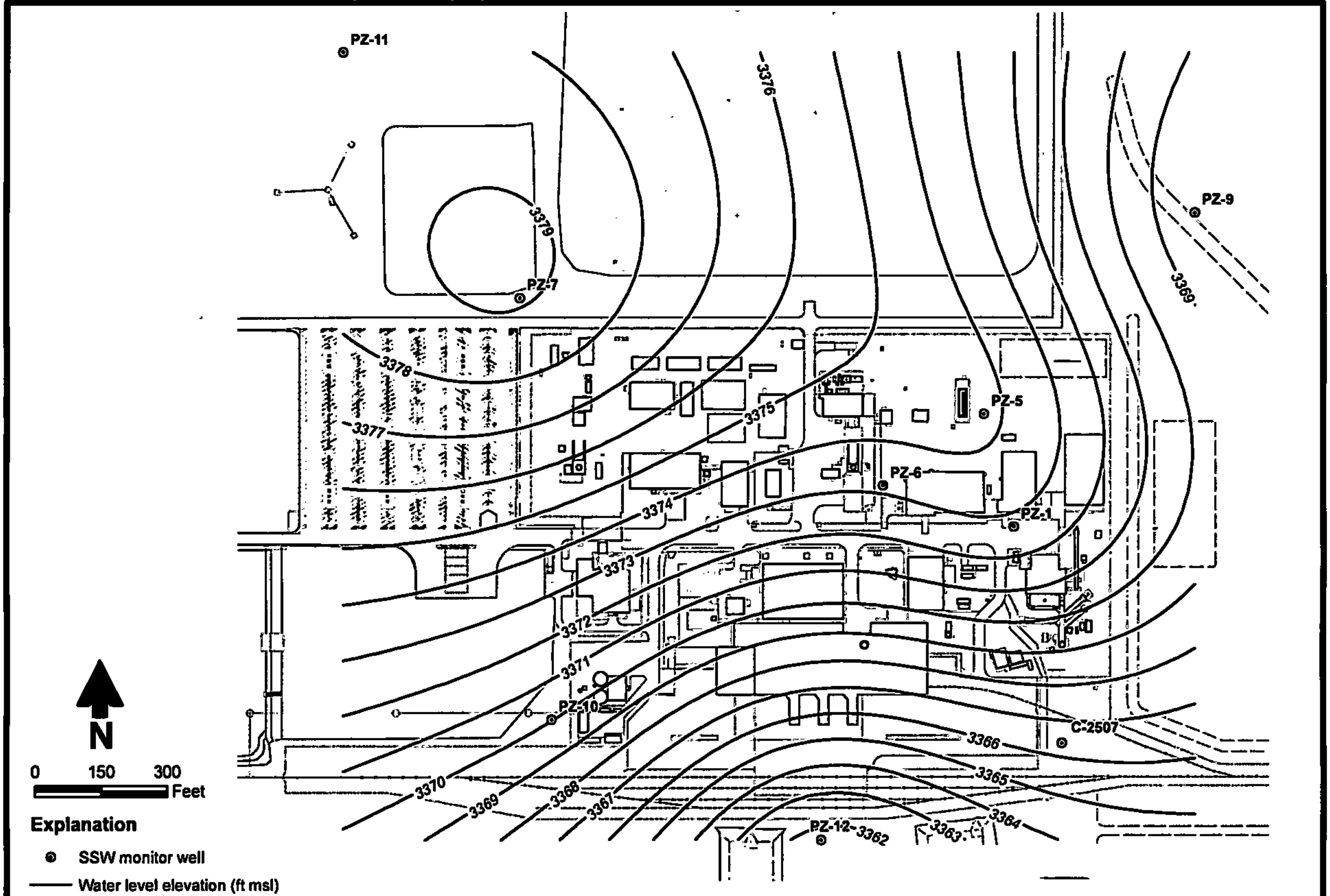
WIPP SHALLOW SUBSURFACE WATER

Water Level Elevation, October 2007

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure E-11

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/WATER_2008_JUNE.MXD



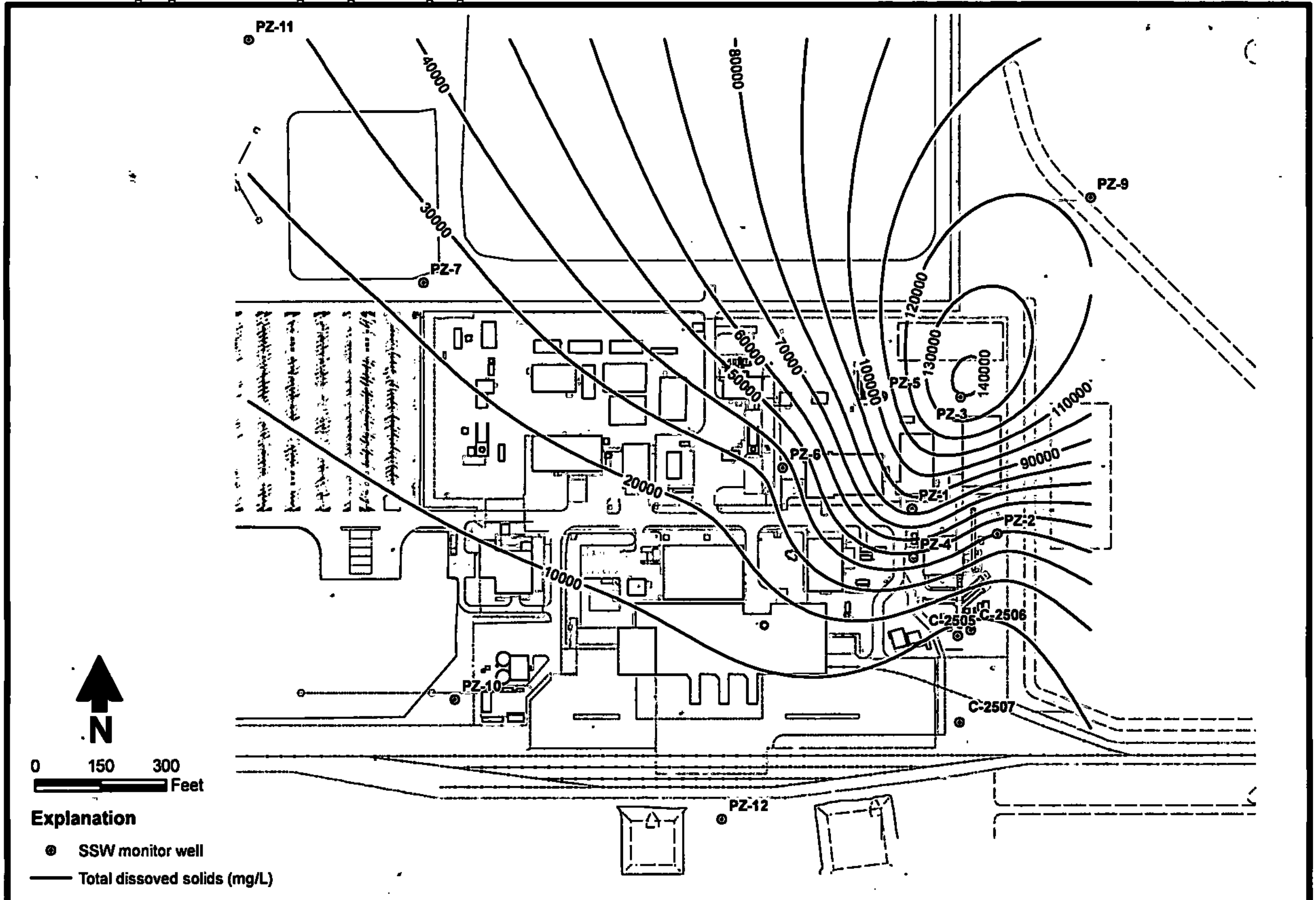
WIPP SHALLOW SUBSURFACE WATER

Water Level Elevation, June 2008

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure E-12

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_1997_OCT.MXD



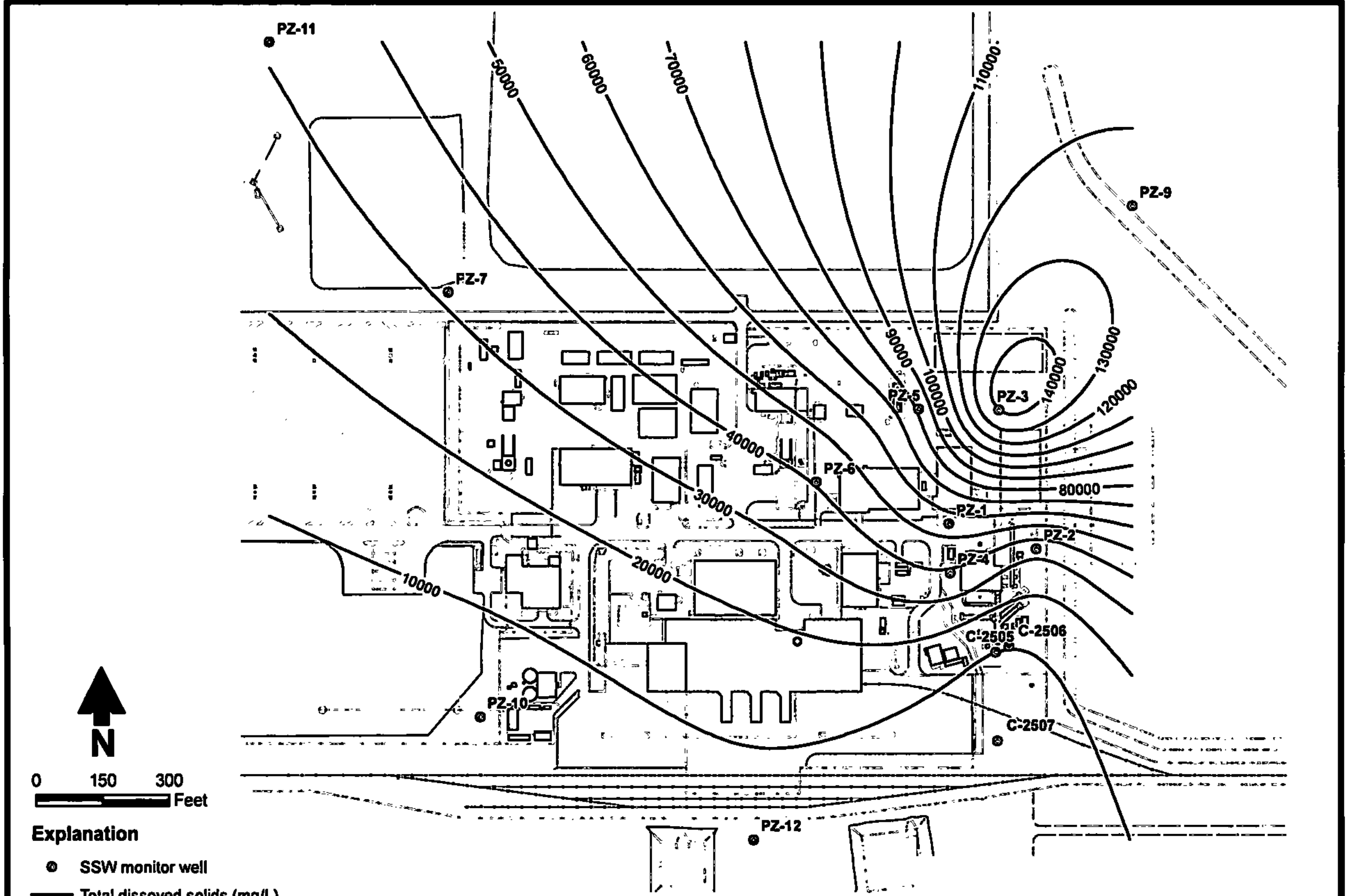
WIPP SHALLOW SUBSURFACE WATER

Total Dissolved Solids, October 1997

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure F-1

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_1998_OCT.MXD



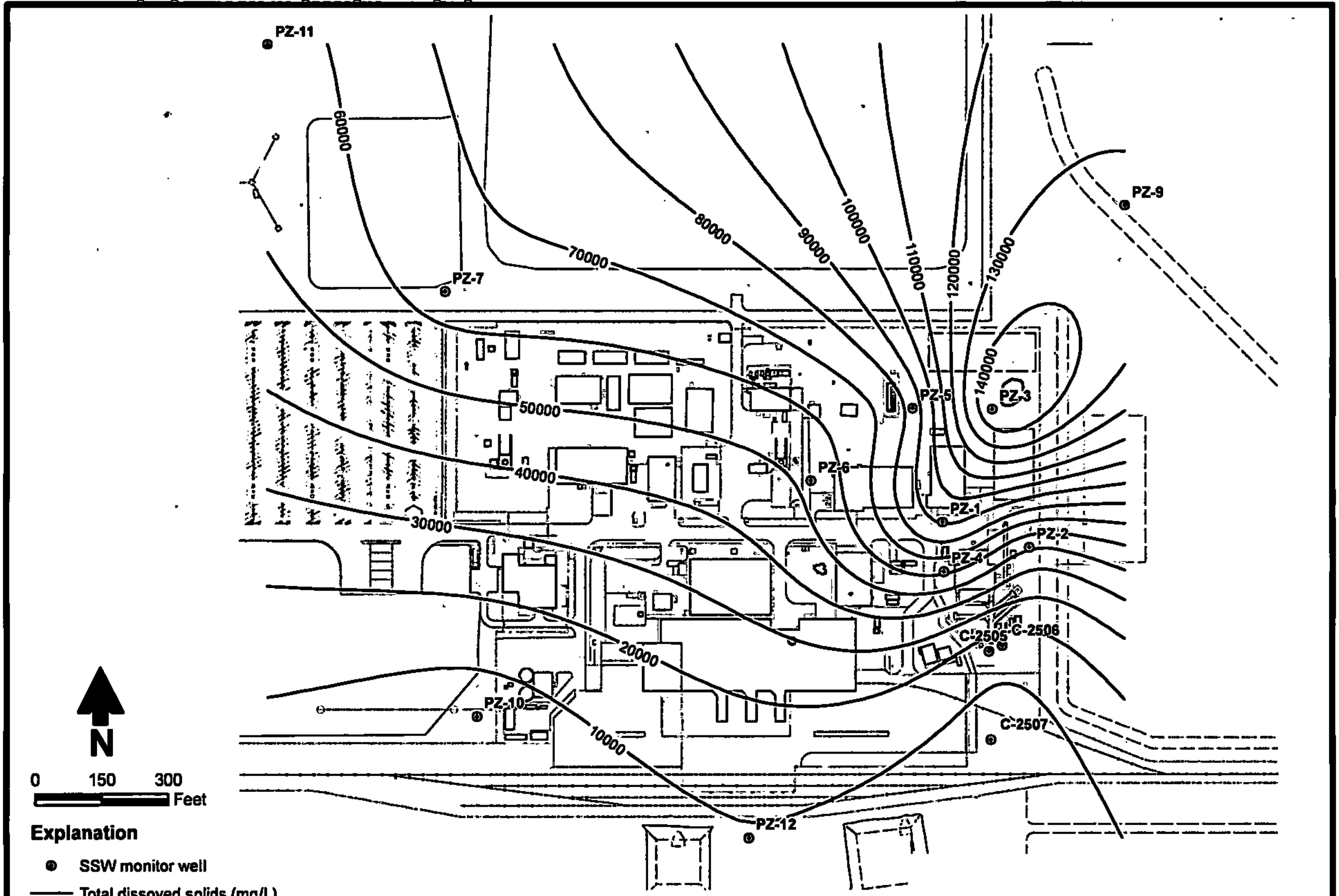
Explanation

- SSW monitor well
- Total dissoved solids (mg/L)

Figure F-2

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

WIPP SHALLOW SUBSURFACE WATER
Total Dissolved Solids, October 1998



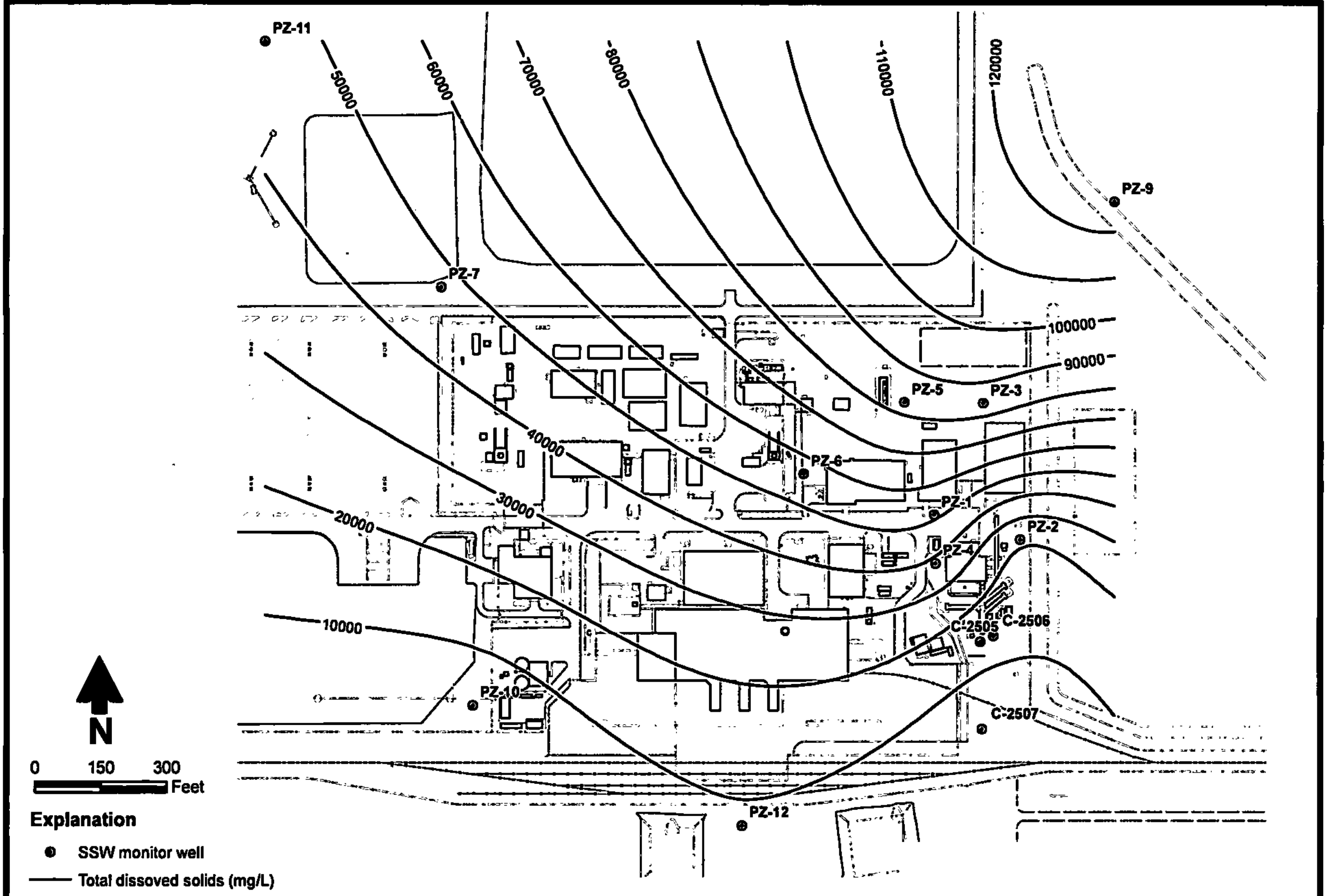
WIPP SHALLOW SUBSURFACE WATER

Total Dissolved Solids, August 1999

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure F-3

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_2000_OCT.MXD



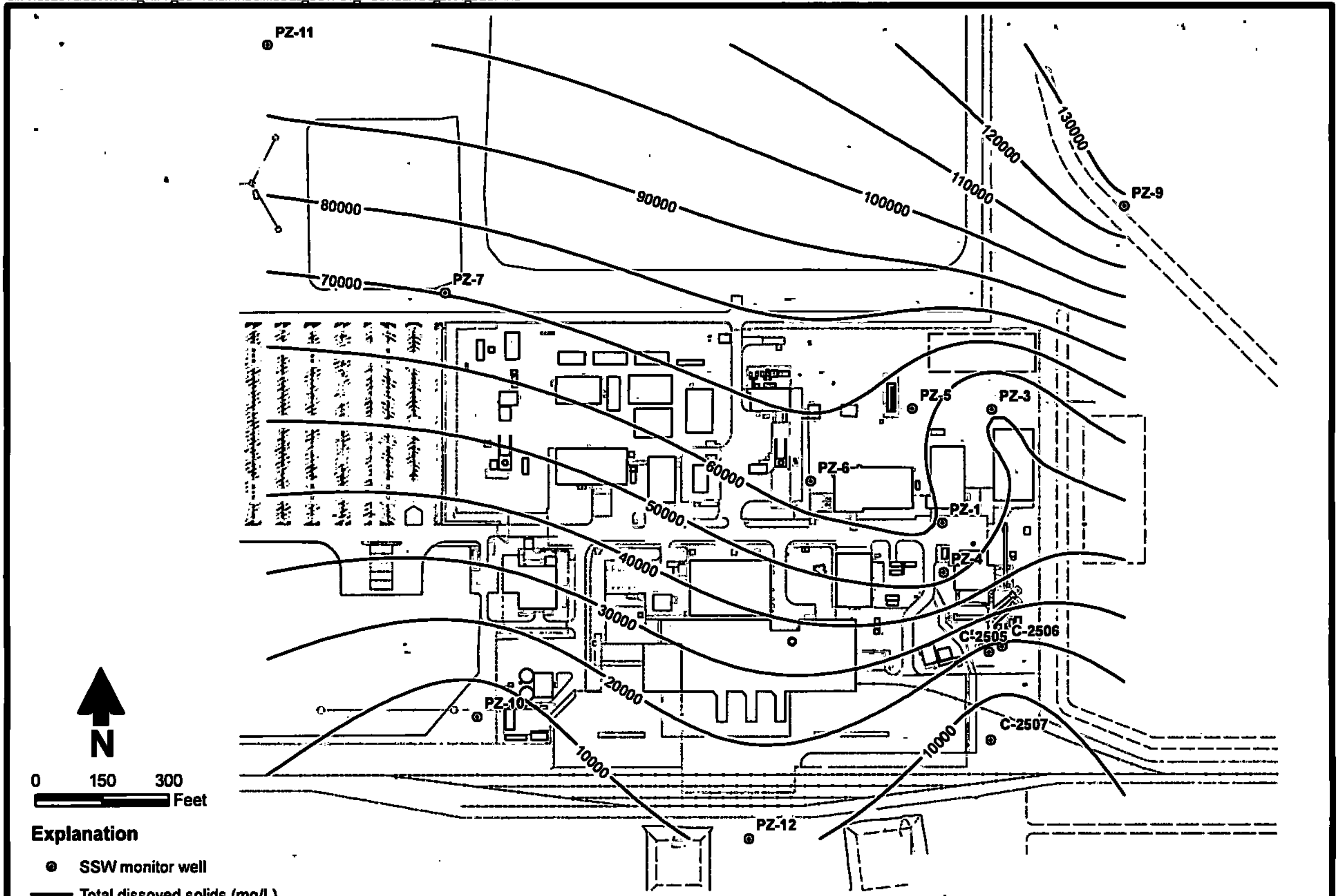
WIPP SHALLOW SUBSURFACE WATER

Total Dissolved Solids, October 2000

Figure F-4

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_2001_DEC.MXD



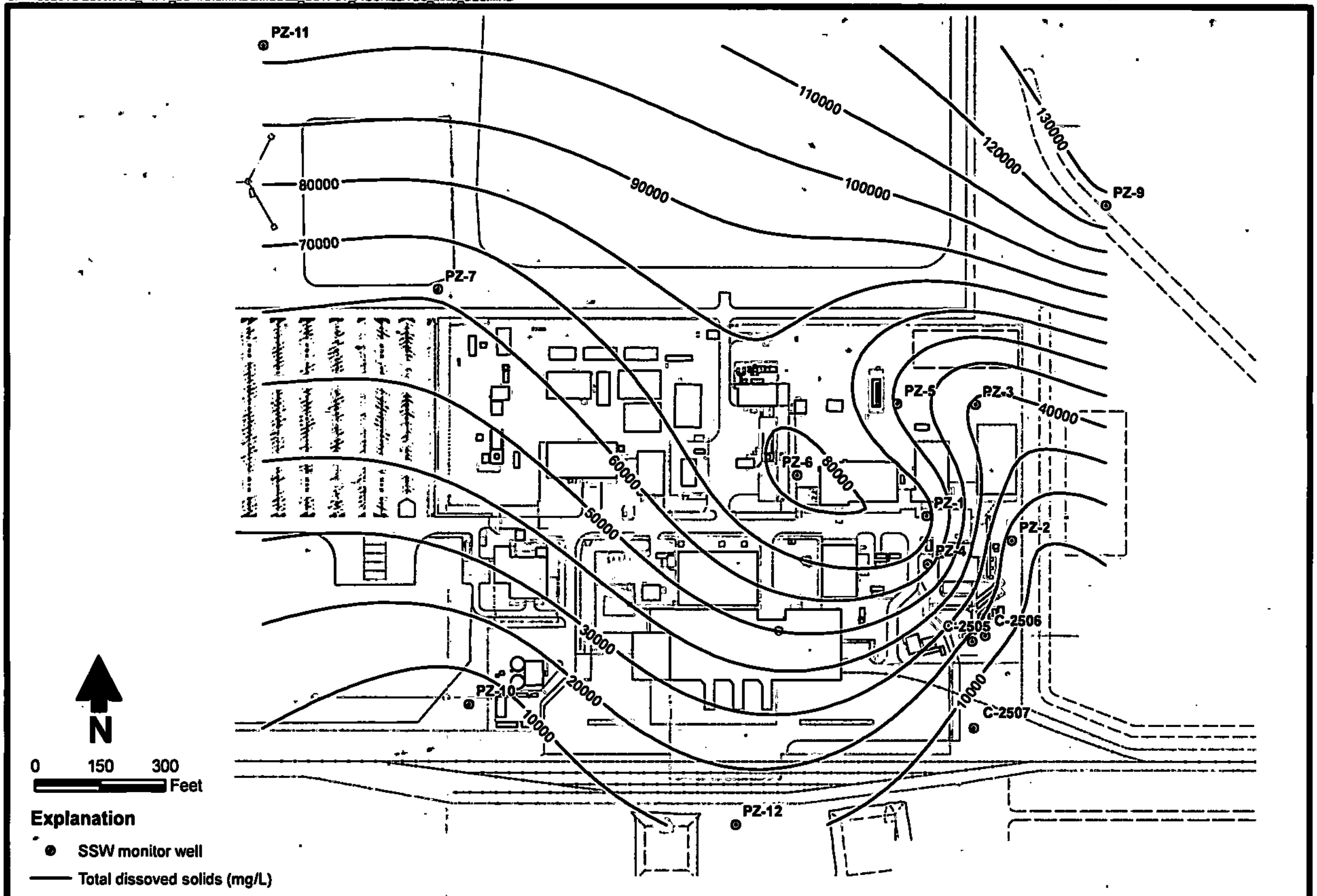
WIPP SHALLOW SUBSURFACE WATER

Total Dissolved Solids, December 2001

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure F-5

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_2002_DEC.MXD



WIPP SHALLOW SUBSURFACE WATER

Total Dissolved Solids, December 2002

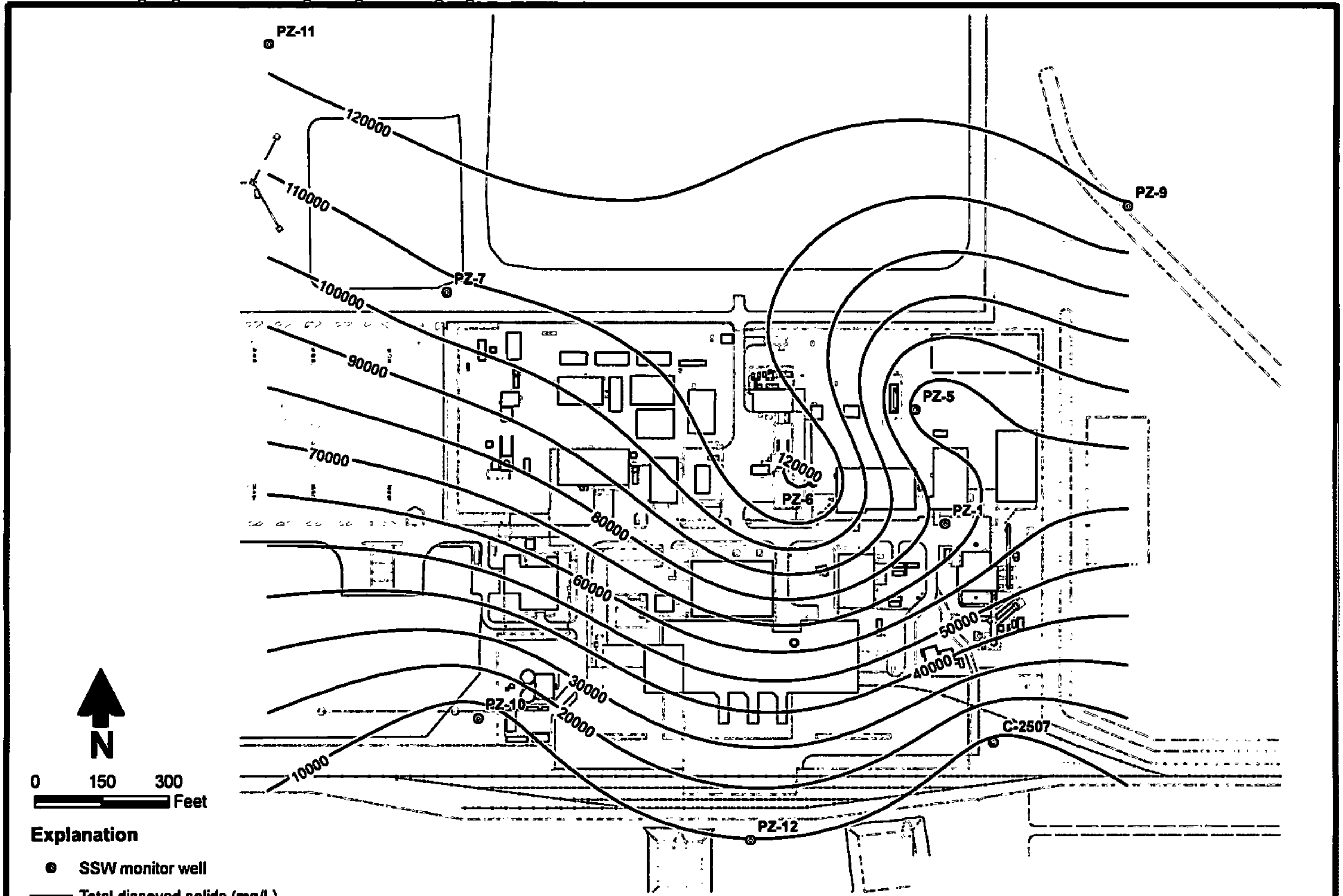
Daniel B. Stephens & Associates, Inc.

9/3/2008

JN ES08.0072

Figure F-6

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_2004_JUNE.MXD



Explanation

- SSW monitor well
- Total dissoved solids (mg/L)

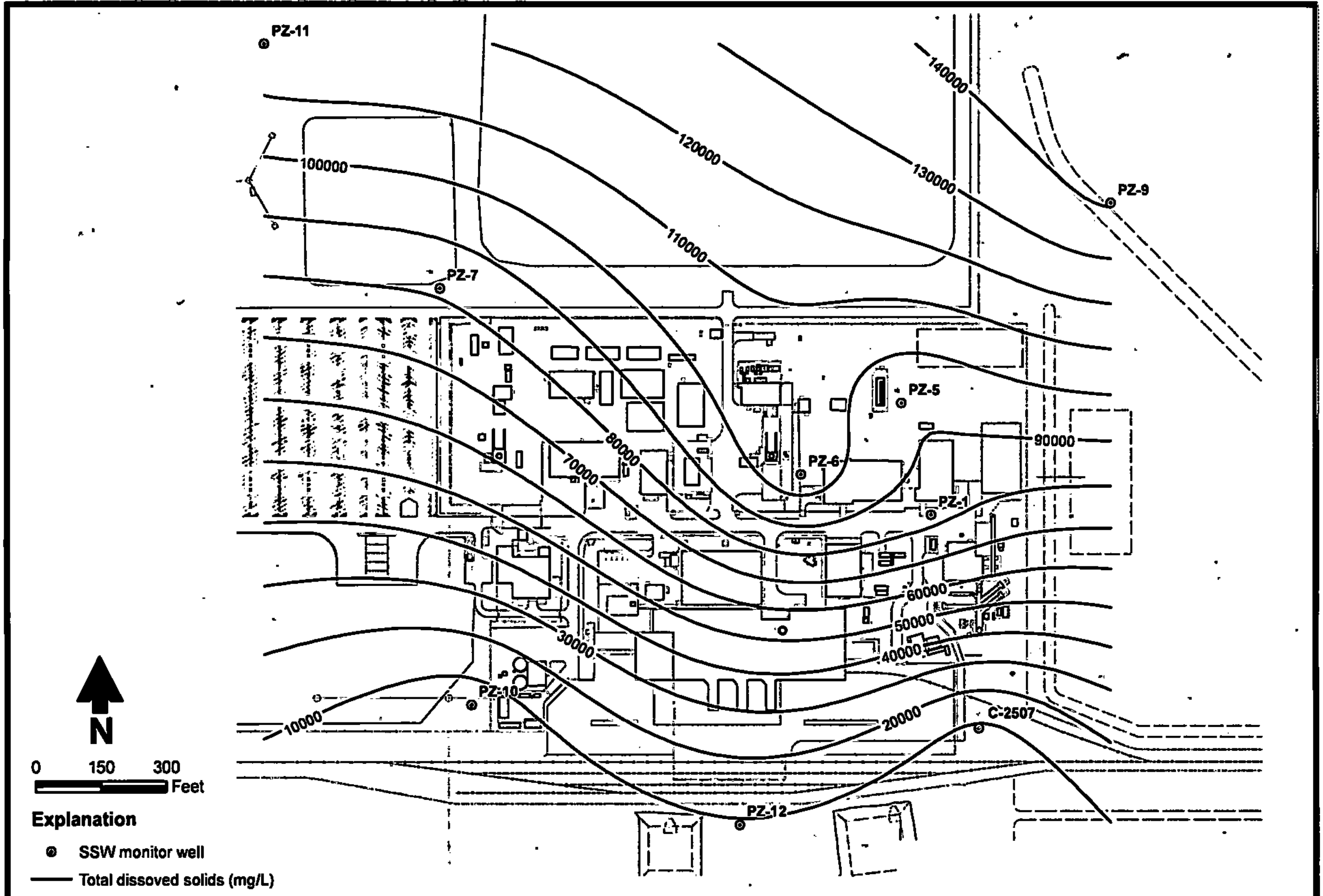
WIPP SHALLOW SUBSURFACE WATER

Total Dissolved Solids, June 2004

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure F-7

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_2004_NOV.MXD



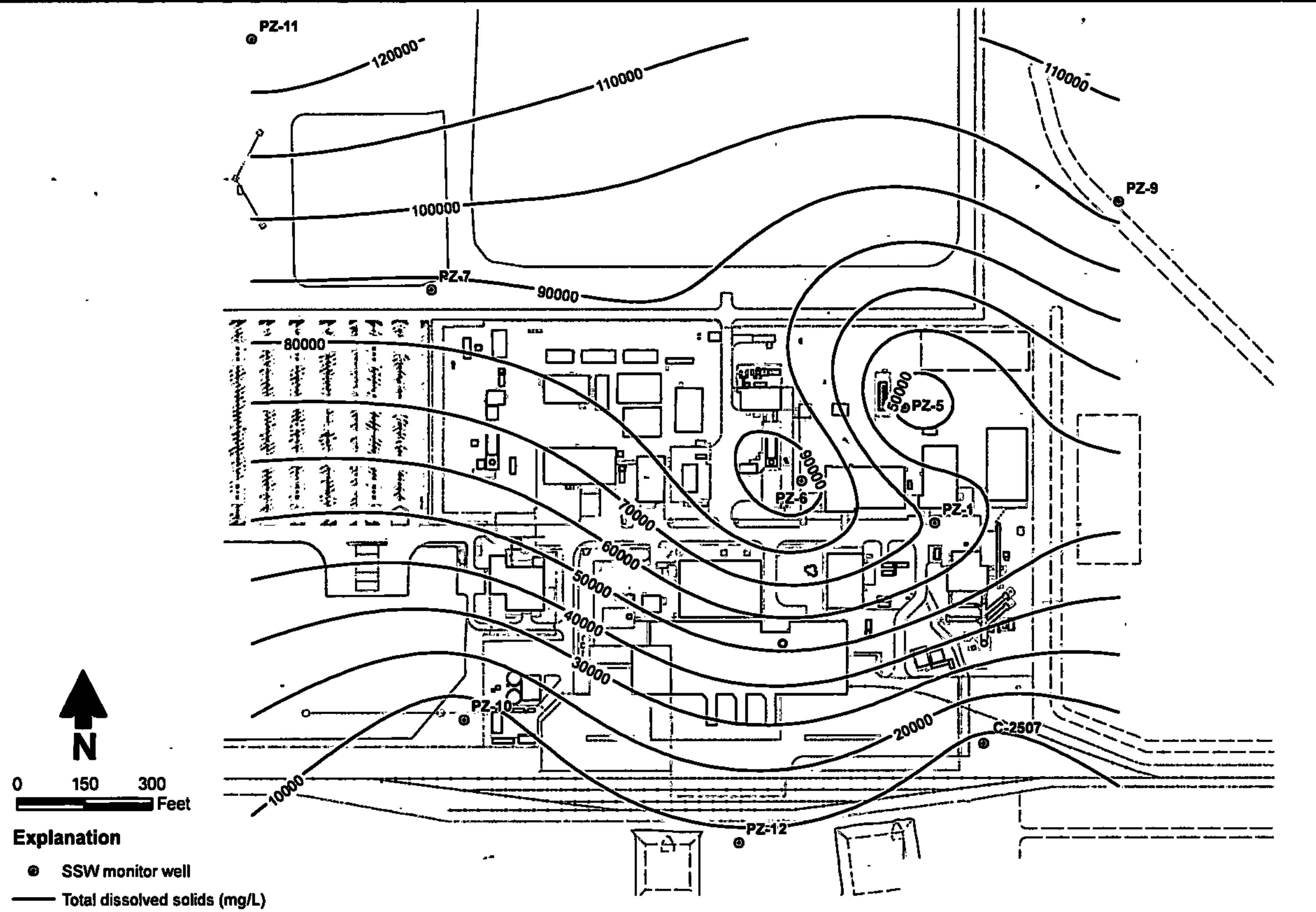
WIPP SHALLOW SUBSURFACE WATER

Total Dissolved Solids, November 2004

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure F-8

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_2005_OCT.MXD



Explanation

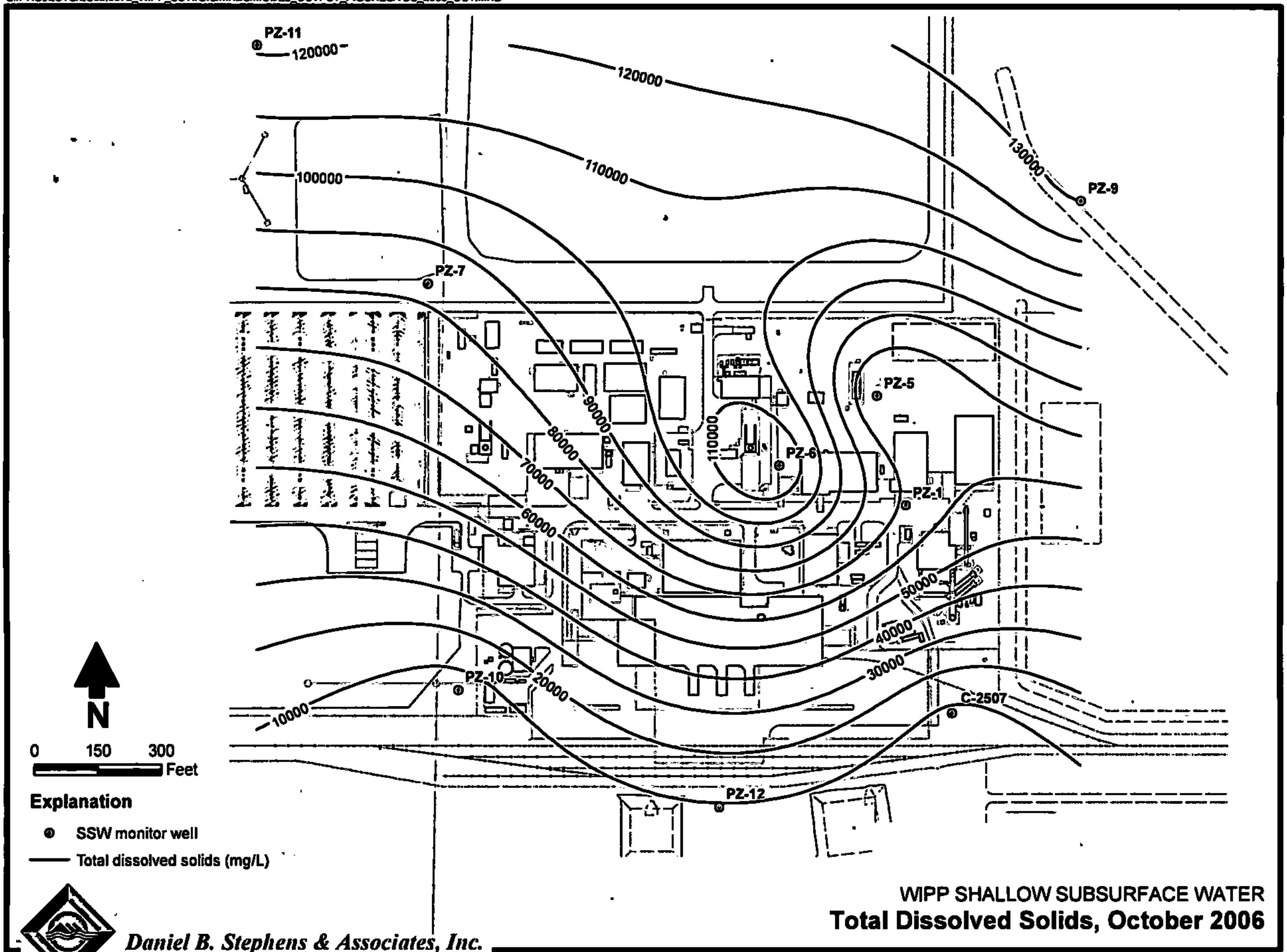
- SSW monitor well
- Total dissolved solids (mg/L)

Figure F-9

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

WIPP SHALLOW SUBSURFACE WATER
Total Dissolved Solids, October 2005

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_2006_OCT.MXD

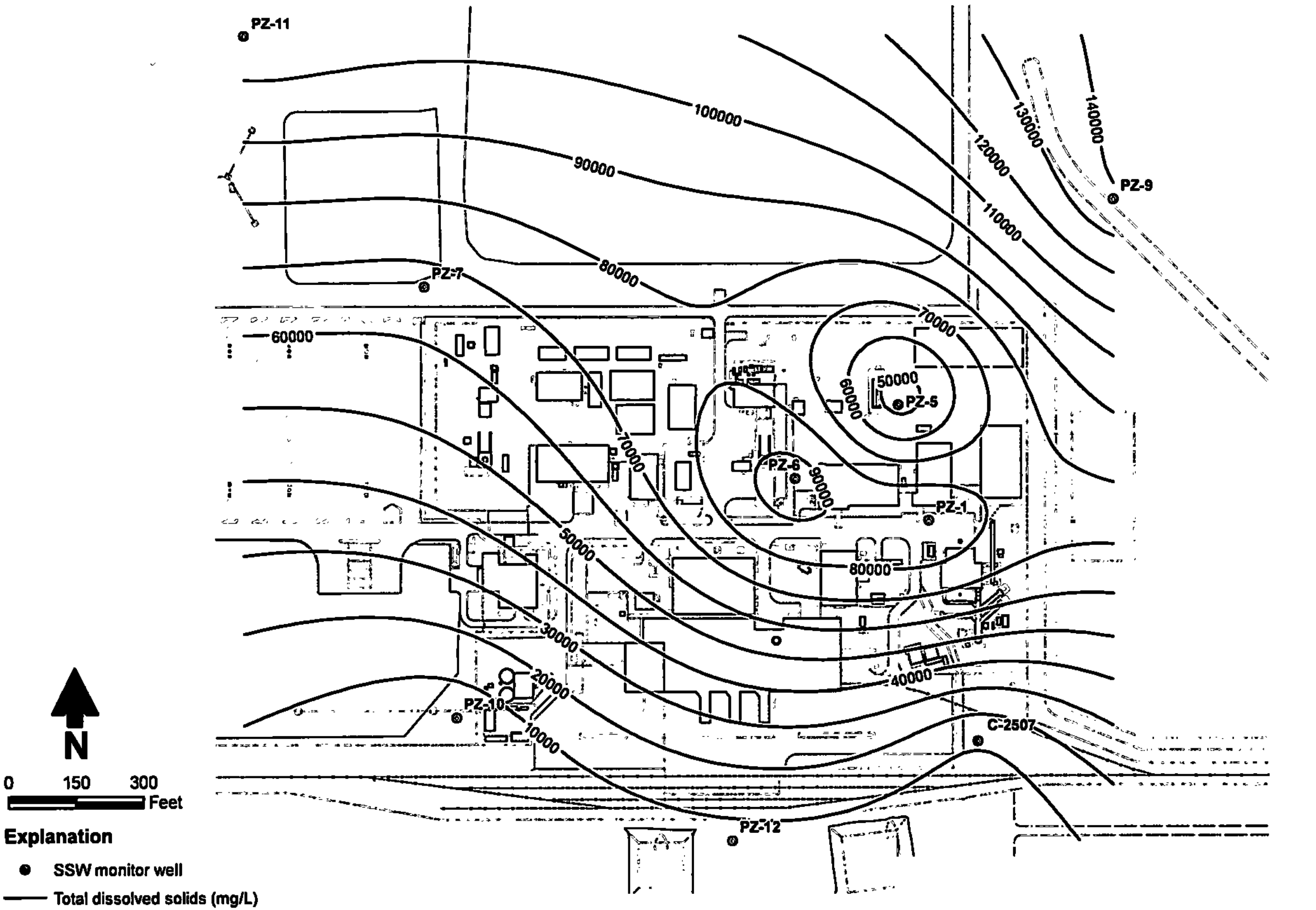


WIPP SHALLOW SUBSURFACE WATER

Total Dissolved Solids, October 2006

Figure F-10

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_2007_OCT.MXD



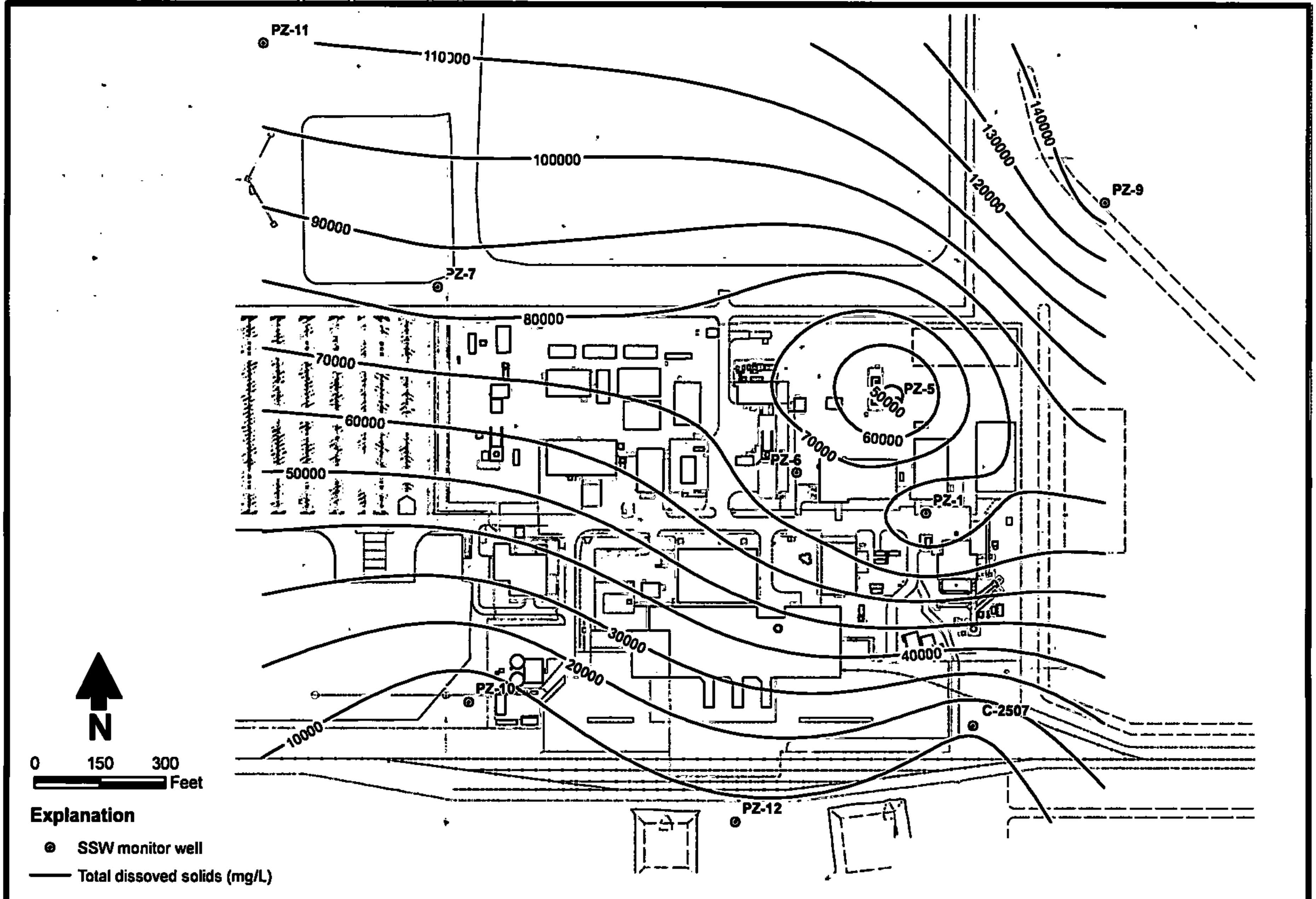
WIPP SHALLOW SUBSURFACE WATER

Total Dissolved Solids, October 2007

Figure F-11

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

S:/PROJECTS/ES08.0072_WIPP_SSW/GIS/MXDS/MODEL_OUTPUT_FIGURES/TDS_2008_JUNE.MXD



WIPP SHALLOW SUBSURFACE WATER

Total Dissolved Solids, June 2008

Daniel B. Stephens & Associates, Inc.
9/3/2008
JN ES08.0072

Figure F-12

Appendix G

Moisture Redistribution Calculations

Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Sandy Clay Loam (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

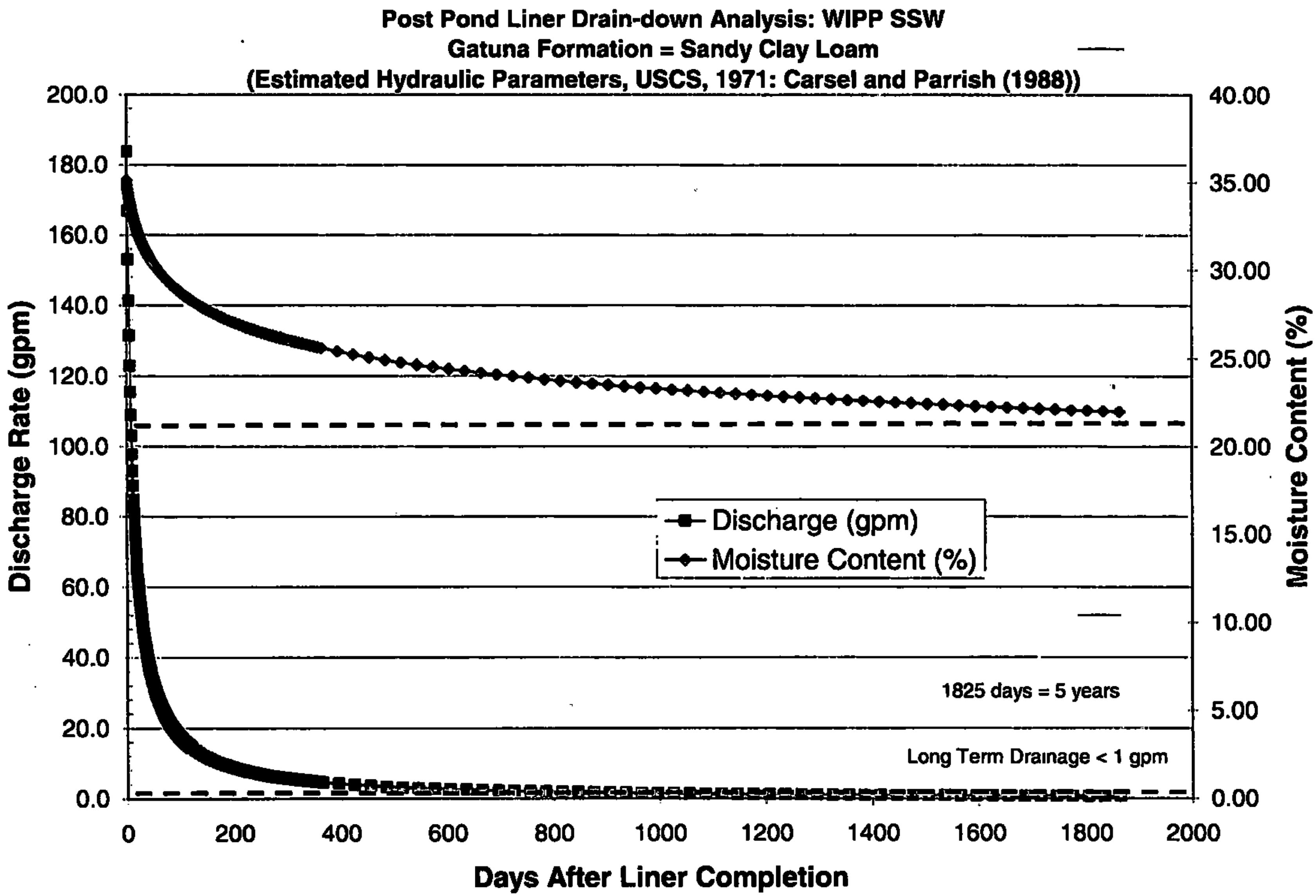
Parameter	*Value*	*Units*	*Notes*
Area	**10.61**	**(acres)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Thickness	**30**	**(ft)**	**Gatuna Formation**
Total Bulk Volume of Saturation	**318.3**	**(acre-ft)**	**Gatuna Formation**
Porosity	**0.39**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.351**	**fraction**	**90% of Saturated Moisture Content (Estimated)**
Initial Storage Volume (Gatuna Formation)	**111.7**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.1**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**79.9**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**41.7**	**(acre-ft)**	**5 Year Drainage**

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	35.10	34 84	34.61	34.40	34 20	34 02		22 03
	Discharge (gpm)	1.84E+02	1.67E+02	1.53E+02	1.41E+02	1.31E+02	1.23E+02		7.71E-01
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	2.70E-05	2.45E-05	2.25E-05	2.08E-05	1.93E-05	1.81E-05		1.13E-07
Effective Saturation (Stephens, 1995)	Se	0.865517	0.856718	0.848729	0.841405	0.834638	0.828346	Daily Time Steps for 5 Years	0.414688
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.48	1.48	1.48	1.48	1.48	1.48		1.48
Mualem model (Stephens, 1995)	m	0.324324	0.324324	0.324324	0.324324	0.324324	0 324324		0.324324
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0 059	0 059	0.059	0.059	0.059	0.059		0 059
Pressure head (Stephens, 1995)	P-head (-cm)	11.46892	12.14953	12.77624	13.35892	13 90482	14.4194		101.2609
Relative hydraulic conductivity	Kr	0.074217	0.067381	0.061772	0.057074	0.053074	0.04962		0.000311
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3 64E-04		3.64E-04
Drainage Volume (acre-ft)		0.00E+00	8.12E-01	7.37E-01	6.76E-01	6.25E-01	5.81E-01		1.04E-01

__References.__

Carsel, R.F and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B , 1996. Vadose Zone Hydrology CRC Press.



T:\Projects\9184\Sheets\Final Water Balance\Vadose Zone Redistribution Estimate Ponds 90 DRAFT 7-22-08_working_copy.xls_Drain-down Chart (SCL, CP)

Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Silt (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

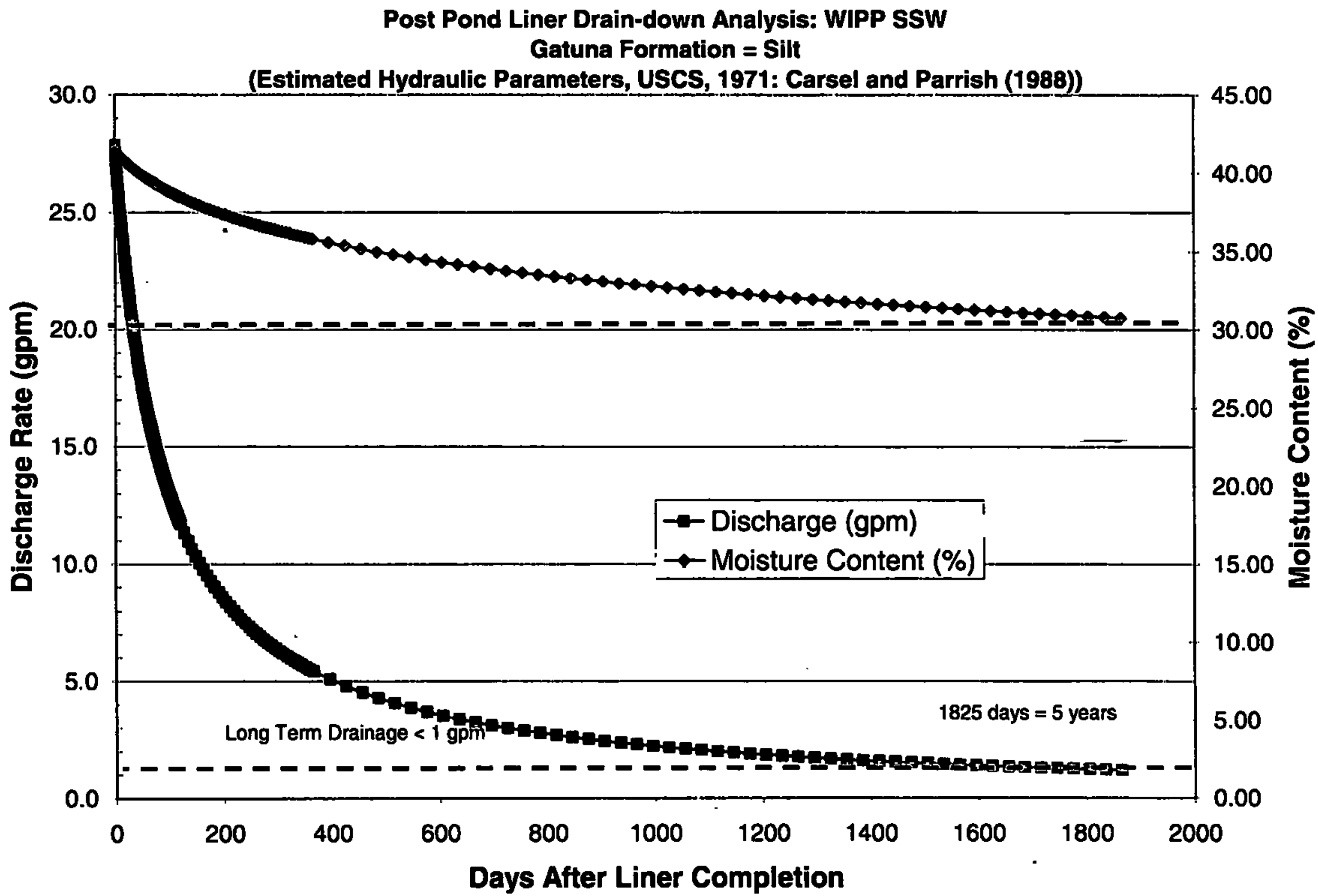
Parameter	*Value*	*Units*	*Notes*
Area	**10.61**	**(acres)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Thickness	**30**	**(ft)**	**Gatuna Formation**
Total Bulk Volume of Saturation	**318.3**	**(acre-ft)**	**Gatuna Formation**
Porosity	**0.46**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.414**	**fraction**	**90% of Saturated Moisture Content (Estimated)**
Initial Storage Volume (Gatuna Formation)	**131.8**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.034**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**121.0**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**33.8**	**(acre-ft)**	**5 Year Drainage**

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	41.40	41.36	41 32	41.29	41.25	41.21		30.84
	Discharge (gpm)	2.79E+01	2.75E+01	2.72E+01	2.69E+01	2 66E+01	2.63E+01		1.24E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	4.09E-06	4.04E-06	4.00E-06	3.95E-06	3.90E-06	3.86E-06		1.83E-07
Effective Saturation (Stephens, 1995)	Se	0.892019	0.891111	0.890214	0.889328	0.888452	0.887586		0.64403
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.37	1.37	1.37	1.37	1.37	1.37	Daily Time Steps for 5 Years	1.37
Mualem model (Stephens, 1995)	m	0.270073	0.270073	0.270073	0.270073	0.270073	0.270073		0.270073
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0 016	0.016	0 016	0.016	0.016	0.016		0 016
Pressure head (Stephens, 1995)	P-head (-cm)	39.14123	39.45359	39.76276	40.06883	40.37189	40 67199		175.0498
Relative hydraulic conductivity	Kr	0 058938	0.058229	0.057538	0.056865	0 056209	0.055569		0.00263
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05		6.94E-05
Drainage Volume (acre-ft)		0.00E+00	1.23E-01	1.22E-01	1.20E-01	1 19E-01	1 17E-01		1.67E-01

References.

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D B., 1996 Vadose Zone Hydrology CRC Press.



T:\Projects\9184\Sheets\Final Water Balance\Vadose Zone Redistribution Estimate Ponds 90 DRAFT 7-22-08_working_copy.xls_Drain-down Chart (Silt, CP)

Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Clay Loam (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

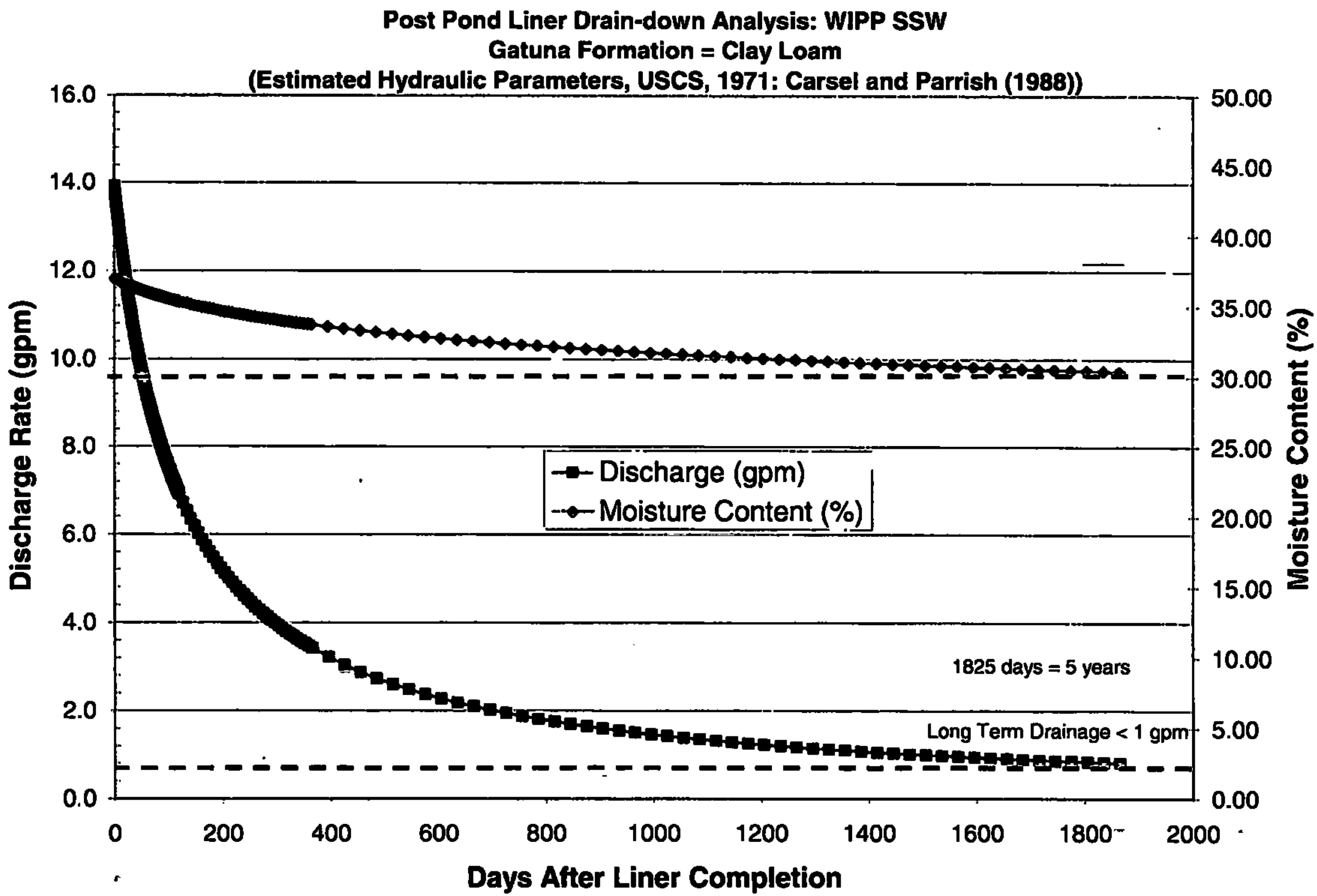
Parameter	*Value*	*Units*	*Notes*
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.41	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.369	fraction	90% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	117.5	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.095	fraction	Carsel and Parrish, 1988
Potential Drainage	87.2	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	20.7	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	36.90	36.88	36.86	36.84	36.82	36.81		30.44
	Discharge (gpm)	1.39E+01	1.38E+01	1 37E+01	1.36E+01	1.35E+01	1.33E+01		8.23E-01
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	2.05E-06	2.03E-06	2 01E-06	1 99E-06	1.98E-06	1.96E-06		1.21E-07
Effective Saturation (Stephens, 1995)	Se	0.869841	0.869228	0.86862	0.868017	0.867419	0.866826		0.6647
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.31	1.31	1 31	1.31	1 31	1.31	Daily Time Steps for 5 Years	1 31
Mualem model (Stephens, 1995)	m	0.236641	0.236641	0.236641	0.236641	0.236641	0.236641		0.236641
van Genuchten Parameter. Carsel and Parrish, 1988	$alpha_{(v)}$	0.019	0.019	0 019	0.019	0 019	0.019		0.019
Pressure head (Stephens, 1995)	P-head (-cm)	44 50117	44.72879	44.95492	45.17958	45.4028	45.6246		169.213
Relative hydraulic conductivity	Kr	0.028318	0.028073	0.027833	0 027597	0.027365	0.027138		0.001675
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05		7.22E-05
Drainage Volume (acre-ft)		0.00E+00	6.15E-02	6 10E-02	6.05E-02	5.99E-02	5.94E-02		1.11E-01

References.

Carsel, R.F and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Clay (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

Parameter	*Value*	*Units*	*Notes*
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.38	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.342	fraction	90% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	108.9	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.068	fraction	Carsel and Parrish, 1988
Potential Drainage	87.2	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	0.9	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	34.20	34.20	34.20	34.20	34.20	34.20		33.92
Incremental Steady State Assumption*	Discharge (gpm)	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01	1.28E-01		9.65E-02
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	1.88E-08	1.88E-08	1.88E-08	1.88E-08	1.88E-08	1.88E-08		1.42E-08
Effective Saturation (Stephens, 1995)	Se	0.878205	0.878199	0.878194	0.878188	0.878182	0.878177	Daily Time Steps for 5 Years	0.869142
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.09	1.09	1.09	1.09	1.09	1.09		1.09
Mualem model (Stephens, 1995)	m	0.082569	0.082569	0.082569	0.082569	0.082569	0.082569		0.082569
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(V)}$	0.008	0.008	0.008	0.008	0.008	0.008		0.008
Pressure head (Stephens, 1995)	P-head (-cm)	427.5553	427.5942	427.6331	427.672	427.7109	427.7498		493.3751
Relative hydraulic conductivity	Kr	0.000339	0.000339	0.000339	0.000339	0.000339	0.000338		0.000255
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05		5.56E-05
Drainage Volume (acre-ft)		0.00E+00	5.66E-04	5.66E-04	5.66E-04	5.66E-04	5.66E-04		1.28E-02

References:

Carsel, R F and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.

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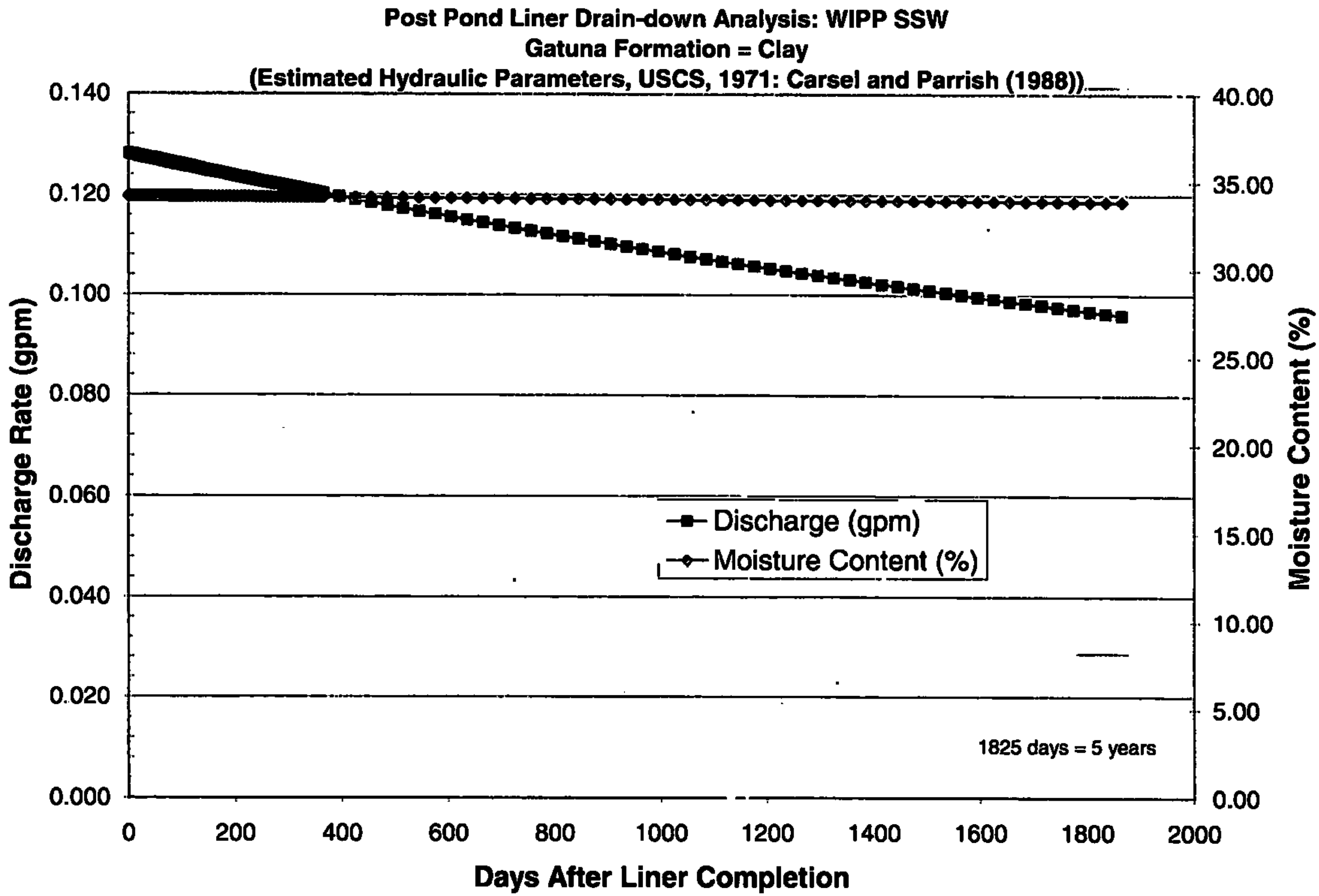

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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Sand (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

Parameter	*Value*	*Units*	*Notes*
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.43	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.387	fraction	90% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	123.2	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.045	fraction	Carsel and Parrish, 1988
Potential Drainage	108.9	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	103.3	(acre-ft)	5 Year Drainage

Hour after Pond Liner Installation		0	1	2	3	4	5		44076
Incremental Steady State Assumption*	Moisture Content (%)	38.70	37.33	36.22	35.29	34.47	33.75		6.25
	Discharge (gpm)	2.36E+04	1.92E+04	1.62E+04	1.41E+04	1.25E+04	1.12E+04		2.48E-01
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	3.47E-03	2.82E-03	2.39E-03	2.07E-03	1.83E-03	1.64E-03		3.65E-08
Effective Saturation (Stephens, 1995)	Se	0.888312	0.852821	0 824	0.799611	0.778435	0.759714	Hourly	0.045582
van Genuchten Parameter (Carsel and Parrish, 1988)	N	2.68	2.68	2.68	2 68	2 68	2 68	Time	2.68
Mualem model (Stephens, 1995)	m	0.626866	0.626866	0 626866	0.626866	0.626866	0.626866	Steps for 5	0.626866
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.145	0 145	0 145	0 145	0 145	0.145	Years	0.145
Pressure head (Stephens, 1995)	P-head (-cm)	3.83833	4.340595	4.719385	5.027641	5.289558	5.518424		43.2306
Relative hydraulic conductivity	Kr	0.420678	0.341629	0.289093	0.251008	0.221898	0.198823		4 42E-06
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03		8.25E-03
Drainage Volume (acre-ft)		0.00E+00	4.35E+00	3.53E+00	2.99E+00	2.60E+00	2.29E+00		3 37E-02

References.

Carsel, R F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B . 1996. Vadose Zone Hydrology. CRC Press.

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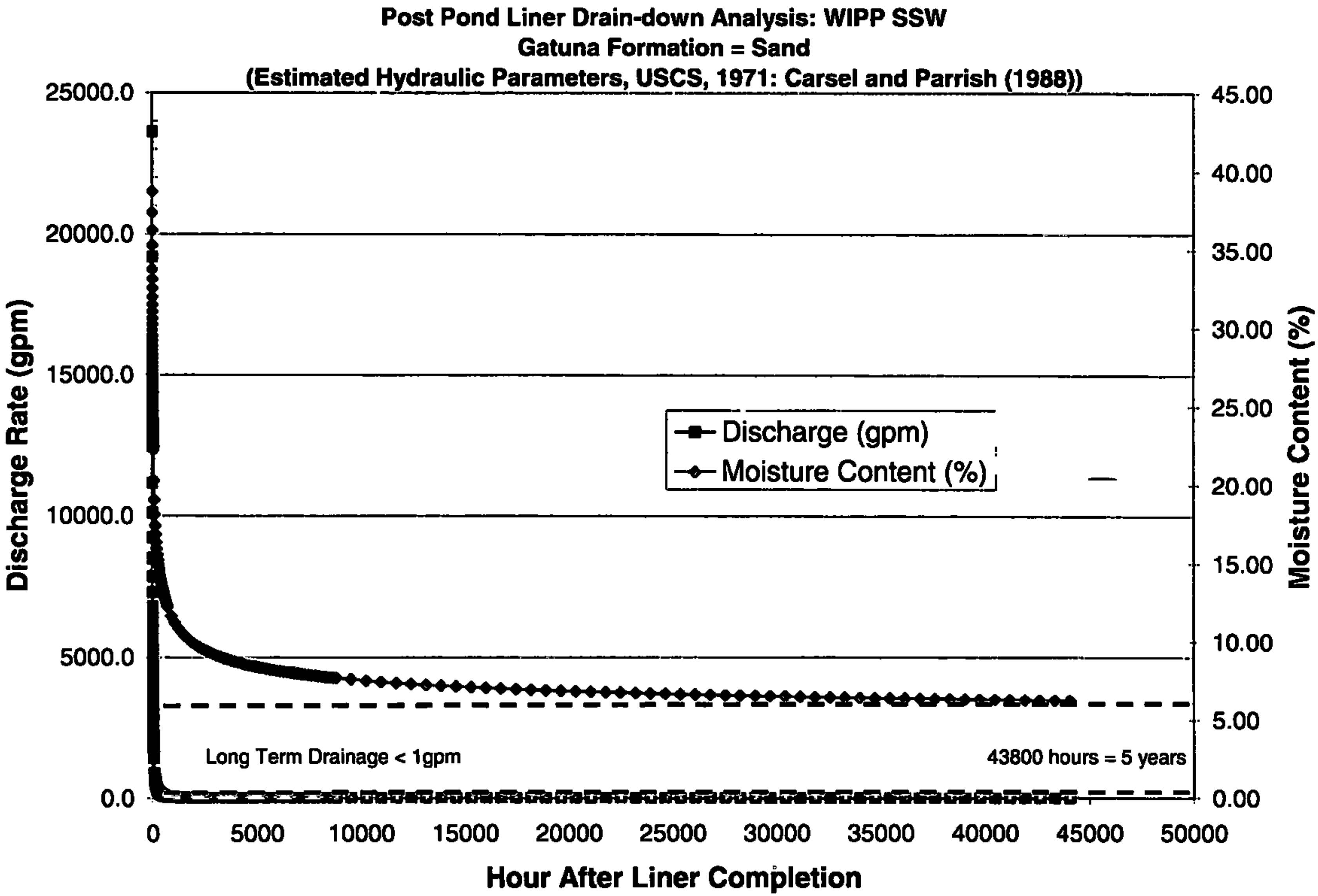

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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Sandy Clay Loam (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

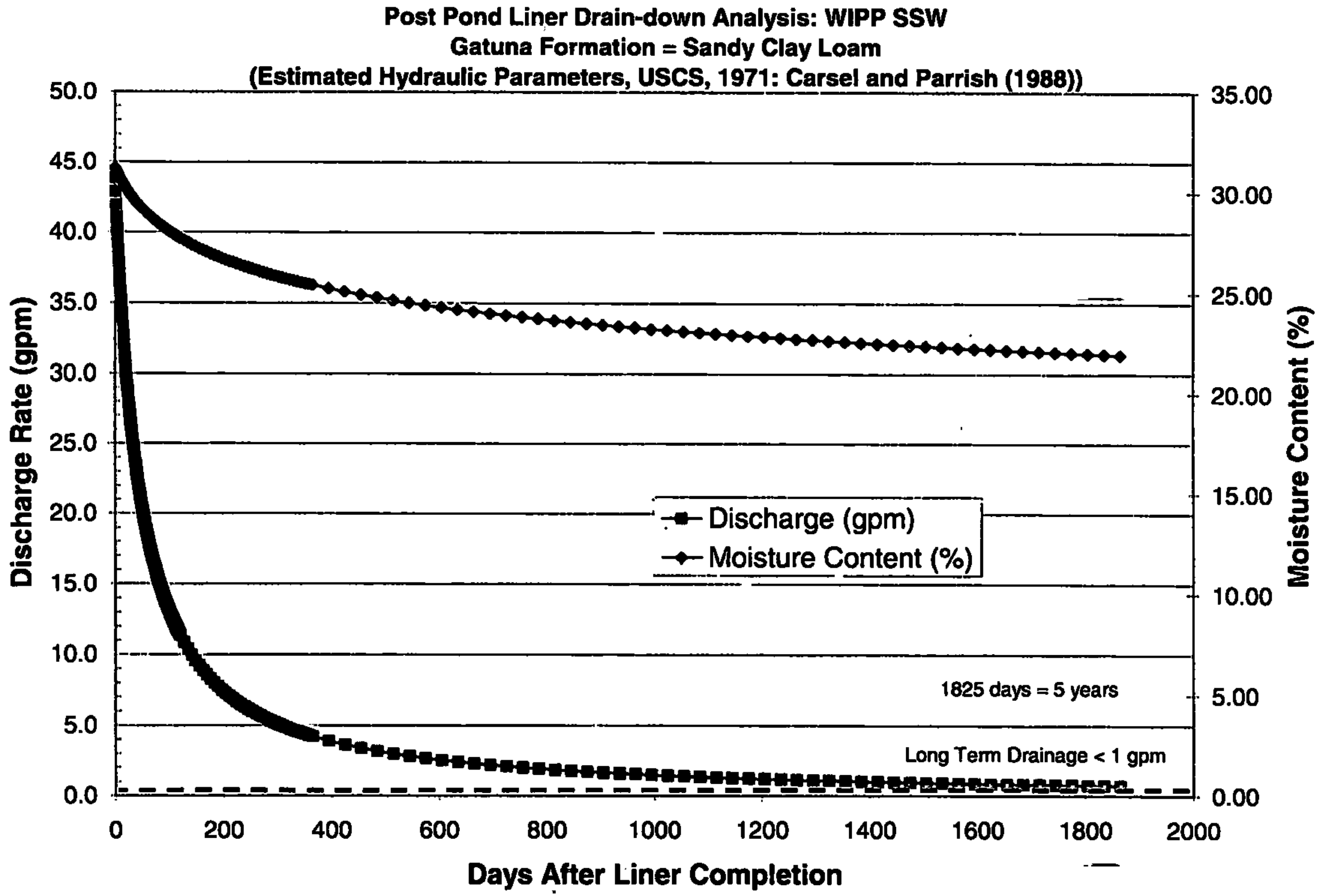
Parameter	*Value*	*Units*	*Notes*
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.39	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.312	fraction	80% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	99.3	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.1	fraction	Carsel and Parrish, 1988
Potential Drainage	67.5	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	29.4	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	31.20	31 14	31.08	31.02	30 96	30 91		21.99
	Discharge (gpm)	4.38E+01	4.29E+01	4.19E+01	4 10E+01	4 02E+01	3.94E+01		7.57E-01
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	6.44E-06	6.30E-06	6.16E-06	6.03E-06	5.90E-06	5.78E-06		1.11E-07
Effective Saturation (Stephens, 1995)	Se	0.731034	0.728936	0 726883	0.724876	0.722911	0.720987	Daily Time Steps for 5 Years	0.413522
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.48	1.48	1.48	1 48	1 48	1.48		1.48
Mualem model (Stephens, 1995)	m	0.324324	0 324324	0 324324	0.324324	0 324324	0.324324		0.324324
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0 059	0 059	0.059	0 059	0.059	0 059		0.059
Pressure head (Stephens, 1995)	P-head (-cm)	23.5531	23 78136	24.00613	24.22755	24.44574	24.66083		101.8987
Relative hydraulic conductivity	Kr	0.017702	0 017309	0.016933	0.016573	0.016227	0.015896		0.000306
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04		3.64E-04
Drainage Volume (acre-ft)		0.00E+00	1.94E-01	1.89E-01	1.85E-01	1 81E-01	1.78E-01		1.02E-01

References:

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Silt (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

Parameter	*Value*	*Units*	*Notes*
Area	**10.61**	**(acres)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Thickness	**30**	**(ft)**	**Gatuna Formation**
Total Bulk Volume of Saturation	**318.3**	**(acre-ft)**	**Gatuna Formation**
Porosity	**0.46**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.368**	**fraction**	**80% of Saturated Moisture Content (Estimated)**
Initial Storage Volume (Gatuna Formation)	**117.1**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.034**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**106.3**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**20.4**	**(acre-ft)**	**5 Year Drainage**

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	36.80	36.79	36.78	36 77	36.76	36.75		30.43
Incremental Steady State Assumption*	Discharge (gpm)	7.22E+00	7.20E+00	7.17E+00	7.15E+00	7.13E+00	7 11E+00		1.10E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	1.06E-06	1.06E-06	1.05E-06	1.05E-06	1.05E-06	1.05E-06		1.61E-07
Effective Saturation (Stephens, 1995)	Se	0.784038	0.783802	0.783568	0.783334	0.783101	0 782868		0.634609
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.37	1.37	1.37	1.37	1 37	1 37	Daily Time Steps for 5 Years	1.37
Mualem model (Stephens, 1995)	m	0.270073	0.270073	0.270073	0.270073	0.270073	0.270073		0.270073
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0 016	0.016	0.016	0 016	0.016	0.016		0.016
Pressure head (Stephens, 1995)	P-head (-cm)	82.45547	82.5681	82.68051	82.7927	82.90467	83.01642		183.8819
Relative hydraulic conductivity	Kr	0.015268	0.015225	0.015181	0.015138	0.015095	0.015053		0.002319
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05		6.94E-05
Drainage Volume (acre-ft)		0 00E+00	3.19E-02	3.18E-02	3.17E-02	3.16E-02	3 15E-02		1.47E-01

References.

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769.

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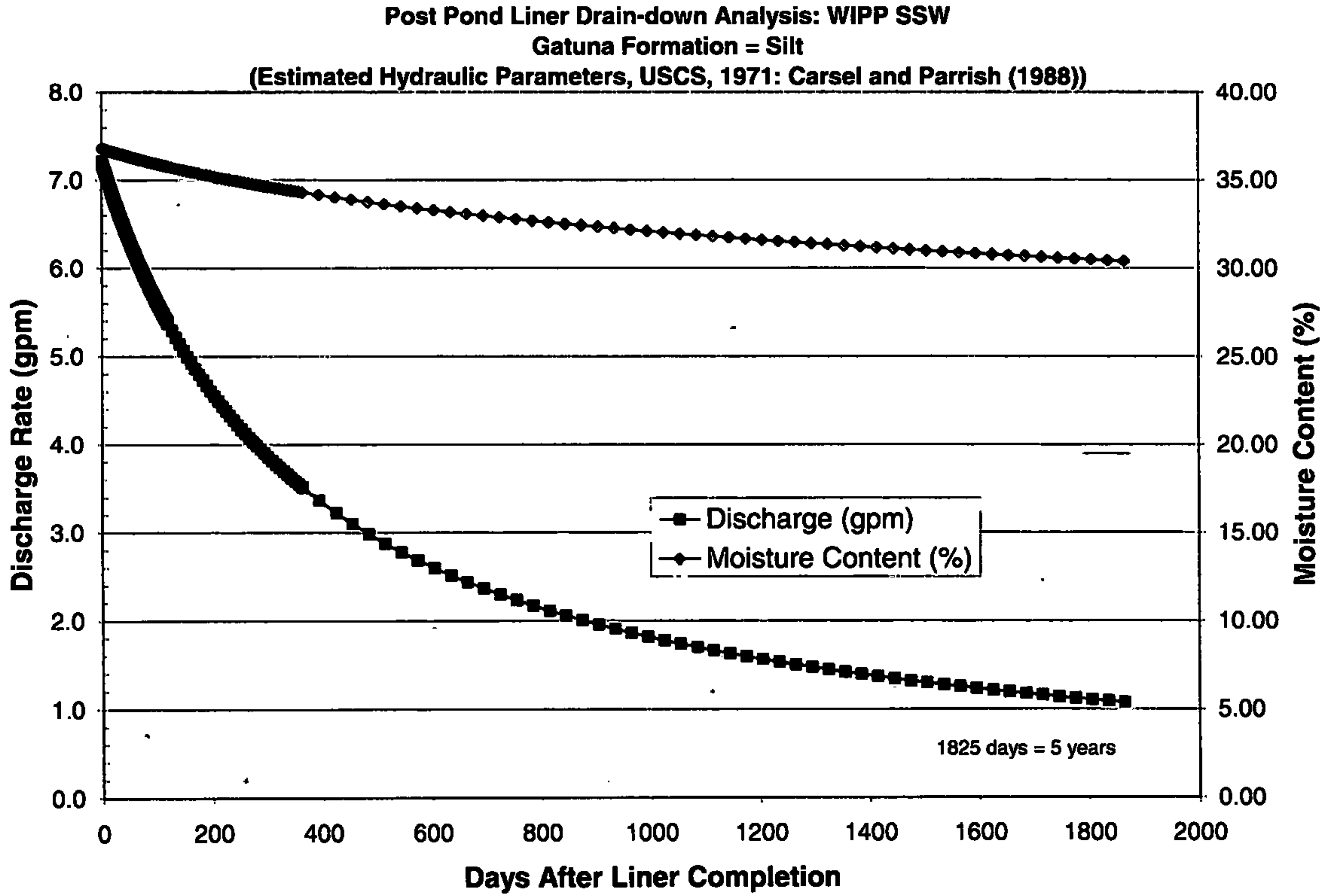

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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Clay Loam (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

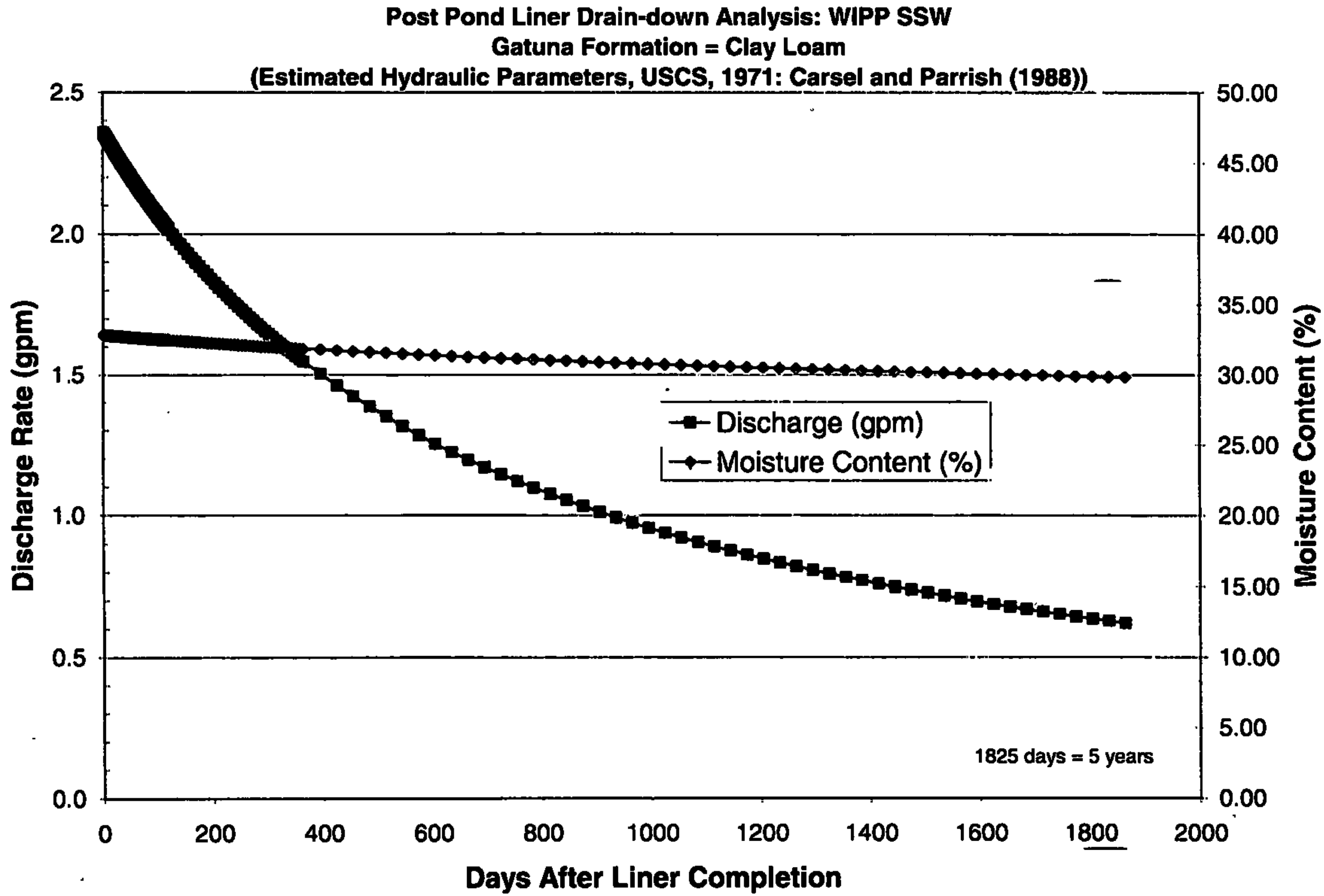
Parameter	*Value*	*Units*	*Notes*
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.41	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.328	fraction	80% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	104.4	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.095	fraction	Carsel and Parrish, 1988
Potential Drainage	74.2	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	9.4	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	32.80	32.80	32.79	32.79	32.79	32.78		29.86
	Discharge (gpm)	2.36E+00	2.35E+00	2.35E+00	2.35E+00	2.34E+00	2.34E+00		6.30E-01
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	3.46E-07	3.46E-07	3.45E-07	3.45E-07	3.45E-07	3.44E-07		9.26E-08
Effective Saturation (Stephens, 1995)	Se	0.739683	0.739579	0.739475	0.739371	0.739268	0.739164	Daily Time Steps for 5 Years	0.6464
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.31	1.31	1.31	1.31	1.31	1.31		1.31
Mualem model (Stephens, 1995)	m	0.236641	0.236641	0.236641	0.236641	0.236641	0.236641		0.236641
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.019	0.019	0.019	0.019	0.019	0.019		0.019
Pressure head (Stephens, 1995)	P-head (-cm)	108.3768	108.445	108.5132	108.5813	108.6493	108.7173		188.5548
Relative hydraulic conductivity	Kr	0.004797	0.00479	0.004784	0.004777	0.00477	0.004763		0.001282
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05		7.22E-05
Drainage Volume (acre-ft)		0.00E+00	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02		8.46E-02

References.

Carsel, R F and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Clay (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

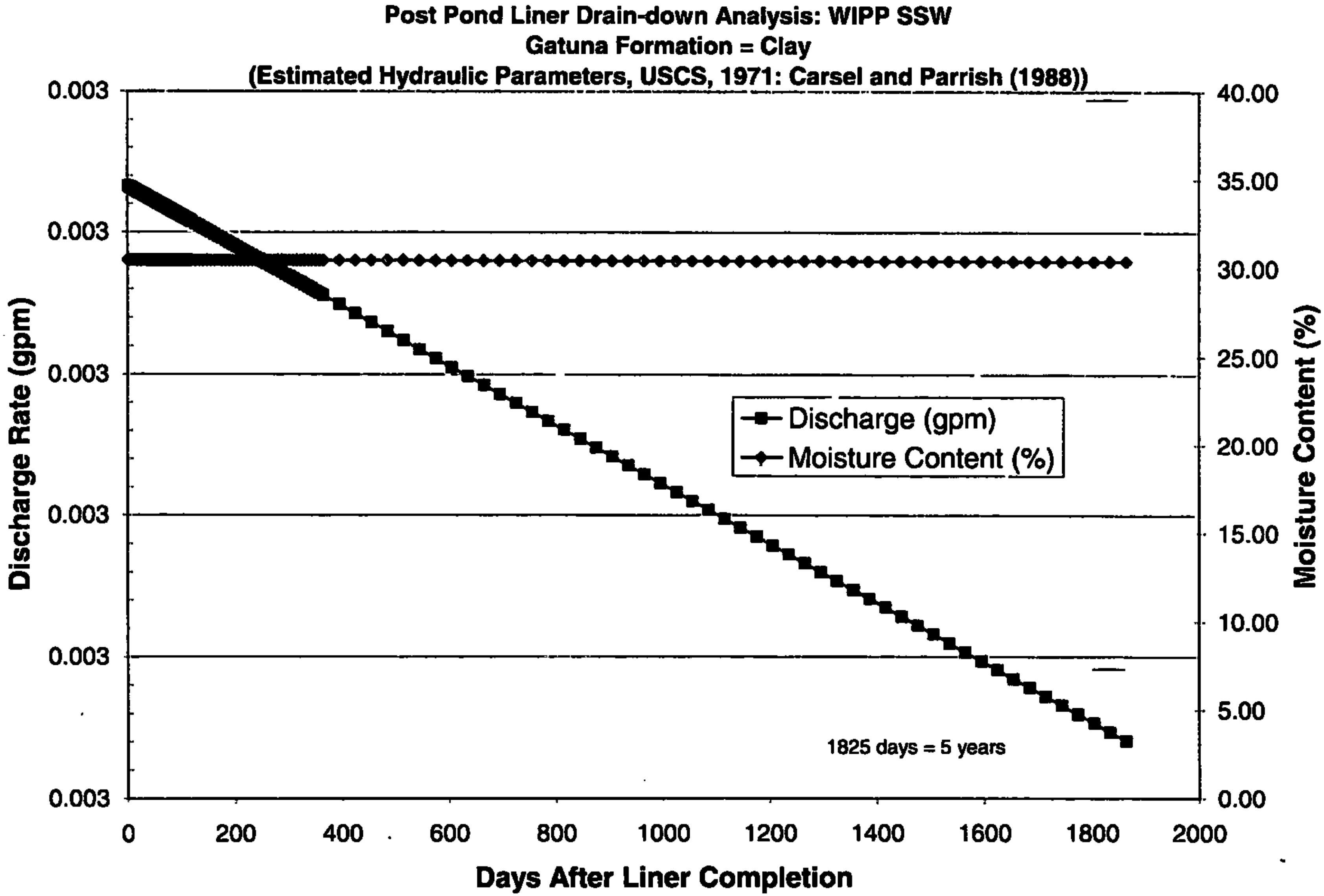
Parameter	*Value*	*Units*	*Notes*
Area	**10.61**	**(acres)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Thickness	**30**	**(ft)**	**Gatuna Formation**
Total Bulk Volume of Saturation	**318.3**	**(acre-ft)**	**Gatuna Formation**
Porosity	**0.38**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.304**	**fraction**	**80% of Saturated Moisture Content (Estimated)**
Initial Storage Volume (Gatuna Formation)	**96.8**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.068**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**75.1**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**2.20E-02**	**(acre-ft)**	**5 Year Drainage**

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	30.40	30.40	30.40	30.40	30.40	30.40		30.39
	Discharge (gpm)	2.68E-03	2.68E-03	2.68E-03	2.68E-03	2.68E-03	2.68E-03		2.66E-03
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	3.93E-10	3.93E-10	3.93E-10	3.93E-10	3.93E-10	3.93E-10		3.90E-10
Effective Saturation (Stephens, 1995)	Se	0.75641	0.75641	0.75641	0.75641	0.75641	0.75641		0.756192
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.09	1.09	1.09	1.09	1.09	1.09	Daily Time Steps for 5 Years	1.09
Mualem model (Stephens, 1995)	m	0.082569	0.082569	0.082569	0.082569	0.082569	0.082569		0.082569
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.008	0.008	0.008	0.008	0.008	0.008		0.008
Pressure head (Stephens, 1995)	P-head (-cm)	2693.165	2693.17	2693.175	2693.18	2693.185	2693.19		2702.1
Relative hydraulic conductivity	Kr	7.08E-06	7.08E-06	7.08E-06	7.08E-06	7.08E-06	7.08E-06		7.03E-06
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05		5.56E-05
Drainage Volume (acre-ft)		0.00E+00	1.18E-05	1.18E-05	1.18E-05	1.18E-05	1.18E-05		3.52E-04

References:

Carsel, R.F and Parrish, R S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Sand (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

Parameter	Value	Units	Notes
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.43	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.344	fraction	80% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	109.5	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.045	fraction	Carsel and Parrish, 1988
Potential Drainage	95.2	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	89.6	(acre-ft)	5 Year Drainage

Hour after Pond Liner Installation		0	1	2	3	4	5		44076
Incremental Steady State Assumption*	Moisture Content (%)	34.40	33.69	33.05	32.47	31.94	31.45		6.25
Incremental Steady State Assumption*	Discharge (gpm)	1.23E+04	1.11E+04	1.00E+04	9.16E+03	8.43E+03	7.80E+03		2.48E-01
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	1.81E-03	1.62E-03	1.47E-03	1.35E-03	1.24E-03	1.15E-03		3.65E-08
Effective Saturation (Stephens, 1995)	Se	0.776623	0.7581	0.741485	0.726428	0.712667	0.700004	Hourly	0.045581
van Genuchten Parameter (Carsel and Parrish, 1988)	N	2.68	2.68	2.68	2.68	2 68	2.68	Time	2.68
Mualem model (Stephens, 1995)	m	0.626866	0.626866	0.626866	0.626866	0.626866	0.626866	Steps for 5	0.626866
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0 145	0 145	0 145	0 145	0 145	0.145	Years	0.145
Pressure head (Stephens, 1995)	P-head (-cm)	5.311788	5.538082	5.740059	5.922926	6.090333	6.244947		43.23115
Relative hydraulic conductivity	Kr	0.219562	0.19694	0.178481	0.163109	0.150097	0.138934		4.42E-06
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03		8.25E-03
Drainage Volume (acre-ft)		0.00E+00	2.27E+00	2.04E+00	1.85E+00	1.69E+00	1.55E+00		3.37E-02

References:

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

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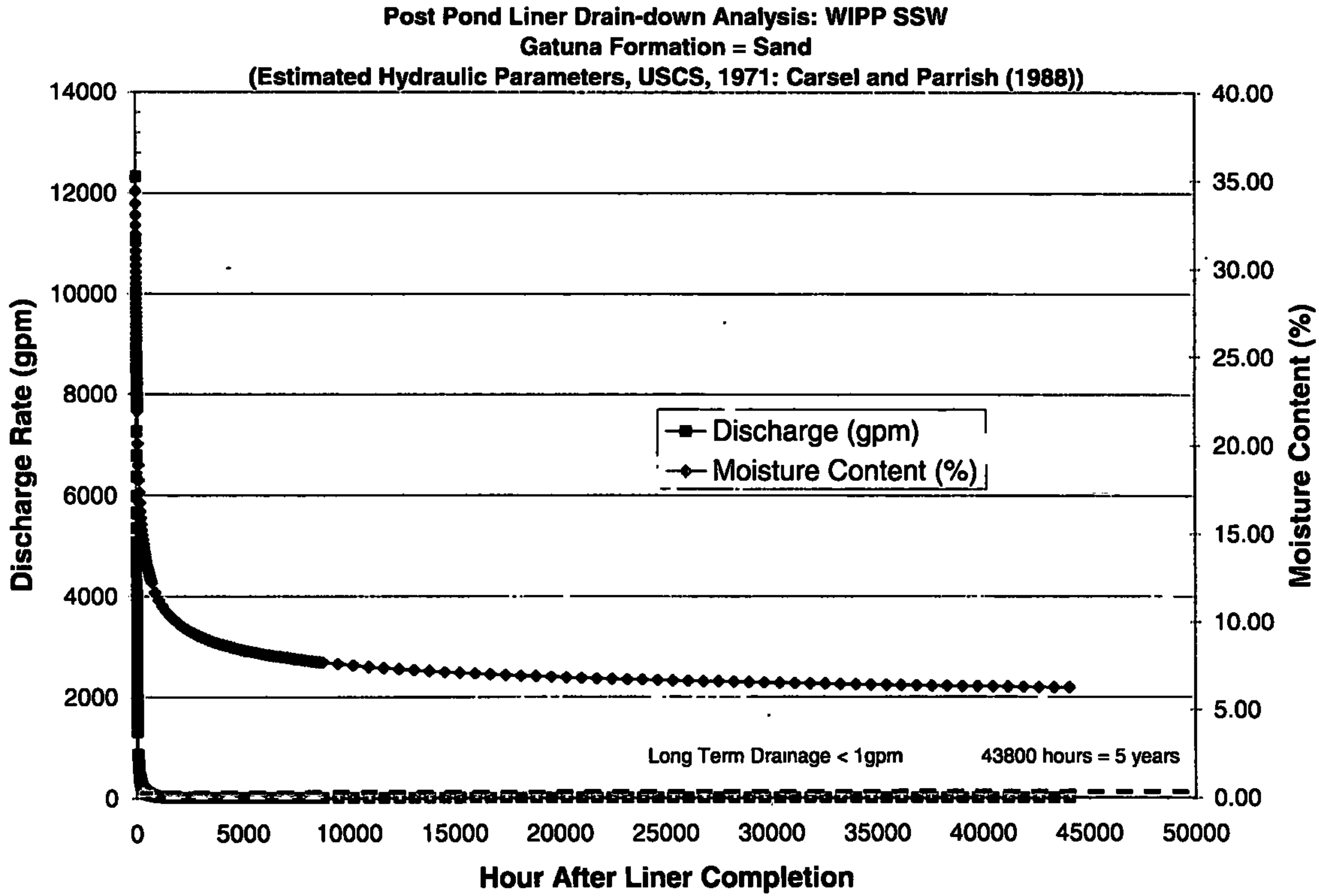


T:\Projects\9184\Sheets\Final Water Balance\Vadose Zone Redistribution Estimate Ponds 80 DRAFT 7-22-08_working_copy xls_Drain-down Chart (Sand, CP)

Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Sandy Clay Loam (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

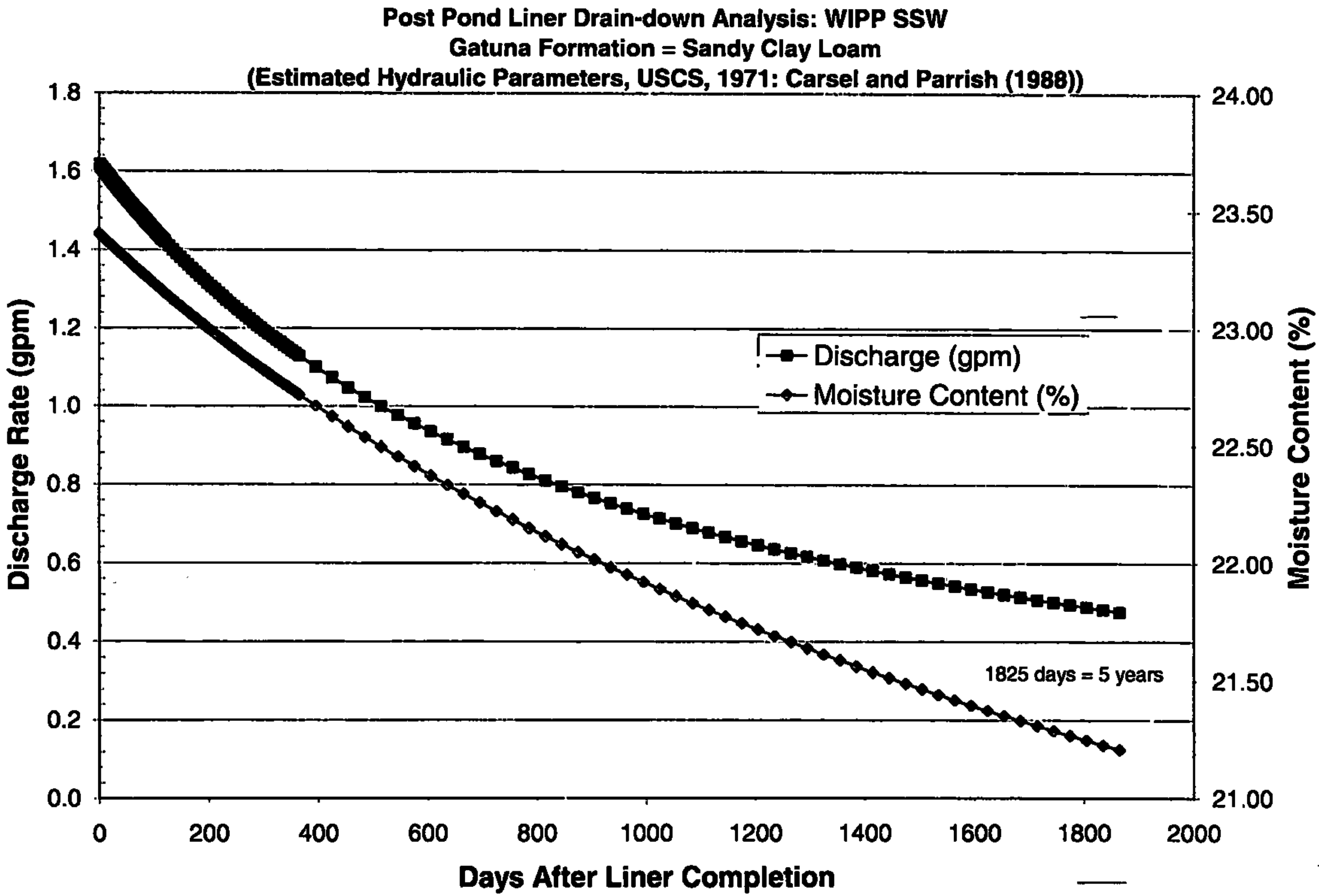
Parameter	*Value*	*Units*	*Notes*
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.39	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.234	fraction	60% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	74.5	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.1	fraction	Carsel and Parrish, 1988
Potential Drainage	42.7	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	7.0	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	23.40	23.40	23.40	23.39	23.39	23.39		21.23
	Discharge (gpm)	1.62E+00	1.62E+00	1 61E+00	1.61E+00	1.61E+00	1.61E+00		4.84E-01
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	2.38E-07	2.37E-07	2 37E-07	2.37E-07	2.36E-07	2 36E-07		7.11E-08
Effective Saturation (Stephens, 1995)	Se	0.462069	0.461992	0.461914	0.461837	0.46176	0.461683	Daily Time Steps for 5 Years	0.387162
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.48	1.48	1.48	1.48	1.48	1 48		1.48
Mualem model (Stephens, 1995)	m	0 324324	0.324324	0 324324	0.324324	0.324324	0.324324		0.324324
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.059	0.059	0.059	0 059	0.059	0.059		0.059
Pressure head (Stephens, 1995)	P-head (-cm)	79.28498	79.31548	79 34596	79.37642	79.40686	79.43728		117.9051
Relative hydraulic conductivity	Kr	0.000653	0.000652	0.000651	0.000651	0.00065	0.000649		0.000195
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04		3.64E-04
Drainage Volume (acre-ft)		0.00E+00	7.15E-03	7 14E-03	7.13E-03	7.12E-03	7 11E-03		6.49E-02

References:

Carsel, R.F and Parrish, R.S., 1988. Developing Joint Frobability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769

Stephens, D B , 1996. Vadose Zone Hydrology CRC Press



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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Silt (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

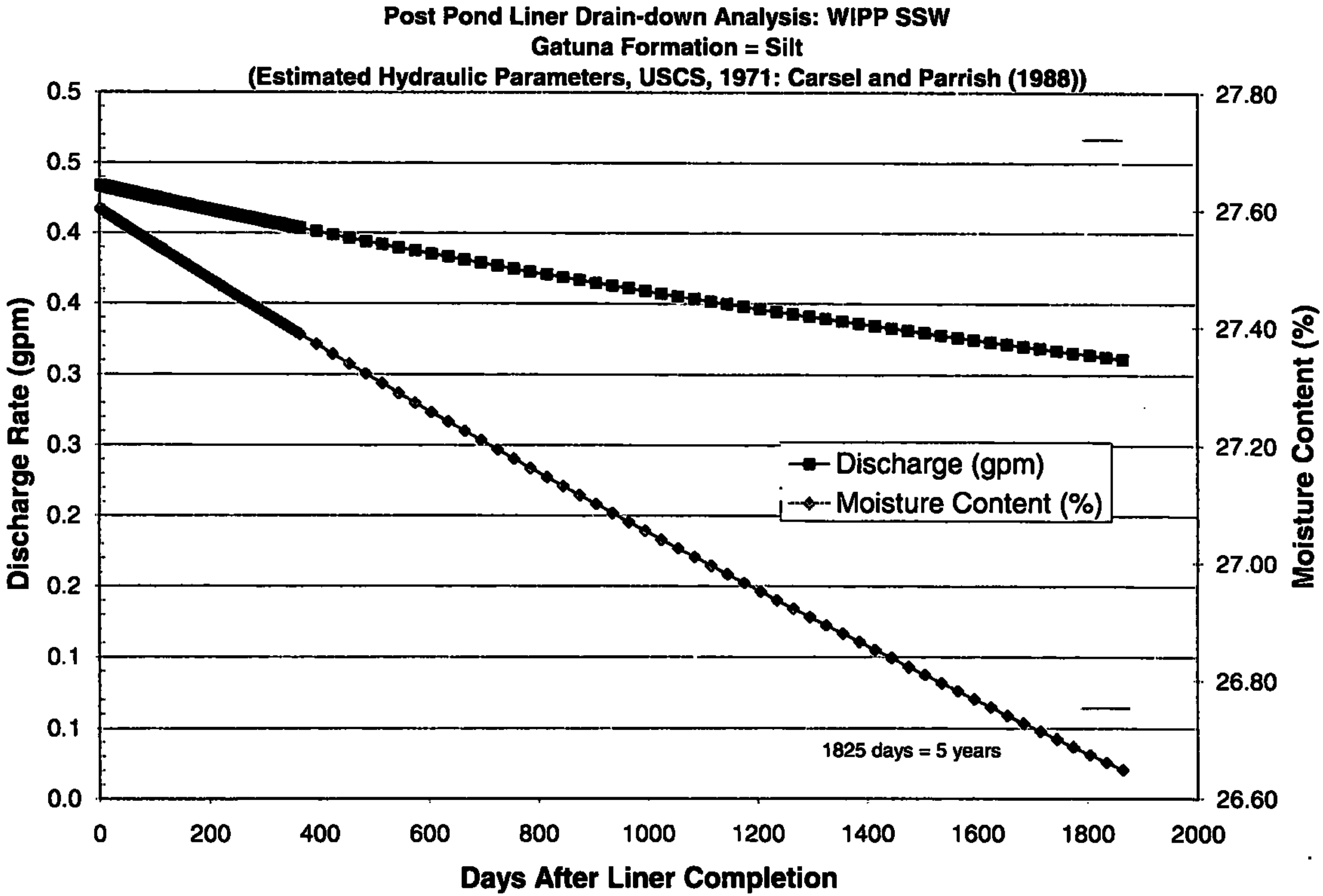
Parameter	Value	Units	Notes
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.46	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.276	fraction	60% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	87.9	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.034	fraction	Carsel and Parrish, 1988
Potential Drainage	77.0	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	3.0	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	27.60	27.60	27.60	27.60	27.60	27.60		26.66
	Discharge (gpm)	4 34E-01	4.33E-01	4 33E-01	4.33E-01	4 33E-01	4.33E-01		3.13E-01
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	6.37E-08	6.37E-08	6.37E-08	6.37E-08	6.37E-08	6.36E-08		4.60E-08
Effective Saturation (Stephens, 1995)	Se	0.568075	0.568061	0.568047	0.568033	0.568019	0 568004	Daily Time Steps for 5 Years	0.546073
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.37	1.37	1.37	1 37	1 37	1.37		1.37
Mualem model (Stephens, 1995)	m	0.270073	0.270073	0.270073	0.270073	0.270073	0.270073		0.270073
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.016	0.016	0.016	0.016	0.016	0.016		0.016
Pressure head (Stephens, 1995)	P-head (-cm)	261 7984	261.8185	261.8386	261.8586	261.8787	261.8988		295.3491
Relative hydraulic conductivity	Kr	0 000917	0.000917	0.000917	0.000917	0 000917	0.000916		0.000662
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05		6.94E-05
Drainage Volume (acre-ft)		0.00E+00	1.92E-03	1.92E-03	1.92E-03	1.91E-03	1.91E-03		4.17E-02

References:

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Clay Loam (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

Parameter	Value	Units	Notes
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.41	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.246	fraction	60% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	78.3	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.095	fraction	Carsel and Parrish, 1988
Potential Drainage	48.1	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	0.3	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	24.60	24.60	24.60	24.60	24 60	24 60		24.50
	Discharge (gpm)	3.95E-02	3.95E-02	3.95E-02	3.95E-02	3.95E-02	3.95E-02		3.72E-02
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	5.80E-09	5.80E-09	5.80E-09	5.80E-09	5.80E-09	5.80E-09		5.47E-09
Effective Saturation (Stephens, 1995)	Se	0.479365	0.479363	0.479362	0.47936	0.479358	0.479356		0.476265
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1 31	1.31	1 31	1.31	1.31	1.31	Daily Time Steps for 5 Years	1.31
Mualem model (Stephens, 1995)	m	0.236641	0.236641	0.236641	0.236641	0.236641	0.236641		0.236641
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0 019	0.019	0.019	0.019	0.019	0.019		0.019
Pressure head (Stephens, 1995)	P-head (-cm)	544.7351	544.7418	544.7485	544 7552	544.7618	544 7685		556.7947
Relative hydraulic conductivity	Kr	8.03E-05	8.03E-05	8.03E-05	8.03E-05	8.03E-05	8.03E-05		7.57E-05
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05		7.22E-05
Drainage Volume (acre-ft)		0.00E+00	1.74E-04	1.74E-04	1 74E-04	1.74E-04	1.74E-04		4.94E-03

References.

Carsel, R F and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769.

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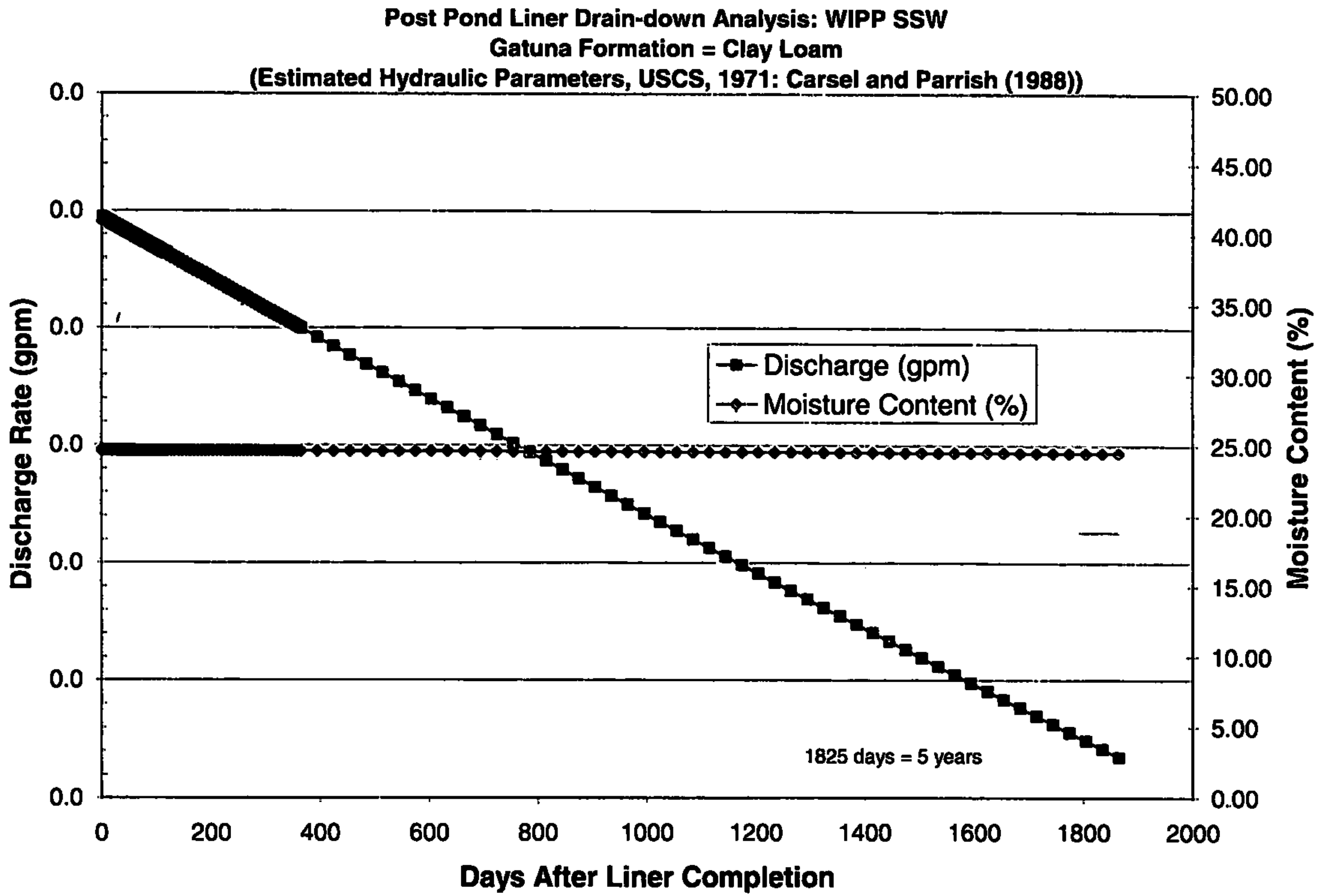

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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Clay (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

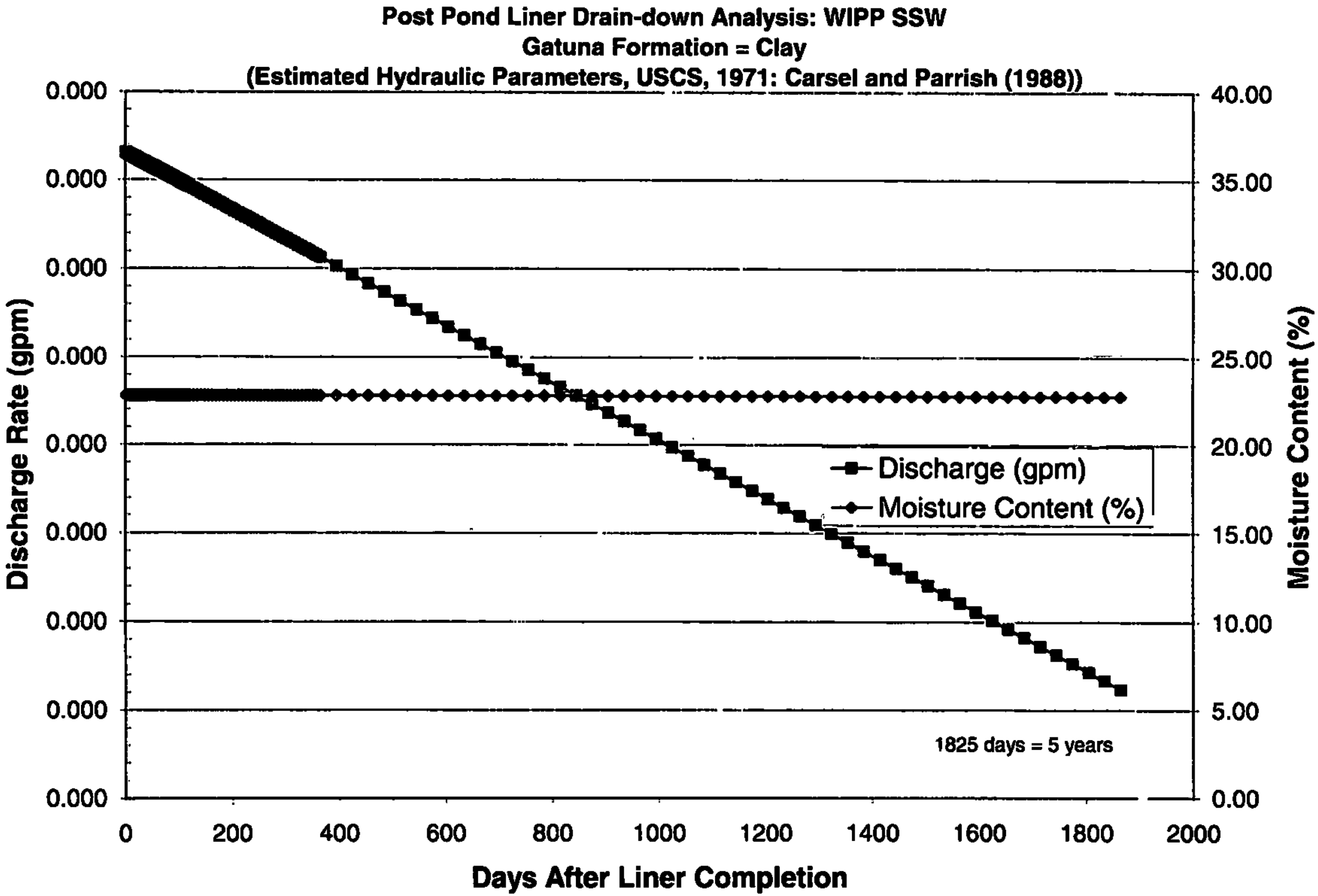
Parameter	Value	Units	Notes
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.38	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.228	fraction	60% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	72.6	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.068	fraction	Carsel and Parrish, 1988
Potential Drainage	50.9	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	1.44E-06	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	22.80	22.80	22.80	22.80	22.80	22.80		22.80
	Discharge (gpm)	1.74E-07	1.74E-07	1.74E-07	1 74E-07	1 74E-07	1 74E-07		1.74E-07
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	2.56E-14	2.56E-14	2.56E-14	2.56E-14	2.56E-14	2 56E-14		2.56E-14
Effective Saturation (Stephens, 1995)	Se	0.512821	0.512821	0.512821	0.512821	0.512821	0.512821	Daily Time Steps for 5 Years	0.51282
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.09	1.09	1.09	1.09	1.09	1.09		1.09
Mualem model (Stephens, 1995)	m	0.082569	0.082569	0.082569	0.082569	0.082569	0.082569		0.082569
van Genuchten Parameter Carsel and Parrish, 1988	$alpha_{(v)}$	0.008	0.008	0.008	0 008	0.008	0.008		0 008
Pressure head (Stephens, 1995)	P-head (-cm)	208638.5	208638.5	208638.5	208638.5	208638.5	208638.5		208638.5
Relative hydraulic conductivity	Kr	4.61E-10	4.61E-10	4.61E-10	4.61E-10	4.61E-10	4.61E-10		4.61E-10
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05		5.56E-05
Drainage Volume (acre-ft)		0.00E+00	7.70E-10	7.70E-10	7 70E-10	7 70E-10	7 70E-10		2.31E-08

References.

Carsel, R.F. and Parrish, R.S , 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Sand (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

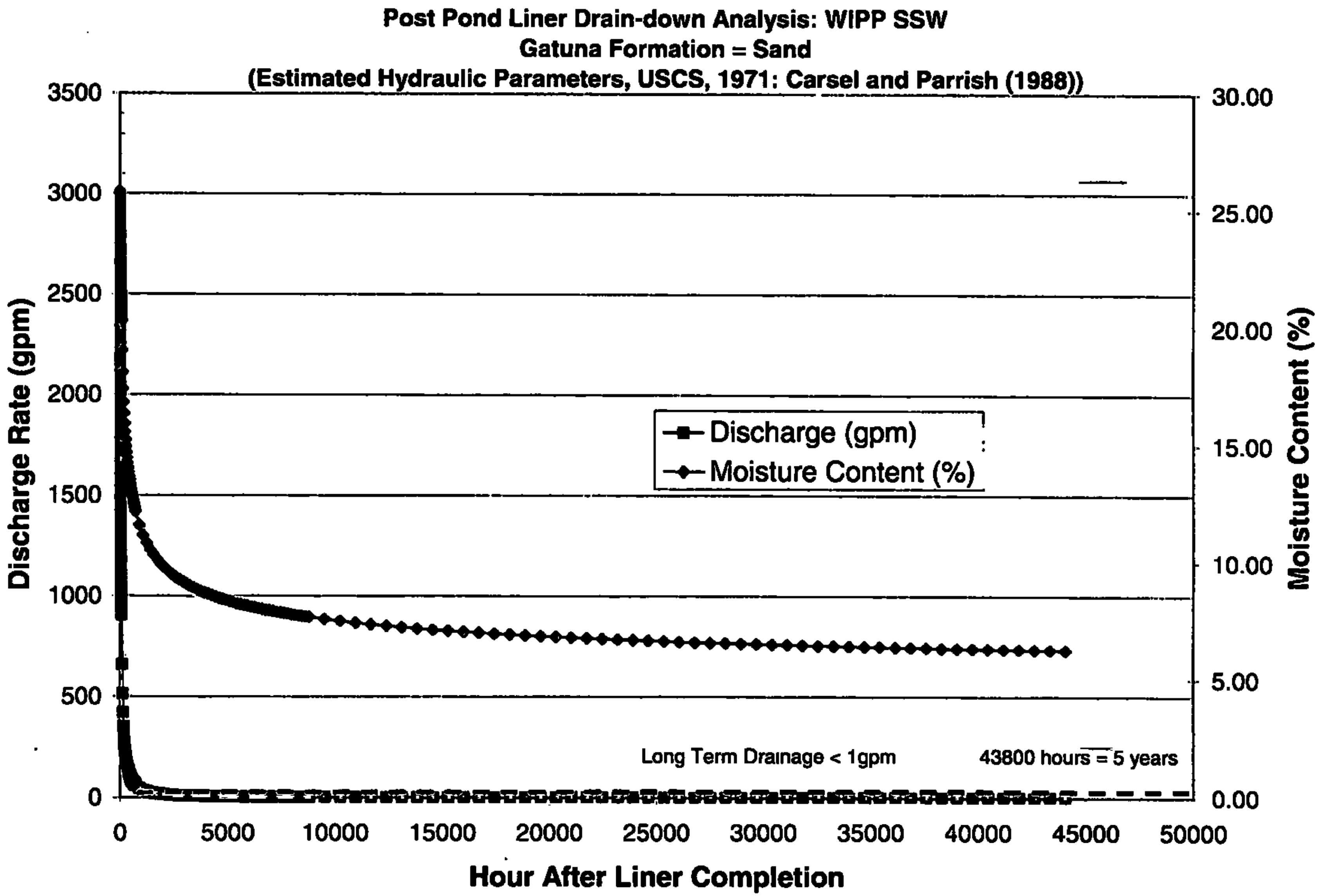
Parameter	*Value*	*Units*	*Notes*
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.43	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.258	fraction	60% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	82.1	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.045	fraction	Carsel and Parrish, 1988
Potential Drainage	67.8	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	62.2	(acre-ft)	5 Year Drainage

Hour after Pond Liner Installation		0	1	2	3	4	5		44076
Incremental Steady State Assumption* {	Moisture Content (%)	25.80	25.63	25.46	25 30	25.15	25.00		6.25
	Discharge (gpm)	2 95E+03	2.85E+03	2 77E+03	2.68E+03	2.60E+03	2.53E+03		2.48E-01
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	4.33E-04	4.19E-04	4.06E-04	3.94E-04	3.82E-04	3.71E-04		3.65E-08
Effective Saturation (Stephens, 1995)	Se	0 553247	0.548818	0.54453	0.540375	0.536345	0.532435	Hourly	0.045574
van Genuchten Parameter (Carsel and Parrish, 1988)	N	2.68	2 68	2.68	2.68	2 68	2.68	Time	2.68
Mualem model (Stephens, 1995)	m	0.626866	0.626866	0 626866	0.626866	0.626866	0.626866	Steps for 5	0.626866
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0 145	0.145	0.145	0.145	0.145	0.145	Years	0.145
Pressure head (Stephens, 1995)	P-head (-cm)	8.162707	8.226603	8.288949	8.349827	8.409313	8.467477		43.23476
Relative hydraulic conductivity	Kr	0 052493	0.050826	0.049252	0.047764	0.046356	0.04502		4.42E-06
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03		8.25E-03
Drainage Volume (acre-ft)		0.00E+00	5.43E-01	5.25E-01	5.09E-01	4.94E-01	4 79E-01		3.37E-02

References.

Carsel, R F. and Parrish, R S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B , 1996 Vadose Zone Hydrology CRC Press



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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Sandy Clay Loam (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

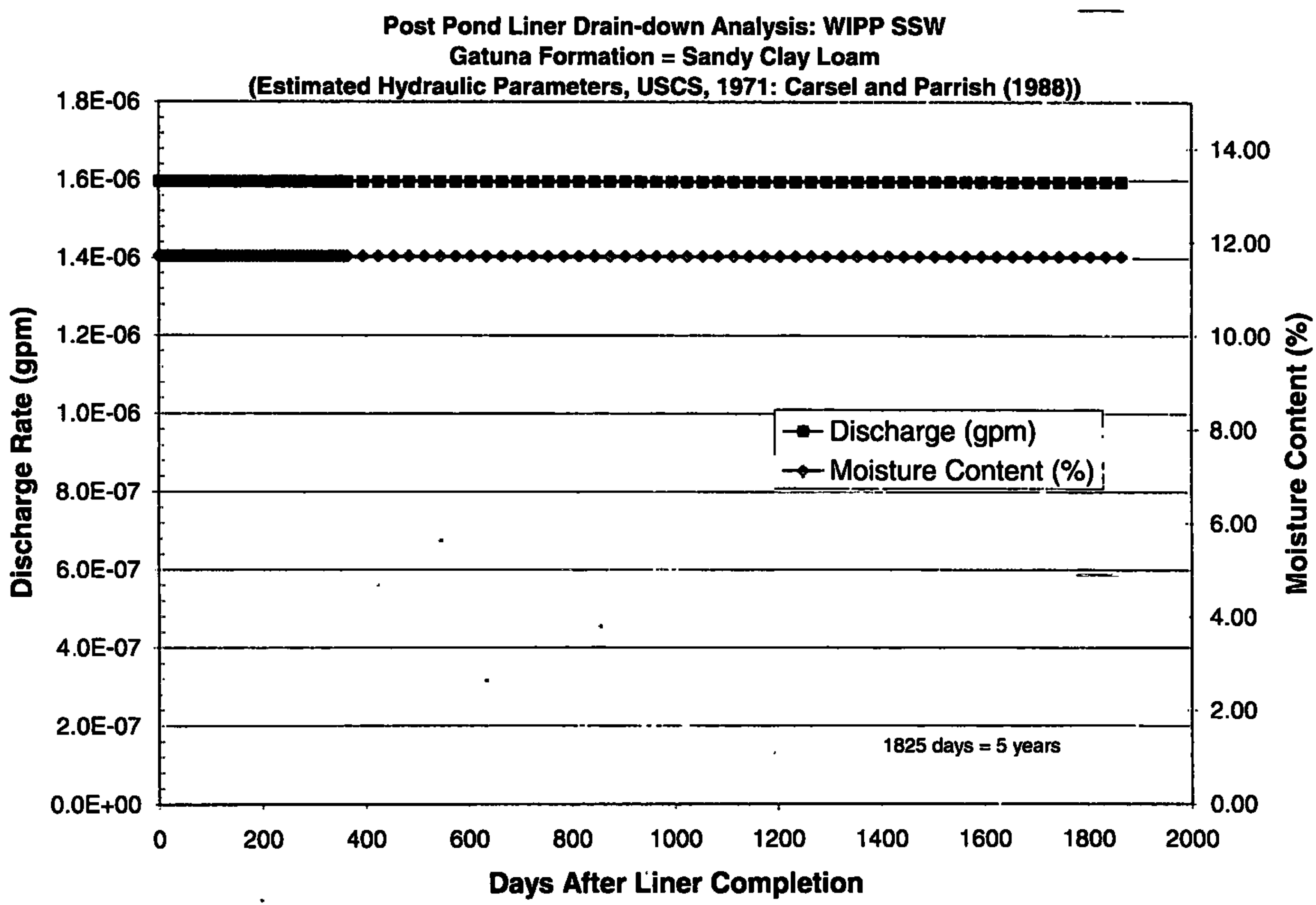
Parameter	*Value*	*Units*	*Notes*
Area	**10.61**	**(acres)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Thickness	**30**	**(ft)**	**Gatuna Formation**
Total Bulk Volume of Saturation	**318.3**	**(acre-ft)**	**Gatuna Formation**
Porosity	**0.39**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.117**	**fraction**	**30% of Saturated Moisture Content (Estimated)**
Initial Storage Volume (Gatuna Formation)	**37.2**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.1**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**5.4**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**1.31E-05**	**(acre-ft)**	**5 Year Drainage**

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	11 70	11 70	11 70	11.70	11 70	11 70		11 70
	Discharge (gpm)	1.60E-06	1.60E-06	1.60E-06	1.60E-06	1.60E-06	1 60E-06		1.60E-06
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	2.34E-13	2 34E-13	2.34E-13	2.34E-13	2.34E-13	2.34E-13		2.34E-13
Effective Saturation (Stephens, 1995)	Se	0.058621	0.058621	0.058621	0.058621	0.058621	0.058621	Daily Time Steps for 5 Years	0.058621
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.48	1 48	1 48	1.48	1.48	1.48		1.48
Mualem model (Stephens, 1995)	m	0.324324	0 324324	0.324324	0 324324	0.324324	0 324324		0.324324
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.059	0 059	0.059	0.059	0 059	0.059		0.059
Pressure head (Stephens, 1995)	P-head (-cm)	6246.862	6246.862	6246.862	6246.862	6246.862	6246.862		6246.893
Relative hydraulic conductivity	Kr	6.44E-10	6.44E-10	6.44E-10	6.44E-10	6.44E-10	6.44E-10		6.44E-10
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	3 64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3 64E-04		3.64E-04
Drainage Volume (acre-ft)		0 00E+00	7 05E-09	7.05E-09	7.05E-09	7.05E-09	7.05E-09		2.11E-07

References:

Carsel, R.F and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Silt (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

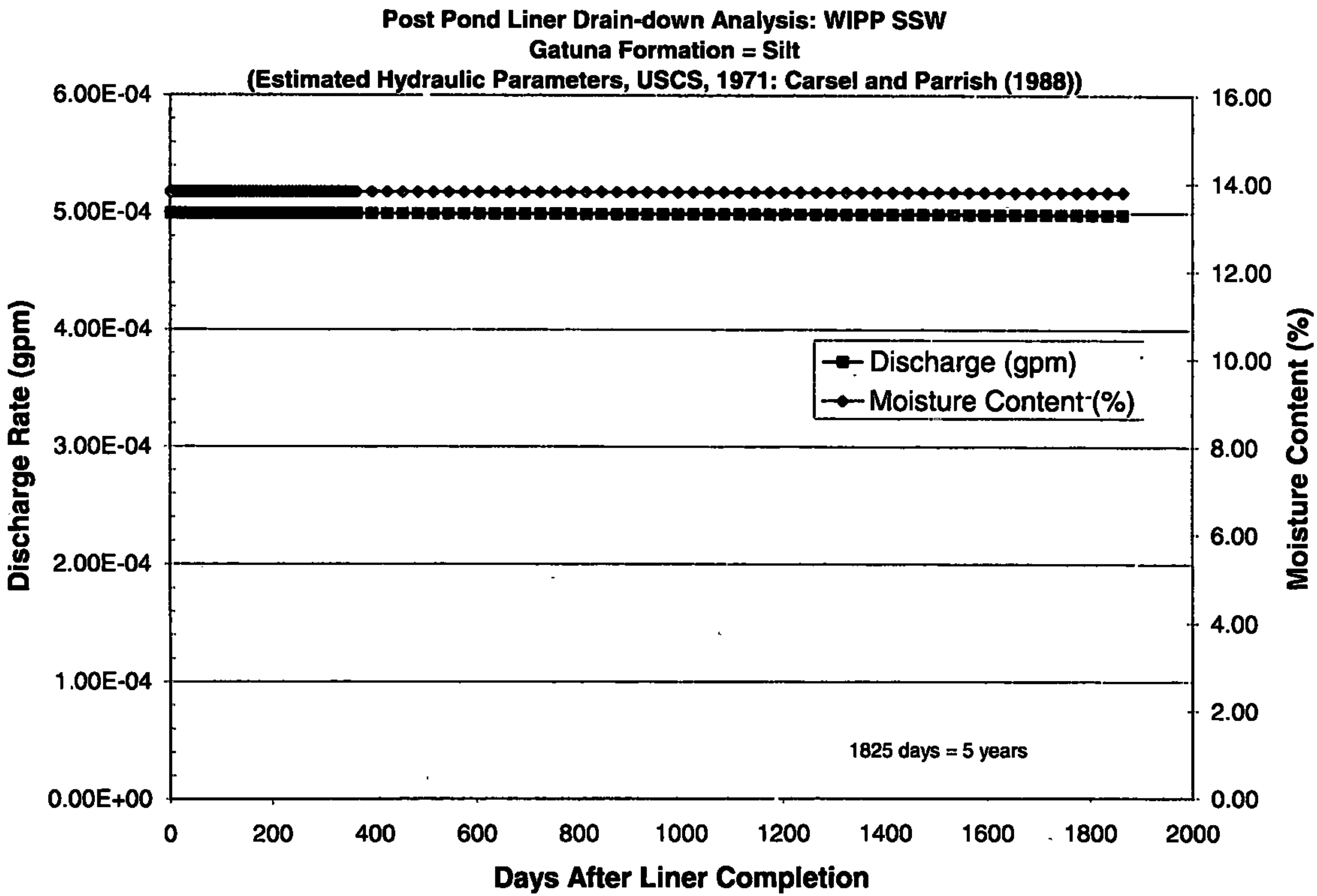
Parameter	*Value*	*Units*	*Notes*
Area	**10.61**	**(acres)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Thickness	**30**	**(ft)**	**Gatuna Formation**
Total Bulk Volume of Saturation	**318.3**	**(acre-ft)**	**Gatuna Formation**
Porosity	**0.46**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.138**	**fraction**	**30% of Saturated Moisture Content (Estimated)**
Initial Storage Volume (Gatuna Formation)	**43.9**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.034**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**33.1**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**4.11E-03**	**(acre-ft)**	**5 Year Drainage**

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	13.80	13.80	13.80	13.80	13.80	13 80		13.80
	Discharge (gpm)	4.99E-04	4.99E-04	4.99E-04	4.99E-04	4 99E-04	4 99E-04		4.99E-04
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	7.33E-11	7.33E-11	7.33E-11	7.33E-11	7.33E-11	7.33E-11		7.33E-11
Effective Saturation (Stephens, 1995)	Se	0.244131	0.244131	0.244131	0.244131	0.244131	0.244131		0.244102
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.37	1 37	1.37	1.37	1 37	1.37	Daily Time Steps for 5 Years	1.37
Mualem model (Stephens, 1995)	m	0.270073	0.270073	0.270073	0.270073	0.270073	0.270073		0.270073
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.016	0.016	0.016	0.016	0.016	0.016		0.016
Pressure head (Stephens, 1995)	P-head (-cm)	2813.416	2813.416	2813.417	2813.417	2813.418	2813.418		2814.35
Relative hydraulic conductivity	Kr	1.06E-06	1.06E-06	1.06E-06	1 06E-06	1.06E-06	1.06E-06		1.05E-06
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05		6.94E-05
Drainage Volume (acre-ft)		0.00E+00	2.21E-06	2.21E-06	2.21E-06	2.21E-06	2.21E-06		6.61E-05

References:

Carsel, R.F and Parrish, R S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769.

Stephens, D.B , 1996. Vadose Zone Hydrology CRC Press



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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Clay Loam (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

Parameter	*Value*	*Units*	*Notes*
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.41	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.123	fraction	30% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	39.2	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.095	fraction	Carsel and Parrish, 1988
Potential Drainage	8.9	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	8.84E-08	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	12.30	12.30	12.30	12.30	12.30	12.30		12 30
	Discharge (gpm)	1.07E-08	1.07E-08	1.07E-08	1.07E-08	1.07E-08	1.07E-08		1.07E-08
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	1.58E-15	1.58E-15	1.58E-15	1.58E-15	1.58E-15	1.58E-15		1.58E-15
Effective Saturation (Stephens, 1995)	Se	0.088889	0.088889	0.088889	0.088889	0.088889	0.088889		0.088889
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.31	1.31	1.31	1.31	1.31	1.31	Daily Time Steps for 5 Years	1.31
Mualem model (Stephens, 1995)	m	0.236641	0.236641	0.236641	0.236641	0.236641	0.236641		0.236641
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.019	0 019	0.019	0.019	0 019	0.019		0 019
Pressure head (Stephens, 1995)	P-head (-cm)	129434.2	129434.2	129434.2	129434.2	129434.2	129434.2		129434.2
Relative hydraulic conductivity	Kr	2 18E-11	2.18E-11	2.18E-11	2.18E-11	2.18E-11	2.18E-11		2.18E-11
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05		7.22E-05
Drainage Volume (acre-ft)		0.00E+00	4.74E-11	4 74E-11	4.74E-11	4.74E-11	4.74E-11		1.42E-09

References.

Carsel, R F and Parrish, R S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769

Stephens, D.B , 1996 Vadose Zone Hydrology CRC Press.

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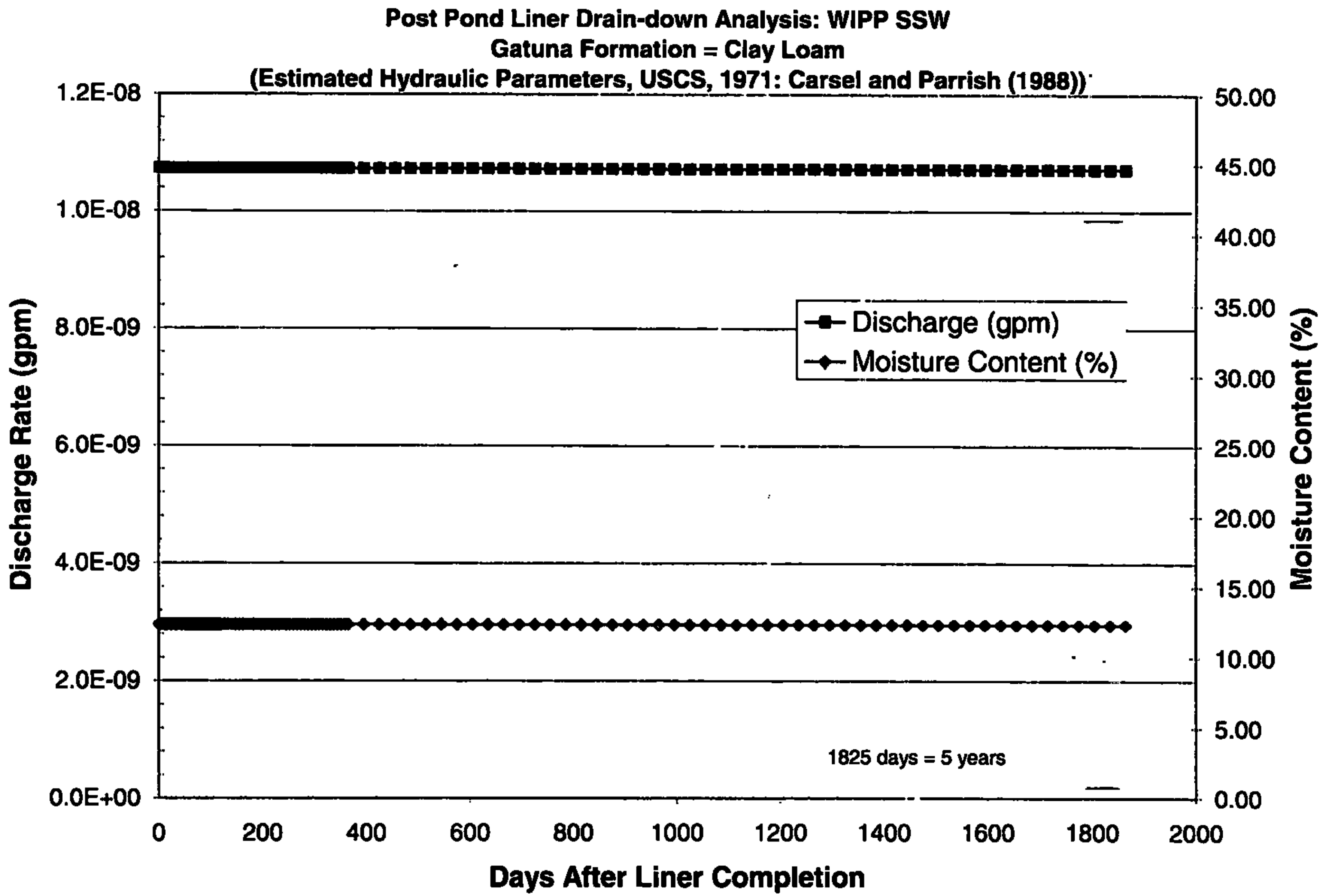

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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Clay (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

Parameter	*Value*	*Units*	*Notes*
Area	10.61	(acres)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Thickness	30	(ft)	Gatuna Formation
Total Bulk Volume of Saturation	318.3	(acre-ft)	Gatuna Formation
Porosity	0.38	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.114	fraction	30% of Saturated Moisture Content (Estimated)
Initial Storage Volume (Gatuna Formation)	36.3	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.068	fraction	Carsel and Parrish, 1988
Potential Drainage	14.6	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	5.93E-20	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	11.40	11.40	11 40	11.40	11 40	11.40		11 40
	Discharge (gpm)	7.20E-21	7.20E-21	7.20E-21	7.20E-21	7.20E-21	7.20E-21		7.20E-21
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	1.06E-27	1.06E-27	1.06E-27	1.06E-27	1.06E-27	1.06E-27		1.06E-27
Effective Saturation (Stephens, 1995)	Se	0.147436	0 147436	0.147436	0 147436	0 147436	0 147436		0.147436
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.09	1.09	1.09	1.09	1.09	1 09	Daily Time Steps for 5 Years	1.09
Mualem model (Stephens, 1995)	m	0.082569	0 082569	0.082569	0 082569	0.082569	0.082569		0.082569
van Genuchten Parameter Carsel and Parrish, 1988	$alpha_{(v)}$	0.008	0.008	0 008	0.008	0.008	—0.008		0.008
Pressure head (Stephens, 1995)	P-head (-cm)	2 16E+11	2 16E+11	2.16E+11	2 16E+11	2 16E+11	2 16E+11		2.16E+11
Relative hydraulic conductivity	Kr	1 9E-23	1.9E-23	1.9E-23	1.9E-23	1 9E-23	1.9E-23		1.9E-23
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05		5.56E-05
Drainage Volume (acre-ft)		0.00E+00	3 18E-23	3.18E-23	3.18E-23	3 18E-23	3.18E-23		9.54E-22

References.

Carsel, R F. and Parrish, R S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.

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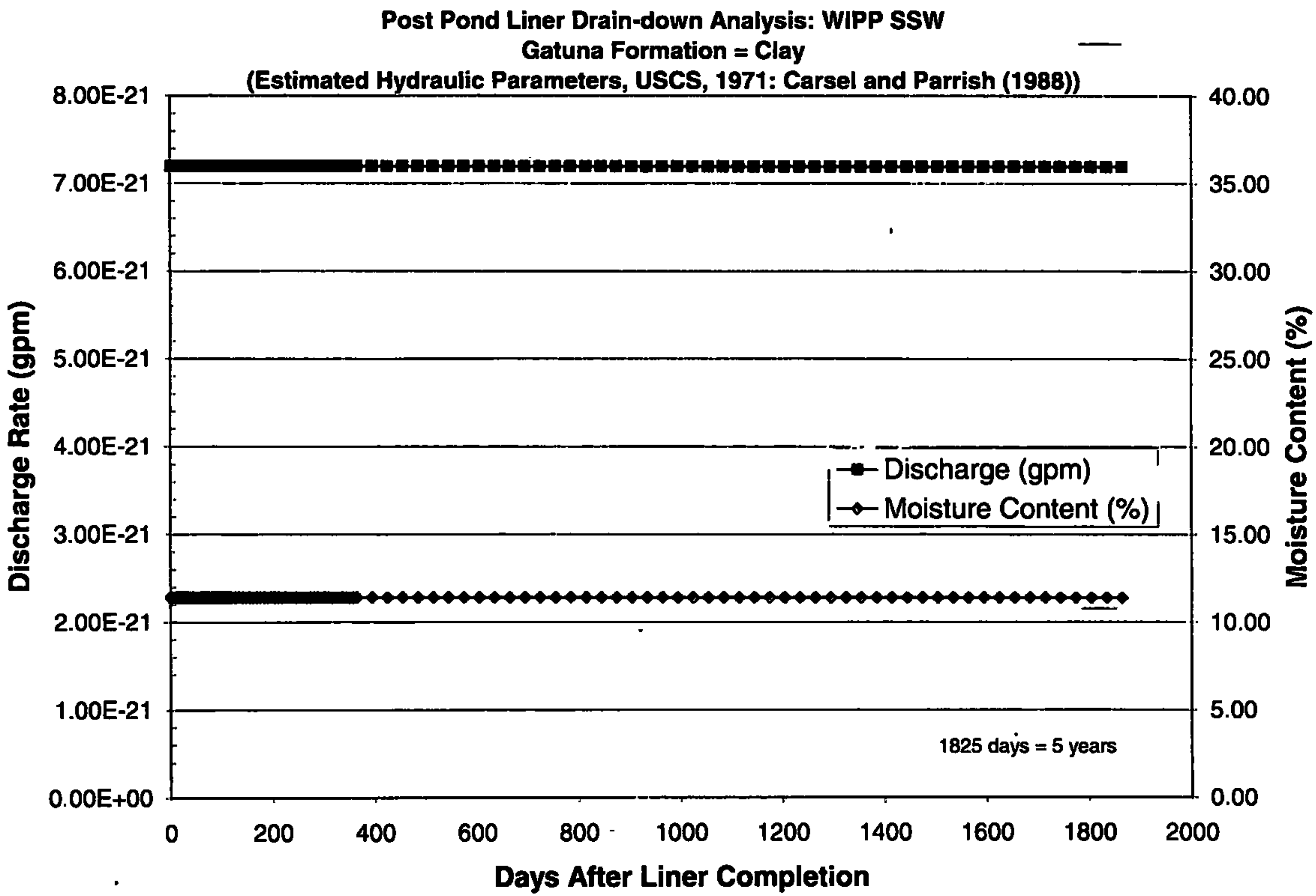

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Post Pond Liner Drain-down Analysis: WIPP SSW

Gatuna Formation = Sand (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

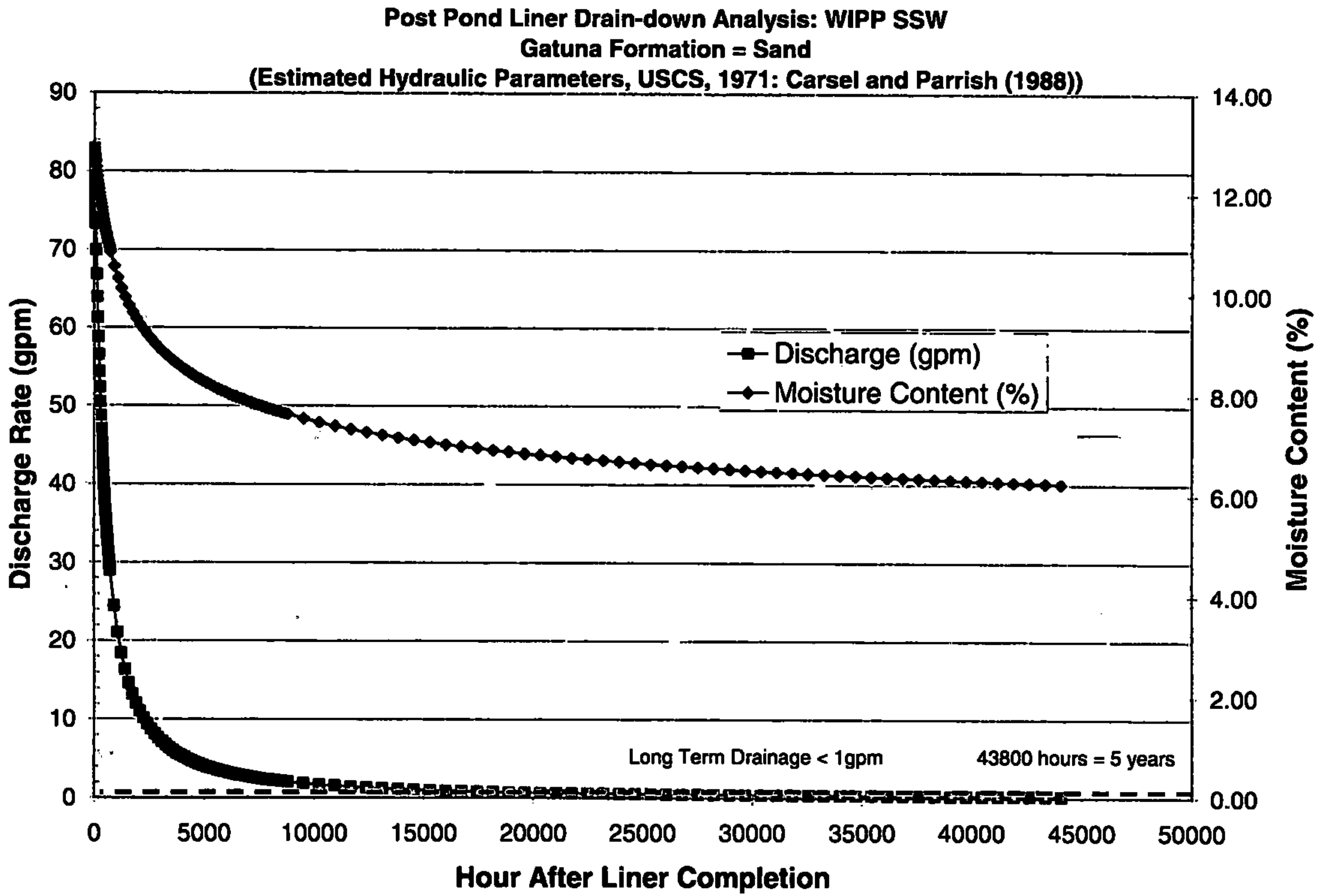
Parameter	*Value*	*Units*	*Notes*
Area	**10.61**	**(acres)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Thickness	**30**	**(ft)**	**Gatuna Formation**
Total Bulk Volume of Saturation	**318.3**	**(acre-ft)**	**Gatuna Formation**
Porosity	**0.43**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.129**	**fraction**	**30% of Saturated Moisture Content (Estimated)**
Initial Storage Volume (Gatuna Formation)	**41.1**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.045**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**26.7**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**21.2**	**(acre-ft)**	**5 Year Drainage**

Hour after Pond Liner Installation		0	1	2	3	4	5		44076
Incremental Steady State Assumption*	Moisture Content (%)	12.90	12.90	12 89	12.89	12.88	12.88		6.25
	Discharge (gpm)	8.29E+01	8.27E+01	8.25E+01	8.23E+01	8.22E+01	8.20E+01		2.45E-01
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	1.22E-05	1.21E-05	1.21E-05	1.21E-05	1.21E-05	1.20E-05		3.60E-08
Effective Saturation (Stephens, 1995)	Se	0.218182	0.218057	0.217933	0.217809	0.217685	0.217562	Hourly	0.045397
van Genuchten Parameter (Carsel and Parrish, 1988)	N	2.68	2 68	2.68	2.68	2.68	2 68	Time	2.68
Mualem model (Stephens, 1995)	m	0.626866	0.626866	0.626866	0.626866	0.626866	0.626866	Steps for 5	0.626866
van Genuchten Parameter, Carsel and Parrish, 1988	alpha$_{(v)}$	0 145	0.145	0.145	0.145	0.145	0 145	Years	0.145
Pressure head (Stephens, 1995)	P-head (-cm)	16.49063	16.49677	16.50291	16.50904	16.51516	16.52128		43.33614
Relative hydraulic conductivity	Kr	0.001476	0.001473	0.00147	0.001466	0.001463	0.00146		4.36E-06
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03		8.25E-03
Drainage Volume (acre-ft)		0.00E+00	1.53E-02	1 52E-02	1.52E-02	1.52E-02	1.51E-02		3.32E-02

References:

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology CRC Press



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Sandy Clay Loam (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

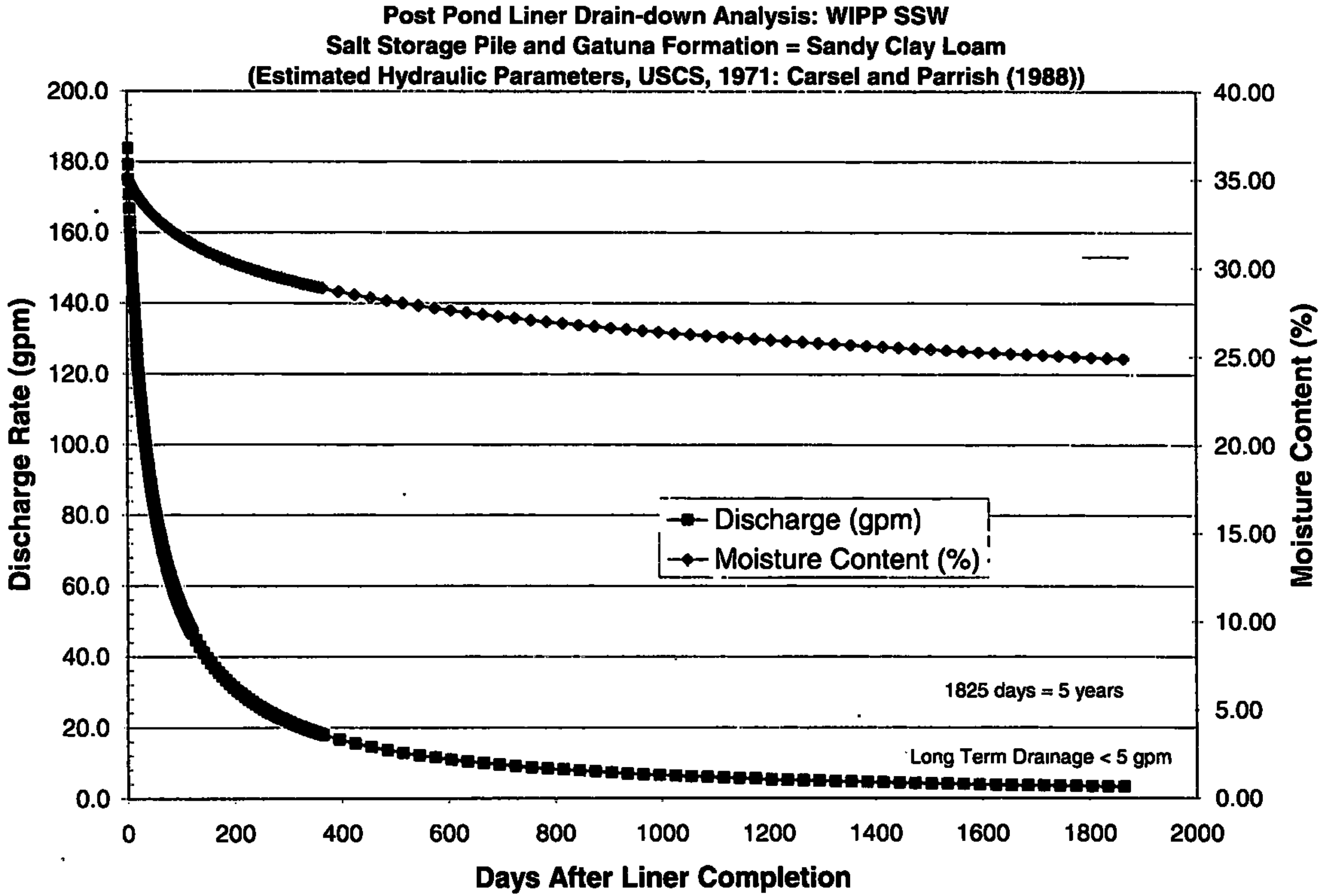
Parameter	*Value*	*Units*	*Notes*
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.39	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.351	fraction	90% of Saturated Moisture Content (Estimated)
Initial Storage Volume	428.9	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.1	fraction	Carsel and Parrish, 1988
Potential Drainage	306.7	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	124.5	(acre-ft)	~ 5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	35 10	35.03	34.97	34.91	34 84	34 78		24 95
	Discharge (gpm)	1.84E+02	1.79E+02	1 75E+02	1.71E+02	1.67E+02	1.63E+02		3.44E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	2.70E-05	2.63E-05	2.57E-05	2.51E-05	2.45E-05	2.40E-05		5.06E-07
Effective Saturation (Stephens, 1995)	Se	0.865517	0.863225	0.86099	0 85881	0.856681	0.854601	Daily Time Steps for 5 Years	0.515446
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.48	1.48	1.48	1 48	1.48	1 48		1.48
Mualem model (Stephens, 1995)	m	0.324324	0.324324	0.324324	0.324324	0.324324	0.324324		0.324324
van Genuchten Parameter. Carsel and Parrish, 1988	$alpha_{(v)}$	0 059	0.059	0 059	0 059	0.059	0.059		0.059
Pressure head (Stephens, 1995)	P-head (-cm)	11.46892	11.64529	11.81787	11 98685	12.15242	12 31477		61.38197
Relative hydraulic conductivity	Kr	0.074217	0.072365	0.070609	0.068941	0.067354	0.065842		0.001391
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04		3.64E-04
Drainage Volume (acre-ft)		0.00E+00	8.12E-01	7.92E-01	7.73E-01	7.54E-01	7.37E-01		4.65E-01

References:

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D B , 1996. Vadose Zone Hydrology CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Silt (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

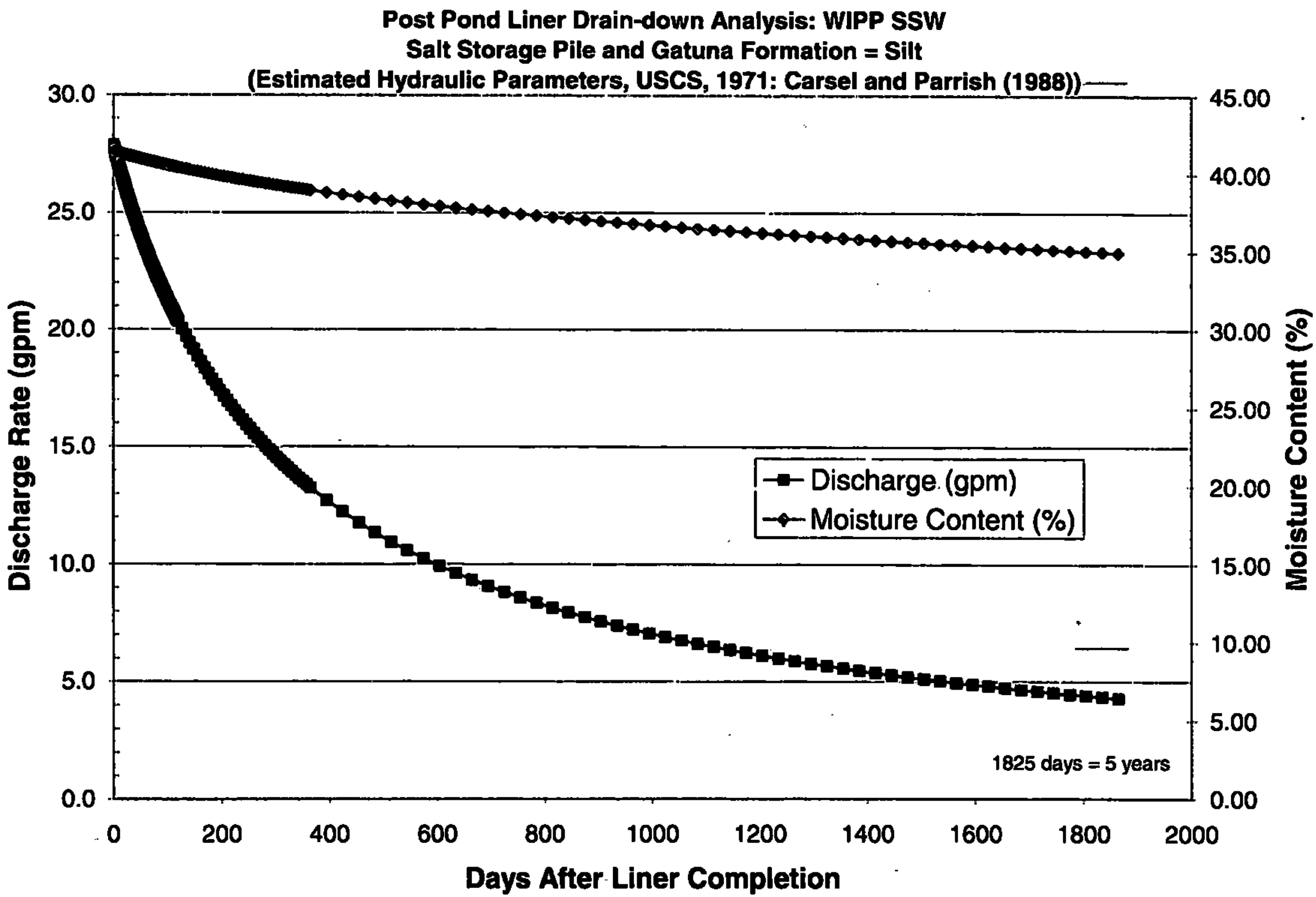
Parameter	*Value*	*Units*	*Notes*
Area	**18.8**	**(acres)**	**Salt Storage Area**
Thickness of Salt Pile	**30**	**(ft)**	**Salt Storage Area**
Thickness of Vadose Zone	**35**	**(ft)**	**Gatuna Formation**
Total Thickness	**65**	**(ft)**	**Salt Pile and Gatuna Formation**
Total Bulk Volume of Saturation	**1222**	**(acre-ft)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Porosity	**0.46**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.414**	**fraction**	**90% of Saturated Moisture Content (Estimated)**
Initial Storage Volume	**505.9**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.034**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**464.4**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**78.3**	**(acre-ft)**	**~ 5 Year Drainage**

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	41.40	41 39	41 38	41 37	41.36	41.35		35.04
	Discharge (gpm)	2 79E+01	2.78E+01	2.77E+01	2.76E+01	2.75E+01	2.74E+01		4.35E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	4.09E-06	4.08E-06	4.07E-06	4.05E-06	4.04E-06	4.03E-06		6.40E-07
Effective Saturation (Stephens, 1995)	Se	0.892019	0.891782	0.891547	0.891312	0.891077	0.890844		0.742692
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.37	1.37	1.37	1 37	1.37	1 37	Daily Time Steps for 5 Years	1.37
Mualem model (Stephens, 1995)	m	0.270073	0.270073	0.270073	0.270073	0.270073	0.270073		0.270073
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0 016	0.016	0.016	0 016	0.016	0.016		0.016
Pressure head (Stephens, 1995)	P-head (-cm)	39.14123	39.22253	39.30362	39.3845	39.46516	39.5456		103 9828
Relative hydraulic conductivity	Kr	0.058938	0.058752	0 058568	0.058385	0.058203	0.058022		0.00921
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05		6.94E-05
Drainage Volume (acre-ft)		0.00E+00	1.23E-01	1.23E-01	1.22E-01	1.22E-01	1.22E-01		5.85E-01

References.

Carsel, R F and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Clay Loam (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

Parameter	*Value*	*Units*	*Notes*
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.41	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.369	fraction	90% of Saturated Moisture Content (Estimated)
Initial Storage Volume	450.9	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.095	fraction	Carsel and Parrish, 1988
Potential Drainage	334.8	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	45.9	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	36.90	36.89	36.89	36.88	36.88	36.87	Daily Time Steps for 5 Years	33.17
Incremental Steady State Assumption*	Discharge (gpm)	1.39E+01	1.39E+01	1.39E+01	1.38E+01	1.38E+01	1.38E+01		2.77E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	2.05E-06	2.04E-06	2.04E-06	2.03E-06	2.03E-06	2.02E-06		4.07E-07
Effective Saturation (Stephens, 1995)	Se	0.869841	0.869681	0.869522	0.869363	0.869204	0.869046		0.751544
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.31	1 31	1.31	1.31	1 31	1.31		1 31
Mualem model (Stephens, 1995)	m	0.236641	0.236641	0.236641	0.236641	0.236641	0.236641		0.236641
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.019	0.019	0.019	0.019	0 019	0.019		0.019
Pressure head (Stephens, 1995)	P-head (-cm)	44.50117	44.56042	44.61956	44 6786	44.73754	44.79638		100.827
Relative hydraulic conductivity	Kr	0.028318	0.028254	0.02819	0.028127	0.028064	0.028001		0.00564
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05		7.22E-05
Drainage Volume (acre-ft)		0.00E+00	6.15E-02	6 14E-02	6 12E-02	6.11E-02	6.10E-02		3.72E-01

References:

Carsel, R.F and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.

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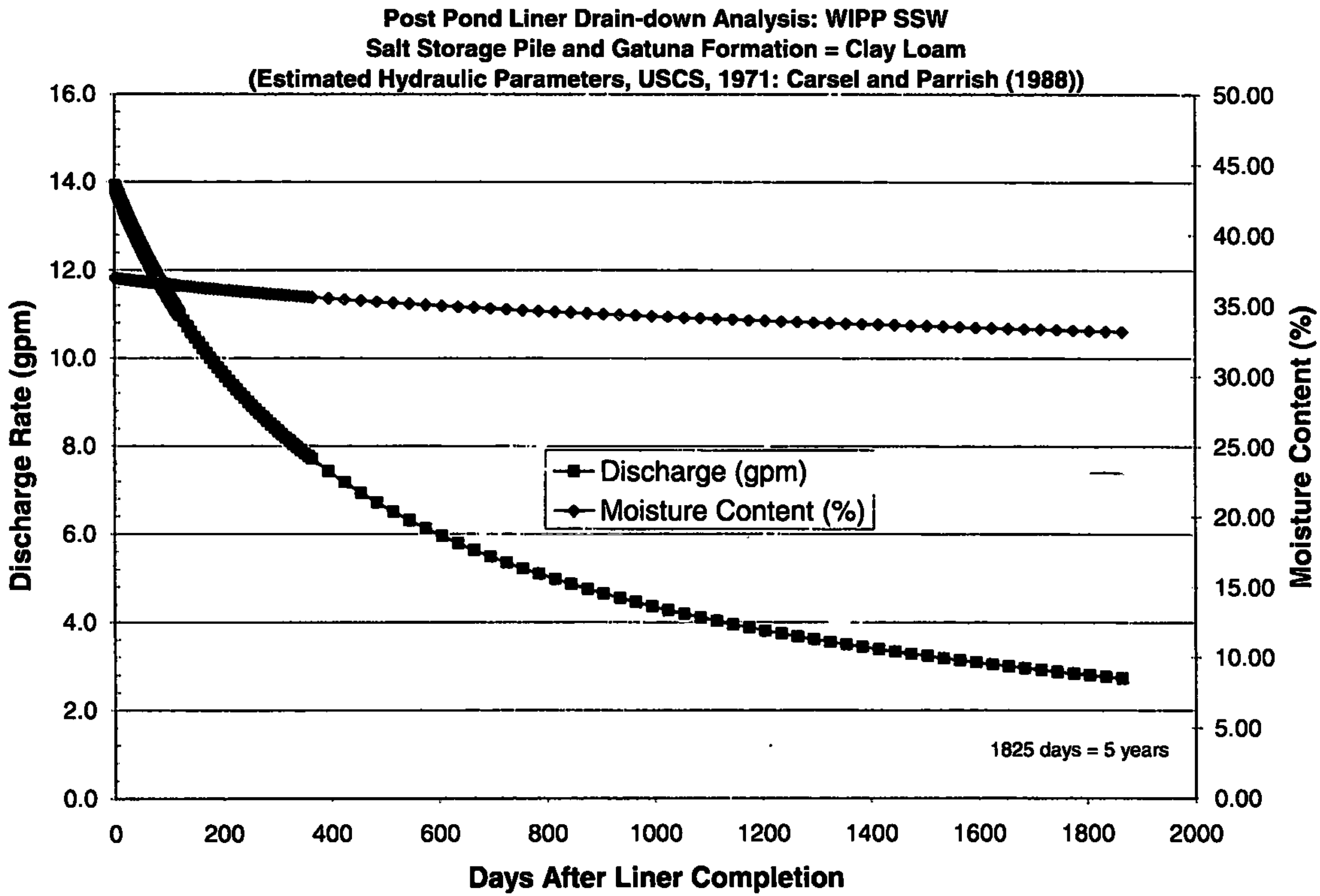

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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Clay (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

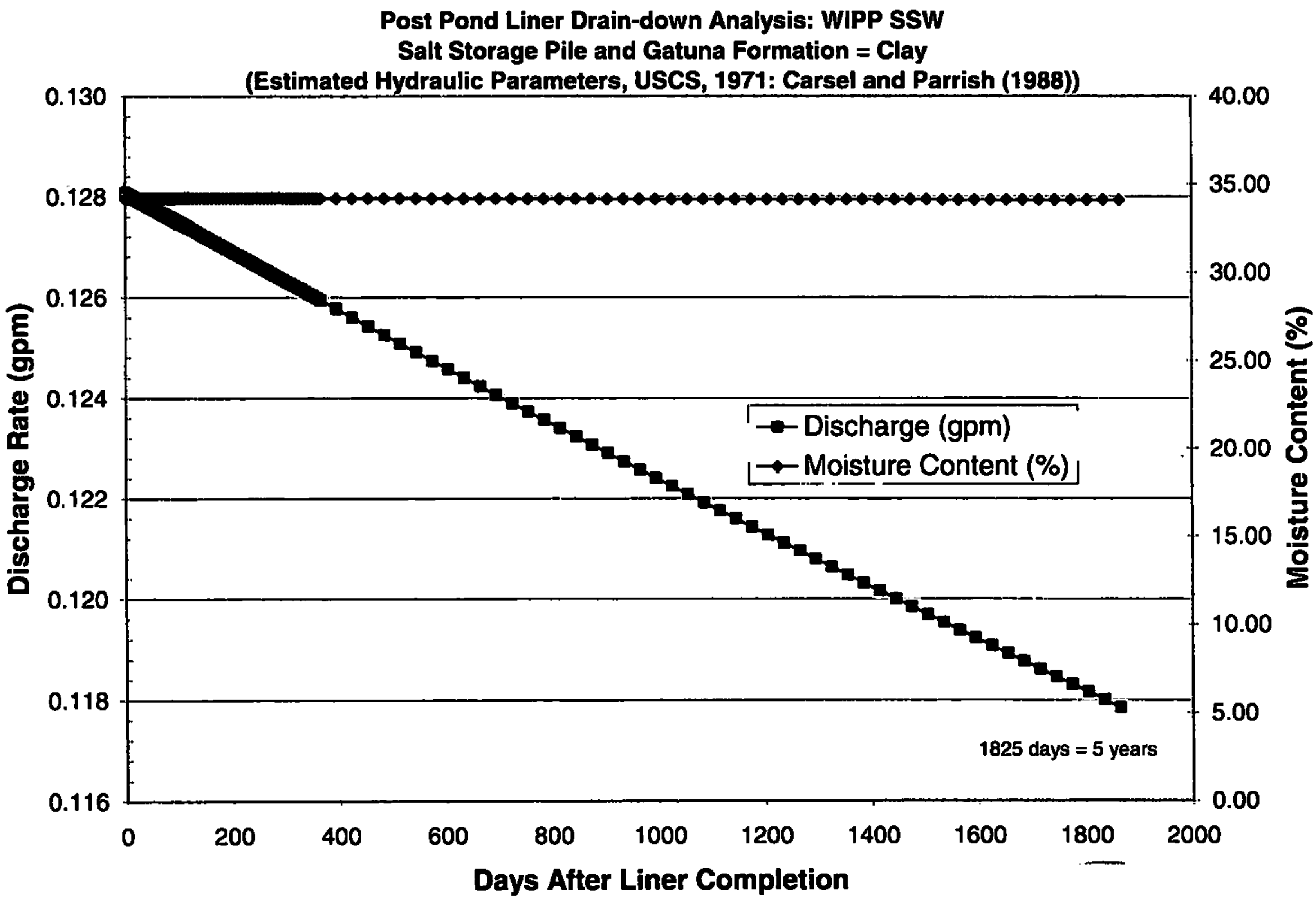
Parameter	*Value*	*Units*	*Notes*
Area	**18.8**	**(acres)**	**Salt Storage Area**
Thickness of Salt Pile	**30**	**(ft)**	**Salt Storage Area**
Thickness of Vadose Zone	**35**	**(ft)**	**Gatuna Formation**
Total Thickness	**65**	**(ft)**	**Salt Pile and Gatuna Formation**
Total Bulk Volume of Saturation	**1222**	**(acre-ft)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Porosity	**0.38**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.342**	**fraction**	**90% of Saturated Moisture Content (Estimated)**
Initial Storage Volume	**417.9**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.068**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**334.8**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**1.0**	**(acre-ft)**	**~ 5 Year Drainage**

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption* {	Moisture Content (%)	34.20	34.20	34.20	34.20	34.20	34.20		34 12
	Discharge (gpm)	1.28E-01	1.28E-01	1.28E-01	1 28E-01	1.28E-01	1.28E-01		1 18E-01
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	1.88E-08	1.88E-08	1.88E-08	1.88E-08	1.88E-08	1.88E-08		1 73E-08
Effective Saturation (Stephens, 1995)	Se	0.878205	0.878204	0.878202	0.878201	0.878199	0.878198	Daily Time Steps for 5 Years	0 87559
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.09	1.09	1.09	1.09	1.09	1.09		1.09
Mualem model (Stephens, 1995)	m	0.082569	0.082569	0.082569	0.082569	0.082569	0.082569		0.082569
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0 008	0 008	0.008	0 008	0 008	0.008		0.008
Pressure head (Stephens, 1995)	P-head (-cm)	427.5553	427.5655	427.5756	427.5857	427.5959	427.606		445.7269
Relative hydraulic conductivity	Kr	0.000339	0.000339	0.000339	0 000339	0.000339	0.000339		0.000312
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5 56E-05	5.56E-05		5.56E-05
Drainage Volume (acre-ft)		0.00E+00	5.66E-04	5.66E-04	5.66E-04	5.66E-04	5.66E-04		1 57E-02

References.

Carsel, R F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B , 1996. Vadose Zone Hydrology. CRC Press



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Sand (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

Parameter	Value	Units	Notes
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.43	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.387	fraction	90% of Saturated Moisture Content (Estimated)
Initial Storage Volume	472.9	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.045	fraction	Carsel and Parrish, 1988
Potential Drainage	417.9	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	382.9	(acre-ft)	~ 5 Year Drainage

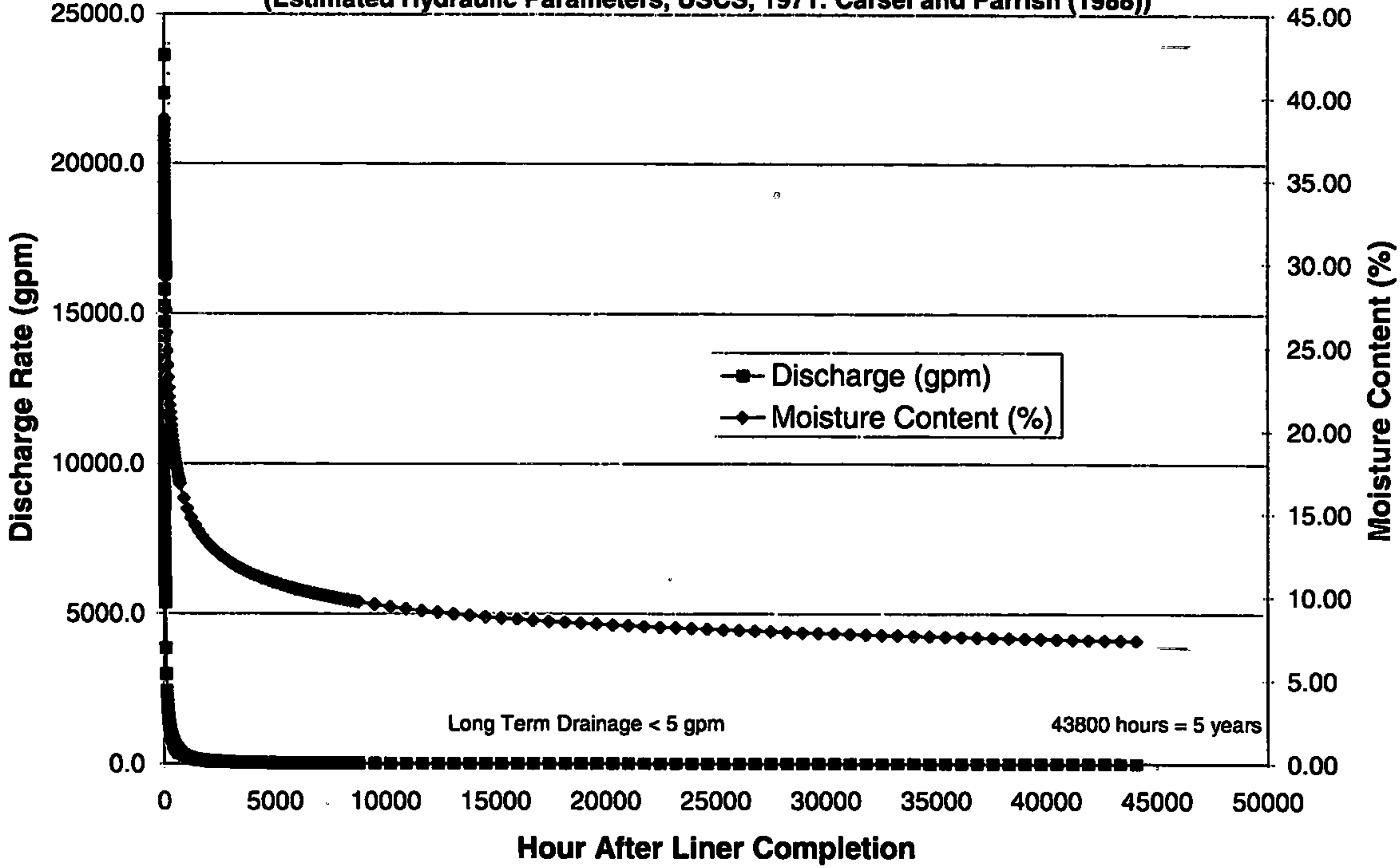
Hour after Pond Liner Installation		0	1	2	3	4	5		44076
Incremental Steady State Assumption*	Moisture Content (%)	38.70	38.34	38.01	37.69	37.38	37.09		7.38
	Discharge (gpm)	2 36E+04	2.24E+04	2 12E+04	2 02E+04	1.93E+04	1.85E+04		1 56E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	3.47E-03	3.29E-03	3.12E-03	2.97E-03	2.84E-03	2.72E-03		2.29E-07
Effective Saturation (Stephens, 1995)	Se	0.888312	0.879067	0.870315	0.862001	0.854082	0.84652	Hourly	0.074925
van Genuchten Parameter (Carsel and Parrish, 1988)	N	2 68	2.68	2 68	2.68	2 68	2.68	Time	2.68
Mualem model (Stephens, 1995)	m	0.626866	0.626866	0.626866	0.626866	0.626866	0.626866	Steps for 5	0.626866
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.145	0 145	0 145	0 145	0.145	0 145	Years	0 145
Pressure head (Stephens, 1995)	P-head (-cm)	3.83833	3.974254	4 09931	4 215284	4.323541	4.42515		32.05386
Relative hydraulic conductivity	Kr	0.420678	0.398287	0.378324	0.360381	0.344141	0.329357		2.78E-05
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03		8.25E-03
Drainage Volume (acre-ft)		0 00E+00	4 35E+00	4 12E+00	3.91E+00	3.73E+00	3.56E+00		2.11E-01

References.

Carsel, R.F and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B , 1996. Vadose Zone Hydrology CRC Press.

Post Pond Liner Drain-down Analysis: WIPP SSW
Salt Storage Pile and Gatuna Formation = Sand
(Estimated Hydraulic Parameters, USCS, 1971: Carsel and Parrish (1988))



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Sandy Clay Loam (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

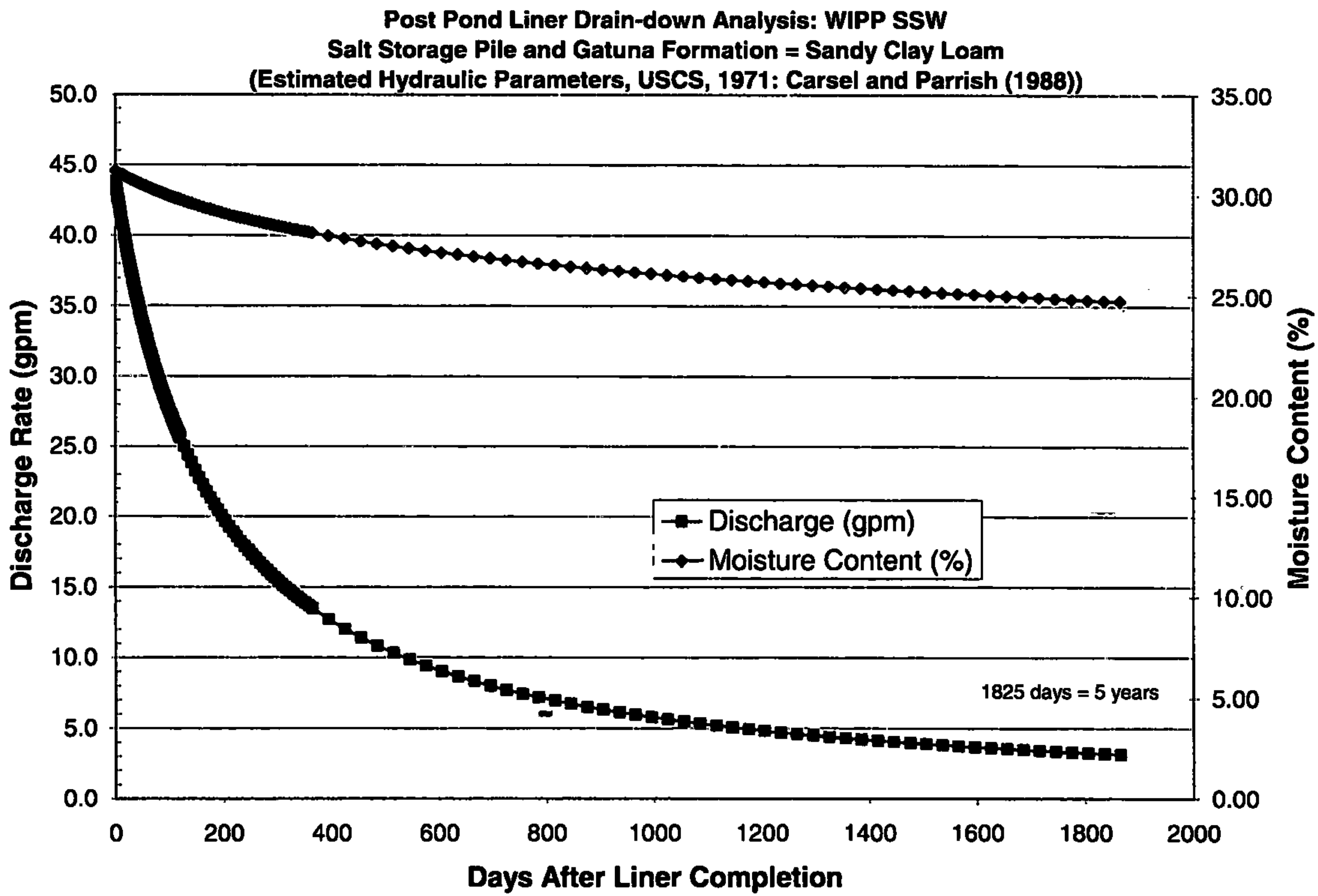
Parameter	*Value*	*Units*	*Notes*
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.39	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.312	fraction	80% of Saturated Moisture Content (Estimated)
Initial Storage Volume	381.3	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.1	fraction	Carsel and Parrish, 1988
Potential Drainage	259.1	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	78.7	(acre-ft)	~ 5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	31.20	31 18	31 17	31.15	31 14	31 12		24.80
	Discharge (gpm)	4.38E+01	4 36E+01	4 33E+01	4.31E+01	4.28E+01	4.26E+01		3.21E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	6.44E-06	6.40E-06	6.37E-06	6.33E-06	6.29E-06	6.26E-06		4.71E-07
Effective Saturation (Stephens, 1995)	Se	0.731034	0.730488	0 729944	0.729404	0.728867	0.728333	Daily Time Steps for 5 Years	0.510217
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.48	1 48	1.48	1.48	1.48	1 48		1 48
Mualem model (Stephens, 1995)	m	0.324324	0.324324	0.324324	0.324324	0.324324	0.324324		0.324324
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.059	0.059	0 059	0.059	0.059	0.059		0.059
Pressure head (Stephens, 1995)	P-head (-cm)	23 5531	23.6124	23.67146	23.73029	23.78889	23.84725		62.89488
Relative hydraulic conductivity	Kr	0.017702	0.017599	0.017497	0.017396	0.017297	0.017198		0.001296
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	3.64E-04	3 64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04		3.64E-04
Drainage Volume (acre-ft)		0.00E+00	1.94E-01	1.93E-01	1.91E-01	1.90E-01	1.89E-01		4 32E-01

References:

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Silt (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

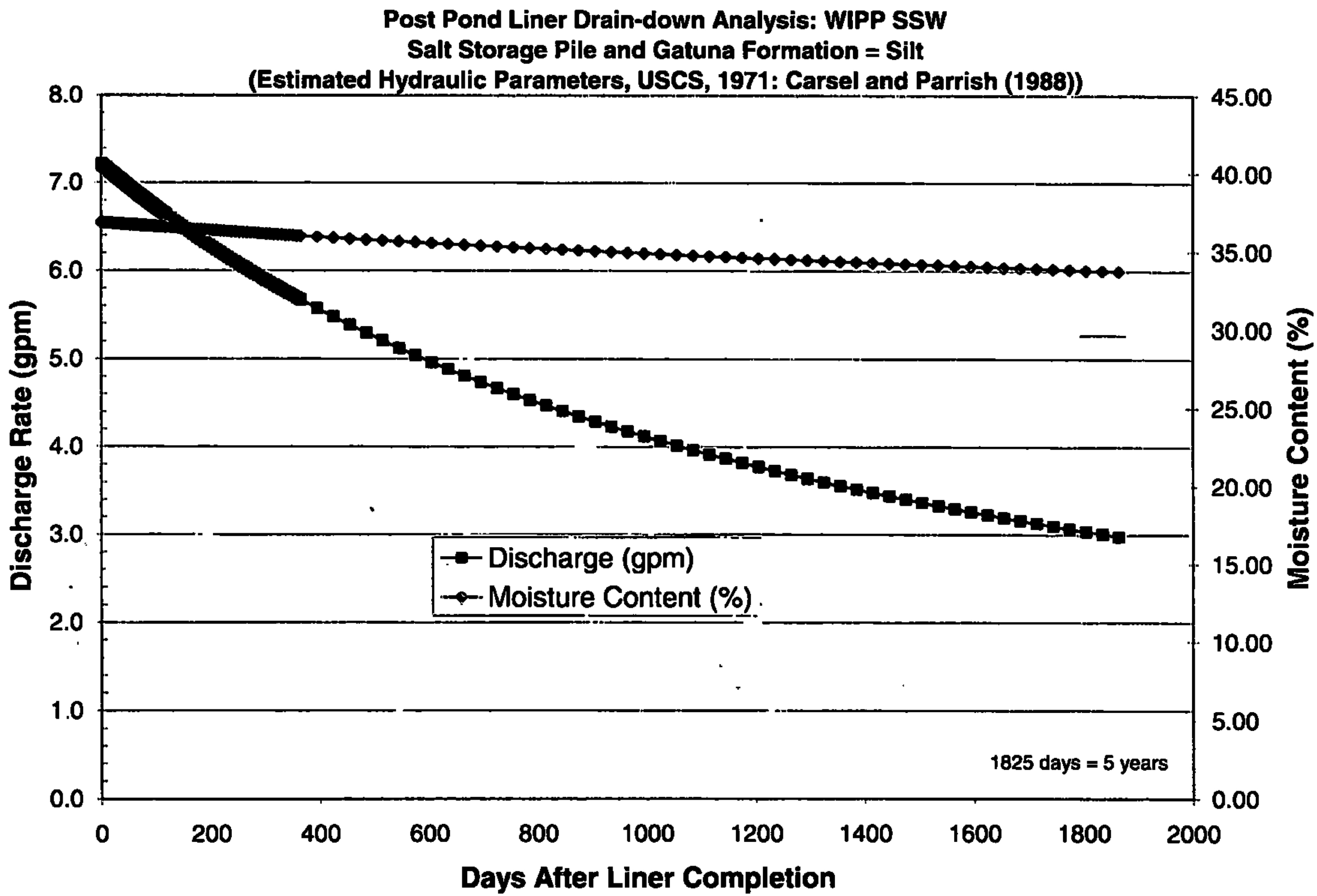
Parameter	*Value*	*Units*	*Notes*
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.46	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.368	fraction	80% of Saturated Moisture Content (Estimated)
Initial Storage Volume	449.7	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.034	fraction	Carsel and Parrish, 1988
Potential Drainage	408.1	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	37.3	(acre-ft)	~ 5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	36.80	36.80	36.79	36 79	36 79	36.79		33.78
	Discharge (gpm)	7.22E+00	7.21E+00	7.21E+00	7.20E+00	7.19E+00	7.19E+00		3.02E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	1.06E-06	1.06E-06	1.06E-06	1.06E-06	1.06E-06	1.06E-06		4.43E-07
Effective Saturation (Stephens, 1995)	Se	0.784038	0 783976	0.783915	0 783854	0.783793	0.783732	Daily Time Steps for 5 Years	0.713093
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.37	1 37	1 37	1.37	1 37	1.37		1.37
Mualem model (Stephens, 1995)	m	0.270073	0.270073	0.270073	0.270073	0.270073	0.270073		0.270073
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.016	0 016	0.016	0.016	0 016	0.016		0.016
Pressure head (Stephens, 1995)	P-head (-cm)	82.45547	82 4848	82.51411	82.54341	82.57269	82.60196		121 9067
Relative hydraulic conductivity	Kr	0.015268	0 015257	0.015246	0.015234	0.015223	0.015212		0.006382
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05		6.94E-05
Drainage Volume (acre-ft)		0.00E+00	3.19E-02	3.19E-02	3 18E-02	3.18E-02	3.18E-02		4.04E-01

References:

Carsel, R F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769

Stephens, D B , 1996. Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Clay Loam (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

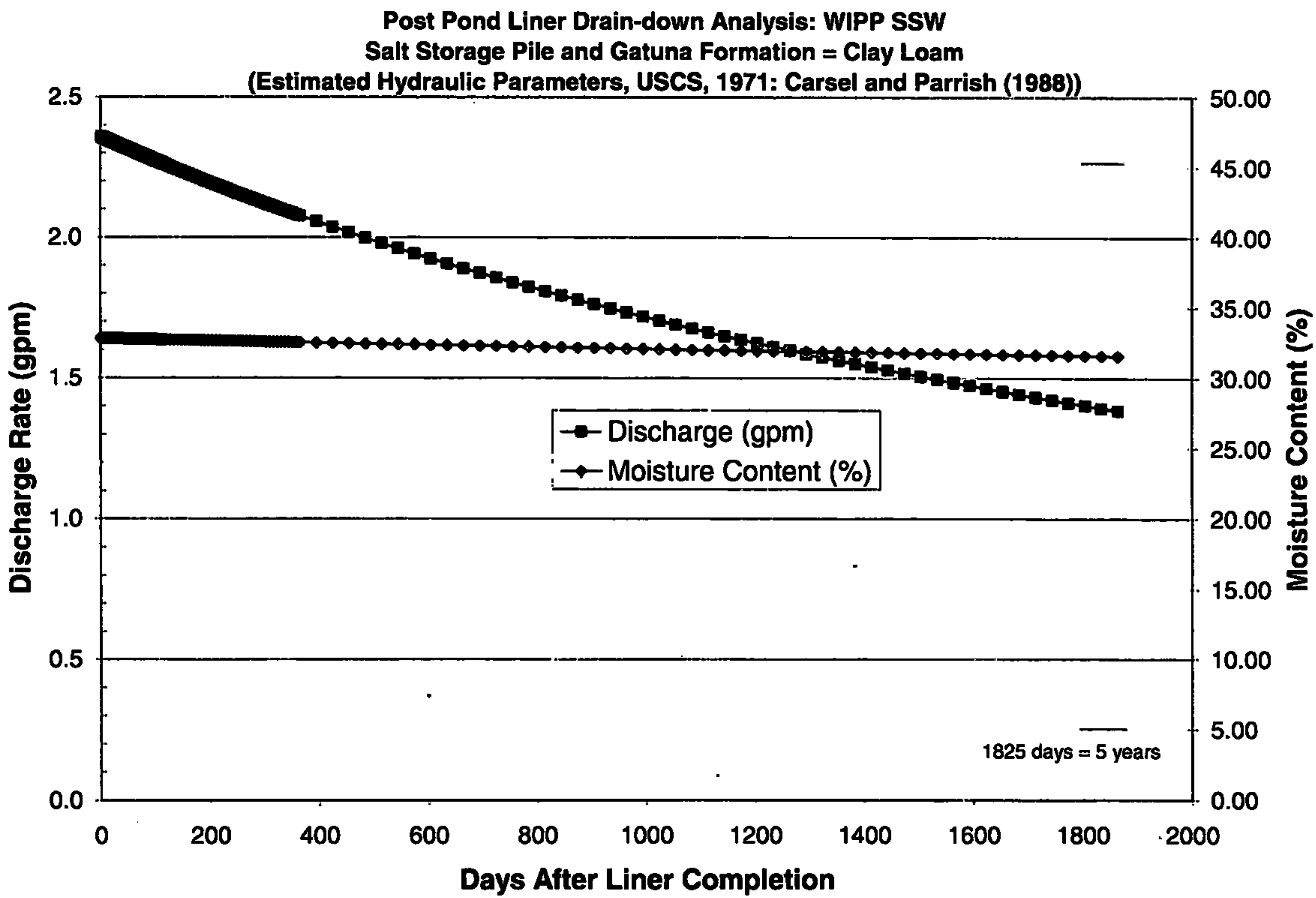
Parameter	Value	Units	Notes
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.41	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.328	fraction	80% of Saturated Moisture Content (Estimated)
Initial Storage Volume	400.8	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.095	fraction	Carsel and Parrish, 1988
Potential Drainage	284.7	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	14.8	(acre-ft)	~ 5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	32.80	32.80	32.80	32.80	32.80	32.80		31.60
	Discharge (gpm)	2.36E+00	2 36E+00	2 36E+00	2.36E+00	2 35E+00	2.35E+00		1.40E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	3.46E-07	3.46E-07	3.46E-07	3.46E-07	3.46E-07	3.46E-07		2 05E-07
Effective Saturation (Stephens, 1995)	Se	0.739683	0.739655	0.739628	0.739601	0.739574	0.739547	Daily Time Steps for 5 Years	0 70174
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.31	1.31	1 31	1 31	1 31	1.31		1 31
Maulem model (Stephens, 1995)	m	0.236641	0.236641	0.236641	0.236641	0.236641	0.236641		0.236641
van Genuchten Parameter. Carsel and Parrish, 1988	$alpha_{(v)}$	0 019	0.019	0.019	0 019	0.019	0.019		0.019
Pressure head (Stephens, 1995)	P-head (-cm)	108.3768	108 3946	108.4124	108 4301	108.4479	108.4656		135 9683
Relative hydraulic conductivity	Kr	0.004797	0 004796	0.004794	0.004792	0.00479	0.004788		0.002838
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05		7.22E-05
Drainage Volume (acre-ft)		0.00E+00	1.04E-02	1.04E-02	1.04E-02	1.04E-02	1.04E-02		1 86E-01

References.

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769

Stephens, D.B., 1996 Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Clay (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

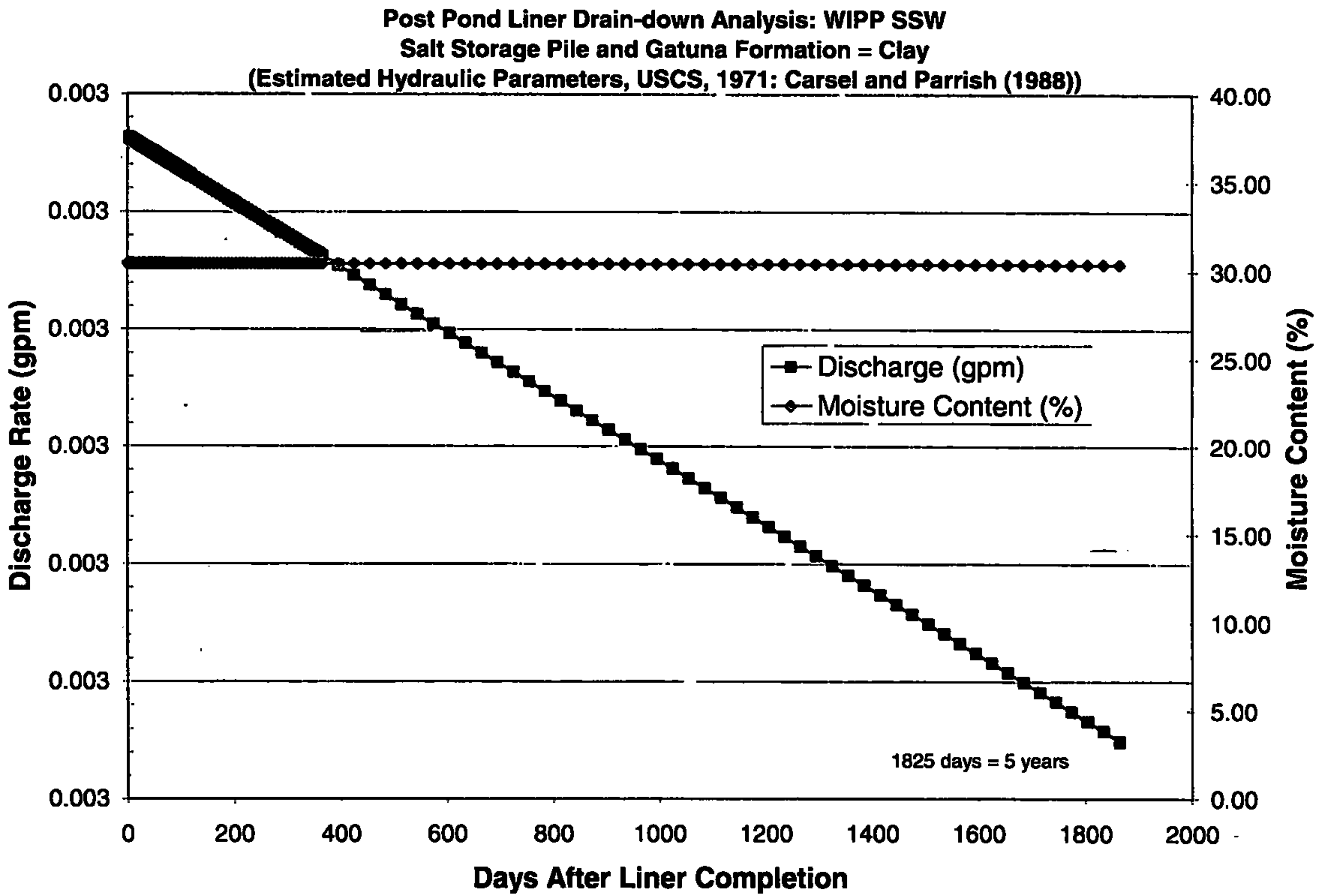
Parameter	*Value*	*Units*	*Notes*
Area	**18.8**	**(acres)**	**Salt Storage Area**
Thickness of Salt Pile	**30**	**(ft)**	**Salt Storage Area**
Thickness of Vadose Zone	**35**	**(ft)**	**Gatuna Formation**
Total Thickness	**65**	**(ft)**	**Salt Pile and Gatuna Formation**
Total Bulk Volume of Saturation	**1222**	**(acre-ft)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Porosity	**0.38**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.304**	**fraction**	**80% of Saturated Moisture Content (Estimated)**
Initial Storage Volume	**371.5**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.068**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**288.4**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**0.02**	**(acre-ft)**	**~ 5 Year Drainage**

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	30.40	30.40	30.40	30.40	30.40	30 40		30 40
	Discharge (gpm)	2.68E-03	2.68E-03	2.68E-03	2.68E-03	2.68E-03	2.68E-03		2 67E-03
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	3.93E-10	3.93E-10	3.93E-10	3.93E-10	3.93E-10	3.93E-10		3.93E-10
Effective Saturation (Stephens, 1995)	Se	0.75641	0.75641	0.75641	0.75641	0.75641	0.75641		0.756353
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.09	1.09	1.09	1.09	1.09	1.09	Daily Time Steps for 5 Years	1.09
Mualem model (Stephens, 1995)	m	0.082569	0.082569	0.082569	0.082569	0.082569	0.082569		0.082569
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.008	0.008	0.008	0 008	0.008	0.008		0.008
Pressure head (Stephens, 1995)	P-head (-cm)	2693.165	2693 166	2693.168	2693.169	2693.17	2693.171		2695.496
Relative hydraulic conductivity	Kr	7.08E-06	7.08E-06	7.08E-06	7.08E-06	7.08E-06	7.08E-06		7.07E-06
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05		5.56E-05
Drainage Volume (acre-ft)		0.00E+00	1.18E-05	1.18E-05	1.18E-05	1.18E-05	1.18E-05		3.54E-04

References.

Carsel, R.F. and Parrish, R S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769.

Stephens, D.B , 1996. Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Sand (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

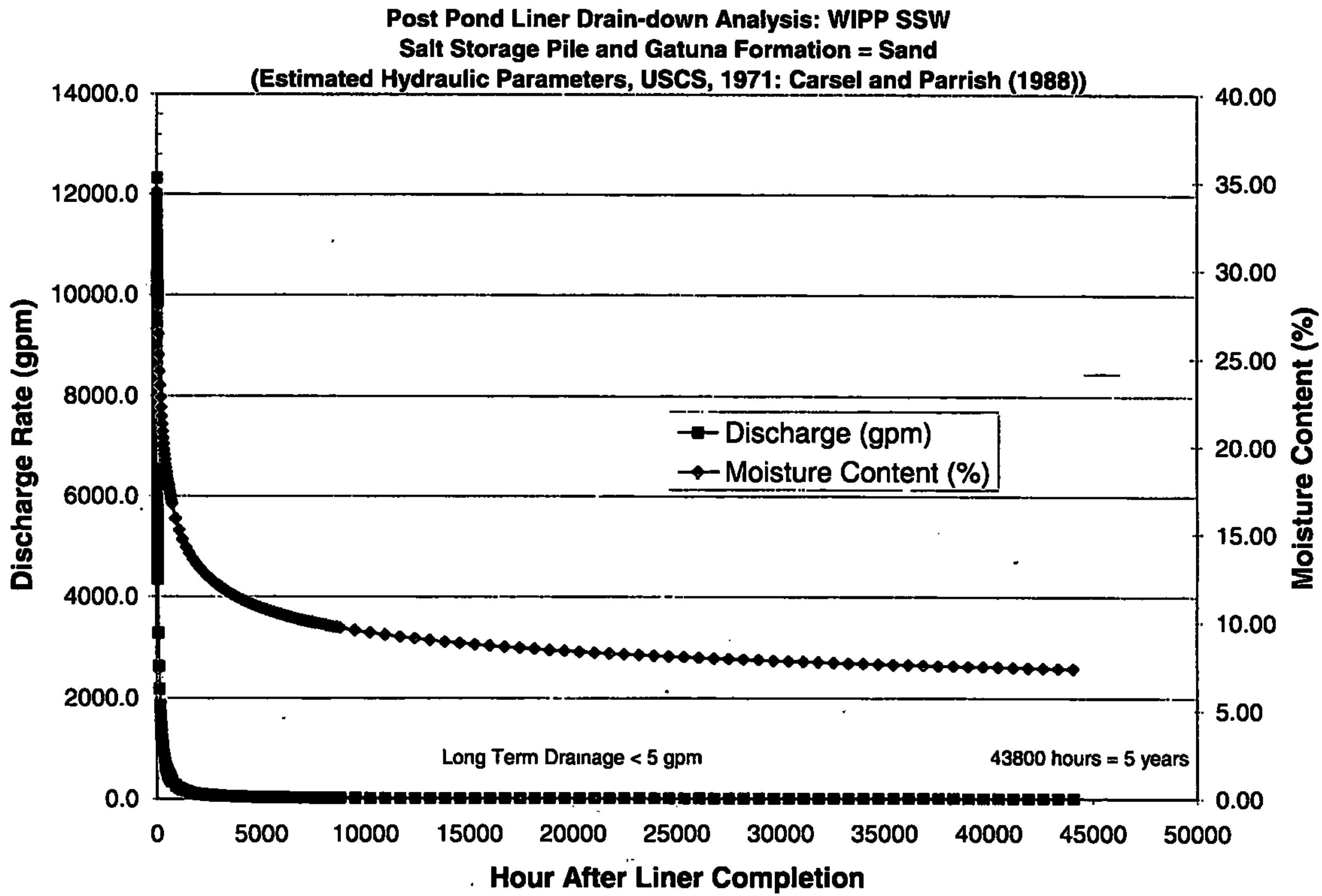
Parameter	*Value*	*Units*	*Notes*
Area	**18.8**	**(acres)**	**Salt Storage Area**
Thickness of Salt Pile	**30**	**(ft)**	**Salt Storage Area**
Thickness of Vadose Zone	**35**	**(ft)**	**Gatuna Formation**
Total Thickness	**65**	**(ft)**	**Salt Pile and Gatuna Formation**
Total Bulk Volume of Saturation	**1222**	**(acre-ft)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Porosity	**0.43**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.344**	**fraction**	**80% of Saturated Moisture Content (Estimated)**
Initial Storage Volume	**420.4**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.045**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**365.4**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**330.3**	**(acre-ft)**	**~ 5 Year Drainage**

Hour after Pond Liner Installation		0	1	2	3	4	5		44076
Incremental Steady State Assumption*	Moisture Content (%)	34.40	34.21	34.03	33.86	33.69	33.52		7.38
	Discharge (gpm)	1.23E+04	1.20E+04	1.17E+04	1.14E+04	1.11E+04	1.08E+04		1.56E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	1.81E-03	1.76E-03	1.71E-03	1.67E-03	1.62E-03	1.58E-03		2.29E-07
Effective Saturation (Stephens, 1995)	Se	0.776623	0.771799	0.767108	0.762545	0.758102	0.753774	Hourly	0.074918
van Genuchten Parameter (Carsel and Parrish, 1988)	N	2.68	2.68	2.68	2.68	2.68	2.68	Time	2.68
Mualem model (Stephens, 1995)	m	0.626866	0.626866	0.626866	0.626866	0.626866	0.626866	Steps for 5	0.626866
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.145	0.145	0.145	0.145	0.145	0.145	Years	0.145
Pressure head (Stephens, 1995)	P-head (-cm)	5.311788	5.370902	5.428244	5.483927	5.538056	5.590724		32.05572
Relative hydraulic conductivity	Kr	0.219562	0.213449	0.207658	0.202164	0.196943	0.191975		2.78E-05
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03		8.25E-03
Drainage Volume (acre-ft)		0.00E+00	2.27E+00	2.21E+00	2.15E+00	2.09E+00	2.04E+00		2.11E-01

References:

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Sandy Clay Loam (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

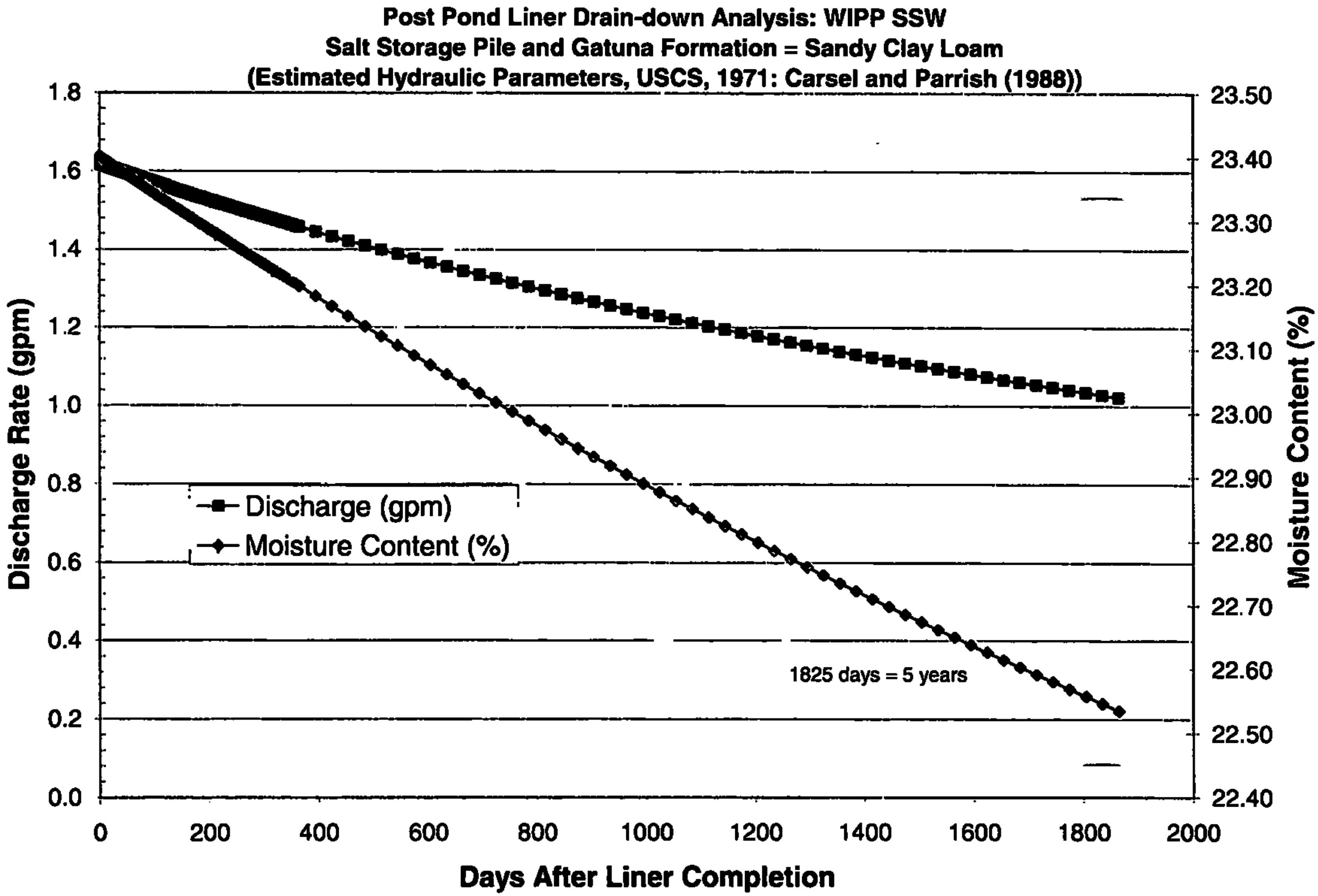
Parameter	Value	Units	Notes
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.39	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.234	fraction	60% of Saturated Moisture Content (Estimated)
Initial Storage Volume	285.9	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.1	fraction	Carsel and Parrish, 1988
Potential Drainage	163.7	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	10.6	(acre-ft)	~ 5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	23 40	23.40	23.40	23.40	23.40	23.40	Daily Time Steps for 5 Years	22.55
	Discharge (gpm)	1.62E+00	1.62E+00	1.62E+00	1.62E+00	1.61E+00	1.61E+00		1.03E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	2.38E-07	2.38E-07	2.37E-07	2.37E-07	2.37E-07	2.37E-07		1.51E-07
Effective Saturation (Stephens, 1995)	Se	0.462069	0.462049	0.462029	0.462008	0.461988	0.461968		0.432635
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.48	1 48	1.48	1.48	1 48	1.48		1.48
Mualem model (Stephens, 1995)	m	0.324324	0.324324	0.324324	0.324324	0.324324	0.324324		0.324324
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.059	0 059	0 059	0.059	0.059	0.059		0.059
Pressure head (Stephens, 1995)	P-head (-cm)	79.28498	79.29292	79 30086	79.3088	79 31674	79.32468		92 08432
Relative hydraulic conductivity	Kr	0.000653	0.000653	0.000653	0.000652	0.000652	0.000652		0.000416
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04	3.64E-04		3.64E-04
Drainage Volume (acre-ft)		0.00E+00	7.15E-03	7.14E-03	7.14E-03	7.14E-03	7.14E-03		1.37E-01

References:

Carsel, R.F. and Parrish, R.S , 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769

Stephens, D B., 1996 Vadose Zone Hydrology CRC Press



T \Projects\9184\Sheets\Final Water Balance\Vadose Zone Redistribution Estimate Salt Storage Area 60 DRAFT 7-22-08_working_copy xls_Drain-down Chart (SCL, CP)

Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Silt (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

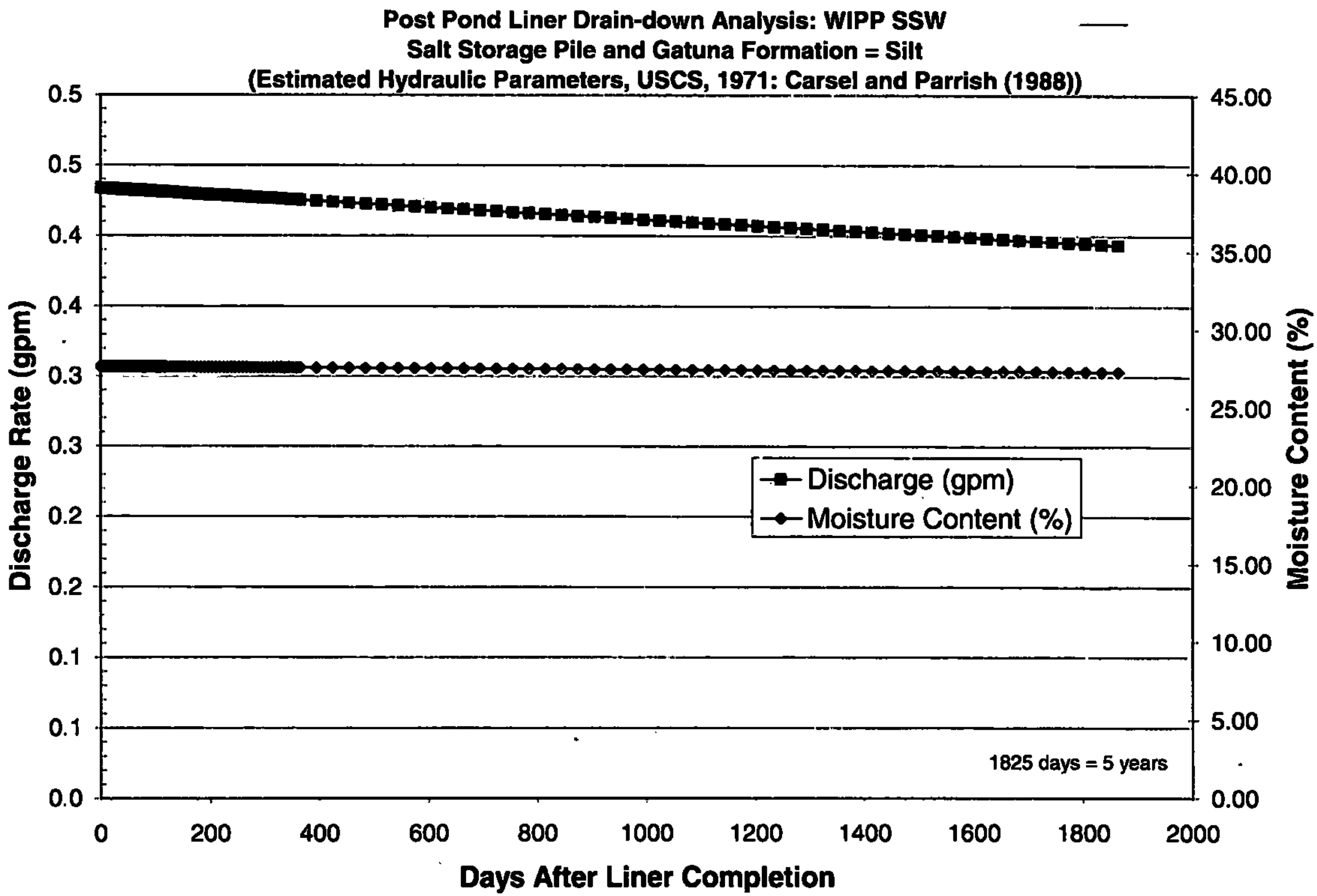
Parameter	Value	Units	Notes
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.46	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.276	fraction	60% of Saturated Moisture Content (Estimated)
Initial Storage Volume	337.3	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.034	fraction	Carsel and Parrish, 1988
Potential Drainage	295.7	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	3.4	(acre-ft)	~ 5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	27 60	27.60	27.60	27.60	27.60	27 60		27.33
	Discharge (gpm)	4.34E-01	4.34E-01	4.34E-01	4.33E-01	4.33E-01	4.33E-01		3.95E-01
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	6.37E-08	6 37E-08	6.37E-08	6.37E-08	6.37E-08	6.37E-08		5.80E-08
Effective Saturation (Stephens, 1995)	Se	0.568075	0.568071	0.568068	0.568064	0.56806	0.568057		0 56163
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.37	1 37	1 37	1.37	1 37	1.37	Daily Time Steps for 5 Years	1.37
Mualem model (Stephens, 1995)	m	0.270073	0.270073	0.270073	0.270073	0.270073	0.270073		0.270073
van Genuchten Parameter. Carsel and Parrish, 1988	$alpha_{(v)}$	0 016	0.016	0.016	0 016	0.016	0.016		0 016
Pressure head (Stephens, 1995)	P-head (-cm)	261 7984	261.8036	261.8089	261.8141	261.8193	261.8246		271 1422
Relative hydraulic conductivity	Kr	0.000917	0 000917	0.000917	0.000917	0.000917	0.000917		0 000835
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05		6.94E-05
Drainage Volume (acre-ft)		0.00E+00	1.92E-03	1.92E-03	1.92E-03	1.92E-03	1.92E-03		5.24E-02

References:

Carsel, R F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B., 1996 Vadose Zone Hydrology CRC Press



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Clay Loam (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

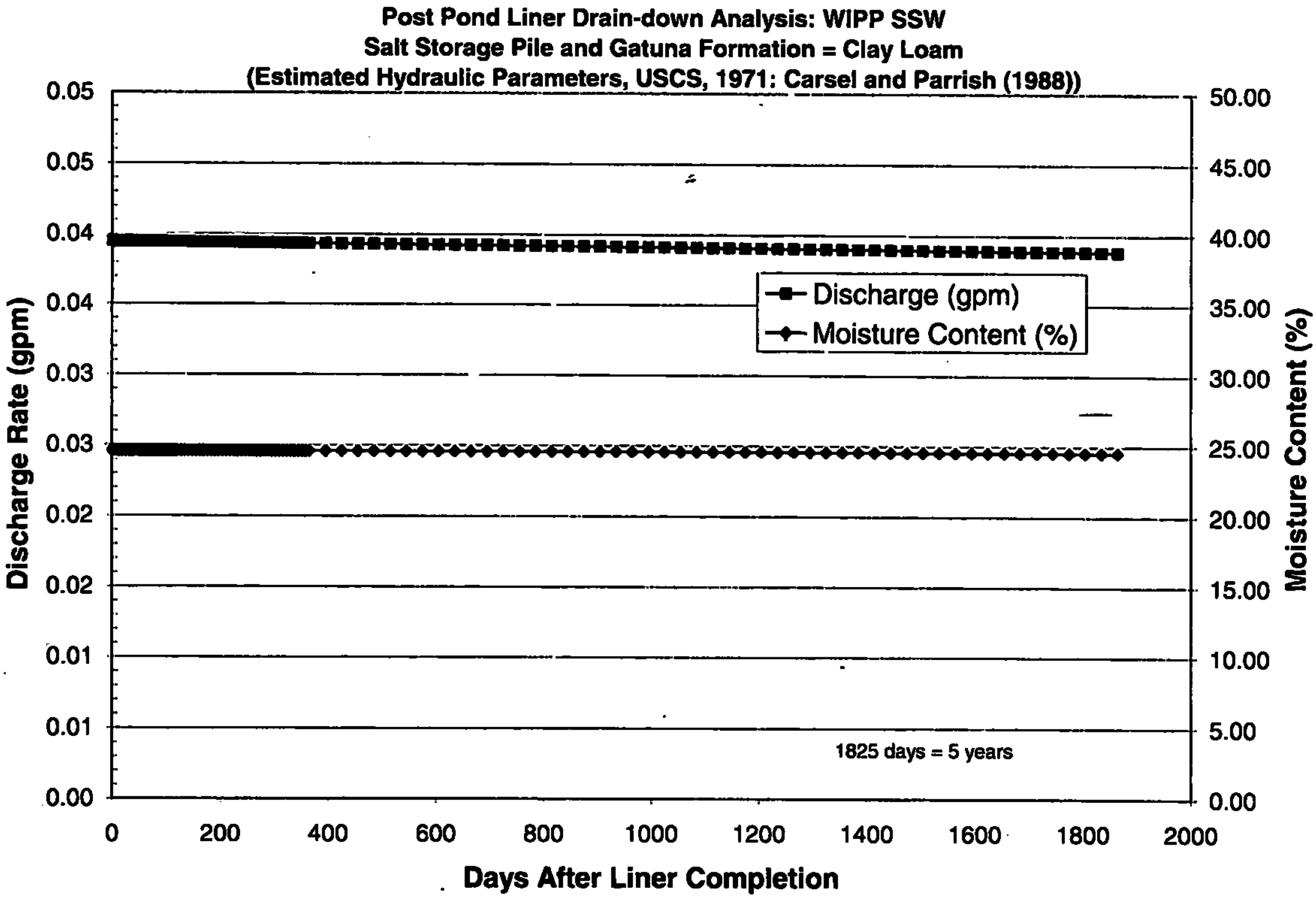
Parameter	Value	Units	Notes
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.41	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.246	fraction	60% of Saturated Moisture Content (Estimated)
Initial Storage Volume	300.6	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.095	fraction	Carsel and Parrish, 1988
Potential Drainage	184.5	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	0.3	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	24.60	24 60	24.60	24.60	24.60	24.60		24.57
	Discharge (gpm)	3.95E-02	3.95E-02	3.95E-02	3.95E-02	3.95E-02	3.95E-02		3.89E-02
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	5.80E-09	5.80E-09	5.80E-09	5.80E-09	5.80E-09	5.80E-09		5.71E-09
Effective Saturation (Stephens, 1995)	Se	0.479365	0.479365	0.479364	0.479364	0.479363	0.479363	Daily Time Steps for 5 Years	0.47854
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1 31	1.31	1.31	1 31	1 31	1.31		1.31
Mualem model (Stephens, 1995)	m	0.236641	0.236641	0.236641	0.236641	0.236641	0.236641		0.236641
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.019	0.019	0 019	0.019	0.019	0.019		0.019
Pressure head (Stephens, 1995)	P-head (-cm)	544.7351	544.7369	544.7386	544 7403	544.7421	544 7438		547.9127
Relative hydraulic conductivity	Kr	8.03E-05	8.03E-05	8 03E-05	8.03E-05	8.03E-05	8.03E-05		7.91E-05
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05		7.22E-05
Drainage Volume (acre-ft)		0 00E+00	1.74E-04	1.74E-04	1.74E-04	1.74E-04	1.74E-04		5.15E-03

References.

Carsel, R.F. and Parrish, R.S , 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769

Stephens, D.B , 1996. Vadose Zone Hydrology CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Clay (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

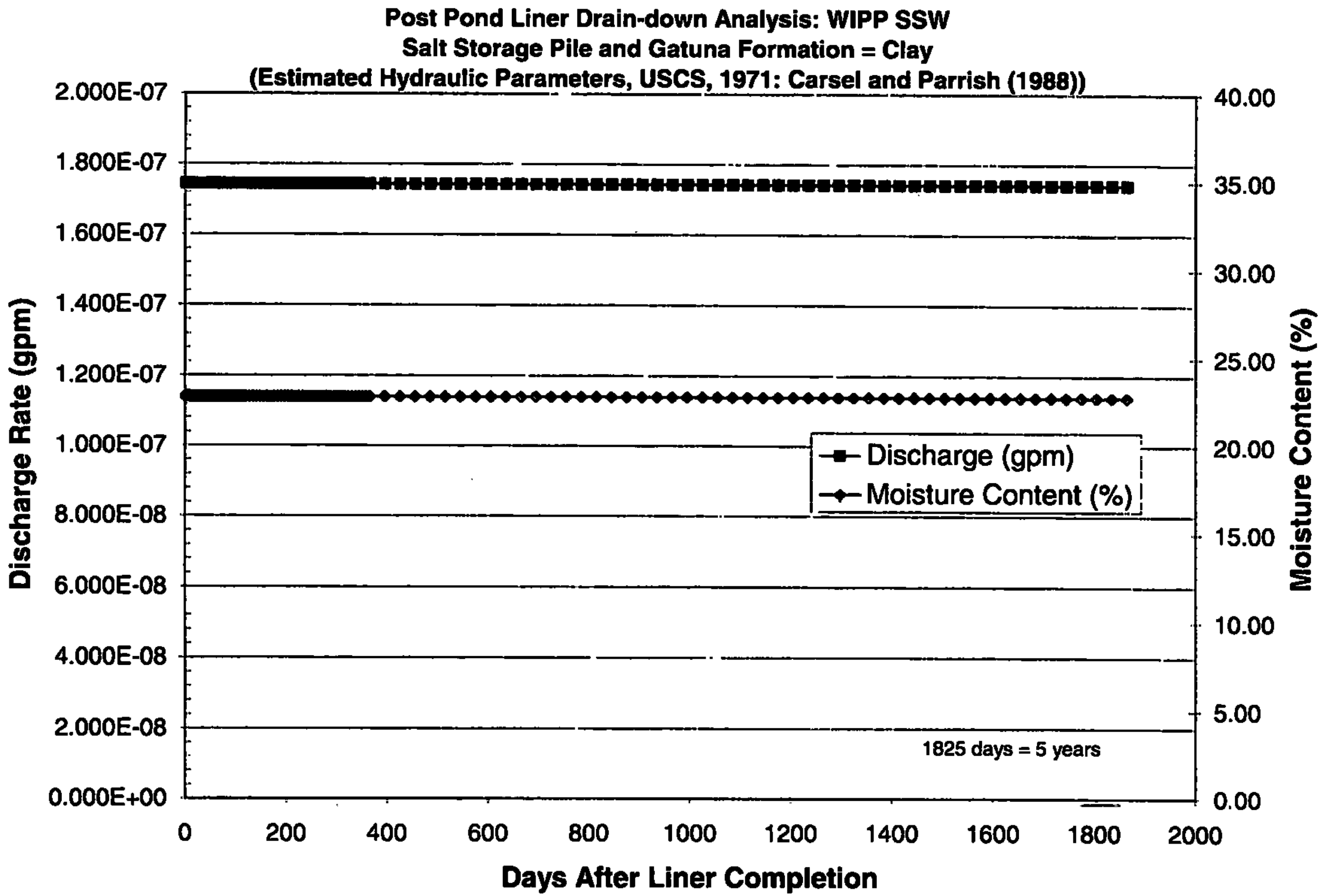
Parameter	*Value*	*Units*	*Notes*
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.38	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.228	fraction	60% of Saturated Moisture Content (Estimated)
Initial Storage Volume	278.6	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.068	fraction	Carsel and Parrish, 1988
Potential Drainage	195.5	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	1.44E-06	(acre-ft)	~ 5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	22.80	22.80	22 80	22.80	22 80	22.80		22.80
	Discharge (gpm)	1.74E-07	1.74E-07	1.74E-07	1.74E-07	1.74E-07	1.74E-07		1.74E-07
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	2.56E-14	2.56E-14	2.56E-14	2.56E-14	2.56E-14	2.56E-14		2.56E-14
Effective Saturation (Stephens, 1995)	Se	0 512821	0.512821	0.512821	0.512821	0.512821	0.512821	Daily Time Steps for 5 Years	0.512821
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.09	1.09	1.09	1.09	1.09	1.09		1.09
Mualem model (Stephens, 1995)	m	0.082569	0.082569	0.082569	0.082569	0.082569	0.082569		0.082569
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(V)}$	0.008	0 008	0 008	0 008	0.008	0.008		0.008
Pressure head (Stephens, 1995)	P-head (-cm)	208638.5	208638.5	208638.5	208638.5	208638 5	208638.5		208638 5
Relative hydraulic conductivity	Kr	4.61E-10	4.61E-10	4.61E-10	4.61E-10	4.61E-10	4.61E-10		4.61E-10
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05		5.56E-05
Drainage Volume (acre-ft)		0 00E+00	7.70E-10	7.70E-10	7.70E-10	7.70E-10	7.70E-10		2.31E-08

References.

Carsel, R.F. and Parrish, R.S , 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769

Stephens, D B , 1996. Vadose Zone Hydrology CRC Press



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Sand (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

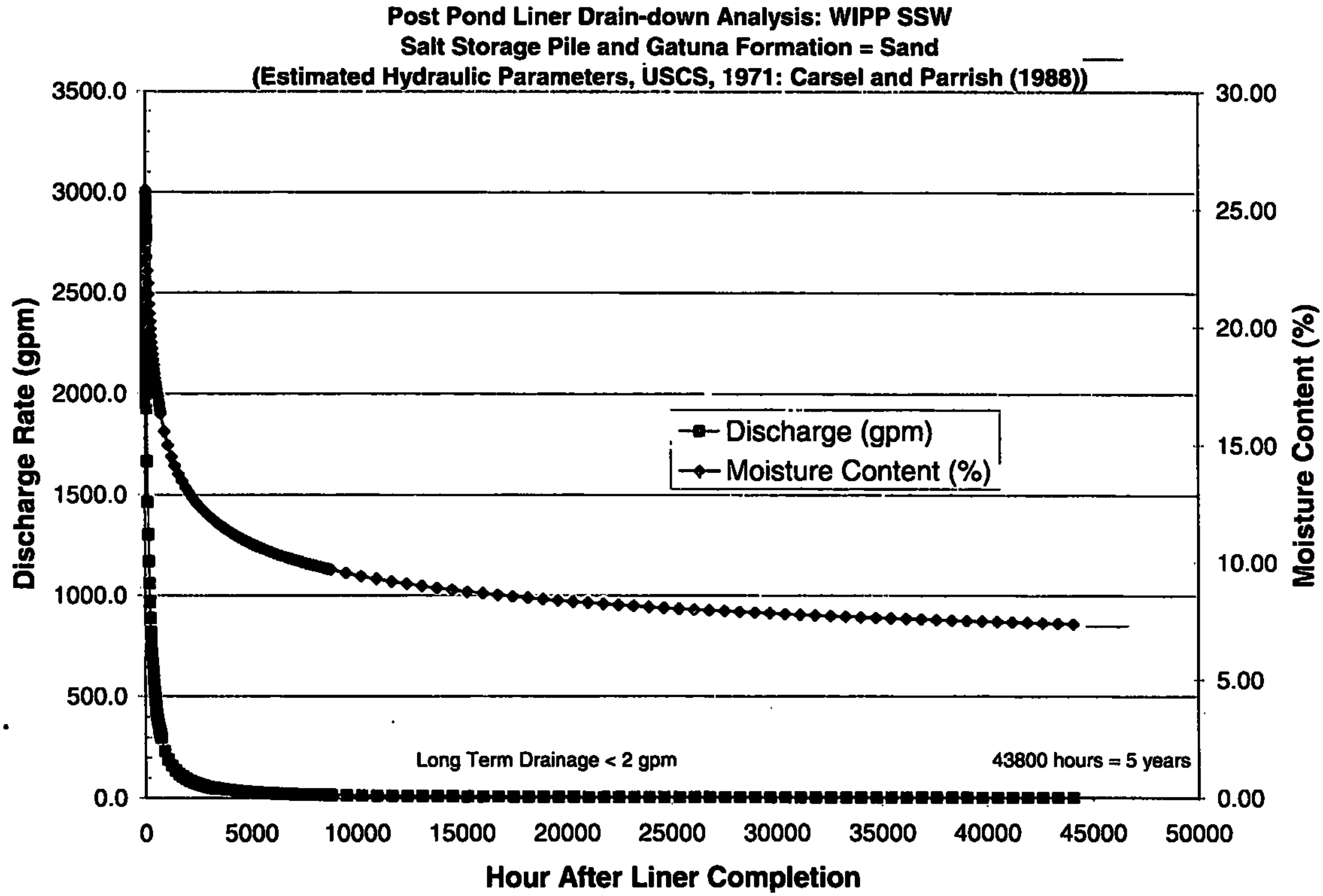
Parameter	*Value*	*Units*	*Notes*
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.43	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.258	fraction	60% of Saturated Moisture Content (Estimated)
Initial Storage Volume	315.3	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.045	fraction	Carsel and Parrish, 1988
Potential Drainage	260.3	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	225.3	(acre-ft)	~ 5 Year Drainage

Hour after Pond Liner Installation		0	1	2	3	4	5		44076
Incremental Steady State Assumption*	Moisture Content (%)	25.80	25.76	25.71	25.67	25.62	25.58		7.38
	Discharge (gpm)	2 95E+03	2.92E+03	2 90E+03	2.87E+03	2.85E+03	2.83E+03		1.56E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	4 33E-04	4.29E-04	4.26E-04	4.22E-04	4 19E-04	4.16E-04		2.29E-07
Effective Saturation (Stephens, 1995)	Se	0.553247	0.552093	0.550949	0.549815	0 54869	0.547574	Hourly	0.074871
van Genuchten Parameter (Carsel and Parrish, 1988)	N	2 68	2.68	2 68	2 68	2 68	2.68	Time	2.68
Mualem model (Stephens, 1995)	m	0 626866	0.626866	0.626866	0 626866	0.626866	0.626866	Steps for 5	0.626866
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0.145	0 145	0 145	0.145	0 145	0.145	Years	0.145
Pressure head (Stephens, 1995)	P-head (-cm)	8.162707	8.179303	8.195793	8.212179	8.228462	8.244644		32 06772
Relative hydraulic conductivity	Kr	0.052493	0.052055	0.051623	0.051198	0 050778	0.050365		2.77E-05
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03		8.25E-03
Drainage Volume (acre-ft)		0.00E+00	5.43E-01	5.38E-01	5.34E-01	5.29E-01	5.25E-01		2.11E-01

References.

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Sandy Clay Loam (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

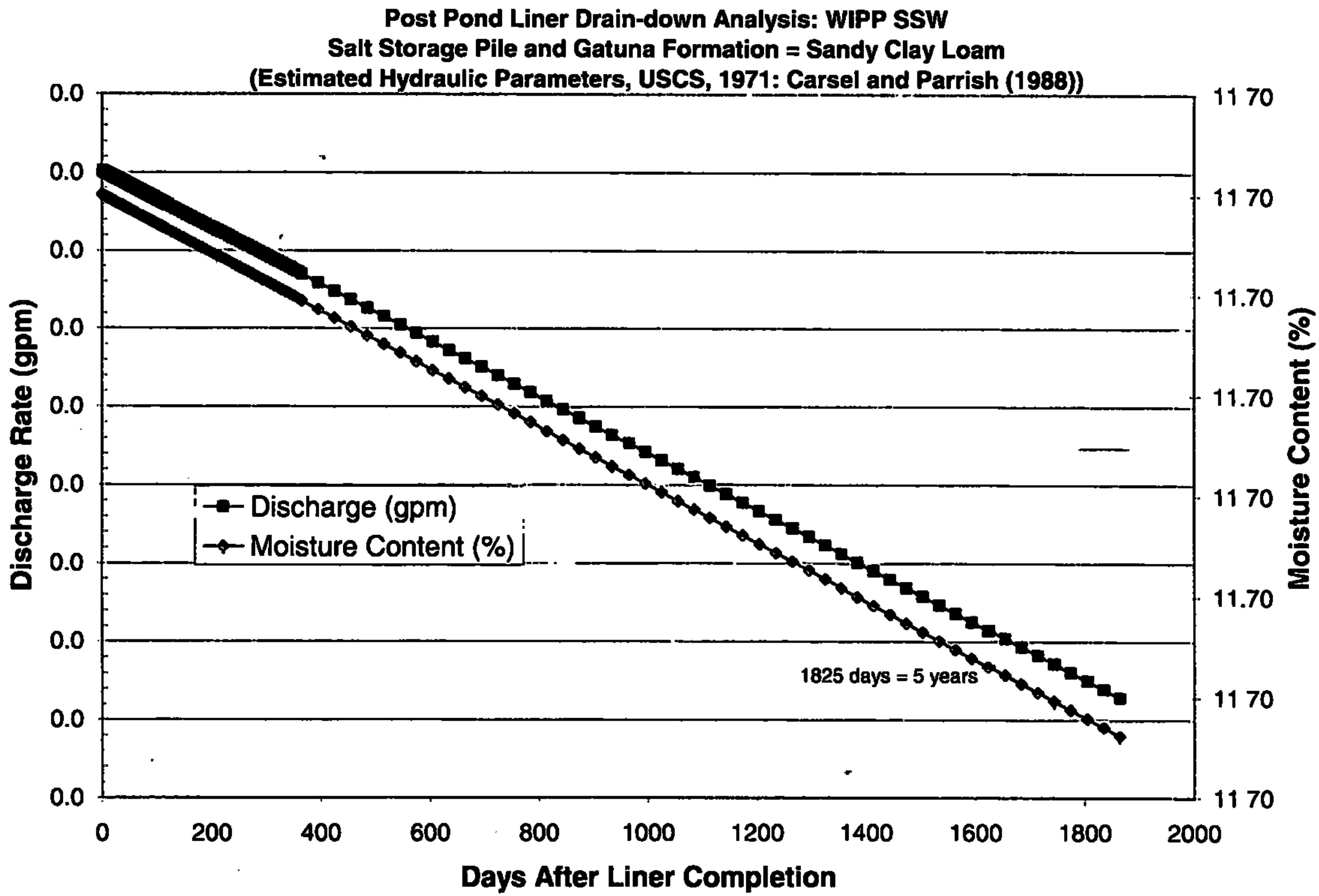
Parameter	*Value*	*Units*	*Notes*
Area	**18.8**	**(acres)**	**Salt Storage Area**
Thickness of Salt Pile	**30**	**(ft)**	**Salt Storage Area**
Thickness of Vadose Zone	**35**	**(ft)**	**Gatuna Formation**
Total Thickness	**65**	**(ft)**	**Salt Pile and Gatuna Formation**
Total Bulk Volume of Saturation	**1222**	**(acre-ft)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Porosity	**0.39**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.117**	**fraction**	**30% of Saturated Moisture Content (Estimated)**
Initial Storage Volume	**143.0**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.1**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**20.8**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**1.31E-05**	**(acre-ft)**	**~ 5 Year Drainage**

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	11 70	11 70	11 70	11 70	11 70	11 70		11.70
	Discharge (gpm)	1.60E-06	1.60E-06	1.60E-06	1.60E-06	1.60E-06	1.60E-06		1.60E-06
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	2.34E-13	2.34E-13	2.34E-13	2.34E-13	2.34E-13	2.34E-13		2.34E-13
Effective Saturation (Stephens, 1995)	Se	0.058621	0.058621	0.058621	0.058621	0.058621	0.058621	Daily Time Steps for 5 Years	0.058621
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.48	1.48	1.48	1.48	1.48	1.48		1.48
Mualem model (Stephens, 1995)	m	0.324324	0.324324	0 324324	0.324324	0.324324	0.324324		0.324324
van Genuchten Parameter. Carsel and Parrish, 1988	$alpha_{(v)}$	0.059	0.059	0.059	0.059	0 059	0.059		0 059
Pressure head (Stephens, 1995)	P-head (-cm)	6246.862	6246.862	6246.862	6246.862	6246.862	6246.862		6246.87
Relative hydraulic conductivity	Kr	6.44E-10	6.44E-10	6.44E-10	6.44E-10	6.44E-10	6.44E-10		6.44E-10
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	3.64E-04	3.64E-04	3 64E-04	3.64E-04	3.64E-04	3.64E-04		3.64E-04
Drainage Volume (acre-ft)		0.00E+00	7.05E-09	7.05E-09	7.05E-09	7.05E-09	7.05E-09		2.12E-07

References.

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769.

Stephens, D.B , 1996. Vadose Zone Hydrology. CRC Press.



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Silt (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

Parameter	*Value*	*Units*	*Notes*
Area	**18.8**	**(acres)**	**Salt Storage Area**
Thickness of Salt Pile	**30**	**(ft)**	**Salt Storage Area**
Thickness of Vadose Zone	**35**	**(ft)**	**Gatuna Formation**
Total Thickness	**65**	**(ft)**	**Salt Pile and Gatuna Formation**
Total Bulk Volume of Saturation	**1222**	**(acre-ft)**	**Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2**
Porosity	**0.46**	**fraction**	**Carsel and Parrish, 1988**
Initial Moisture Content	**0.138**	**fraction**	**30% of Saturated Moisture Content (Estimated)**
Initial Storage Volume	**168.6**	**(acre-ft)**	**Water Filled porosity**
Residual Moisture Content	**0.034**	**fraction**	**Carsel and Parrish, 1988**
Potential Drainage	**127.1**	**(acre-ft)**	**Initial Storage Volume Minus Residual Moisture Content**
Total Drainage	**0.0041**	**(acre-ft)**	**~ 5 Year Drainage**

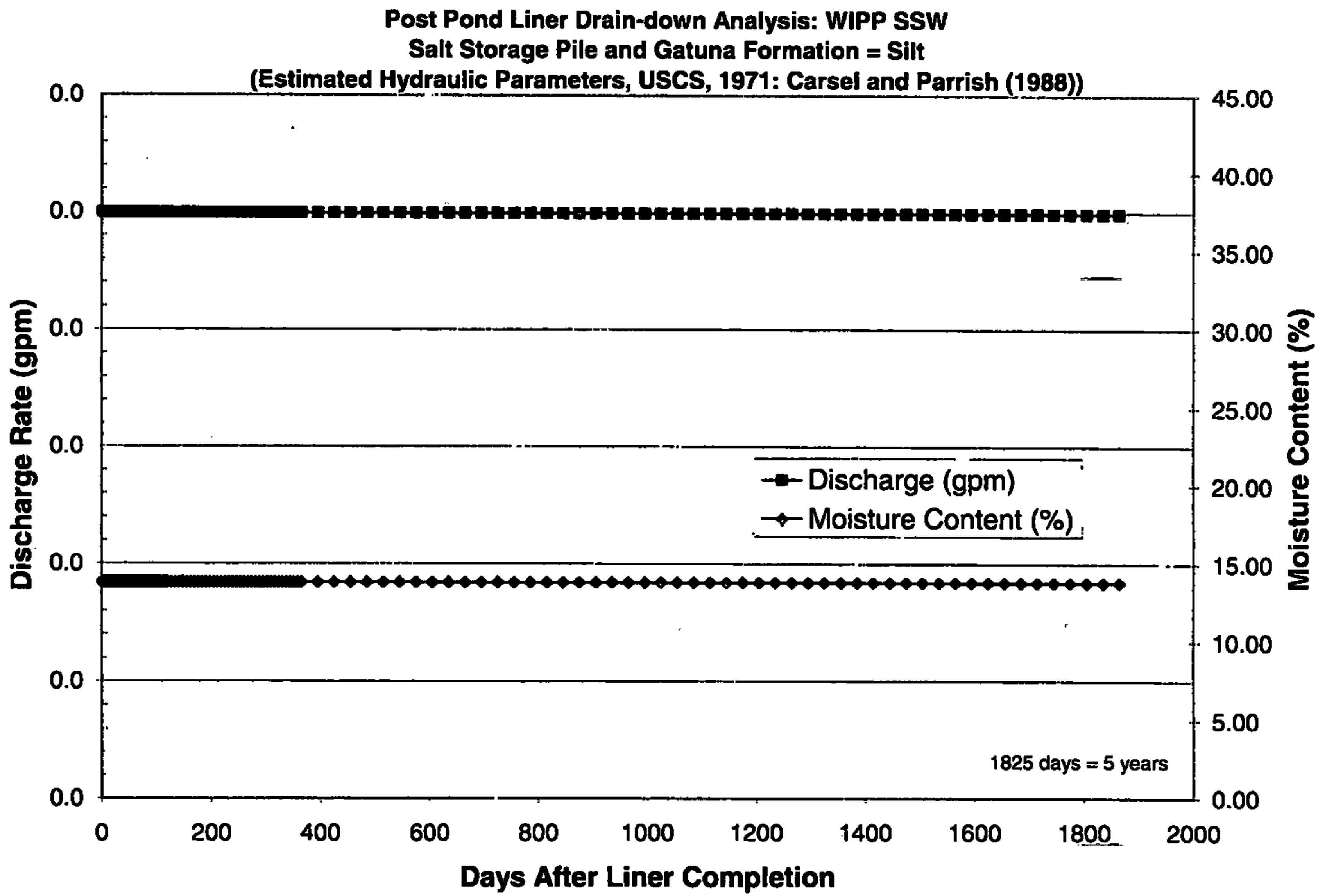
Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	13.80	13.80	13.80	13.80	13.80	13.80		13.80
	Discharge (gpm)	4 99E-04	4 99E-04	4.99E-04	4.99E-04	4.99E-04	4.99E-04		4.99E-04
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	7.33E-11	7.33E-11	7.33E-11	7.33E-11	7.33E-11	7.33E-11		7.33E-11
Effective Saturation (Stephens, 1995)	Se	0.244131	0.244131	0.244131	0.244131	0.244131	0.244131		0.244124
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.37	1.37	1 37	1.37	1 37	1.37	Daily Time Steps for 5 Years	1.37
Mualem model (Stephens, 1995)	m	0.270073	0.270073	0.270073	0.270073	0.270073	0.270073		0.270073
van Genuchten Parameter. Carsel and Parrish, 1988	$alpha_{(v)}$	0.016	0.016	0.016	0 016	0.016	0.016		0 016
Pressure head (Stephens, 1995)	P-head (-cm)	2813.416	2813.416	2813.416	2813.416	2813.416	2813.416		2813.659
Relative hydraulic conductivity	Kr	1.06E-06	1.06E-06	1.06E-06	1.06E-06	1.06E-06	1.06E-06		1.06E-06
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05	6.94E-05		6.94E-05
Drainage Volume (acre-ft)		0.00E+00	2.21E-06	2.21E-06	2.21E-06	2.21E-06	2.21E-06		6.61E-05

References.

Carsel, R.F and Parrish, R S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769.

Stephens, D.B , 1996. Vadose Zone Hydrology. CRC Press

T:\Projects\9184\Sheets\Final Water Balance\Vadose Zone Redistribution Estimate Salt Storage Area 30 DRAFT 7-22-08_working_copy.xls_Drain-down Analysis (Silt, CP)



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Clay Loam (Carsel and Parrish, 1988, Tables, 2, 3, 4, 5)

Parameter	*Value*	*Units*	*Notes*
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.41	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.123	fraction	30% of Saturated Moisture Content (Estimated)
Initial Storage Volume	150.3	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.095	fraction	Carsel and Parrish, 1988
Potential Drainage	34.2	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	8.84E-08	(acre-ft)	5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption*	Moisture Content (%)	12.30	12 30	12.30	12.30	12 30	12 30		12.30
	Discharge (gpm)	1.07E-08	1.07E-08	1.07E-08	1.07E-08	1.07E-08	1.07E-08		1.07E-08
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	1.58E-15	1.58E-15	1.58E-15	1.58E-15	1.58E-15	1.58E-15		1.58E-15
Effective Saturation (Stephens, 1995)	Se	0.088889	0.088889	0.088889	0.088889	0.088889	0.088889		0.088889
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.31	1 31	1.31	1.31	1 31	1 31	Daily Time Steps for 5 Years	1.31
Mualem model (Stephens, 1995)	m	0.236641	0.236641	0.236641	0.236641	0.236641	0.236641		0.236641
van Genuchten Parameter, Carsel and Parrish, 1988	$alpha_{(v)}$	0 019	0.019	0.019	0 019	0.019	0.019		0.019
Pressure head (Stephens, 1995)	P-head (-cm)	129434 2	129434.2	129434.2	129434.2	129434.2	129434.2		129434 2
Relative hydraulic conductivity	Kr	2.18E-11	2.18E-11	2.18E-11	2.18E-11	2.18E-11	2.18E-11		2 18E-11
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05	7.22E-05		7.22E-05
Drainage Volume (acre-ft)		0.00E+00	4.74E-11	4.74E-11	4.74E-11	4.74E-11	4.74E-11		1.42E-09

References:

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.

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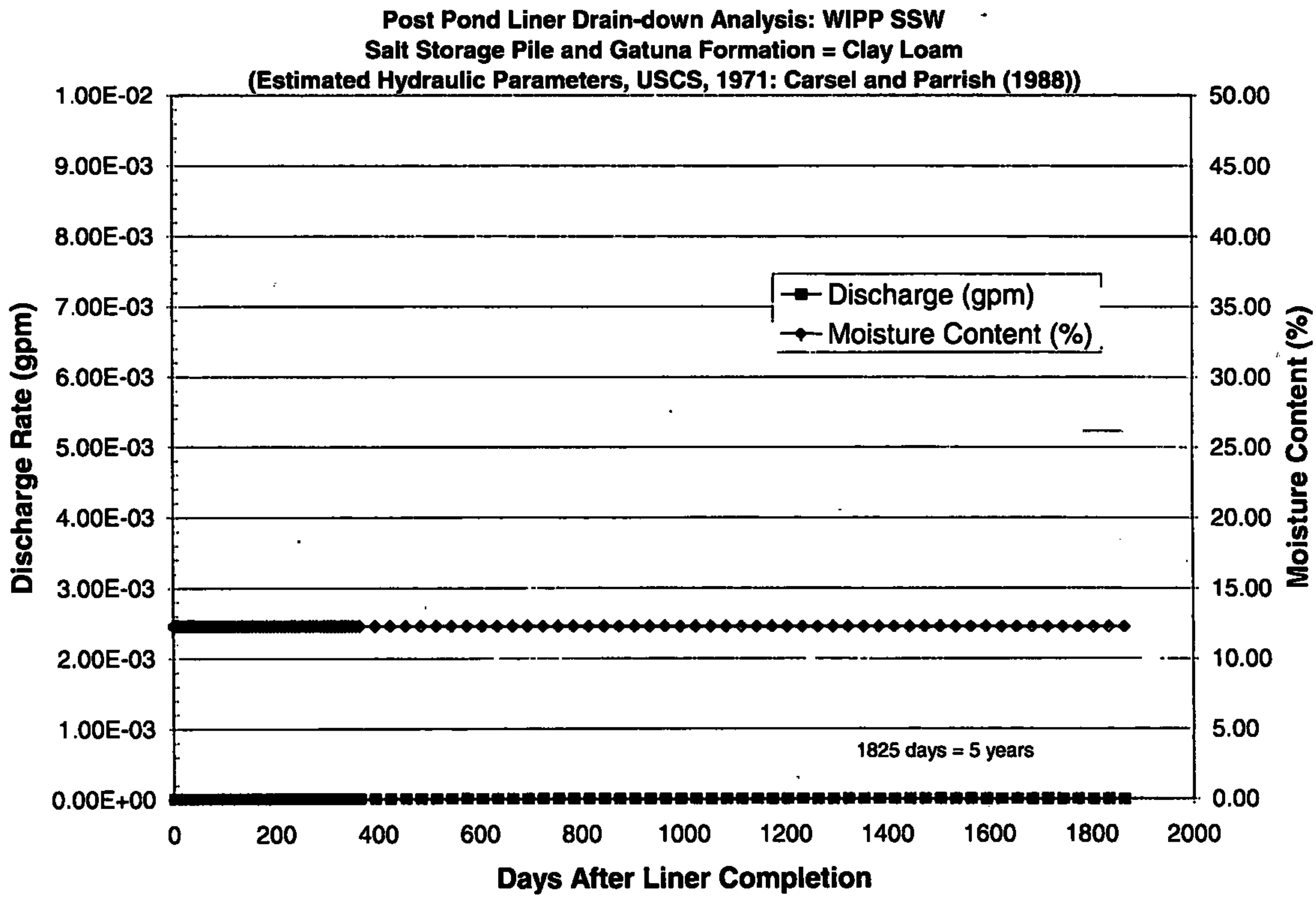

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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Clay (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

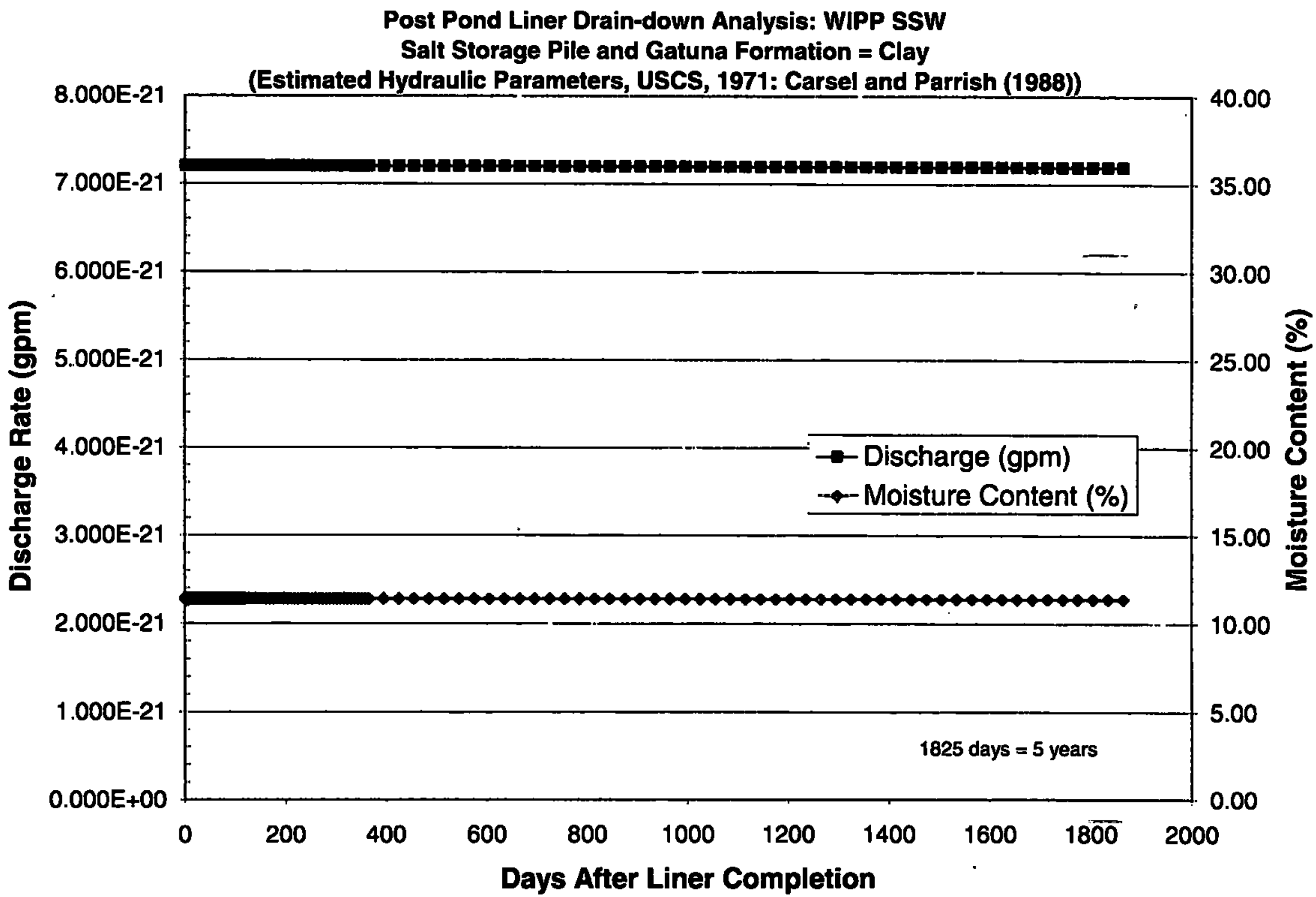
Parameter	*Value*	*Units*	*Notes*
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.38	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.114	fraction	30% of Saturated Moisture Content (Estimated)
Initial Storage Volume	139.3	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.068	fraction	Carsel and Parrish, 1988
Potential Drainage	56.2	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	5.93E-20	(acre-ft)	~ 5 Year Drainage

Day after Pond Liner Installation		0	1	2	3	4	5		1835
Incremental Steady State Assumption* {	Moisture Content (%)	11.40	11.40	11.40	11.40	11.40	11.40		11.40
	Discharge (gpm)	7.20E-21	7.20E-21	7.20E-21	7.20E-21	7.20E-21	7.20E-21		7.20E-21
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	1.06E-27	1.06E-27	1.06E-27	1.06E-27	1.06E-27	1.06E-27		1.06E-27
Effective Saturation (Stephens, 1995)	Se	0 147436	0.147436	0.147436	0.147436	0.147436	0.147436	Daily Time Steps for 5 Years	0 147436
van Genuchten Parameter (Carsel and Parrish, 1988)	N	1.09	1.09	1.09	1.09	1.09	1.09		1.09
Mualem model (Stephens, 1995)	m	0 082569	0.082569	0.082569	0.082569	0 082569	0.082569		0.082569
van Genuchten Parameter Carsel and Parrish, 1988	$alpha_{(v)}$	0.008	0.008	0.008	0.008	0.008	0.008		0 008
Pressure head (Stephens, 1995)	P-head (-cm)	2 16E+11	2.16E+11	2.16E+11	2.16E+11	2.16E+11	2.16E+11		2 16E+11
Relative hydraulic conductivity	Kr	1.9E-23	1.9E-23	1.9E-23	1.9E-23	1.9E-23	1.9E-23		1 9E-23
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05	5.56E-05		5.56E-05
Drainage Volume (acre-ft)		0 00E+00	3.18E-23	3.18E-23	3.18E-23	3.18E-23	3.18E-23		9.54E-22

References.

Carsel, R.F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Charactenstics. Water Resources Research, v. 24, no. 5 p. 755-769.

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Fress



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Post Pond Liner Drain-down Analysis: WIPP SSW

Salt Storage Pile and Gatuna Formation = Sand (Carsel and Parrish, 1988, Tables 2, 3, 4, 5)

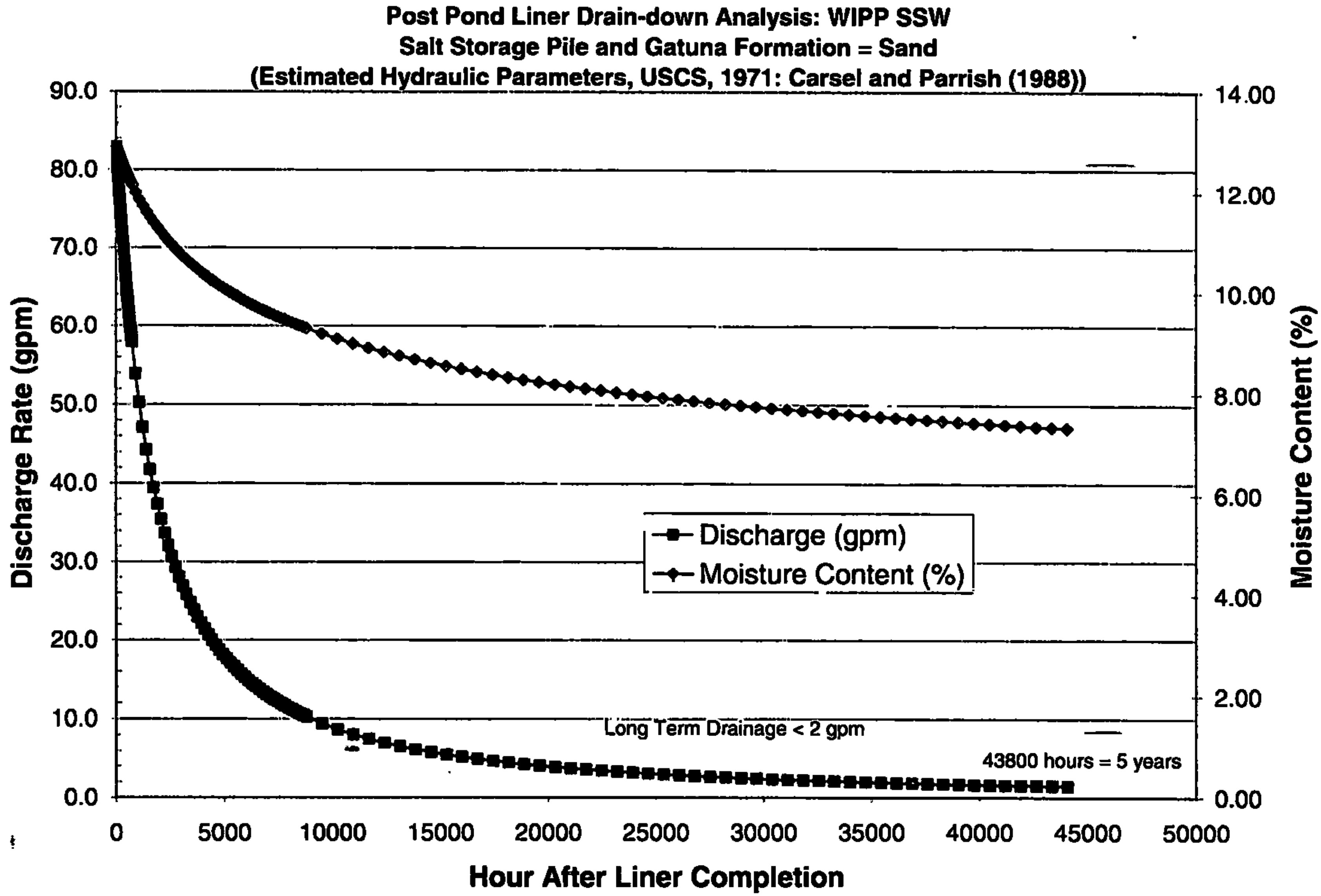
Parameter	Value	Units	Notes
Area	18.8	(acres)	Salt Storage Area
Thickness of Salt Pile	30	(ft)	Salt Storage Area
Thickness of Vadose Zone	35	(ft)	Gatuna Formation
Total Thickness	65	(ft)	Salt Pile and Gatuna Formation
Total Bulk Volume of Saturation	1222	(acre-ft)	Salt Evaporation Pond, Detention Basin A, Pond 1, and Pond 2
Porosity	0.43	fraction	Carsel and Parrish, 1988
Initial Moisture Content	0.129	fraction	30% of Saturated Moisture Content (Estimated)
Initial Storage Volume	157.6	(acre-ft)	Water Filled porosity
Residual Moisture Content	0.045	fraction	Carsel and Parrish, 1988
Potential Drainage	102.6	(acre-ft)	Initial Storage Volume Minus Residual Moisture Content
Total Drainage	68.2	(acre-ft)	~ 5 Year Drainage

Hour after Pond Liner Installation		0	1	2	3	4	5		44076
Incremental Steady State Assumption*	Moisture Content (%)	12.90	12.90	12.90	12.90	12.90	12.89		7.34
	Discharge (gpm)	8.29E+01	8.28E+01	8.28E+01	8.27E+01	8.27E+01	8.26E+01		1.47E+00
Unsaturated hydralic conductivity (Stephens, 1995)	Kunsat (cm/s)	1.22E-05	1.22E-05	1.22E-05	1.22E-05	1.21E-05	1.21E-05		2.15E-07
Effective Saturation (Stephens, 1995)	Se	0.218182	0.218149	0.218117	0.218085	0.218052	0.21802	Hourly	0.073679
van Genuchten Parameter (Carsel and Parrish, 1988)	N	2.68	2.68	2.68	2.68	2.68	2.68	Time	2.68
Mualem model (Stephens, 1995)	m	0.626866	0.626866	0.626866	0.626866	0.626866	0.626866	Steps for 5	0.626866
van Genuchten Parameter. Carsel and Parrish, 1988	$alpha_{(v)}$	0.145	0.145	0.145	0.145	0.145	0.145	Years	0.145
Pressure head (Stephens, 1995)	P-head (-cm)	16.49063	16.49223	16.49383	16.49542	16.49702	16.49862		32.38045
Relative hydraulic conductivity	Kr	0.001476	0.001475	0.001474	0.001473	0.001473	0.001472		2.61E-05
Saturated Permeability, Carsel and Parrish, 1988	Ksat (cm/s)	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03	8.25E-03		8.25E-03
Drainage Volume (acre-ft)		0.00E+00	1.53E-02	1.52E-02	1.52E-02	1.52E-02	1.52E-02		1.99E-01

References.

Carsel, R F. and Parrish, R.S., 1988. Developing Joint Probability Distributions of Soil Water Retention Characteristics. Water Resources Research, v. 24, no. 5 p. 755-769

Stephens, D.B., 1996. Vadose Zone Hydrology. CRC Press.



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Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

DEC 0 4 2008

DEC 2008
NMED Hazardous
Waste Bureau

Mr. Art Vollmer
Hazardous Waste Bureau
2905 Rodeo Park Drive East Building 1
Santa Fe, NM 87505-6303

Mr. Clint Marshall
Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Information Requested in Notice of Violation, dated November 14, 2008

Dear Messrs. Vollmer and Marshall:

The purpose of this letter is to respond to your letter of November 14, 2008, *Reference: Notice of Violation*. The Permittees were required to "submit to NMED within fifteen (15) days of receipt of [the] letter evidence that all corrective actions associated with the two findings identified in the Audit I08-03, *Hydrology and Water Management*, have been completed and that all corrective actions recommended in the *WIPP Discharge Evaporation Pond H-19 Root Cause Analysis Report*" have been implemented. NMED also requests a written description of any actions that the Permittees have taken since the Response [submitted to you on November 20, 2007, November 30, 2007, and January 25, 2008,] to address the violations described above, and a schedule for implementation for any actions not yet completed." In response to these requests, the Permittees are providing you the following information:

- Documentation that the corrective actions for two findings identified in Audit I08-03, *Hydrology and Water Management* have been completed.

- Documentation for the corrective actions recommended in the *Waste Isolation Pilot Plant (WIPP) Discharge to Evaporation Pond H-19 Root Cause Analysis Report*.

- A written description of any actions the Permittees have taken since the *Response to NMED Hazardous Waste Bureau Letter, dated January 18, 2008, received January 23, 2008* to address the alleged violations in the November 14, 2008 Letter, *Notice of Violation*.

I. Corrective Actions for Findings identified in Audit I08-03, *Hydrology and Water Management*.

Audit I08-03, *Hydrology and Water Management*, resulted in two findings related to procedural non-compliance.

Finding I08-03-F-01 related to instances where procedural compliance was not adequately completed in all instances. Attachment 1 (2-pages) contains the Corrective Action Plan for Finding I08-03-F-01.

Corrective/Preventative Actions for I08-03-F-01 were:

a. Consolidate WIPP Procedure (WP) 02-EM1016 Revision 2, *Request to Discharge to Evaporations Ponds* and WP 02-RC3108 Revision 6, *Request for Disposal* into one procedure. This was completed on June 30, 2008 and Attachment 1.a. (21-pages) contains WP 02-RC3108 Revision 7, *Request for Disposal*. .
b. Re-train Environmental Monitoring and Hydrology and Site Environmental Compliance Staff to the WP 02-EM1016 Revision 2, *Request to Discharge to Evaporations Ponds* and WP 02-RC3108 Revision 6, *Request for Disposal* procedures. Attachment 1.b. (1-page) contains the training documentation completed on February 29, 2008.
c. Environmental Monitoring and Hydrology and Site Environmental Compliance staff received Conduct of Operations[1] training. Attachment 1.c. (1-page) contains the training documentation completed on February 27, 2008.

Finding I08-03-F-02 related to instances of procedural non-compliance Attachment 2 (2-pages) contains the Corrective Action Plan for Finding I08-03-F-02. Corrective/Preventative Actions for I08-03-F-02 were:

a. Consolidate WP 02-EM1016 Revision 2, *Request to Discharge to Evaporations Ponds* and WP 02-RC3108 Revision 6, *Request for Disposal* procedures into one procedure. This was completed on June 30, 2008 and Attachment 1.a. contains WP 02-RC3108 Revision 7, *Request for Disposal*, as previously discussed in Finding I08-03-F-01.
b. Reinstate the offsite non-hazardous waste disposal vendor on the Quality Supplier List (QSL). The vendor was reinstated on the QSL on March 11, 2008. Attachment 2.a. (1 page) contains the QSL database printout of information reflecting reinstatement of the vendor.
c. WP 02-EC.06, Revision 6, Table 2 lists "Required Analysis" for site effluents, which includes analyses that are not necessary for characterizing all waste streams. The procedure was revised to reflect "common" analyses and "potential" analyses to clarify that all parameters do not necessarily have to be analyzed for each waste stream. This allows procedural flexibility to run only necessary parameters instead of procedurally requiring all analytes. Attachment 2.b. (5-pages) contains the cover page of WP 02-RC3108, Revision 7 and the revised pages including Table 2 of WP 02-EC.06,

[1] Conduct of Operations is a set of standards which establishes an overall philosophy for achieving excellence in the operation of DOE facilities. This is achieved through effective implementation and control of operations activities recognizing that environment, safety, and productivity are compatible goals. Conduct of Operations Field Handbook, Rev 1, 9/1/93

Revision 7. Attachment 2.b. also contains training documentation on the revised procedure for members of the Sampling Team.

II. Corrective Action Recommendations described in the *WIPP Discharge to Evaporation Pond H-19 Root Cause Analysis Report.*

Attachment 3 (14 pages) contains a copy of the *WIPP Discharge to Evaporation Pond H-19 Root Cause Analysis Report*. Each recommended corrective action is itemized below (1-7) with a description of corrective actions implemented.

1. Improved Management Assessments

Attachment 4 (24 pages) contains a management assessment conducted to determine readiness to resume the disposal of non-hazardous water in the H-19 Evaporation Pond or offsite disposal facility. Several criteria were established and documented as complete before water disposal activities were allowed to resume by management. The criteria that were satisfied included:

- Manpower is identified and in place.
- Equipment is ready.
- Tools and supplies are in place.
- Plans and procedures are approved and ready to use.
- Personal Protective Equipment is identified and ready.
- Notification (for disposal) has been given.
- Methods of communication are in place.
- Corrective Actions are complete.

The Readiness Review was completed in May of 2008. This review was conducted to WP 02-RC3108, Revision 6 prior to the issuance of Revision 7.

2. Clarification of Procedures, including:
   - Ownership and responsibilities in procedures (WP 02-EM1016, WP 02-RC3108).
   - Enforce attention to detail (implement independent verification forms for accuracy/completion prior to discharge of materials).
   - Enforce sequential completion of forms/approvals.
   - Sequential step(s) completion.

Prior to June 30, 2008, two procedures existed that controlled the disposal of water and other solid wastes generated at the WIPP site, 02-RC3108, *Request for Disposal* and 02-EM1016, *Authorization to Discharge Nonhazardous Effluent into the WIPP Sewage Treatment Facility.* As discussed in the Corrective Action Plans contained in Attachments 1 and 2, 02-EM1016 was merged into 02-

RC3108 to reduce redundant steps, improve efficiencies, and clarify language to ensure steps can be completed in sequence. The Request for Disposal form was simplified and instructions were clarified to ensure that the processes of waste characterization, storage and disposal are appropriately completed and clearly documented.

Attention to detail, sequential completion of forms/approvals and procedural steps has been addressed by the renewed emphasis on Conduct of Operations referenced in multiple attachments and corrective actions discussed in this letter.

3. Improve communication (process and equipment), including:
   - Implementation of pre-job briefings.
   - Information turnover process.

Pre-job briefings have been implemented as a matter of policy. See, Attachment 4, *Readiness Review Criteria for the On-Site Disposal of Non-Hazardous Water and Shipment of Water for Off-Site Disposal*, Section 1.7. Attachment 5 (20 pages), *02-EC1001, Characterization Sampling, Shipping, and Documentation*, Section 1.0, Pre-sampling Activities addresses pre-job briefings for non-routine sampling events. In addition, the procedures being used to accomplish field work are being revised during their periodic review cycle to incorporate pre-job and post-job briefings as deemed appropriate. This enhancement aligns field program activities with a formal Conduct of Operations approach to conducting work. Employees conducting disposal operations were also provided upgraded cell phones for improved communications in the remote area of the WIPP site.

4. Improve Identification of containers (enhance the clarity and visibility of identification):

This was emphasized during the Management Assessment for the readiness review for the disposal of Water enclosed in Attachment 4, see *Readiness Review Criteria for the On-Site Disposal of Non-Hazardous Water and Shipment of Water for Off-Site Disposal*, Section 1.8.2.2. Container identification was a specific topic discussed during the Management Assessment. The goal was to ensure that sufficient information is always noted on container labels to prevent any confusion for personnel handling waste.

5. Improve scheduling (management attention to scheduling of activities requiring the same personnel):

Management has established weekly staff meetings. An action discussed in the meetings is the schedule of activities to ensure appropriate staffs are available to complete tasks.

6. Consider establishment of a locking process for trailers:

The recommended corrective action for locking trailers was reviewed and the decision was made to not implement this recommendation. This is based on the fact that trailers used to manage water pending characterization are located in secure facilities. The implementation of the corrective actions addressed in Item 4 above related to improved visibility and clarity of labels will also prevent confusion about the contents of containers containing waste pending characterization or disposal.

7. Reinforce employee authority/accountability:

This recommended corrective action has been addressed through the site-wide emphasis on Conduct of Operations affirming the importance of following procedures. Attachment 6 (2 pages) contains training documentation relative to this recommended corrective action.

III. Written description of other actions taken subsequent to the Response to NMED Hazardous Waste Bureau Letter, Dated January 18, 2008 to address the alleged violations in the November 14, 2008 Letter, Notice of Violation.

The Permittees routinely conduct management assessments and evaluations of operations. Routine quality assurance assessments and procedure reviews that are included in the Environmental Compliance Assessment Program are among the tools used to continually monitor and improve programs. Washington TRU Solutions has implemented a Conduct of Operations Council (Council) to enhance the over-arching philosophy of Conduct of Operations for all WIPP programs. The environmental programs in place at WIPP are within this Council's purview and are being reviewed and improved, as deemed appropriate, throughout the entire evaluation process.

We certify under penalty of law that this document and all enclosures were prepared under our direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

If you have any questions or need additional information please contact Mr. H. L. (Jody) Plum at 575-234-7462.

Sincerely,

David C. Moody

David C. Moody, Manager
Carlsbad Field Office

for M. F. Sharif

M. F. Sharif, General Manager
Washington TRU Solutions LLC

Enclosure

cc: w/enclosure

J. Bearzi, NMED	*ED
W. Olson, NMED	ED
C. Noble, NMED	ED
S. Zappe, NMED	ED

cc: w/o enclosure

M. Mentrey, NMED	ED

*ED denotes electronic distribution

CBFO:AMO:HLP:KJB:08-1433:UFC5486

Index of Attachments for Information Requested in Notice of Violation dated November 14, 2008

Attachment 1
Corrective Action Plan for Finding I08-03-F-01

Attachment 1.a.
WP 02-RC3108 Revision 7, *Request for Disposal*

Attachment 1.b.
February 29, 2008 Training Documentation on WP 02-EM1016, Revision 2 and WP 02-RC3108, Revision 6

Attachment 1.c.
February 27, 2008 Conduct of Operations Training

Attachment 2
Corrective Action Plan for Finding I08-03-F-02

Attachment 2.a.
QSL Database Information for Non-hazardous Brine Disposal Facility

Attachment 2.b.
WP 02-EC.06, Revision 7, Cover Page and Revised Pages

Training Documentation for the WP 02-EC.06, Revision 7

Attachment 3
WIPP Discharge to Evaporation Pond H-19 Root Cause Analysis Report

Attachment 4
Washington Regulatory and Environmental Services Management Assessment Report May 2008, WRES MA SEC-08-008

Attachment 5
02-EC1001, Revision 8, Characterization Sampling, Shipping, and Documentation

Attachment 6
Conduct of Operations Training Documentation, February 27, 2008 and April 24, 2008

Attachment 1

Attachment 1

Corrective Action Plan for Finding I08-03-F-01

Corrective Action Plan for WIPP Form 08-024, CTS item 30971

Issue Being Addressed
Finding I08-03-F-01 relates to instances where procedural compliance was not adequately completed in all instances. Issues were:

- Ensure all forms are completed in sequence and that the forms are completed with yes / no, dates, signatures, and with N/A in blank spaces where information is needed to complete a document.
- As per WP-02-EM-1016 rev. 2, *Request to Discharge to Evaporation Ponds*, notification to Central Monitoring Room of the individual entering and leaving the area, date and time of entry and departure, and the amount of material being disposed of in the H-19 Evaporation Pond or Evaporation Pond B was not routinely performed.

Cause of the Issue
Inattention to detail and a lack of understanding by staff of the importance to thoroughly follow procedural sequences to operate in accordance with Conduct of Operations requirements.

Extent and Impact Cause
There was extensive evidence of the 2006 and 2007 disposal records for the H-19 Evaporation Pond that the sequences of procedures were not followed. None of the disposals reviewed during the audit I08-03 related to improper disposal of hazardous waste into the H-19 Evaporation Pond, therefore outside of WTS procedure compliance requirements and expected Conduct of Operations, there were no additional compliance impacts as all disposals were of non-hazardous waste.

Corrective / Preventive Actions Planned
Consolidate WP 02-EM1016 rev. 2, *Request to Discharge to Evaporation Ponds*, and WP 02-RC3108 rev. 6 *Request for Disposal* procedures into one procedure.
Due date: July 31, 2008

Re-train Environmental Monitoring and Hydrology and Site Environmental Compliance staff to the WP 02-EM-1016 rev. 2, *Request to Discharge to Evaporation Ponds*, and WP 02-RC3108 rev. 6, *Request for Disposal* procedures.
Due date: March 10, 2008—Completed

Environmental Monitoring and Hydrology and Site Environmental Compliance staff receive Conduct of Operations Training.
Due date March 10, ~~2009~~ 8—Completed
SJ 4/3/08

Submitted by:
Stewart Jones / Stewart Jones Date 3-12-08

Reviewed by:
Jon Hoff / W.W. Allen FOR Date 3/13/08
William Wierzbicki / Wille W. Wyl Date 3/12/08

Attachment 1.a

Attachment 1.a.

WP 02-RC3108 Revision 7, *Request for Disposal*

WP 02-RC3108

Revision 7

Request for Disposal

Management Control Procedure

EFFECTIVE DATE: 06/30/08

Stewart Jones

APPROVED FOR USE

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INTRODUCTION [1, 2]

This procedure provides instruction for the disposition, characterization, and tracking of site-generated wastes at the Waste Isolation Pilot Plant (WIPP), from the point of generation through final disposal. With the exception of sanitary waste, lead-acid batteries, nonhazardous scrap metal and other waste types that are approved by Site Environmental Compliance (SEC), this procedure addresses all other wastes, including hazardous waste, nonhazardous waste, universal waste, low-level waste, mixed low-level waste, special waste and construction debris. This procedure also applies to waste water that may be discharged into the evaporation ponds (EP), sewage treatment system or site manholes. Mined salt is managed in accordance with WP 04-GC.01.

This procedure applies to the WIPP contractors, unless contractual requirements specify otherwise.

This procedure generates the following Quality Assurance (QA) records:

- Attachment 1, Request for Disposal (RFD)
- Attachment 2, Materials Listing and Disposition Record (MLDR)

REFERENCES

BASELINE DOCUMENTS

- Title 40 *Code of Federal Regulations* (CFR), *Protection of Environment*, Parts 260-299, Resource Conservation Recovery Act (RCRA)
- U.S. Department of Energy (DOE) Order 450.1, Environmental Protection Program
- DOE Order 5400.5, Radiation Protection of the Public and the Environment
- State of New Mexico, Environmental Department, Ground Water Quality Bureau Discharge Permit Renewal DP-831, April 29, 2003, or the most recent modification or renewal
- 20.9.2 New Mexico Administrative Code (NMAC), Solid Waste Management
- 20.6.2 NMAC, Ground and Surface Water Protection
- WP 02-EC.06, WIPP Site Effluent and Hazardous Materials Sampling Plan
- WP 02-EC1001, Characterization Sampling, Shipping, and Documentation

- WP 02-EM3003, Data Validation and Verification of RCRA Constituents
- WP 02-RC.01, Hazardous and Universal Waste Management Plan
- WP 02-RC.02, Special Waste Management Plan
- WP 02-RC3109, Satellite Accumulation Area, Hazardous Waste Storage Area, and Universal Waste Storage Area Inspections
- WP 04-GC.01, Management of Mined Materials Plan
- WP 04-GC1201, Sewage Lagoon System Operation
- WP 12-ES3918, Reporting Occurrences in Accordance with DOE Order 232.1A
- WP 12-RE3003, Radiological Release of Potentially Contaminated Materials, Waste, and Items
- WP 13-1, Washington TRU Solutions LLC Quality Assurance Program Description

REFERENCED DOCUMENTS

- WP 02-EC1108, Construction Landfill Operation
- WP 02-EM3003, Data Validation and Verification of RCRA Constituents
- WP 02-RC3110, Low-Level and Mixed Low-Level Waste Characterization and Certification
- WP 02-RC3503, Universal Waste Management
- WP 08-NT3103, Shipment of Waste
- WP 12-ER4902, Hazardous Material Spill and Release Response
- WP 12-IS.01-5, Industrial Safety Program - Hazardous Locations and Working Surfaces
- WP 15-PM3509, Utilization and Disposal of Excess/Surplus Government Personal Property

EQUIPMENT

- Radio, telephone (communications should always be available)

PRECAUTIONS AND LIMITATIONS

- The transportation of hazardous material or hazardous waste in privately owned vehicles is prohibited.
- Only personnel with a completed RFD may discharge directly into the WIPP evaporation ponds, sewage lagoons or site manholes.
- The Sewage Lagoon and H-19 perimeter fence gate shall remain locked during all times when the area is unoccupied.
- Operations within the Sewage Lagoon fence area should be conducted during daylight hours whenever possible.
- All cuts, abrasions, and similar injuries must be promptly cleaned and treated by the site Health Services personnel or Emergency Services Technicians.
- Eating, drinking, smoking, and chewing are prohibited within the Sewage Lagoon fenced perimeter.
- Life jackets must be worn around the ponds in accordance with WP 12-IS.01-5, Section 3.9, Work Over or Around Water.

PERFORMANCE

NOTE

Sampling for the purpose of this procedure may occur prior to initiation of the RFD.

NOTE

Attachment 3, Waste Flow Chart is an example of the possible instruction for disposition, characterization, and tracking of site-generated wastes at the WIPP from the point of generation through final disposal.

1.0 DISPOSAL OF WASTE

1.1 Requestor, perform the following:

1.1.1 **IF** a material is no longer needed and can still be used for its intended purpose,
THEN exit this procedure and go to WP 15-PM3509.

1.1.2 Requestor/Generator, when a waste requires disposal, complete Section I of the RFD with the following information:

- The commercial or generic name of the material that requires disposal (e.g., hydraulic oil, condensate water)

- The physical form of the waste (solid, liquid, gas), check all that apply
- The location where the waste was generated and the process generating the waste (e.g., mine dewatering, demolition, spill cleanup)
- Material Safety Data Sheet (MSDS) information included (if applicable)
- The type of container in which the waste is located
- The number of containers to be disposed
- The size of the containers in weight or volume. If the final quantity will not be known until disposed, record the estimated volume or weight and note as estimated.
- Printed name, signature, and phone number of the person requesting the disposal and the date of the request

NOTE

If waste is known or suspected to be hazardous, it must be placed in the Hazardous Waste Staging Area (Area 474) or other 90 day hazardous waste area and properly labeled.

1.1.3 Attach supporting documentation, such as any applicable MSDS or evidence of process knowledge, to the RFD.

1.1.4 If the waste is generated from a Satellite Accumulation Area (SAA) and the container becomes full, write the accumulation start date on the container and ensure the container is transferred to the Hazardous Waste Staging Area (Area 474) or other 90-day hazardous waste area within 3 days.

1.1.5 **IF** the waste is a result of a spill cleanup activity,
THEN complete an RFD and attach a copy of Attachment 1, WIPP Hazardous Materials Incident Log, from WP 12-ER4902.

1.1.6 **IF** the waste is a rechargeable battery,
THEN refer to WP 02-RC3503 or contact SEC for disposal.

1.1.7 **IF** the waste to be disposed of is not specifically addressed by this procedure,
THEN contact SEC for appropriate guidance.

NOTE

The RFD and supporting documentation must never be left unattended (e.g., on top of unattended desk or file cabinet).

1.1.8 Deliver the RFD and supporting documentation to an SEC representative, (e.g., do not leave the RFD on an unattended desk).

1.1.9 For materials where volumes or weights are estimated in Section I of the RFD, provide the contractor's disposal ticket(s) and/or other available documentation for weight or volume of that waste stream to SEC when all materials have been disposed.

1.2 SEC, perform the following:

1.2.1 Record the date and time that the RFD was received in Section II of the RFD.

1.2.2 Review the information provided in Section I of the RFD and supporting documentation.

1.2.3 Based on the information provided in the RFD and supporting documentation, determine staging area requirements and record the staging area location in Section II of the RFD.

1.2.4 **IF** the waste is a low-level waste (LLW) or mixed low-level waste (MLLW),
THEN GO TO WP 02 RC3110.

NOTE

Steps in Sections 1.2.6, 1.2.7 and 1.2.8 may be performed in any order or may be performed concurrently.

NOTE

RFD and container numbers are of the following format: the two digit year followed by a dash and the next three digit sequential number. The first RFD and container number for the calendar year will be designated as XX-001.

1.2.5 Obtain the next sequential RFD from column 1 of the Materials Listing and Disposition Record (MLDR) and record the RFD number on the RFD and in column 1 of the MLDR.

1.2.6 SEC, perform the following:

[A] Obtain the next sequential container number(s) from column 2 of the MLDR and record the corresponding container number(s) on the RFD and in column 2 of the MLDR.

NOTE

The RFD number may be the same for several different container numbers (e.g., one RFD for 10 drums of the same type of waste).

[B] Label the container(s) with the container number, accumulation start date, and commercial or generic name of the waste on each container or provide a label to the requestor.

[C] Arrange for the waste to be transported to the following areas as described in the RFD, Section II.

- Nonhazardous waste (antifreeze, used oil, etc.) may be placed in the Nonhazardous Waste Staging Area (NWSA) (located southeast of Area 474).
- All hazardous waste, or waste that is being managed as hazardous pending analysis, will be placed in the designated location in the Hazardous Waste Staging Area 474 or other 90 day staging area, and labeled appropriately.
- All New Mexico Special Waste will be placed in Hazardous Waste Staging Area 474, or other area designated by SEC.
- All Universal Waste will be placed in a Universal Waste Staging Area (Area 474 A[c], the surface and underground tool cribs, Skeen-Whitlock Building, 401 N. Canal or other area designated by SEC).
- LLW and MLLW will be placed in Area 474 B[a] or other area designated by SEC.

[D] Prior to transporting the waste container to the appropriate staging area, inspect it for the following:

- The closure device is secure.
- The drum ring is installed correctly, if applicable.
- The bung caps are in place and tightened, if applicable.
- The lid is installed correctly, if applicable.
- The container is in good condition (e.g., metal drums do not show signs of compromised integrity due to rust or corrosion; fiber containers are not ripped or torn) and will provide containment and protection until waste is disposed.

[E] Deliver the waste to the specified staging area.

[F] Allow a minimum of two feet of space between spill pallets when placing waste at Area 474 or the NWSA.

[G] Provide the requestor with a replacement container, as necessary.

[H] Record the following information on the MLDR, columns 3 through 7. Record N/A when not applicable.

- Quantity - Amount of waste by weight or volume
- Waste Code - Applicable EPA waste codes
- Commercial or generic name of the waste material
- Staging Location - Location where the waste will be staged while awaiting disposal
- Accumulation Start Date - Date when waste accumulation began

1.2.7 SEC, perform the following:

[A] Request an evaluation of the materials/wastes from Radiological Technology for proper release requirements if the material is:

- A metal which is in or has been in the CH Bay, RH complex, or Radiation, Contamination, or Airborne Radioactivity Areas in the underground.
- Water which collects in the Waste Handling Building sumps.
- HEPA filters which are associated with Waste Handling Building or underground exhaust systems.
- Materials which could potentially or are suspected to be radiologically contaminated.

[B] **IF** a Radiological Technology review is not required, **THEN** check the appropriate box in Section II of the RFD, and sign and date the corresponding line, and **GO TO** Step 1.2.8.

[C] Rad Technology, review materials from Section I of the RFD.

[D] Rad Technology, check the appropriate box in Section III of the RFD and sign and date to acknowledge review of materials has been completed.

1.2.8 SEC, perform the following:

[A] Based on the information provided in Section I of the RFD, determine if sampling will be required to characterize the waste.

NOTE

SEC may determine when waste characterization sampling is required.

NOTE

Waste stream profile data must be up-to-date. Routine, active waste streams that have been previously characterized by sampling must be sampled and analyzed when analytical data is more than five years old to ensure that there have been no changes to the waste stream.

[B] Sampling may be required when an MSDS or process knowledge is unavailable and:

- Hazards of a waste stream are unknown
- Waste is from a new, uncharacterized waste stream with unknown hazards
- Waste stream profile data for a routine, active waste stream is more than five years old
- A process generating a routine waste stream has changed
- A non-routine waste stream with unknown hazards

[C] **IF** sampling is **NOT** required,
THEN GO TO Step 1.2.9.

NOTE

If the waste requires sampling and analysis to determine if it is hazardous, the waste must be managed as a hazardous waste pending analysis. All hazardous waste management requirements apply to the waste until analytical data indicates the waste is nonhazardous.

[D] **IF** sampling is required,
THEN contact a SEC sampling team member to perform the sampling event.

[E] Record the date the samples were collected and the sample ID numbers in the appropriate lines on the RFD.

[F] After sampling analytical data is received obtain a copy of the completed data validation and verification (V&V) form(s) from the sampling team.

1.2.9 Make a final waste determination based on the analytical results, process knowledge, V&V or MSDS and mark the appropriate box for the type of waste in Section II of the RFD and record the basis used to make the determination.

NOTE

Nonhazardous waste which does not require shipment off-site for disposal may be disposed of on-site in the construction landfill or in the evaporation ponds.

1.2.10 SEC, once waste determination has been made, record on the RFD the U.S. Environmental Protection Agency (EPA) Hazard Code(s) that apply to the waste or record N/A if not applicable.

1.2.11 Provide information on the RFD about how the waste is to be handled and any incompatibilities or precautions to be considered.

1.2.12 **IF** nonhazardous waste is to be disposed of on-site at the construction landfill or in the evaporation ponds,
GO TO Step 1.3 for guidance on construction debris disposal or Step 1.4 for guidance on waste water disposal and record disposal location on the RFD.

1.2.13 If waste is to be sent off-site for disposal, determine the desired waste disposal vendor and record the vendor name on the RFD.

1.2.14 For hazardous waste shipments, check that the vendor is currently on the WIPP Qualified Suppliers List (QSL).

NOTE

RFD must be signed by an SEC representative before waste is disposed. The SEC representative who signs must be different than the Requestor.

1.2.15 Print, sign and date the RFD when Section II of the RFD has been completed and analytical data has been reviewed, validated, and verified or process knowledge has been reviewed.

1.2.16 File the RFD and supporting documentation.

NOTE

If additional information or changes are added to the RFD after it has been signed, then the changes must be marked by initials and the date the changes were made.

1.3 SEC, for waste to be disposed in the construction landfill, **GO TO** WP 02-EC1108.

1.3.1 When disposal at the construction landfill is complete, record the waste disposition information corresponding to the RFD number on the MLDR, as follows:

- Record "CL" in Column 6.
- Record disposition date in Column 8.
- Record "N/A" in Columns 9, 11, 12, and 13.
- Record "WIPP" in Column 10.

1.3.2 Retain the RFD and Attachment 1, Construction Debris Disposal Sheet as a record.

NOTE

DP-831 allows for the discharge of up to 2,000 gallons per day (GPD) of nonhazardous brine waters to Evaporation Pond B of the WIPP sewage system, and up to 8,000 gallons per day of nonhazardous brine to the H-19 Evaporation Pond. These permitted effluents typically result from the pumping of groundwater observation wells around WIPP, mine dewatering activities, air compressor condensate and other nonhazardous sources.

NOTE

DP-831 requires that all waters being discharged be nonhazardous. Additionally, waste waters shall not be discharged into the sewer or evaporation ponds if they are of sufficient quantity or toxicity that they may interfere with the facultative functions of the lagoons. Wastes that are incompatible with the synthetic liners at the lagoons are not suitable discharge to the lagoon system or evaporation ponds.

1.4 SEC, perform the following for waste waters to be disposed in the evaporation ponds and site manholes:

1.4.1 Verify that documentation package is complete and includes the following:

- The completed and signed RFD

- A copy of analytical results or evidence of process knowledge

- The appropriate V&V forms

1.4.2 Check the MLDR to verify that the gallons to be disposed does not exceed the daily amount permitted as specified in DP-831.

1.4.3 After disposal of waste water in one of the evaporation ponds is complete, record the waste disposition information corresponding to the RFD number on the MLDR, as follows:

- Record "EP" and the number of the pond in Column 6.

- Record disposition date in Column 8.

- Record "N/A" in Columns 9, 11, 12, and 13.

- Record "WIPP" in Column 10.

1.4.4 Retain the RFD and associated documentation as a record, in accordance with the SEC Records Inventory and Disposition Schedule.

1.4.5 Personnel performing waste water discharge, perform the following:

[A] Carry a copy of WP 02-RC3108 and refer to it while performing this procedure.

[B] Carry a copy of the documentation package, which includes:

- The completed and signed RFD

- The analytical results or evidence of process knowledge

- The appropriate V&V forms

[C] Obtain key from Facility Operations to enter Sewage Lagoon fenced area and/or from Washington Regulatory and Environmental Services to enter the H-19 fenced area.

[D] Before disposing of water, verify that the label on the container coincides with the container number listed on the RFD.

[E] After disposal of waste water, ensure the gates are locked upon leaving the area and return the key to the appropriate organization.

2.0 SHIPPING OF WASTE

2.1 SEC, take a copy of the RFD to Transportation Operations.

2.2 Transportation Operations, **GO TO** WP 08-NT3103.

2.3 SEC, complete columns 8 through 12 , if applicable, of the MLDR after the waste has been shipped off-site with the following information:

- Disposition Date - date that waste was shipped off-site or disposed of on-site in the construction landfill or evaporation ponds
- Shipment Number - shipment number obtained from the Transportation shipping documents
- Carrier - the vendor that took the waste (can also be WIPP)
- Shipping Weight - total shipping weight of the waste
- Manifest Number - number obtained from shipping manifests provided by the vendor

3.0 RETURN OF HAZARDOUS WASTE MANIFESTS

3.1 SEC, record the date the returned manifest is received in column 13 of the MLDR.

3.2 SEC, if the manifest is not received within 35 calendar days of the waste shipment, perform the following:

3.2.1 Call the waste disposal vendor or transporter to determine the status of the hazardous waste shipment. Create a telephone log of the conversation and file it with the waste shipment paperwork.

3.2.2 If the vendor or transporter does not commit to providing the signed copy of the manifest within 10 days, notify the SEC manager and, if necessary, the U.S. Department of Energy Carlsbad Field Office (DOE/CBFO) of the status of the manifest and the vendor's explanation.

3.3 SEC, if the manifest is not received within 45 calendar days of the waste shipment, perform the following:

3.3.1 Prepare an exception report in accordance with the requirements of Title 40 CFR 262.42(2).

3.3.2 Notify the SEC manager and the DOE/CBFO of the status of the manifest.

3.3.3 Transmit the Exception Report to DOE/CBFO for submission to the EPA and to the New Mexico Environment Department.

3.3.4 File copies of the Exception Report and any supporting documentation with the waste shipment paperwork.

4.0 DEFINITIONS

- Accumulation Start Date - The date that waste accumulation starts. For an SAA container this is the date that the container becomes full. For containers not from an SAA, this is the date that waste is first put into the container.

- Construction and Demolition Debris - Nonhazardous, non-water soluble materials generated from construction or demolition of structures or from land clearing activities.

    - Includes, but is not limited to, steel, glass, brick, concrete, asphalt roofing materials, pipe, gypsum wallboard and lumber, rocks, soil, tree remains, and other vegetative matter

    - Does not include asbestos-containing materials, liquids, waste paints, solvents, sealers, adhesives, or potentially hazardous materials

- Hazardous waste - Waste is considered hazardous if it is listed in 40 CFR 261, Subpart D or is ignitable, corrosive, reactive, or toxic.

- Low-level waste - Radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material, or Naturally Occurring Radioactive Material.

- Mixed low-level waste - LLW that also contains at least one hazardous component subject to the RCRA.

- New Mexico special waste - The following types of solid wastes (as defined in 20.9.2 NMAC) that have unique handling, transportation, or disposal requirements to assure protection of the environment and the public health and safety:

    - Treated formerly characteristic hazardous waste (TFCH)

    - Asbestos waste

    - Infectious waste

- Sludge
- Industrial solid waste
- Spill of a chemical substance or commercial product
- Dry chemicals, which, when wetted, become characteristically hazardous
- Petroleum contaminated soils

* WIPP Contractors - The WIPP Managing and Operating Contractor and affiliated organizations.
* Sanitary waste - Nonhazardous, non-liquid waste generated at the site which is appropriate to be disposed of at the municipal landfill.
* Universal waste - any of the following hazardous waste that are subject to the universal waste requirements of 40 CFR Part 273 which includes batteries, pesticides, thermostats, lamps.

Attachment 1 - Request for Disposal

RFD # ____________
(SEC USE ONLY)

This form must accompany waste to be disposed of by the WIPP site. Fill out completely.

SECTION I
(FOR REQUESTOR USE ONLY)

For large volumes of waste where difficulties exist for quantity estimation (i.e., well development, roll-offs) see Steps 1.1.9 and 1.2.3.

Commercial or generic name of waste: ____________

Waste Form: ☐ Solid ☐ Liquid ☐ Gas

Location of and process generating the waste: (e.g., SAA, maintenance) ____________

MSDS attached? ☐ Yes ☐ No If no, explain ____________

____

Container type: ☐ Metal drum ☐ Plastic container ☐ Box ☐ Can ☐ Other (specify): ____________

Number of container(s):____________ Size of container(s): (weight or volume) ____________

Requestor: ____________

Printed name | Signature | Date | Phone

SECTION II
(FOR SEC USE ONLY)

RFD received by SEC personnel: Date: ____________ Time: ____________

Staging location: ____________ Container(s) #: ____________

Sampling required? ☐ No
☐ Yes If yes, date samples collected:____________ Sample ID # ____________

Rad review required? ☐ Yes ☐ No ____________

SEC Signature | Date

Basis of determination: (i.e., analytical data, process knowledge, MSDS, etc.) ____________

EPA Hazard code(s): ____________

Handling Instructions: ____________

____

Vendor or Disposal Location: ____________

SEC Representative: ____________ ____________ ____________

Printed name | Signature | Date

Attachment 1 - Request for Disposal

SECTION III (FOR RADIOLOGICAL TECHNOLOGY USE ONLY)		
☐ Material may be released without radiological controls.		
☐ Material may be released for reuse or disposal but not for metal recycle.		
☐ Material may not be released as non-radioactive materials.		
Rad Tech Representative:		
Printed name	Signature	Date

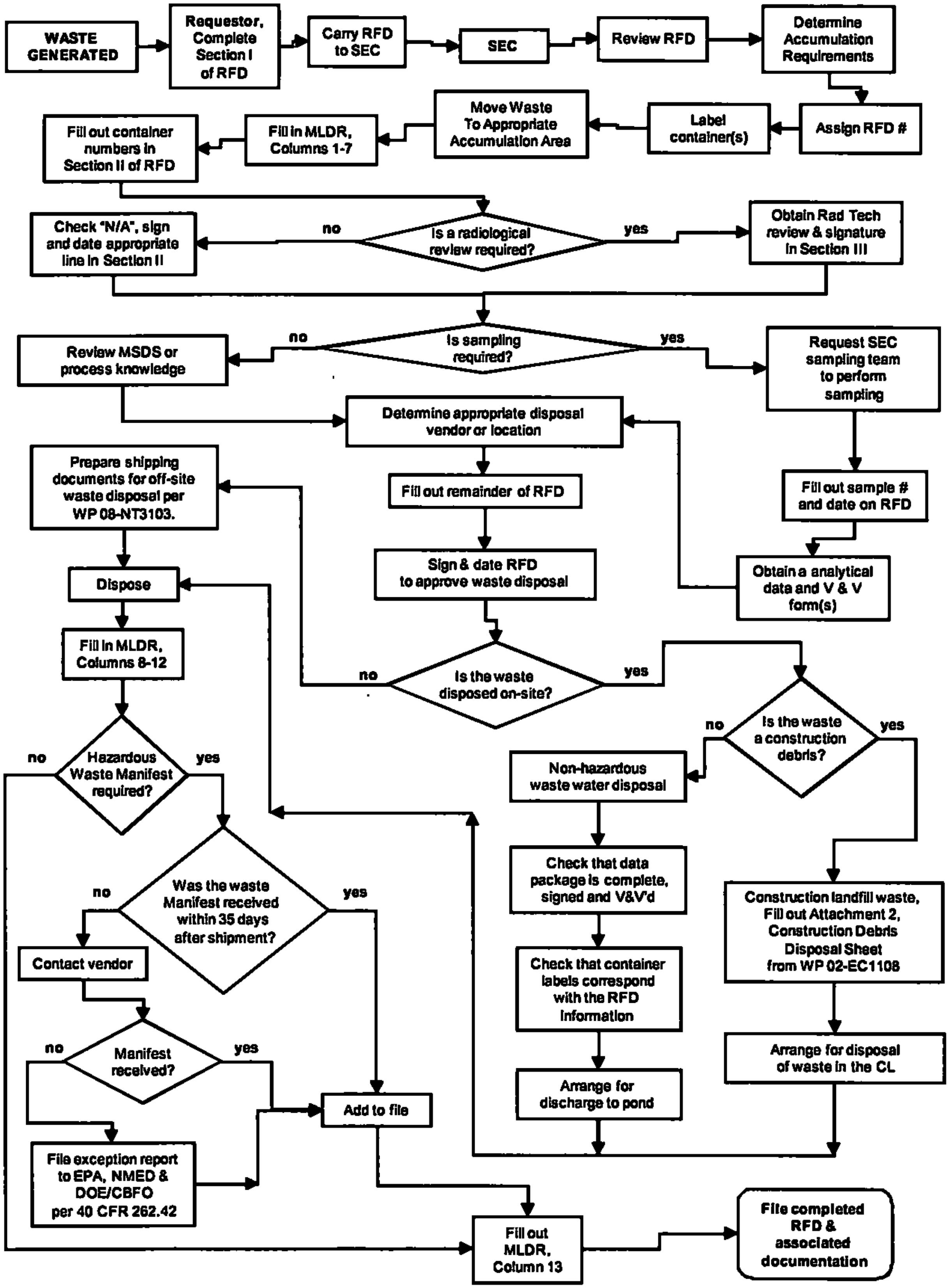
Working Copy

Attachment 2 - Materials Listing and Disposition Record

1 RFD Number	2 Container Number	3 Quantity	4 Waste Code	5 Commercial or Generic Name of Material	6 Staging Location	7 Accumulation Start Date	8 Disposition Date	9 Shipment Number	10 Carrier	11 Shipping Weight	12 Manifest Number	13 Manifest Return Date

Working Copy

Attachment 3 - Waste Flow Chart



Attachment 1.b

Attachment 1.b.

February 29, 2008 Training Documentation on WP 02-EM1016, Revision 2 and WP 02-RC3108, Revision 6

Working Copy

WF 08 024

Action #2

Attachment 1 - Training Attendance Sheet

TRAINING ATTENDANCE SHEET

Course/Session: Training covering WP 02-EM1016 Rev 2 and WP 02-RC3108 Rev 6 Course Number/Mat. Code: N/A

Conducted by: Stewart Jones SEC (Name / Department / Section) Date: 02/29/08 Hours: 2

Location: WIPP X Offsite ☐ Safety Bldg Conference Room (Building / Room / Site) Page 1 of 1

Attendee(s): Print applicable information in black ink and sign. This form is a quality document. Correct errors by drawing a single line through the incorrect information and initial and date the correction.

	Badge Number	Print Name: Last, First, MI	Signature	Company/Dept	Grade	Status	Comments
1	CE03757	Travis Steven L	[signature]	WRES	C		
2	CE03813	Nelson, Kristine D	[signature]	WRES	C		
3	CE03666	Whiteley, Rick E	[signature]	WRES/SEC	C		
4	CE01157	Contreras, Danny	[signature]	WTS/SEC	C		
5	CE03797	Jaco, William	[signature]	WRES/SEC	C		
6	CE04061	Jimenez Richard	[signature]	WRES/EMH	C	N/A	N/A
7	CE03920	BAldertama, Mel	[signature]	WRES/EMH	C		
8	CE03856	~~JAMES~~ MALY, JAMES	[signature]	WRES/EMH	C		
9	CE03387	McLemore, Judy	[signature]	WRES/SEC	C		
10	CE04388	SIEGEL, JOEL	[signature]	WRES	C		
11	CE03446	B.P. Roush	[signature]	WRES/SEC	C		
12							

Q = Qual Card, W = Waiver C = Complete, No Exam (attendance) X = Complete, Passed L = Complete, Failed D = Retake, Failed R = Retake, passed I = Incomplete

The above information is valid and complete. Sign and return this form to the training section.

Print Name: S.B. Jones Signature: [signature] Date: 2-29-08

Attachment 1.c.

February 27, 2008 Conduct of Operations Training

WF 08 024

Action #3

Washington Regulatory and Environmental Services

Department: WRES Site Environmental Compliance and Hydrology/Environmental Monitoring groups and off-site employees	Date of Meeting 2-27-08
Managers: Bill Wierzbicki, Stewart Jones, Joel Siegel, Ron Galbraith	
Meeting Location: WIPP Site Safety Building Conference Room and Teleconference	

Employees Attending (Show date if other than meeting)

1. SB Jones
2. [illegible]
3. Miriam Whatley
4. [illegible]
5. [illegible]
6. [illegible]
7. Bill [illegible]
8. B. P. [illegible]
9. M. Baldessari
10. [illegible]
11. R. Jimenez
12. C. Whiteley
13. [illegible]
14. [illegible] Garcia
15. Deanna Ybarra
16. [illegible]
17. Jeff McLemore
18. [illegible]
19. [illegible]
20. Kathy Zbryk
21. Eric D'Amico
22.

No. Empl. Attending

No. Empl. Supervised

REVIEWED BY

Name

Name

Date

1. PROBLEM/TOPIC

Conduct of Operations Presentation

2. DISCUSSION

REASONS FOR THE ABOVE	HOW DO WE OVERCOME THIS?
A	A
B	B
C	C
D	D

3. CONCLUSION

WHAT WE AGREE TO DO DIFFERENTLY AFTER THIS MEETING TO ELIMINATE OR CONTROL THE UNSAFE ACT (OUR PROBLEM):

4. FOLLOW UP

OTHER ACTION NEEDED TO ENSURE THAT THE CONCLUSION IS CARRIED OUT:

5. REMARKS

ANY COMMENTS/OBSERVATIONS FOR ACTION OR REVIEW AFTER THIS MEETING

(Also List Any Instructions, Other Safety Training, Comments, Etc.)

Attachment 2

Attachment 2

Corrective Action Plan for Finding I08-03-F-02

Corrective Action Plan for WIPP Form 08-025, CTS item 30964

Revision one

Issue Being Addressed

Finding I08-03-F-02 relates to instances of procedural non-compliance.

(1) Procedure WP 02-RC3108 *Request for Disposal* indicates that if material is to be sent offsite for disposal, the vendor is to be listed on the QSL. Brine waters were sent to Sundance, a non-hazardous waste disposal vendor, that had been graded QL 0, resulting in the removal of Sundance from the QSL.

(2) Procedure WP 02-EC.06, Table 2 notes a list of analysis that are "required" for site effluents. The entire list of analyses was not conducted for all site effluents.

(3) Procedure WP 02-EM1016 states that air compressor condensates require an Authorization to Discharge (ATD) before they are discharged to the sewage system. ATD's are not being generated for these effluents, and at this time no exemptions are described.

Cause of the Issue

(1) Personnel did not check the QSL vendor list to assure that Sundance was still on the list prior to sending non-hazardous brine water off-site for disposal.

(2) Complete analysis of Site Effluent specified in WP 02-EC.06 Table 2 was not performed prior to disposal; a subset of the analyses list was used for characterization which did not include some listed analysis. The table heading with "required" leads a reviewer to expect that all analyses listed in the table are required for each characterization; this was not the intent.

(3) ATD's have not routinely been generated for the disposal of non-hazardous air compressor condensate, as required in WP 02-EM1016.

All three of the issues being addressed have a common cause, which is failure to follow all of the procedural requirements.

Extent and Impact Cause

Although no hazardous wastes have been disposed of inappropriately and the three disposal topics listed have not contributed to improper disposal, the extent of the problem warrants immediate attention, even though other disposals were in compliance with NMED regulations. A continuation of these practices could have significant impact to the facility and needs to be corrected.

Corrective / Preventive Actions Planned

Site Environmental Compliance and Environmental Monitoring and Hydrology have reviewed the listed procedures, regulatory requirements, and best management practices to determine the retraining requirements that will ensure

WF08-025

REVISION ONE

personnel follow the procedural requirements. The procedures will be modified to more clearly define the requirements.

- Combine procedures (WP 02-EM1016 and WP 02-RC3108) into one procedure and train personnel to follow the specific requirements in the revised procedures. The procedures will be combined and personnel will be trained.
  Due Date July 31, 2008
- The offsite non-hazardous waste disposal vendor has been reinstated on the QSL (March 26, 2008). Completed March 26.2008
- WP 02-EC.06 Table 2 lists "Required Analysis" for site effluents, which includes analyses that are not necessary for characterizing all waste streams. This procedure has been revised.
  Completed March 1, 2008
- ~~WP 02-EM1016 indicates that condensates from air compressors require an ATD before they are discharged into the sewage system. WP 02-EM1016 condensate discharge requirements will be followed.~~
  ~~Due date June 31, 2008~~

S.J. 4-29-08

Submitted by:

Stewart Jones, Stewart W. Jones Date 4-14-08

Reviewed by:

Jon Hoff, Jon E. Hoff Date 4/15/08

William Wierzbicki, William W. Wierzbicki Date 4/14/08

Attachment 2.a

Attachment 2.a.

QSL Database Information for Non-hazardous Brine Disposal Facility

WF 08 025

QSLR: 08-007

Action #2

QUALIFIED SUPPLIERS LIST

COMPANY NAME:	SUNDANCE SERVICES, INC.
STREET ADDRESS:	1001 6TH STREET P.O. BOX 1737
CITY:	EUNICE
STATE:	NM
ZIP:	88231

QA CONTACT:	DONNA ROACH		
PHONE NO.:	(505) 394-3480	Email:	ssidonna@aol.com
FAX:	(505) 394-2590		
SECOND CONTACT:	N/A		
PHONE NO.:	N/A	2nd Email:	N/A

QA PROGRAM BASIS:

NM OIL CONSERVATION DIVISION RULE 711 PERMIT (*SEE BELOW IN COMMENTS)

QA PROGRAM DESCRIPTION/TITLE:	NM OIL CONSERVERVATION DIVISION PERMIT NM-01-0003
REVISION:	N/A
DATE:	2/18/2002

PRODUCT(S)/SERVICES(S) QUALIFIED TO SUPPLY:

TRANSPORT, STORAGE, AND DISPOSAL OF NON-HAZARDOUS BRINE WATER IN ACCORDANCE WITH NMOCD PERMIT NM-01-0003

BASIS FOR QUALIFICATION:

DESKTOP EVAL DSE2008-005

DATE OF INITIAL QUALIFICATION:	9/22/2004
LAST EVALUATION:	3/11/2008
EXPIRATION DATE:	3/31/2009

PROCUREMENT RESTRICTIONS/LIMITATIONS:

NONE

COMMENTS:

* MODIFICATION APPROVAL, PERMIT NM-01-0001 WITH ATTACHMENT. SUPPLIER IS WORKING UNDER THE PROVISIONS OF NM OIL CONSERVATION DIVISION RULE 711 PERMIT MODIFICATION APPROVAL PERMIT NM-01-0003 AND WP 13-1 PER THE STATEMENT OF WORK SECTION 5.0. THE SERVICE PROVIDED IS GRADED AS A QL-0 BUT THE PROCEDURE REQUIRES A QSL APPROVED SUPPLIER. SUPPLIER WILL BE REACTIVATED TO THE WTS QUALIFIED SUPPLIERS LIST CONTINUING TO PROVIDE SERVICES IN ACCORDANCE WITH THE STATEMENT OF WORK.

Attachment 2.b

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

Criteria/Description	Closed Date	Verified By (Signature)	Verification Date	Comments
1.3.2 Hoses	06MAY08			
1.3.2.1 Hoses inspected	06MAY08	M. Whatley	5-14-08	
1.3.2.2 Hoses on-site	06MAY08	M. Whatley	5-14-08	
	[redacted]			
1.4 Plans and procedures are approved and ready to use.	OPEN			
1.4.1 02 EM 1016 (Request to Discharge to Evaporation Ponds; Rev. 2)	14MAY08			
1.4.1.1 Document package completeness verified	14MAY08	M. Whatley	5-14-08	
1.4.1.2 Assemble document package	13MAY08	M. Whatley	5-14-08	RFD 08-037/038
1.4.1.2.1 Request for Disposal form	13MAY08			RFD 08-037/038
1.4.1.2.2 Analytical results or evidence of process knowledge	13MAY08	M. Whatley	5-14-08	RFD 08-037/038
1.4.1.2.3 Completed and signed Attachment 1 "Authorization to Discharge Non Hazardous Effluent in the Sewage Treatment Facility"	13MAY08			RFD 08-037/038
1.4.1.3 Owner training complete	01MAY08			
1.4.1.4 Participants training complete	07MAY08			
1.4.1.4.1 Support staff training complete	07MAY08	M. Whatley	5-14-08	
1.4.1.4.2 Bargaining Unit operator training complete	07MAY08	M. Whatley	5-14-08	
1.4.1.4.3 Bargaining Unit qualifications in place	07MAY08			
1.4.1.5 Approved procedure in place	01MAY08			
1.4.2 02 RC 3108 (Request for Disposal; Rev. 6)	OPEN			
1.4.2.1 Attachment 2 of 02 RC 3108 complete	OPEN			Post disposal criteria
1.4.2.2 RFD and attachments hand delivered to SEC	13MAY08	M. Whatley	5-14-08	Per Owner 12MAY08
1.4.2.3 RFD complete with attachments	13MAY08			
1.4.2.3.1 Current analytical data	13MAY08			RFD 08-037/038

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

Criteria/Description	Closed Date	Verified By (Signature)	Verification Date	Comments
1.4.2.3.2 Applicable MSDSs for any additives	13MAY08			No additives used
1.4.2.3.3 Attachment 1 from 02 EM 1016	13MAY08	M. Whatley	5-14-08	RFD 08-037/038
1.4.2.4 Owner training complete	01MAY08			
1.4.2.5 Participants training complete	07MAY08			
1.4.2.5.1 Support staff training complete	07MAY08	M. Whatley	5-14-08	
1.4.2.5.2 Bargaining Unit operator training complete	07MAY08	M. Whatley	5-14-08	
1.4.2.5.3 Bargaining Unit qualifications in place	07MAY08			
1.4.2.6 Approved procedure in place	01MAY08			
1.4.3 Approved JHA ready to use	08MAY08	M. Whatley	5-14-08	
1.4.3.1 JHA reviewed by owner	08MAY08			Topic in 08MAY08 meeting
1.4.3.2 JHA reviewed by support staff	08MAY08			Topic in 08MAY08 meeting
1.4.3.3 JHA reviewed by Bargaining Unit operator	05MAY08			
1.4.3.4 Approved JHA in place	05MAY08	M. Whatley	5-14-08	
<u>1.5 PPE is identified and ready.</u>	05MAY08			
1.5.1 Workers have gloves, eye protection, and cell communications per JHA	05MAY08	M. Whatley	5-14-08	
<u>1.6 Notifications have been given.</u>	OPEN			
1.6.1 CMR notified	OPEN			
1.6.1.1 CMR notified upon leaving H-19	OPEN			Post disposal criteria
1.6.1.2 CMR notified upon entering H-19	14MAY08	M. Whatley	5-14-08	
1.6.2 Owner approves	14MAY08	M. Whatley	5-14-08	

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

Criteria/Description	Closed Date	Verified By (Signature)	Verification Date	Comments
1.7 Methods of communication are in place.				
1.7.1 Pre-job briefing complete	14MAY08			Topic in 08MAY08 meeting
1.7.2 Bargaining Unit operator has contact cards	05MAY08	M. Whatley	5-14-08	
1.7.3 Cell communications are operable	06MAY08	M. Whatley	5-14-08	
1.8 Corrective Actions are complete.	OPEN			
1.8.1 WIPP Form actions complete	OPEN			
1.8.1.1 Operator has a copy of the document package (CTS 31235)	14MAY08	M. Whatley	5-14-08	
1.8.1.2 CONOPS training complete (CTS 31227)	OPEN	M. Whatley	5-14-08	P. Roush did not train
1.8.1:3 Retrain staff to 02 EM 1016; Rev 2 and 02 RC 3108; Rev 6 (CTS 31229)	07MAY08	M. Whatley	5-14-08	
1.8.2 Root Cause Analysis	14MAY08			
1.8.2.1 Independent review of data packages prior to discharge	14MAY08	M. Whatley	5-14-08	
1.8.2.2 Containers thoroughly identified as to water source	09MAY08			
1.8.2.3 All trailers parked in a designated area	09MAY08			
1.8.2.4 Implement pre-job briefings	14MAY08	M. Whatley	5-14-08	S. Jones memo 14MAY08
1.8.2.5 Operator to take verified documentation to the work site	14MAY08			
1.8.2.6 Consider locking process for trailers	09MAY08	M. Whatley	5-14-08	
1.8.3 Eight DOE Actions for Approval to Use H-19	08MAY08			
1.8.3.1 Actions implemented or in process	08MAY08			22APR08 letter
1.8.4 Participants complete Root Cause Analysis review	08MAY08			Topic in 08MAY08 meeting

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

Readiness Status:

Unconditional Not Ready

Conditional X (1.0 and 2.0)

Remarks:

1. 1.8.1.2 – CONOPS training complete. (CTS 31227). P. Roush training not documented.
2. 1.8.1 – WIPP Form actions complete. See 1.8.1.2.
3. 1.8 – Corrective Actions are complete. See 1.8.1. **(Remains Open.)**
4. 2.4.3.2 – JHA reviewed by support staff. Not reviewed by 2 staff members. Not critical to start.
5. 2.4.3 – Approved JHA ready for use. See 2.4.3.2.
6. 2.4.2.1 – Attachment 2 of 02RC 3108 complete. This form can only be completed after disposal.
7. 2.4.2 – 02 RC 3108 (Request for Disposal; Rev. 6). See 2.4.2.1.
8. 2.4 – Plans and procedures are approved and ready for use. See 2.4.2 and 2.4.3.

Administered by:
Gene L. Valett; WRES Project Manager Gene L. Valett 29 MAY 08

Approvals:

Signature	Print Name	Title	Date
Stewart Jones	Stewart Jones	Manager; WRES Site Environmental Compliance	5-29-08
S. B. Jones For	Joel Siegel	Manager; WRES Environmental Monitoring and Hydrology	5-29-08

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

2.0	Shipment of Water for Off-Site Disposal is Ready	Open	Closed
2.1	Manpower is identified and in place.		X
2.2	Equipment is ready.		X
2.3	Tools and supplies are in place.		X
2.4	Plans and Procedures are approved and ready for use.	X	
2.5	PPE is identified and ready.		X
2.6	Notifications have been given.		X
2.7	Methods of communication are in place.		X

Valett, Gene

From: Siegel, Joel

Sent: Wednesday, May 21, 2008 7:58 AM

To: Balderrama, Melvin; Boatwright, Wesley; Jimenez, Richard; Jungclaus, Gregory; Maly, James; Salness, Rick; Whatley, Miriam; Valett, Gene; Wiemers, Karyn

Cc: Guevara, Donna; Kehrman, Bob; Kouba, Steve; Jones, Stewart; Chavez, Rick; Wierzbicki, William

Subject: Joel will be out Friday 05/23, return Monday 06/02

Stewart will be in charge.

Our intern, Daniel Albus, will sit opposite Jim. Please make him feel welcome and give him small doses of work while I am gone.

Joel Siegel, P.E.
Washington Regulatory and Environmental Services
Washington Division, URS Corporation
PO Box 2078, MS 452-09
Carlsbad, New Mexico 88220
(575) 234-8313
cell (575) 302-3518

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

Criteria/Description For Shipment of Water For Off-Site Disposal	Closed Date	Verified By (Signature)	Verification Date	Comments
2.1 Manpower is identified and in place.	20MAY08	M. Whatley	5-29-08	
2.1.1 Process owner is identified	20MAY08	M. Whatley	5-29-08	
2.1.2 Support staff is identified	20MAY08	M. Whatley	5-29-08	
2.1.3 Bargaining Unit operator is identified	20MAY08	M. Whatley	5-29-08	
	[redacted]			
2.2 Equipment is ready.	28MAY08			
2.2.1 Collection containers ready to use	28MAY08			
2.2.1.1 Containers pass inspection	28MAY08			
2.2.1.1.1 Complete Attachment 5 "Frac Tank Inspection" from 02 EM 1024	14MAY08			See 14MAY08 email from R. Salness (Process Owner)
2.2.1.1.2 Flashlight for collection container inspection	27MAY08	M. Whatley	5-29-08	
2.2.1.2 Containers on-site	27MAY08	M. Whatley	5-29-08	I.D. Number=620 AC
2.2.1.3 Container contract in place	12MAY08			See 2.4.4.2
	[redacted]			
2.3 Tools and supplies are in place.	19MAY08	M. Whatley	5-29-08	2.3 N/A. S/C task.
2.3.1 Pumps	N/A			2.3 N/A. S/C task.
2.3.1.1 Pumps inspected	N/A			2.3 N/A. S/C task.
2.3.1.2 Fuel for pumps properly contained	N/A			2.3 N/A. S/C task.
2.3.1.3 Pumps on-site	N/A			2.3 N/A. S/C task.
2.3.1.4 MSDSs identified and in place	N/A			2.3 N/A. S/C task.
2.3.2 Hoses	N/A			2.3 N/A. S/C task.
2.3.2.1 Hoses inspected	N/A			2.3 N/A. S/C task.
2.3.2.2 Hoses on-site	N/A			2.3 N/A. S/C task.

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

Criteria/Description	Closed Date	Verified By (Signature)	Verification Date	Comments
2.4 Plans and procedures are approved and ready to use.	OPEN	M. Whatley	5-29-08	
2.4.1 02 EM 1016 (Request to Discharge to Evaporation Ponds; Rev. 2)	N/A			Only 02 RC 3108 applies
2.4.1.1 Document package completeness verified	N/A			Only 02 RC 3108 applies
2.4.1.2 Assemble document package	N/A			Only 02 RC 3108 applies
2.4.1.2.1 Request for Disposal form	N/A			Only 02 RC 3108 applies
2.4.1.2.2 Analytical results or evidence of process knowledge	N/A			Only 02 RC 3108 applies
2.4.1.2.3 Completed and signed Attachment 1 "Authorization to Discharge Non-Hazardous Effluent in the Sewage Treatment Facility"	N/A			Only 02 RC 3108 applies
2.4.1.3 Owner training complete	N/A			Only 02 RC 3108 applies
2.4.1.4 Participants training complete	N/A			Only 02 RC 3108 applies
2.4.1.4.1 Support staff training complete	N/A			Only 02 RC 3108 applies
2.4.1.4.2 Bargaining Unit labor training complete	N/A			Only 02 RC 3108 applies
2.4.1.4.3 Bargaining Unit qualifications in place	N/A			Only 02 RC 3108 applies
2.4.1.5 Approved procedure in place	N/A			Only 02 RC 3108 applies
2.4.2 02 RC 3108 (Request for Disposal; Rev. 6)	OPEN			
2.4.2.1 Attachment 2 of 02 RC 3108 complete	OPEN			Have pre-disposition record
2.4.2.2 RFD and attachments hand delivered to SEC	27MAY08	M. Whatley	5-29-08	
2.4.2.3 RFD complete with attachments	27MAY08	M. Whatley	5-29-08	
2.4.2.3.1 Current analytical data	27MAY08	M. Whatley	5-29-08	
2.4.2.3.2 Applicable MSDSs for any additives	27MAY08	M. Whatley	5-29-08	No additives used
2.4.2.3.3 Attachment 1 from 02 EM 1016	N/A	M. Whatley	5-29-08	Only 02 RC 3108 applies
	[redacted]			

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

Criteria/Description	Closed Date	Verified By (Signature)	Verification Date	Comments
2.4.2.4 Owner training complete	21MAY08	M. Whatley	5-29-08	
2.4.2.5 Participants training complete	22MAY08	M. Whatley	5-29-08	
2.4.2.5.1 Support staff training complete	21MAY08			
2.4.2.5.2 Bargaining Unit operator training complete	22MAY08			
2.4.2.5.3 Bargaining Unit qualifications in place	21MAY08			O/G Surveillance
2.4.2.6 Approved procedure in place	01MAY08	M. Whatley	5-29-08	See 1.4.2.6
2.4.3 Approved JHA ready to use	OPEN	M. Whatley	5-29-08	See 2.4.3.2
2.4.3.1 JHA reviewed by owner	27MAY08			
2.4.3.2 JHA reviewed by support staff	OPEN			S. Travis/J. Siegel absent
2.4.3.3 JHA reviewed by Bargaining Unit operator	27MAY08			
2.4.3.4 Approved JHA in place	12MAY08	M. Whatley	5-29-08	Approval date 10APR08
2.4.4 QSL vendors in place	12MAY08	M. Whatley	5-29-08	
2.4.4.1 Off-site location under contract	12MAY08			
2.4.4.2 Container supplier under contract	12MAY08			
<u>2.5 PPE is identified and ready.</u>	27MAY08			
2.5.1 Steel toe safety shoes, safety glasses, hard hat, leather gloves	N/A	M. Whatley	5-29-08	2.5.1 N/A. S/C task.

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

Criteria/Description	Closed Date	Verified By (Signature)	Verification Date	Comments
2.6 Notifications have been given.	29MAY08			
2.6.1 Owner approves	29MAY08	M. Whatley	5-29-08	
	[redacted]			
2.7 Methods of communication are in place.	29MAY08			
2.7.1 Pre-job briefing complete	29MAY08	M. Whatley	5-29-08	
2.7.2 Bargaining Unit operator has contact cards	21MAY08			
2.7.3 Cell communications are operable	21MAY08	M. Whatley	5-29-08	

Attachment 2.b.

WP 02-EC.06, Revision 7, Cover Page and Revised Pages

Training Documentation for the WP 02-EC.06, Revision 7

CTS: 31397 WF 08 025

Working Copy Action #1

WP 02-RC3108

Revision 7

Request for Disposal

Management Control Procedure

EFFECTIVE DATE: 06/30/08

Stewart Jones
APPROVED FOR USE

Working Copy

Action #3

WF 08 025

Effective Date: 02/26/08

WP 02-EC.06
Revision 7

WIPP Site Effluent and Hazardous Materials Sampling Plan

Cognizant Section: Site Environmental Compliance

Approved By: Stewart Jones

material give the sampler an idea of what the composition might be, making it easier to determine the analyses needed to be conducted by the analytical laboratory.

5.1.1 pH Measurement

In most cases, the pH will be measured by the contract laboratory. For purposes of shipping, pH may be measured in the field using pH strips. As required, the pH of a substance may be measured per WP 02-EM1005, Groundwater Serial Sample Analysis, or applicable instrument instructions. The pH can be measured only if the sample media is aqueous or multiphase with the aqueous part of the sample media being at least 20 percent of the total volume.

5.1.2 Temperature Measurement

When it is necessary to determine the temperature of a substance, it will be measured per WP 02-EM1005 or the applicable instrument instructions.

5.1.3 Conductivity Analysis

When it is necessary to determine the conductivity of a solution, it will be measured per WP 02-EM1005 or the applicable instrument instructions.

5.2 Qualitative and Quantitative Analyses

Sample analyses must be specified on the Request for Analysis (RFA) form sent to the contract laboratory with the samples. Common analyses are listed in Table 2. The contract laboratory will be responsible for providing the results to the qualitative and quantitative analyses according to their contract. SW-846 methods, when available, are suggested for analyses of all parameters. The contract laboratory may deviate from SW-846 if the laboratory method is at least as accurate as the suggested SW-846 method. The contract laboratory shall present the deviations from SW-846 for approval at the time of contract placement.

6.0 TRANSPORTATION [6,7]

6.1 Shipment of Samples for Laboratory Analysis

Samples being transported to a laboratory for the purpose of testing to determine their characteristics or composition are exempted from RCRA regulations under 40 CFR §261.4(d), "Exclusions." However, sample shipment shall be coordinated with Transportation Operations to ensure that the applicable U.S. Department of Transportation (DOT) regulations for packaging and shipping have been met. Shipments of samples that are hazardous materials as defined by the DOT will be completed in accordance with WP 08-NT3101, Shipment of Nonradioactive Hazardous Materials, or WP 08-NT3110, Shipment of Radioactive Materials. Verification of this process shall be indicated by a signature from a designated Transportation Operations representative on the Shipping Authorization form in accordance with WP 15-PM3525.

Table 2 - Common Analytical Parameters

Program	Potential Analyses
Hazardous Waste Characterization	- pH - Ignitability - TCLP metals, semivolatiles, and volatiles - TSS - TOC
Soil Samples	- Na - Mg - Cl - Ca - K - Metals, if applicable - Oil and Grease, if applicable
Site Effluent	- Metals - pH - Conductance - TOC - Volatiles - Semivolatiles
TRU-Mixed Waste Samples	- pH - Ignitability - TCLP metals and organics - TSS - TOC - Gross alpha and gross beta/gamma - PCBs

WF08-02 , CTS 30964
Action #3

[redacted]

[redacted] ATTENDANCE SHEET

Course/Session: Procedure 02 EC.06 Course Number/Mat. Code: 02EC.06 Table 2

Conducted by: Bill Jaco, Ricky Whiteley (Name / Department / Section) Date: 4-14-08 Hours: 1

Location: WIPP ☒ Offsite ☐ Safety Conference Room (Building / Room / Site) Page 1 of 1

Attendee(s): Print applicable information in black ink and sign. This form is a quality document. Correct errors by drawing a single line through the incorrect information and initial and date the correction.

	Badge Number	Print Name: Last, First, MI	Signature	Company/Dept	Grade	Status	Comments
1	[redacted]	Travis, Steven L	[signature]	WRES			
2	[redacted]	Jaco, William H	William H. Jaco	WRES			
3	[redacted]	Nelson, Kristine D	[signature]	WRES/SEC			
4	[redacted]	Whiteley, Rick E	R E Whiteley	WRES/SEC			
5	[redacted]	Contreras, Danny	Danny Contreras	WTS/SEC			
6							
7							
8							
9							
10							
11							
12							

Q = Qual Card W = Waiver C = Complete, No Exam (attendance) X = Complete, Passed L = Complete, Failed D = Retake, Failed R = Retake, passed I = Incomplete

The above information is valid and complete. Sign and return this form to the training section.

Print Name: Bill Jaco, Rick Whiteley Signature: Bill Jaco, R E Whiteley Date: 4-14-08, 4-14-08

Attachment 3

Attachment 3

WIPP Discharge to Evaporation Pond H-19 Root Cause Analysis Report

Washington
TRU Solutions LLC

QA:08:00036
UFC:2300.00

INTER-OFFICE CORRESPONDENCE

DATE: February 15, 2008

FROM: C. E. Nesser — LOCATION: Assurance Programs

TO: W. M. Wierzbicki ED — LOCATION: Washington Regulatory Environmental Services (WRES)

SUBJECT: WIPP DISCHARGE TO EVAPORATION POND H-19 ROOT CAUSE ANALYSIS REPORT

This correspondence transmits the final Root Cause Analysis Report on the WIPP Discharge to Evaporation Pond H-19. This Report is the result of an investigation conducted by an appointed Root Cause Analysis Team (RCAT) and each member on the RCAT has concurred with the content of the Report.

The root cause was identified by the RCAT as failure to follow procedures.

Eight recommended corrective actions were identified by the RCAT to prevent recurrence.

If you have any questions or comments regarding this Root Cause Analysis Report, please contact me at Extension 8376.

CEN:bdv

Attachment

cc:	G. L. Bell	ED
	K. M. Bennett	ED
	J. E. Hoff	ED
	G. J. Johnson	ED
	S. B. Jones, WRES	ED
	M. D. Keathley	ED
	R. F. Kehrman, WRES	ED
	M. F. Sharif	ED
	J. Siegel, WRES	ED
	G. L. Valett, WRES	ED
	J. D. VandeKraats	ED
	P. D. Yocum	ED

ROOT CAUSE ANALYSIS REPORT

WIPP Discharge to Evaporation Pond H-19

Washington TRU Solutions LLC
February 14, 2008

1. Executive Summary

This Root Cause Analysis addresses issues surrounding and leading to the November 9, 2007 disposal of approximately 150 gallons of water into the H-19 Evaporation Pond (EP) without following a requirement defined in Technical Procedure WP 02-EM1016, *Request to Discharge to Evaporation Ponds.*

Technical Procedure WP 02-EM1016, requires that prior to discharge into H-19, Washington Regulatory and Environmental Services (WRES) Environmental Monitoring and Hydrology (EM&H) and Site Environmental Compliance (SEC) authorize the discharge and document the authorization on Attachment 1 to the procedure. These authorizations were not obtained.

The unauthorized disposal of 150 gallons of leaded brine water in EP H-19 was documented through the WIPP Form process (WP 04-IM1000, *Issues Management Processing of WIPP Forms* [WF]), on WF08-011. WIPP Form 08-011 was evaluated by Quality Assurance (QA) Management, and determined not to be a Significant Condition Adverse to Quality (SCAQ).

WRES SEC, the organization cognizant over the evaporation ponds, requested a QA audit of the Hydrology and Water Management program. Audit I08-03, *Hydrology and Water Management*, was completed on December 20, 2007. This audit was performed to evaluate the implementation effectiveness of established programs, procedures, processes, and practices for compliance with WIPP Procedure (WP) 13-1, *WTS Quality Assurance Program Description*, Revision 26, and requirements from other applicable regulations and procedures.

The results of audit I08-03 indicate that although portions of the system for collection, characterization, sampling, analysis, and disposal of site-generated effluent waters are effectively implemented, some weaknesses exist in the procedural guidance and implementation of the system.

This audit resulted in the identification of two findings, related to recording of information taken during the water sampling process, one condition corrected during the audit (CDA), and one observation. The two findings were documented on WIPP Forms WF 08-024 and WF 08-025, both issues were determined to be Significant Conditions Adverse to Quality (SCAQs), according to the following criteria, as defined in WP 13-1, *WTS Quality Assurance Program Description*, Section 1.3.4.2, Revision 26, *Significant Conditions Adverse to Quality*:

- If uncorrected, could lead to a serious effect on safety/operability, the ability to isolate waste, TRU waste site certification, regulatory compliance demonstration, or effective implementation of the QA program (WF08-024); or
- Constitutes an adverse trend or inclination, as determined by formal performance evaluation and trend analysis (WF08-024 and WF08-025).

Per WP 04-IM1000, Attachment 2 - *Response to SCAQ WIPP Forms*, Section 1, "SCAQ WIPP Forms require the initiation of a CAP and completion of an evaluation, which includes the documentation of a formal root cause analysis in accordance with WP 13-QA3016."

The Root Cause Analysis Team (RCAT) identified several significant contributing factors that led to the inappropriate disposal of leaded brine water into EP H-19. However, the root cause was determined to be a failure to strictly adhere to procedure.

1.1 Introduction

This root cause evaluation was chartered by the WRES management team to review the circumstances regarding the release of water taken from the Exhaust Shaft Intercept Borehole Collection System that was discharged into EP H-19, November 9, 2007, without utilization of available analyses, and prior to completion of required documentation.

Prior to the initiation of this root cause evaluation, an audit was performed by the WTS Quality Assurance group. This audit concentrated on the evaluation of the collection, sampling, analysis, and disposal of site-generated effluent waters. The findings and observations noted in this audit are currently being tracked on WTS corrective action documents and will be referenced in this report but the actions will not be duplicated as open actions.

Interviews were conducted with WRES management personnel that had direct responsibility for the environmental program, as well as with personnel responsible for the technical basis aspects daily program operations, and maintenance of the program. An understanding was gained as to such aspects as knowledge base of assigned personnel, clarity of procedural guidance, personnel interaction related to the sampling, tracking, testing, release and documentation of the site effluent water.

2.0 Similarity with Other Events or Incidents

During Internal Audit I08-03, *Hydrology and Water Management*, 127 data packages were reviewed to verify that documents were completed in accordance with procedure requirements. A pattern of instances between January 2006 and October 2007 were identified, in which omissions to documents associated with the sequence of identifying specific effluent waters, discharge requests, authorizations, and annotations of disposal and failure to follow relative procedure(s) were identified. The identified issues can be generally categorized as:

- Failure to follow process sequence as defined by procedure;
- Incomplete documentation of discharge events; and
- Omission of a required document in (reviewed) data packages.

Although instances of failure to follow procedural requirements were identified, during interviews, it was noted that no other discharges of unallowable materials into EP H-19 have occurred.

3.0 Facts

Procedures used to perform sampling and disposal functions are:

WP 02-RC3108, Revision 6, November 21, 2006, *Request for Disposal*
WP 02-RC3108, Revision 7, Draft, *Request for Disposal*
WP 02-EM1016, Revision 2, June 29, 2004, *Request to Discharge to Evaporation Ponds*
WP 02-EC1001, Revision 6, February 28, 2006, *Characterization Sampling, Shipping, and Documentation*
WP 02-EC.05, Revision 4, April 12, 2006, *Quality Assurance Project Plan for WIPP Site Effluent and Hazardous Materials Sampling*
WP 02-EC.06, Revision 6, April 5, 2006, *WIPP Site Effluent and Hazardous Materials Sampling Plan*
WP 02-EM.02, Revision 2, December 12, 2005, *Integrated Sample Control Plan*

The groups involved with the incident include members of WRES SEC, WRES EM&H, WTS Engineering/Geotechnical Engineering, and WTS Radiological Services/Emergency Management (Environmental Safety and Health Technician). The Environmental Safety and Health Technician performs most water hauling/discharge duties for the site. This team configuration is typical for performance of water sampling and discharge activities.

Training records for primary personnel in this event were reviewed during Internal Audit I08-03. Qualification for specific individuals to STC-01, *Sampling Team Coordinator*; and ST-01, *Sampling Team Member*, were found to be current.

Events, as understood via personnel interviews occurred in the following sequence:

Date/Sequence	Event
June 29, 2004	WP 02-EM1016, Revision 2 effective
September 23, 2005	DOE Letter to NMED regarding sampling analysis, and disposition of brine water
November 21, 2006	WP 02-RC3108, Revision 6 effective
October 29, 2007	RFD #07-146, Section 1 of Attachment 1 completed, Section 2 signed (by SEC), although analytical results of test were not known
October 30, 2007	Samples were collected and transferred to the contract analytical laboratory
November 8, 2007	(The form) *Authorization to Discharge Nonhazardous Effluent into the WIPP Sewage Treatment Facility* (WP 02-EM1016, Attachment 1 / authorized by SEC (Section 3 not signed, no EM&H authorization to release).
November 9, 2007	Received Trace Analysis' "Analytical and Quality Control Report" Work Order #7110117 / Sample #141417 Results of brine analysis received, and Section 2 of Attachment 1 completed (first analysis)
November 9, 2007	150 gallons of the 560 gallons of brine discharged into EP H-19
November 14, 2007	Received Trace Analysis' "Analytical and Quality Control Report" Work Order #7110117 / Re-run values
November 14, 2007	RFD #07-146 date revised to show date of second analytical receipt
November 28, 2007	Remaining brine drummed, RFD #07-163 initiated to ship material off-site to Veolia Environmental

Interviews with cognizant individuals indicated that the discharge into EP H-19 involved Exhaust Shaft Intercept Borehole water. Water accumulation for this area is checked on a weekly basis by cognizant individuals (WRES SEC, or WTS Geotechnical Engineering). Water is sampled after it has collected for 45 days (accumulation start date is determined by instrumentation, and entered into Attachment 1 of WP 02-RC3108). Toxic Characteristic Leaching Procedure results are typically returned from the contract analytical laboratory within two weeks.

During an interview, as part of the RCA process, the Technician indicated that he was working under heavier than normal schedule pressure, and had a large quantity of 700 fan collection water along with

Sandia National Lab (SNL) water to discharge. Discharge of SNL well water is a typical activity, which is coordinated by WRES.

On November 9, 2007 the individual (SEC) that performs the majority of RFD data package development and release was away from the office, but stated that the data package had been left in the Environmental Safety and Health Technician's chair. An email from the analytical lab (Trace Analysis) was received by SEC on November 9, 2007, and indicated that the analyzed sample tested slightly high in lead content. This information was not immediately relayed to the Technician, because it was presumed that he was discharging 700 fan and SNL water first, and there would be sufficient time to contact him later in the day.

It was observed by interviewees, that the containers used to haul the water for discharge are not clearly identified as to origin (700 fans, SNL, exhaust shaft borehole, etc.). Only one container was available at the time of the incident, and the Technician was not aware that the water was from the Exhaust Shaft Intercept Borehole, but assumed that he was discharging water collected from the 700 fan(s). Although pumping of the container had begun, the Technician noticed that the quantity of water to be discharged was different than that normally discharged from 700 fan accumulation. At that point, the Technician attempted to get analysis information and direction from alternate SEC personnel, via cell phone communication.

SEC was able to relay to the Technician that the water had high lead content, and the Technician had already stopped pumping. It was reported by all interviewees that cell phone communications were poor.

In the proper sequence of events, the Technician acknowledged that the last form he completes for a discharge event is the *Authorization to Discharge Nonhazardous Effluent into the WIPP Sewage Treatment Facility* (WP 02-EM1016, Attachment 1). Although the data package relative to this incident was not carried with the container to the discharge site, the Technician stated that he now recognizes that all required forms (or copies) should be carried with the container for discharge.

The personnel involved with this event were qualified and experienced in the task(s) being performed. However, the RCA Team found that the approvals required for discharge in this incident, and previous discharges (as discussed in Internal Audit I08-03), were non-sequential. Documentation of approvals and dates was not accurate (also addressed in I08-03).

Interviewees noted that human performance issues also contributed to the incident. The Technician indicated that he was distracted by the significant, unanticipated illness of an immediate family member, and experienced additional stress due to perceived schedule pressure (SNL and 700 fan water discharge).

The cognizant SEC representative and the Technician stated that the incident was immediately reported to SEC management.

4.0 Analysis Tools

WP 13-QA3016 directs that one or a combination of methods be used depending on the circumstances. A combination of analysis tools was used to ensure that all relevant areas were appropriately evaluated. The analysis tools used were the TapRoot Analysis, Phoenix Analysis, and Barrier Analysis processes.

The TapRoot Analysis system is based on laws, rules, and theories of human and equipment performance and the application of these rules to performance improvement. The Phoenix Analysis process looks from a broad perspective, allowing the use of the best available information to ensure that significance is adequately analyzed. The Barrier Analysis method focuses on the barriers (physical, administrative, and procedural controls) that should have prevented the nonconformances from occurring.

THE TAPROOT ANALYSIS

The TapRoot Causal Tree Analysis method is generally advantageous for obtaining insights into factors influencing the performance of activities, e.g., work environment and management interaction. It offers clear traceability for human performance, work direction, management systems, training, and components that were particularly applicable to this event.

Factors	Conclusion
Procedures (failure to follow procedure was determined to be the root cause of this incident.) Quality Control (contributing factor)	• WP 02-RC3108, R/6, §1.1.10, requires that the RFD and required documentation, be hand-carried to SEC, and not left at an unattended desk (issue: forms left in Technician's chair). • WP 02-EM1016, R/2, §1.3.3, requires that the requestor (Technician) verify the documentation package is complete, and states that the requestor is not to proceed until the package is complete (issue: forms not completed in sequence / analysis information not in package at the time of the incident. Non-sequential approval dates in data packages has been a recurring issue). Procedures used in this process are generally well developed, and have been in continuous use for several years. There are, however, areas in which procedures steps were not followed, or in which the process could be strengthened: • The RCA Team observed that a final hold point is not yet procedurally required. However, an independent review of data packages prior to discharge would help ensure that the packages are complete and accurate. • The RCA Team observed that additional, random independent review of data packages prior to discharge would provide additional assurance.
Training (contributing factor) Communications (contributing factor)	• All personnel directly involved in the inappropriate discharge into EP H-19, are trained and qualified for the activity. Most of the involved personnel have performed data package preparation and water discharge functions as a regular part of the job function. One individual is trained and qualified, as required, but serves as an alternate to the cognizant individual, and has had few opportunities to perform the required SEC function(s). • Although the process is proceduralized, per interview with SEC personnel, performance of the job was taught with "tribal knowledge." • SEC personnel and the Technician are provided with cell phones. However, this specific geographical area has poor cell phone reception, and communications

Factors	Conclusion
	during this event were hampered, thereby impacting relay of significant information.
Management System (contributing factor) Work Direction (contributing factor)	• During interview, the Technician indicated that he experienced stress due to perceived schedule pressure to discharge SNL, 700 fan, and borehole water. • It was observed (as noted in I08-03) that incomplete and/or non-sequentially completed/signed authorization documents are part of data packages dating back to 2006, indicating that there has been insufficient independent or management oversight of the data package preparation. • Via interview, the RCA Team determined that team communications and turnover of responsibilities are insufficient. • During interview, the Technician indicated that he was distracted/stressed due to the significant, unanticipated illness of an immediate family member.
Human Engineering (contributing factor)	• Per interview, containers used to store/transport water for discharge are not thoroughly identified as to location of source. • Per interview, placement of the water trailers with non-hazardous water is a concern, and it is proposed that all trailers be parked in a designated area.

THE PHOENIX ANALYSIS

Eight Question Analysis	
Impact	
Consequences (Tangible and intangible adverse effects)	Potential: • Diminished stakeholder confidence • Increased oversight by Customer/Stakeholder • Increase in equipment costs due to water holding requirements
Significance (What does this mean for the future of the facility?)	Potential: • Diminished stakeholder confidence • Increased oversight by Customer/Stakeholder • Increase in equipment costs due to water holding requirements
Influences on Consequences	
Vulnerability (What set us up for this event?)	• Inadequate procedures / failure to comply with procedures • Complacency • No independent verification • Distraction • Inadequate information turnover • Perceived schedule pressure

	• Poor communication
Trigger (What put the ball in motion?)	• Procedure not followed • Perceived schedule pressure • Primary SEC personnel unavailable • Complacency
Exacerbation (What made the consequences as bad as they were?)	• Analytical report showing high level of lead available, but not utilized prior to discharge • Poor communication
Mitigation (What kept the consequences from being a lot worse?)	• Technician recognition of adverse condition • Self-reported
Close Out	

Lessons to be Learned (What skills, rules, and knowledge should be added or reinforced?)	• Improved Management Assessments
	• Management walkdown of processes
	• Implement pre-job briefings / SEC and EM&H Plan of the Day
	• Attention to detail
	• Completion of forms
	• Clarifying responsibilities in procedures (WP 02-EM1016, WP 02-RC3108)
	  o Procedural ownership
	  o taking documentation to worksite
	  o sequential step(s) completion
	• Information turnover process

Corrective Actions (What conditions and behaviors should be changed?)	• Improve identification of containers (include RFD number, etc.) • Improve scheduling • Consider establishment of a locking process for trailers to verify accuracy and completion of discharge documentation • Reinforce employee authority/accountability • Improve communication (process and equipment) • Clarification of sampling requirements for all materials • Independent Verification • Implement SEC and EM&H Plan of the Day • Consolidation of records • Add field for RFD number to WP 02-EM1016, Attachment 1 • Clarify the date to be disposed by on WP 02-EM1016; Attachment 1 (vs. signature date) • Other corrective actions are being addressed as a result of WTS Internal Audit I08-03.

The Phoenix Analysis reflected the following causal factors:

1. Failure of barriers – procedures, communication, etc.
2. Changed process – primary assigned SEC off-site
3. Lack of pre-job briefings
4. Failure to adhere to procedural requirements
5. Complacency

THE BARRIER ANALYSIS

Barriers are controls that should have prevented the nonconformance from occurring. Barriers generally fall in the following categories: equipment, design, administrative (procedures and work processes), supervisory/management, warning devices, knowledge and skills, and physical. The principle benefits of barrier analysis are that it identifies safety system elements that failed, and the results can be succinctly presented.

Barrier	Conclusion
Barrier 1 – Standards, Policies, Procedures/ Administrative Controls	Barrier failed – Cognizance for elements of collection, sampling, and discharge of materials into the evaporation ponds falls under four distinct and organizationally separate groups: WRES Site Environmental Compliance, WRES Environmental Monitoring and Hydrology, WTS Site Operations and Disposal/Environmental Monitoring Support, and WTS Engineering/Geotechnical Engineering. Communication among to the organizations appears to be sufficient. • There has been inadequate management supervision of the water sampling and discharge process, as evidenced by the recurring instances of failure to follow the sequential order of applicable procedures. • There has been inadequate management attention to the scheduling of water discharge events. The Technician in this incident perceived pressure to expedite discharge of SNL water. • There is inadequate opportunity for independent verification that forms are complete and appropriate authorization attained prior to discharge of materials (procedure). • The containers to be discharged were identified, but not clearly or distinctively). • The Technician did not verify the information about the water, and did not carry the data package to the discharge point. There is no procedural requirement for the Technician to carry the documentation to the discharge point.
Barrier 2 – Communications	Barrier failed – • An assumption was made by a SEC representative that there was no urgent need to provide the Technician with lab analysis information. • Cell phone communications were poor due to reception quality.
Barrier 3 – Turnover of Information	Barrier failed – • Although the procedure requires hand delivery of the data package/forms, the data package for the leaded brine water was left at the Technician's (unattended) desk. • Although trained/qualified, the alternate SEC

Barrier	Conclusion
	representative has had little experience in preparing data packages for discharge events. • An assumption was made by a SEC representative that there was no urgent need to provide the Technician with lab analysis information.
Barrier 4 – Attention to Detail	Barrier failed – • As evidenced in I08-03, inattention to detail has been an issue for the past 18 months (forms not completed in sequential order, all required documentation not attached to RFD, etc.). • There is no procedural requirement for independent verification of completion and accuracy of data packages prior to discharge of materials.

4.1 Summary of Causes and Recommendations

The three methods of analysis used resulted in identification of the following causes:

Procedures (failure to follow procedures/inadequate procedures)
Quality Control (no independent verification/hold points)
Communications (equipment/timeliness)
Management System (schedule pressure, inadequate oversight of process)
Work Direction (Inadequate information turnover)
Human Engineering (complacency, distraction)

4.1.1 Contributing Causes

- Management System
- Work Direction
- Communications
- Human Engineering

4.1.2 Root Cause

- Failure to follow procedures

5.0 Conclusions

This analysis included the use of multiple analysis tools and identified similar causes. The RCA Team determined that the root and contributing causes have been adequately identified (as noted above). If the contributing causes are effectively addressed, the Site Environmental Compliance and Environmental Management and Hydrology program(s) can be greatly improved. However, the recommended actions will require significant management focus to ensure effective implementation.

6.0 Corrective Actions

Corrective Action recommendations include:

- Improved Management Assessments
- Clarification of procedures
  - ownership and responsibilities in procedures (WP 02-EM1016, WP 02-RC3108)
  - enforce attention to detail (implement independent verification of forms for accuracy/completion prior to discharge of materials)
  - Enforce sequential completion of forms/approvals
  - taking documentation to worksite
  - sequential step(s) completion
- Improve communication (process and equipment)
  - Implementation of pre-job briefings (procedure revision)
  - Information turnover process (Procedurally, RFDs are to be hand-delivered, and not left at an unattended desk.)
- Improve identification of containers (enhance the clarity and visibility of identification)
- Improve scheduling (management attention to scheduling of activities requiring the same personnel)
- Consider establishment of locking process for trailers
- Reinforce employee authority/accountability
- Other corrective actions are being addressed as a result of WTS Internal Audit I08-03.

RCAT SIGNATURES/TITLES

Root Cause Analysis Team Leader:

M. Keathley — 2/14/08

M. D. Keathley — Date
WTS Quality Assurance/Assessment Services

Team Members:

C. E. Nesser — 2.14.08

C. E. Nesser — Date
WTS Quality Assurance/~~Manager~~ Assurance Programs

Glen P. Valett — 14 Feb 08

G. L. Valett — Date
WRES, Project Manager

2-15-08

K. M. Bennett — Date
WTS Site Operations and Disposal/CH Waste Handling

WRES Senior Management:

W. M. Wierzbicki — Date
WRES Manager

WTS Senior Management:

Jon E. Hoff — 2/14/08

J. E. Hoff — Date
WTS Quality Assurance Manager

02199

RCAT SIGNATURES/TITLES

Root Cause Analysis Team Leader:

M. D. Keathley
WTS Quality Assurance/Assessment Services

Date

Team Members:

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Date

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WRES Senior Management:

William M. Wierzbicki

W. M. Wierzbicki
WRES Manager

2/14/08
Date

WTS Senior Management:

J. E. Hoff
WTS Quality Assurance Manager

Date

Attachment 4

Attachment 4

Washington Regulatory and Environmental Services Management Assessment Report May 2008, WRES MA SEC-08-008

Washington

Regulatory and Environmental Services
(an affiliate of Washington TRU Solutions LLC)

WRES:08:551
UFC:2300.00

INTER-OFFICE CORRESPONDENCE

DATE: July 17, 2008

FROM: S. B. Jones, Manager S B Jones LOCATION: Site Environmental Compliance

TO: W. M. Wierzbicki, Manager LOCATION: Washington Regulatory and Environmental Services

SUBJECT: Washington Regulatory and Environmental Services Management Assessment Report May 2008, WRES MA SEC-08-008

The purpose of this correspondence is to transmit the management assessment report for Washington Regulatory Environmental Services Site Environmental Compliance (SEC) MA SEC-08-008. This assessment was to determine readiness to initiate disposal of non-hazardous water in the H-19 evaporation pond or offsite at a commercial disposal facility.

The final report is comprised of this communication and the supporting Attachments. It summarizes the process used for conducting the assessment and resulting conclusions. This assessment was performed in alignment with WP 15-GM1000, Management Assessment and assessment guidance available on the WIPP intranet. It also utilized a graded approach in completing the appropriate level of readiness review for these two processes.

Assessment Process

The management assessment was performed from May 1 through May 31, 2008 under the direction of the readiness review administrator, Gene Valett. The assessment completed an in-depth review of the state of readiness for disposal of non-hazardous water prior to re-initiating disposal operations. This assessment was completed in two phases, the first phase focused on onsite disposal while the second phase focused on offsite disposal. Each phase focused on confirming the following eight criteria:

- Manpower identified and in place
- Equipment readiness
- Tools and Supplies in place
- Plans and Procedures ready to use
- Personal Protective Equipment is identified and ready
- Notifications have been given
- Methods of communication are in place
- Corrective actions are completed (onsite disposal only)

The detailed list of the readiness review criteria is included as Attachment A. These criteria corresponded to multiple items from WIPP's MA Guidance documents 001, 002, 005, 006, 007, 009, and 010.

The full range of assessment methods were utilized including visual inspection, interviews, and review of documents and records. WRES and WTS personnel participating in the disposal processes were identified and involved in completing the assessment. Personnel involved are listed in the following table. A WRES staff member, independent of the waste disposal processes, verified the results of the review on May 14, 2008 and May 29, 2008.

Personnel Participating in Review

Name	Process Role
Gene Valett	Readiness Review Administrator
Stewart Jones	Manager, Site Environmental Compliance
Joel Siegel	Manager, Environmental Monitoring and Hydrology
Miriam Whatley	Independent Verifier
On-Site Disposal of Non-Hazardous Water Process	
Rick Whiteley	Owner
Bill Jaco	Owner Backup
Danny Contreras	Bargaining Unit Operator
Parrish Roush	Participant
Jimmy Neatherlin	Participant
Steve Travis	Participant
Kristine Nelson	Participant
Judy McLemore	Participant
Mel Balderrama	Participant
Richard Jimenez	Participant
Rick Salness	Participant
James Maly	Participant
Off-Site Disposal of Non-Hazardous Water Process	
Rick Salness	Owner
Rick Whiteley	Owner Backup
Aurelio Rivas	Bargaining Unit Operator
Jimmy Neatherlin	Participant
Steve Travis	Participant
Greg Jungclaus	Participant
Mel Balderrama	Participant

Assessment Results

Site readiness for disposal of non-hazardous water was demonstrated with objective evidence consolidated and documented and retained in the MA file. There were three items that had not been closed at the completion of the assessment. Each of these items was determined to not be critical to complete prior to initiating disposal. Copies of the readiness review summaries are included as Attachment B.

Results for onsite disposal and for offsite disposal were reviewed by the Readiness Review Administrator with WRES Managers for SEC and Environmental Monitoring & Hydrology on May 14, 2008 and May 29, 2008 respectively.

Please call me at extension 8293 should you have any questions.

JM:hdm

Attachments (2)

cc: W. M. Wierzbicki, WRES	ED
R. R. Chavez, WRES	ED
E. D'Amico, WRES	ED
S. B. Jones, WRES	ED
R. F. Kehrman, WRES	ED
S. C. Kouba, WRES	ED
J. McLemore, WRES	ED
J. Siegel, WRES	ED

ATTACHMENT A

READINESS REVIEW CRITERIA FOR
ON-SITE DISPOSAL OF NON-HAZARDOUS WATER
AND
SHIPMENT OF WATER FOR OFF-SITE DISPOSAL

READINESS REVIEW CRITERIA FOR
ON-SITE DISPOSAL OF NON-HAZARDOUS WATER
AND
SHIPMENT OF WATER FOR OFF-SITE DISPOSAL

1.0 <u>On-Site Disposal of Non-Hazardous Water at H-19 is Ready</u>

1.1 Manpower is identified and in place.
- 1.1.1 Process owner is identified
- 1.1.2 Support staff is identified
- 1.1.3 Bargaining Unit operator is identified

1.2 Equipment is ready.
- 1.2.1 Collection containers ready to use
  - 1.2.1.1 Containers inspected
  - 1.2.1.2 Containers on-site
- 1.2.2 Trailers
  - 1.2.2.1 Trailers inspected
  - 1.2.2.2 Trailers on-site
- 1.2.3 Truck with hitch
  - 1.2.3.1 Truck with hitch inspected
  - 1.2.3.2 Truck with hitch on-site

1.3 Tools and supplies are in place.
- 1.3.1 Pumps ready to use
  - 1.3.1.1 Pumps inspected
  - 1.3.1.2 MSDSs identified and in place
  - 1.3.1.3 Fuel for pumps properly contained
  - 1.3.1.4 Pumps on-site
- 1.3.2 Hoses
  - 1.3.2.1 Hoses inspected
  - 1.3.2.2 Hoses on-site

1.4 Plans and Procedures are approved and ready to use.
- 1.4.1 02 EM 1016 (Request to Discharge to Evaporation Ponds; Rev. 2)
  - 1.4.1.1 Document package completeness verified
  - 1.4.1.2 Assemble document package
    - 1.4.1.2.1 Request for Disposal form
    - 1.4.1.2.2 Analytical results or evidence of process knowledge
    - 1.4.1.2.3 Completed and signed Attachment 1 "Authorization to Discharge Non Hazardous Effluent in the Sewage Treatment Facility"
  - 1.4.1.3 Owner training complete
  - 1.4.1.4 Participants training complete

1.4.1.4.1 Support staff training complete
1.4.1.4.2 Bargaining Unit operator training complete
1.4.1.4.3 Bargaining Unit qualifications in place
1.4.1.5 Approved procedure in place

1.4.2 02 RC 3108 (Request for Disposal; Rev. 6)
1.4.2.1 Attachment 2 of 02 RC 3108 complete
1.4.2.2 RFD and attachments hand delivered to SEC
1.4.2.3 RFD complete with attachments
1.4.2.3.1 Current analytical data
1.4.2.3.2 Applicable MSDSs for any additives
1.4.2.3.3 Attachment 1 from 02 EM 1016
1.4.2.4 Owner training complete
1.4.2.5 Participants training complete
1.4.2.5.1 Support staff training complete
1.4.2.5.2 Bargaining Unit operator training complete
1.4.2.5.3 Bargaining Unit qualifications in place
1.4.2.6 Approved procedure in place
1.4.3 Approved JHA ready to use
1.4.3.1 JHA reviewed by owner
1.4.3.2 JHA reviewed by support staff
1.4.3.3 JHA reviewed by Bargaining Unit operator
1.4.3.4 Approved JHA in place

1.5 PPE is identified and ready
1.5.1 Workers have gloves, eye protection, and cell communications per JHA

1.6 Notifications have been given
1.6.1 CMR notified
1.6.1.1 CMR notified upon leaving H-19
1.6.1.2 CMR notified upon entering H-19
1.6.2 Owner approves

1.7 Methods of communication are in place
1.7.1 Pre-job briefing complete
1.7.2 Bargaining Unit labor has contact cards
1.7.3 Cell communications are operable

1.8 Corrective Actions are complete
1.8.1 WIPP Form actions complete
1.8.1.1 Operator has a copy of the document package (CTS 31235)
1.8.1.2 CONOPS training is complete (CTS 31227)
1.8.1.3 Retrain staff to 02 EM 1016; Rev 2 and 02 RC 3108; Rev 6
1.8.2 Root Cause Analysis
1.8.2.1 Independent review of data packages prior to discharge

1.8.2.2 Containers thoroughly identified as to water source
1.8.2.3 All trailers parked in a designated area
1.8.2.4 Implement pre-job briefings
1.8.2.5 Operator to take verified documentation to the work site
1.8.2.6 Consider locking process for trailers

1.8.3 Eight DOE Actions for Approval to use H-19
1.8.3.1 Actions implemented or in process

1.8.4 Participants complete Root Cause Analysis review

2.0 Shipment of Water for Off-Site Disposal is Ready

2.1 Manpower is identified and in place.
- 2.1.1 Process owner is identified
- 2.1.2 Support staff is identified
- 2.1.3 Bargaining Unit operator is identified

2.2 Equipment is ready.
- 2.2.1 Collection containers ready to use
  - 2.2.1.1 Containers pass inspection
    - 2.2.1.1.1 Complete Attachment 5 "Frac Tank Inspection" from 02-EM 1024
    - 2.2.1.1.2 Flashlight for container inspection
  - 2.2.1.2 Containers on-site
  - 2.2.1.3 Container contract in place

2.3 Tools and supplies are in place.
- 2.3.1 Pumps
  - 2.3.1.1 Pumps inspected
  - 2.3.1.2 Fuel for pumps properly contained
  - 2.3.1.3 Pumps on-site
  - 2.3.1.4 MSDSs identified and in place
- 2.3.2 Hoses
  - 2.3.2.1 Hoses inspected
  - 2.3.2.2 Hoses on-site

2.4 Plans/Procedures are approved and ready to use.
- 2.4.1 02 EM 1016 (Request to Discharge to Evaporation Ponds; Rev. 2)
  - 2.4.1.1 Document package completeness verified
  - 2.4.1.2 Assemble document package
    - 2.4.1.2.1 Request for Disposal form
    - 2.4.1.2.2 Analytical results or evidence of process knowledge
    - 2.4.1.2.3 Completed and signed Attachment 1 "Authorization to Discharge Non Hazardous Effluent in the Sewage Treatment Facility"
  - 2.4.1.3 Owner training complete
  - 2.4.1.4 Participants training complete
    - 2.4.1.4.1 Support staff training complete
    - 2.4.1.4.2 Bargaining Unit operator training complete
    - 2.4.1.4.3 Bargaining Unit qualifications in place
    - 2.4.1.5 Approved procedure in place
- 2.4.2 WP 02 RC 3108 (Request for Disposal; Rev. 6)
  - 2.4.2.1 Attachment 2 of 02 RC3108 complete
  - 2.4:2.2 RFD and attachments hand delivered to SEC
  - 2.4.2.3 RFD complete with attachments

- 2.4.2.3.1 Current analytical data
- 2.4.2.3.2 Applicable MSDSs for any additives
- 2.4.2.3.3 Attachment 1 from 02 EM 1016

2.4.2.4 Owner training complete

2.4.2.5 Participants training complete

- 2.4.2.5.1 Support staff training complete
- 2.4.2.5.2 Bargaining Unit operator training complete
- 2.4.2.5.3 Bargaining Unit qualifications in place

2.4.3 Approved JHA ready to use

- 2.4.3.1 JHA reviewed by owner
- 2.4.3.2 JHA reviewed by support staff
- 2.4.3.3 JHA reviewed by Bargaining Unit operator
- 2.4.3.4 Approved JHA in place

2.4.4 QSL vendors in place

- 2.4.4.1 Off-site location under contract
- 2.4.4.2 Container supplier under contract

2.5 PPE is identified and ready

- 2.5.1 Steel toe safety shoes, safety glasses, hard hat, leather gloves

2.6 Notifications have been given

- 2.6.1 Owner approves

2.7 Methods of communication are in place

- 2.7.1 Pre-job briefing complete
- 2.7.2 Bargaining Unit labor has contact cards
- 2.7.3 Cell communications are operable

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

Readiness Status:

Unconditional

Conditional X (1.0 only)

Not Ready X (2.0 only)

Remarks:

1. 1.8.1.2 – CONOPS training complete. (CTS 31227). P. Roush training not documented.
2. 1.8.1 – WIPP Form actions complete. See 1.8.1.2.
3. 1.8 – Corrective Actions are complete. See 1.8.1.
4. 1.6.1.1 – CMR notified upon leaving H-19. This notification can only be given after disposal.
5. 1.6.1 – CMR notified. See 1.6.1.1.
6. 1.6 – Notifications have been given. See 1.6.1.
7. 1.4.2.1 – Attachment 2 of 02 RC 3108 complete. This form can only be completed after disposal.
8. 1.4.2 – 02 RC 3108 (Request for Disposal; Rev. 6). See 1.4.2.1.
9. 1.4 – Plans and procedures are approved and ready to use.

Administered by:

Gene L. Valett; WRES Project Manager Gene L Valett 15 May 08

Approvals:

Signature	Print Name	Title	Date
Stewart Jones	Stewart Jones	Manager; WRES Site Environmental Compliance	5-15-08
Joel Siegel	Joel Siegel	Manager; WRES Environmental Monitoring and Hydrology	05/15/08

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

		Open	Closed
1.0	**On-Site Disposal of Non-Hazardous Water at H-19 is Ready**		
1.1	Manpower is identified and in place.		X
1.2	Equipment is ready.		X
1.3	Tool and supplies are in place.		X
1.4	Plans and Procedures are approved and ready for use.	X	
1.5	PPE is identified and ready.		X
1.6	Notifications have been given.	X	
1.7	Methods of communication are in place		X
1.8	Corrective Actions are complete.	X	

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

2.0	Shipment of Water for Off-Site Disposal is Ready	Open	Closed
2.1	Manpower is identified and in place.		
2.2	Equipment is ready.		
2.3	Tools and supplies are in place.		
2.4	Plans and Procedures are approved and ready for use.		
2.5	PPE is identified and ready.		
2.6	Notifications have been given.		
2.7	Methods of communication are in place.		

Readiness Review
On-Site Disposal of Non-Hazardous Water
And
Shipment of Water for Off-Site Disposal

Criteria/Description For On-Site Disposal of Non-Hazardous Water	Closed Date	Verified By (Signature)	Verification Date	Comments
1.1 Manpower is identified and in place.	07MAY08			
1.1.1 Process owner is identified	07MAY08	M. Whatley	5-14-08	
1.1.2 Support staff is identified	07MAY08			
1.1.3 Bargaining Unit operator is identified	07MAY08	M. Whatley	5-14-08	
	[redacted]			
1.2 Equipment is ready.	06MAY08			
1.2.1 Collection containers ready to use	06MAY08			
1.2.1.1 Containers inspected	06MAY08	M. Whatley	5-14-08	
1.2.1.2 Containers on-site	06MAY08	M. Whatley	5-14-08	
1.2.2 Trailers	06MAY08			
1.2.2.1 Trailers inspected	06MAY08	M. Whatley	5-14-08	
1.2.2.2 Trailers on-site	06MAY08			
1.2.3 Truck with hitch	06MAY08			
1.2.3.1 Truck with hitch inspected	06MAY08	M. Whatley	5-14-08	
1.2.3.2 Truck with hitch on-site	06MAY08			
	[redacted]			
1.3 Tools and supplies are in place.	07MAY08			
1.3.1 Pumps ready to use	07MAY08			
1.3.1.1 Pumps inspected	07MAY08	M. Whatley	5-14-08	
1.3.1.2 MSDSs identified and in place	06MAY08			
1.3.1.3 Fuel for pumps properly contained	07MAY08	M. Whatley	5-14-08	
1.3.1.4 Pumps on-site	07MAY08			

Attachment 5

Attachment 5

02-EC1001, Revision 8, Characterization Sampling, Shipping, and Documentation

Working Copy

WP 02-EC1001

Revision 8

Characterization Sampling, Shipping, and Documentation

Technical Procedure

EFFECTIVE DATE: 06/30/08

Stewart Jones

APPROVED FOR USE

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INTRODUCTION [1]

This procedure provides instructions for characterization sampling, documentation, and off-site shipment of samples of site-generated, nonhazardous, hazardous, transuranic (TRU) waste, PCB (polychlorinated biphenyl)-containing TRU waste, and TRU-mixed waste. Throughout the rest of this procedure, "TRU waste," "PCB-containing TRU waste" and, "TRU-mixed waste" will be referred to as "TRU waste."

Industrial Hygiene sampling procedures are addressed within the WP 12-IH series of documents and are not within the scope of this document.

Performance of this procedure generates the following records:

- Entries in Sample Field Logbook
- Entries in Sample Tracking Logbook
- Verification and Validation of Waste Characterization Analytical Data
- Sampling documentation file (includes Analytical and Quality Control report, Request for Analysis [RFA] form, Chain-of-Custody [COC] form, Shipping Authorization form, and any other information pertinent to the sampling event that is not already contained in a logbook)

REFERENCES

BASELINE DOCUMENTS

- WP 02-EC.05, Quality Assurance Project Plan for WIPP Site Effluent and Hazardous Materials Sampling
- WP 02-EC.06, WIPP Site Effluent and Hazardous Materials Sampling Plan
- WP 12-HP3400, Contamination Control
- WP 12-IH.02, WIPP Industrial Hygiene Program Manual - Overview
- WP 12-IS.01, Industrial Safety Program - Structure and Management

REFERENCED DOCUMENTS

- DOE O 231.1A, *Environment, Safety, and Health Reporting*
- EPA 530-D-02-002, August 2002, RCRA Waste Sampling Draft Technical Guidance
- EPA R9QA/006.1, Section 3, Region 9 Superfund Data Evaluation/Validation Guidance

- EPA QA/G-8, Guidance on Environmental Data Verification and Data Validation
- EPA SW-846, Test Methods for Evaluating Solid Wastes Physical/Chemical Methods
- WP 02-EC3506, Environmental Incident Reporting
- WP 02-EM3001, Administrative Processes for Environmental Monitoring and Hydrology Programs
- WP 02-RC3108, Request for Disposal
- WP 05-WH1036, Site-Derived Mixed Waste Handling
- WP 08-NT3101, Shipment of Nonradioactive Hazardous Materials
- WP 08-NT3102, Shipment of Hazardous Materials By Air
- WP 08-NT3103, Shipment of Waste
- WP 08-NT3110, Shipment of Radioactive Materials
- WP 12-ES3918, Reporting Occurrences in Accordance with DOE Order 231.1A
- WP 15-PM3525, Preparation and Processing of Shipping Authorization
- EA15PM3525-1-0, Shipping Authorization

EQUIPMENT

- pH litmus paper or litmus paper
- Sampling kit (sample containers, sampling equipment, decontamination swipes, etc.)

PRECAUTIONS AND LIMITATIONS

- Logbooks are quality records. Only photocopies of the logbooks may be taken off-site unless the field logbook is being used during a sampling activity.
- Only personnel qualified in accordance with SAF-630, Respiratory Protection, may wear a respirator.
- Only personnel qualified in accordance with the Waste Isolation Pilot Plant (WIPP) Sampling Team Qualification Card ST-01, or the Sampling Team Assistant Qualification Card STA-01, may collect samples.

- Qualified Sampling Team Assistants (STA-01) may collect samples only if a qualified Sampling Team Member (ST-01) is present.

- Only personnel qualified in accordance with RAD 201, Radworker II; and either the WIPP Sampling Team Qualification Card ST-01, or the Sampling Team Assistant Qualification Card STA-01 may collect TRU waste samples in radiological areas.

- The appropriate personal protective equipment (PPE), as described in WP 02-EC.06 or in the Radiological Work Permit (RWP), whichever is applicable, shall be used when sampling.

- The integrity of all PPE shall be verified before donning by checking for rips, cracks, pinholes, etc. PPE shall be periodically inspected during use for damage or contamination. If damage or contamination occurs, sampling activities shall be stopped and new PPE donned.

- If there is a possibility of toxic gaseous emissions during a sampling event, Industrial Safety and Hygiene (IS&H) must be contacted for proper respiratory protection.

- Because of possible contamination from the outside of sample containers, personnel engaged in sampling activities must remain in PPE until sample containers are sealed.

- Inhaling of vapors from containers should be avoided.

- Personnel **MUST NOT** attempt to identify any material by odor.

- Personnel **MUST** hold sample containers away from the body to avoid spilling or splashing the sample material on the body.

- Personnel **MUST NOT** add sample preservative to unknown material.

- For safety reasons, at least two people will be involved in any sampling activity.

- Disposable sampling equipment such as coliwasas, funnels, scoops, etc. should be placed in the original packaging, then into a plastic trash bag for disposal.

- Used paper towels should be placed into plastic trash bags after use for disposal.

- PPE should be placed into plastic bags or appropriate containers for disposal after removal.

PREREQUISITE ACTIONS

- Use WP 02-EC.06, Table 1, Containers, Preservatives, and Holding Times, to identify the sample containers required for each sampling activity.
- If necessary, obtain sample containers, with preservatives added, from the contracted analytical laboratory. If sample containers with preservatives are not available, samples can be preserved by the Sampling Team Coordinator (STC) or a trained technician in a WIPP laboratory. If necessary, consult the contract laboratory for guidance.
- Inspect all sampling equipment for integrity before starting field sampling activities.

PERFORMANCE

1.0 PRESAMPLING ACTIVITIES

1.1 Samplers, hold pre-job briefings for all nonroutine sampling activities, and discuss the following:

- Number of samples to be taken
- Level of PPE required to perform sampling activities and inspection of PPE prior to donning
- Types of material (liquid, solid, sludge, or heterogeneous) to be sampled
- RWP, if radioactive material is suspected
- Safety hazards associated with the sampling activity
- Sample location

1.2 Contact IS&H regarding appropriate PPE requirements for sampling involving unknowns or non-routine hazards.

NOTE

The pre-job briefing, if necessary, should be signed by all personnel participating in the sampling event. The pre-job briefing should be retained in the sampling documentation file.

1.3 If necessary, review Chapter 9 of EPA SW-846 or RCRA Waste Sampling Draft Technical Guidance to perform the following:

1.3.1 Determine appropriate sampling protocols.

1.3.2 Document the review.

1.3.3 Summarize the protocols in the field logbook.

1.4 Obtain the first available sequential sample number for each sample to be collected from the field logbook.

NOTE

The format for sample numbers is WST-YY-XXX, where YY is the last two digits of the current calendar year and XXX is the next sequential number. The first sample collected in each calendar year is designated as sample number WST-YY-001.

1.5 Obtain sample kit **AND** materials.

1.6 **IF** liquids are being sampled,
GO TO Section 2.0.

1.7 **IF** solids are being sampled,
GO TO Section 3.0.

1.8 **IF** contaminated areas from a TRU waste spill are being sampled,
GO TO Section 4.0.

2.0 CHARACTERIZATION SAMPLING OF LIQUIDS

2.1 Don the appropriate PPE after inspecting for holes and tears that would compromise the integrity of the PPE .

2.2 Perform one of the following:

2.2.1 **IF** sample media is containerized,
GO TO Step 2.3.

2.2.2 **IF** a liquid sample is collected from anything other than a container, such as a lagoon, retention basin, well, or drainage ditch,
GO TO Step 2.6.

2.3 Visually inspect container of materials to be sampled.

2.4 **IF** crystallization that cannot be verified as salt is present on the containers, the contents of the container are unknown, **OR** the containers are bulging,
THEN perform the following:

2.4.1 **DO NOT** open or move containers.

2.4.2 Move away from the immediate area.

2.4.3 Prevent access to the area by others.

2.4.4 Call the Central Monitoring Room (CMR).

2.4.5 Stop work until the integrity of the container has been determined.

2.5 **IF** the container appears to be in good condition,
GO TO Step 2.6.

2.6 If applicable, obtain a pH measurement of the sample material by dipping litmus paper into the liquid.

2.7 Record pH measurements in the sample field logbook.

2.8 Collect representative samples by using a coliwasa, bailer, or dipper as follows:

- Ensure all phases of a multiphased material are represented in a sample.
- If a single representative sample cannot be obtained, collect a sample of each phase present.
- If solid material is at the bottom of a container, ensure some solid material is included in the sample.

2.9 Perform the following when obtaining samples for semi-volatile or volatile organics analysis:

2.9.1 Fill the sample containers to the top.

2.9.2 Secure the lid on the sample container and invert.

2.9.3 If air bubbles are observed in the sample, remove the lid and add more of the sample material.

2.9.4 Repeat Steps 2.9.2 and 2.9.3 until no air bubbles are observed when the sample container is inverted.

2.10 Secure the lid on the sample container.

2.11 If drips or splashes occur when sampling, perform the following:

2.11.1 Decontaminate the outside of the sample container by rinsing it with deionized water or wiping it with decontamination swipes or paper towels.

2.11.2 If hazardous material has splashed on PPE, and compromised the integrity of the PPE, change PPE before continuing sampling activities to prevent accidental contact with hazardous material.

2.12 **GO TO** Section 5.0 for Sampling Event Documentation.

3.0 CHARACTERIZATION SAMPLING OF SOLIDS, SLUDGES, OR HETEROGENEOUS MATERIALS

3.1 Don the appropriate PPE.

3.2 If the materials to be sampled are containerized, visually inspect the containers.

3.3 If the container is breeched or bulging, perform the following:

3.3.1 **DO NOT** open or move the containers.

3.3.2 Move away from the immediate area.

3.3.3 Prevent access to the area by others.

3.3.4 Stop work and call the CMR.

3.4 **IF** the container appears to be in good condition,
GO TO Step 3.5.

3.5 Collect representative samples as follows:

- Ensure all phases of a multiphased material are represented in a sample.
- If a single representative sample cannot be obtained, collect a sample of each phase present.

3.6 Secure the lid on the sample container.

3.7 If the material being sampled gets on the outside of the sample container, decontaminate the outside of the sample container by rinsing it with deionized water and wiping it with decontamination swipes or paper towels.

3.8 Change PPE before sampling another waste source to prevent cross-contamination of subsequent samples.

3.9 **GO TO** Section 5.0 for Sampling Event Documentation.

4.0 CHARACTERIZATION SAMPLING OF SURFACE AREAS CONTAMINATED FROM TRU WASTE

NOTE

In the event of a TRU waste spill the sampling team will collect clean-up verification samples only after radiological clean-up is complete. Occupational Health Physics will notify Site Environmental Compliance (SEC) when the removable radioactivity contamination survey is below 20 dpm/100 cm^2 alpha and 200 dpm/100 cm^2 beta/gamma.

Process knowledge, which may include review of applicable waste stream profiles, should be used to determine the analyses to be performed. Analyses may include, but are not limited to, the following:

- Total metals
- Total semivolatiles
- Total volatiles
- PCBs

4.1 Collect swipe samples for PCB analysis in accordance with the directions provided with the PCB test kit, if applicable.

4.2 Collect solid or liquid samples for PCB analysis in accordance with directions provided by the contract laboratory.

4.3 Collect total or Toxicity Characteristic Leachate Procedure (TCLP) analysis samples as specified in Sections 2.0 and 3.0, as applicable.

5.0 SAMPLING EVENT DOCUMENTATION

5.1 Record the following information in the sample field logbook:

- Sample number
- Location of sampling point
- Type of material (e.g., water, sludge)
- Number and volume of containers of samples taken
- Purpose of sampling (e.g., hazardous waste characterization)
- Date and time of collection
- Analytical parameters

- Notation if the sample is a blank, duplicate, or equipment rinseate
- Preservative used, if applicable
- Field observations, if applicable
- Field measurements, if applicable (e.g., pH, conductivity)
- Detailed description of how the sample is collected, including the in situ orientation of the sample, if applicable
- Notation that PPE was inspected prior to donning
- Any other information that may be pertinent to the sampling event, if applicable (e.g., photographs, maps, drawings, or descriptions that delineate the sample area)

5.2 At least two people involved in the sampling event, sign the last page of the sample field logbook entries for the day of sampling.

6.0 SEALING SAMPLE CONTAINERS

6.1 Complete a container label with the following information for each sample container:

- Sample number
- Date and time of sample collection
- Location of sample collection
- Known sample hazards
- A team member's signature

6.2 Place the container label around the mid-section of the container.

6.3 Complete a custody seal with the following minimum information for each sample container lid:

- Date
- A team member's signature

6.4 Ensure the sample container lid is securely tightened.

6.5 Seal the lid to the sample container by wrapping seal tape or electrical tape around the lid and the neck of the sample container.

6.6 Place a custody label over the tape around the sample container lid.

6.7 Place clear tape over the container label to hold it in place and to prevent moisture damage.

7.0 DISPOSAL OF PPE AND SAMPLING EQUIPMENT

7.1 **IF** process knowledge indicates the sampled materials or the PPE **AND** disposable equipment are nonhazardous,
THEN discard the PPE and disposable equipment in the plant trash.

7.2 **IF** the sampled materials are suspected to be hazardous
AND process knowledge indicates the PPE and disposable equipment are hazardous,
THEN complete a Request for Disposal for the PPE and disposable equipment in accordance with WP 02-RC3108.

7.3 If the sampled materials are TRU waste, discard the PPE and disposable equipment as site-derived waste in accordance with WP 05-WH1036.

8.0 SAMPLING SHIPPING DOCUMENTATION

NOTE

Information required to complete a COC form can be obtained from the sample field logbook.

A sample of a COC form is maintained as an attachment to procedure WP 02-EM3001. This is an example only. There is not a required format for a COC form if the form being used contains the required information.

8.1 Complete a COC form, as follows:

8.1.1 Record the following required information in the appropriate blanks:

- Unique COC number (preprinted on the corresponding RFA Form)
- Sample number(s)
- Sample location and description
- Date and time of sample collection
- Sample type (e.g., liquid, solid, soil)
- Container type
- Sampling program (e.g., WIPP Sampling Team)

- Names of sampling team members involved in the sampling event
- Name of the laboratory being used for sample analysis

8.1.2 Record any special instructions or sample hazards in the appropriate blanks.[2]

NOTE

Information required to complete an RFA form can be obtained from the sample field logbook.

An example of an RFA form is maintained as an attachment to procedure WP 02-EM3001. This is an example only. There is not a required format for an RFA form if the form being used contains the required information.

8.2 Complete an RFA form, as follows:

8.2.1 Record the following required information in the appropriate blanks:

- Sample number(s)
- Sample type
- Sample quantity
- Preservative, if applicable
- Required testing program
- Special instructions, if applicable
- Sampling Program (e.g., WIPP Sampling Team)
- Purchase order number
- Date of shipment
- Name of laboratory being used for analysis
- Name of laboratory contact
- Address to send report to
- Date report is due

- Name of project contact
- Project contact telephone number

8.2.2 Record any special instructions or sample hazards in the appropriate blanks.

8.2.3 Use the following address for laboratory report:

WIPP Site/Jal Highway
370 Louis Whitlock Road
Carlsbad, NM 88220

NOTE

EA15PM3525-1-0, including the instructions for use, is available in the electronic document processing system.

8.3 Complete the Shipping Authorization, EA15PM3525-1-0, using WP 15-PM3525, as follows:

8.3.1 Check "Material Being Shipped Covered by a Purchase Order/Blanket Purchase Order" in Section 1, and enter the purchase order number.

8.3.2 Enter the receiving address in Section 2.

8.3.3 Check "Prepaid-WIPP Cost" in Section 3 **AND** enter the appropriate cost account number.

8.3.4 Check "FEDEX" in Section 4.

8.3.5 Check "WIPP Warehouse" in Section 5.

8.3.6 **IF** the samples are preserved,
THEN check "Yes" in Section 6 if shipment method will cost more than normal rate.

8.3.7 Enter special instructions in Section 7, such as, but not limited to: Must meet sample holding time, turnaround time, Rush Analysis, etc.

NOTE

If two or more samples of one material are included in a shipment, the amount listed is the total quantity of each material. For example, two 6-oz. samples of material "A" should be listed as 12 oz. of material "A."

8.3.8 In Section 8.0, insert a line item number for each item starting with the number 1 (one).

8.3.9 List quantities of materials, see above note.

8.3.10 Insert description of material being shipped.

8.3.11 Include the following language for preserved samples, as appropriate:

[A] For samples preserved with Nitric Acid specify "Preserved to pH<2 with HNO_3 in water concentration of 0.15% by weight or less."

[B] For samples preserved with Hydrochloric Acid specify "Preserved to pH<2 with HCl in water concentrations of 0.04% by weight or less."

[C] For samples preserved with Sulfuric Acid specify "Preserved to pH<2 with H_2SO_4 in water concentrations of 0.35% by weight or less."

[D] For sample preserved with Sodium Hydroxide specify "Preserved to pH>12.5 with NaOH in water concentrations of 0.08% by weight or less."

8.3.12 Enter name, phone extension, mail stop, and date in Section 9.

8.4 In Section 10.0, obtain the signature of the SEC Manager or designee.

NOTE

For shipment of samples, Sections 11 and 12 should be stamped with "Soil/Water." Property and Procurement signatures are not required for shipment of samples.

8.5 Carry the Shipping Authorization and any documents that are to accompany the shipment to Transportation Operations.

8.6 Transportation Operations, perform one of the following:

8.6.1 **IF** material is considered a U.S. Department of Transportation (DOT) hazardous materials shipment,
THEN GO TO WP 08-NT3101, or WP 08-NT3110, as applicable, and advise SEC of the proper DOT shipping container.

8.6.2 **IF** material is shipped by air,
THEN GO TO WP 08-NT3102, as applicable.

8.6.3 If material is considered a DOT nonhazardous materials shipment, stamp Section 13 of the Shipping Authorization "Approved for Shipment" and sign the appropriate line.

9.0 SAMPLE CONTAINER PACKAGING [3]

9.1 Wrap all glass sample containers with several layers of plastic bubble wrap. Tape the bubble wrap securely in place.

9.2 Place each sample container in a sealable plastic bag, remove as much air as possible, and seal the bag.

9.3 For liquid samples, place each bagged sample container into a second sealable plastic bag and fill each outside bag approximately half full with absorbent material, remove as much air as possible, and seal the bag.

9.4 Place the bagged sample containers into the cooler or shipping container.

9.5 If the samples need to be cooled, place blue ice packs around the plastic bags.

9.6 If necessary, label the outside of the cooler or shipping container with the words "Samples Chilled at 4° (or Degrees) C."

9.7 Add bubble wrap or other packing material to the cooler or shipping container to prevent the sample containers from moving or contacting each other during shipping.

10.0 SAMPLE SHIPMENT

10.1 Transport the cooler and shipping documents to the WIPP warehouse.

10.2 Warehouse personnel, complete Sections 14 and 15 of the Shipping Authorization.

10.3 Photocopy the Shipping Authorization for SEC records after the completion of Section 14.

10.4 Leave the original copy of the Shipping Authorization with WIPP warehouse personnel.

10.5 Complete the first available "Relinquished by" line on the COC form, with a signature, company name, date, and time of relinquishment.

10.6 Warehouse personnel, complete the first available "Received by" line with a signature, company name, date, and time of receipt.

10.7 Place the original copies of the RFA and COC forms into a sheet protector.

10.8 Place the sheet protector containing the RFA and COC forms inside the cooler or shipping container.[2]

10.9 Tape the cooler lid closed using shipping tape.

11.0 SAMPLE DOCUMENTATION FILE

11.1 Place the remaining copies of the RFA and COC forms and the photocopy of the Shipping Authorization in a file folder.

11.2 Mark or label the file folder with the following:

- The words "Environmental Analysis"
- Sample numbers
- COC number
- Sample Delivery Group (SDG) number (provided by the laboratory with the analytical data package)

11.3 Place any other sample documentation (e.g., pre-job safety briefs, sampling plans, etc.) in the file folder.

12.0 SAMPLE TRACKING LOGBOOK

12.1 STC, ensure the following information from the sample documentation packet is entered into the sample tracking logbook:

- Sample number
- Date of sample collection
- COC form number
- Location of sampling
- Description of sampled material
- Analyses requested
- Initials of the person logging the information

13.0 ANALYTICAL AND QUALITY CONTROL REPORT REVIEW[1]

13.1 Upon receipt of the Analytical and Quality Control Report (AQCR) from the contract laboratory, the STC, a contractor, or the STC's designee will review the AQCR using Attachment 1, Verification and Validation of Waste Characterization Analytical Data. The person filling out Attachment 1 will be the Reviewer.

13.1.1 The Reviewer will complete every section of Attachment 1 by looking for the information on the AQCR. The Reviewer will sign and date Attachment 1 upon completion of the form.

The STC, or other SEC personnel, other than the Reviewer will verify the Reviewer's calculations and sign the section where the calculations were involved. This person will also review the completion of Attachment 1 and sign and date the bottom of the Attachment.

13.1.2 If necessary, request the AQCR be reviewed by additional SEC, Environmental Monitoring and Hydrology, or Quality Assurance personnel.

13.1.3 Document all reviews on Attachment 1, and place it in the sample documentation file folder.

13.2 Place the AQCR and Attachment 1 in an accordion folder.

13.3 Label the accordion folder with the Sample Number, Chain of Custody, and Lab's SDG Number.

Attachment 1 - Verification and Validation of Waste Characterization Analytical Data

Date of this Report:____________________
Laboratory Name:____________________
Sample Delivery Group (SDG) Number:____________________
Chain-of-Custody/Request for Analysis Form Number(s):____________________
Sample Ship Date by WTS:____________________
Sample Receipt Date at the Lab:____________________
Parameters Requested for Analysis (circle): VOCs by 8260; SVOCs by 8270;
Metals by 6010; Hg by 7470; others (list):____________________

Sample Identification Information (if needed, copy this page for more samples):

A	B	C	E	F
WST No.	Lab ID No.	Sample Type	Sampling Date	Sampling Time

Analysis Information (where applicable):

VOC analysis date(s):	
VOC holding time(s)*:	
SVOC extraction date(s):	
SVOC analysis date(s):	
SVOC holding time(s)*:	
Metals analysis date(s):	
Metals holding time(s)*:	
Mercury analysis date(s):	
Mercury holding time(s)*:	

*Holding time in days = Analysis Date - Sample Collection Date

Attachment 1 - Verification and Validation of Waste Characterization Analytical Data

Other parameter analysis dates and holding times (if applicable): ____________________

Review of Chain of Custody	YES	NO
Are the signatures of the samplers/handlers present with dates and times?		
Is the signature of the laboratory receiver present with date and time?		
Were the samples received intact and in good condition?		
Was the temperature at 4 degrees C ± 2 degrees C?		
Lab's Analytical and Quality Control Report		
Is a Case Narrative present?		
Is there a Cover Page present signed by a lab representative?		
Are the data analysis summary sheets present?		
Was the data report free of apparent transcription errors?		
Are recovery ranges listed for the CCVs?		
Are recovery ranges listed for the LCS/LCSDs?		
Are recovery ranges listed for the MS/MSDs?		
Are all the reported recovery values within the specified ranges? (List any particular problem percent recoveries here): ____________________		
Was the LCS/LCSD recovery of at least one analyte from each analysis group checked by hand to confirm the lab recovery result (e.g., one VOC, one SVOC, one metal). List specific analytes checked: ____________________		
I verify the Reviewer's Calculations above: ____________________(Project Leader)		
Are appropriate units provided for the analysis results?		
Were the concentrations of any contaminants detected in any trip blank/method blank samples well below the reporting limit concentrations? List any significant TB/MB concentrations here: ____________________		
Was a MS/MSD analyzed for each analysis group?		
Data Quality and Usability		
Is the quality of the sample and associated QC analytical data usable and defensible for the intended purpose of the sample analyses?		

I certify that the above evaluation is the best to my knowledge based on the information provided.

____

Print Name Signature Date

As the Project Leader, I have reviewed the Data Reviewer's completion of this Attachment.

____

Print Name Signature Date

Attachment 6

Attachment 6

Conduct of Operations Training Documentation, February 27, 2008 and April 24, 2008

Department: WRES Site Environmental Compliance and Hydrology/Environmental Monitoring groups and off-site employees	Date of Meeting 2-27-08
Managers: Bill Wierzbicki, Stewart Jones, Joel Siegel, Ron Galbraith	
Meeting Location: WIPP Site Safety Building Conference Room and Teleconference	

Washington Regulatory and Environmental Services

Employees Attending (Show date if contacted other than meeting date.)

1. SB Jones
2. [illegible]
3. Miriam Whatley
4. [illegible]
5. [illegible]
6. [illegible]
7. Bill [illegible]
8. B. P. [illegible]
9. M Baldeviama
10. [illegible]
11. R. Jimenez
12. [illegible]
13. [illegible]
14. Oscar Garcia
15. Jeanna Ybarra
16. [illegible]
17. [illegible] McLemore
18. [illegible]
19. [illegible]
20. Kathy Zbryk
21. Eric D'Amico
22.

No. Empl. Attending

No. Empl. Supervised

REVIEWED BY

Name

Date

Date

1. PROBLEM/TOPIC

Conduct of Operations Presentation

2. DISCUSSION

REASONS FOR THE ABOVE	HOW DO WE OVERCOME THIS?
A	A
B	B
C	C
D	D

3. CONCLUSION

WHAT WE AGREE TO DO DIFFERENTLY AFTER THIS MEETING TO ELIMINATE OR CONTROL THE UNSAFE ACT (OUR PROBLEM):

4. FOLLOW UP

OTHER ACTION NEEDED TO ENSURE THAT THE CONCLUSION IS CARRIED OUT:

5. REMARKS

ANY COMMENTS/OBSERVATIONS FOR ACTION OR REVIEW AFTER THIS MEETING.

(Also List Any instructions, Other Safety Training, Comments, Etc.)

TRAINING ATTENDANCE SHEET

Course/Session: Con. of ops for ES&H + SEC Course Number/Mat. Code: N/A

Conducted by: W. Wierzbicki Date: 4-29-08 Hours: 07:30

Name / Department / Section

Location: WIPP Offsite Safety Con. Room Page 1 of 2

Building / Room / Site

Attendee(s): Print applicable information in black ink and sign. This form is a quality document. Correct errors by drawing a single line through the incorrect information and initial and date the correction.

	Badge Number	Print Name: Last, First, MI	Signature	Company/Dept	Grade	Status	Comments
1	CE03933	S.B. Jones	SB Jones	WRES/SEC	N/A	N/A	N/A
2	CE03920	M. L. Balderrama	M L Balderrama	WRES/ES&H	N/A	N/A	
3	CE01657	D. Contreras	Dan Contreras	WTS/SEC	N/A	N/A	
4	CE04661	R. Jimenez	[illegible]	WRES/ES&H	N/A	N/A	
5	CE04388	J. Siegel	[illegible]	EM&H	N/A	N/A	
6	CE04053	R. Salness	[illegible]	ESH&H	NA	NA	
7	CE02695	J Netherlin	[illegible]	WTS/EMSH	N/A	N/A	
8	CE02734	VALETT GENE L	Gene Valett	WRES	N/A	N/A	
9	CE03813	Nelson, Kristine D	Kristine Nelson	WRES/SEC	NA	NA	
10	CE03666	Whiteley, Rick E	R E Whiteley	WRES/SEC	N/A	N/A	
11	CE03757	Travis, Steven L	[illegible]	WRES/SEC	N/A	N/A	
12	CE03797	Jaco, William H	William H Jaco	WRES/SEC	N/A	N/A	

Q = Qual Card W = Waiver C = Complete, No Exam (attendance) X = Complete, Passed L = Complete, Failed D = Retake, Failed R = Retake, passed I = Incomplete

The above information is valid and complete. Sign and return this form to the training section.

Print Name: William M. Wierzbicki Signature: William M. Wierzbicki Date: 4/24/08

(Over)

Badge No.	Print Name	Signature	Company/Dept.	Grade	Status
CE03387	J.A. McLemore	Judy A. McLemore	WRES/SEC	N/A	N/A
CE03856	J MALY	[illegible]	~~WRES~~	~~III~~	—
CE03156	DAVE SJOMELING	Dave Sjomeling	WTS / OPS	N/A	N/A

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

1190 St. Francis Drive
P.O. Box 26110, Santa Fe, NM 87502
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us
William C. Olson, Bureau Chief

7008 0500 0001 1242 7227

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Total Postage & Fees	$

Sent To David C. Moody, Man
Street, Apt. No.; US Dept. of Energy
or PO Box No. Carlsbad Field Off
City, State, ZIP+4 P.O. Box 3090

PS Form 3800, August 2006

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

December 5, 2008

David C. Moody, Manager
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, New Mexico 88221

RE: Corrective Action Approval, DP-831, Interim Actions to Control High Water Levels in the Salt Storage Extension and Salt Storage Extension Basin, Waste Isolation Pilot Plant

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) received oral notification followed by a written corrective action report dated October 31, 2008 (Report) of a discharge of brine water from the Salt Storage Extension Facility (SSE) and the Salt Storage Extension Basin (SSEB) at the U.S. Department of Energy's (DOE) Waste Isolation Pilot Plant (WIPP). A follow-up letter (Letter) detailing corrective action activities was submitted to NMED on November 14, 2008, and a Modified Corrective Action Plan was submitted on December 5, 2008 (Plan). The Report, Letter and Plan were submitted in accordance with Condition 3 of the September 9, 2008 Discharge Permit Renewal and Modification (DP-831). The interim corrective actions described in these submittals are hereby approved by NMED.

According to the Report, the WIPP site received 2.96 inches of rain over a 15-hour period beginning October 13, 2008. The rainfall caused the water level in the SSEB to rise above the one foot of freeboard required in DP-831. On October 22, 2008, as water levels continued to rise, it was discovered that the water had covered the spillway between the SSE and the SSEB. It was also discovered that the center of the spillway was not covered with a synthetic liner, which is not in accordance with the construction designs required in Condition 2 of the December 22, 2003 Discharge Permit Modification. The rise in salt contaminated water over the unprotected spillway berm resulted in a discharge to the ground.

As an initial corrective action, sandbags and liner material were emplaced to halt the discharge. After discovering that water levels were still rising, sandbagging was abandoned and an alternative corrective action implemented. The alternative plan consisted of constructing an unlined holding pond in the top of the active salt pile in Cell A of the SSE and pumping water from the SSEB to the pond for evaporation. The intention was to lower the water level below the spillway at which time synthetic liner material would be attached over the spillway and adjacent berm thereby eliminating discharges to the ground. Construction of the holding pond was completed on November 10, 2008. It was soon discovered that pumping water to the pond was ineffective in lowering water levels in the SSEB.

In the Modified Corrective Action Plan proposed by teleconference on December 3, 2008, and submitted in writing on December 5, 2008, the DOE proposes to pump water from the SSE and SSEB to Evaporation Ponds B and C, and H-19. These actions are intended to lower the water levels in the SSE and SSEB while providing additional evaporation capacity to reduce the overall volume of water. Once water levels are lowered the spillway and berm will be synthetically lined. As part of the corrective action, NMED hereby temporarily waives the requirement in Conditions 2a, 2b and 2c of DP-831, which limits daily discharges to Evaporation Ponds B and C, and Pond H-19 to 50,000 gallons per day provided one foot of freeboard is maintained at all times.

The DOE is evaluating permanent long term corrective actions to permanently control water levels in the SSEB. These proposals will be submitted to NMED at a future date.

If additional information becomes available indicating these corrective actions are inadequate, then additional actions may be required. Approval of this corrective action report does not relieve you of your responsibility to comply with any other applicable federal, state and/or local laws and regulations.

If you have any questions, please contact Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027 or clint.marshall@state.nm.us.

Sincerely,

Mary Ann Menetrey, Program Manager
Mining Environmental Compliance Section
Ground Water Quality Bureau

MAM/CLM

xc: District Manager, NMED District 4

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

GROUND WATER

DEC 10 2008

BUREAU

DEC 05 2008

Mr. Clint Marshall
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Modified Corrective Action Plan for Loss of Freeboard in the Salt Storage Extension Evaporation Basin

References: (1) CBFO Letter from Dr. David Moody to Mr. Clint Marshall dated October 31, 2008, Subject: Notification of Discharge

(2) CBFO Letter from Dr. David Moody to Mr. Clint Marshall dated November 14, 2008, Subject: Interim Corrective Actions

Dear Mr. Marshall:

The purpose of this letter is to provide the Ground Water Quality Bureau with a modified Corrective Action Plan in accordance with Section III, Condition 3 of the Waste Isolation Pilot Plan (WIPP) Discharge Permit issued on September 9, 2008. This Corrective Action Plan addresses the loss of one foot of freeboard in the Salt Storage Extension Basin (SSEB) and water levels rising above the elevation of the berm and engineered spillway between the SSEB and the Salt Storage Extension (SSE). This modified Corrective Action Plan was discussed with you during a phone conversation on December 3, 2008, and the Department of Energy (DOE) has begun implementation based on your verbal approval.

This modified Corrective Action Plan also serves as a follow-up to the initial corrective actions described in the October 31, 2008, and November 14, 2008, Notification of Discharge letters. The first plan proposed in the October 31, 2008, Notification of Discharge has, so far, proven ineffective for lowering the water level sufficiently to permit work on the berm. Water infiltrates the salt pile and drains back to the SSE and SSEB too rapidly.

The DOE has modified the October 31, 2008, corrective action plan based on your verbal approval of December 3, 2008. We will continue to pump water to the top of the salt pile in the Salt Storage Extension Area. In addition, we have begun pumping brine water to Evaporation Ponds B and C at the sewage treatment facility and potentially the H-19 Evaporation Pond. These ponds are currently permitted for the disposal of up to 50,000 gallons per day for Evaporation Pond B and C, and H-19, of miscellaneous non-hazardous waste water provided one foot of freeboard is maintained. Evaporation

CBFO:AMO:HLP:KJB:08-1438:UFC5486

Ponds B and C provide for a combined capacity of approximately 1 million gallons and the H-19 Evaporation Pond provides an additional 350,000 gallons of capacity if needed.

We have requested, and you verbally approved, a waiver from the 50,000 gallon per day limit to quickly lower the elevation of water in the SSEB below the elevation of the berm between the SSE and SSEB. This will allow DOE an opportunity to raise the elevation of the east berm of the SSE from 3,420 feet (3419 feet at the engineered spillway) above mean sea level to an elevation more consistent with the top of the south, north and west edges at 3,424 feet above mean sea level. If additional capacity is needed to accomplish the modifications, we will seek a temporary authorization to pump salt water from the SSEB to the Salt Pile Evaporation Pond which is not currently permitted for the disposal of salt water.

The DOE committed to reline Evaporation Pond B by September 30, 2009, in a November 3, 2005, letter, *Sewage Lagoon Electrical Leak Testing Results, Liner Integrity Evaluations and Corrective Action Plan*. DOE still intends to meet this commitment; however, an extension could be necessary if evaporation rates do not dry Evaporation Pond B and/or precipitation limits the capacity to transfer water to other locations.

During our phone conversation on December 3, 2008, we also discussed permanent corrective measures to provide additional water management capacity for the SSE. Initial engineering evaluations are favoring construction of an additional evaporation pond. The construction of this pond may be on top of the Salt Pile in Cell A of the Salt Storage Extension. We will provide an update on our engineering evaluations by December 31, 2008, as we proposed in our October 31, 2008, Notification of Discharge letter.

If you have any questions about this report or require any additional information or actions, please contact H.L. (Jody) Plum at (575) 234-7462.

Sincerely,

David C Moody

David C. Moody
Manager

cc:

J. Bearzi, NMED	*ED
J. Kieling, NMED	ED
S. Zappe, NMED	ED

*ED denotes electronic distribution

CBFO:AMO:HLP:KJB:08-1438:UFC5486

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030

Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, NM 87502-5469
Phone (505) 827-2918 Fax (505) 827-2965

www.nmenv.state.nm.us

BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary

JON GOLDSTEIN
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

COPY

November 14, 2008

David Moody, Manager
Carlsbad Field Office
Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

Farok Sharif, President
Washington TRU Solutions LLC
P.O. Box 2078
Carlsbad, New Mexico 88221-5608

RE: NOTICE OF VIOLATION
WASTE ISOLATION PILOT PLANT, EPA I.D. # NM4890139088

Dear Dr. Moody and Mr. Sharif:

On November 16, 2007, the New Mexico Environment Department (NMED) Groundwater Quality Bureau and Hazardous Waste Bureau received verbal reports from Mr. Jody Plum of the Department of Energy's Carlsbad Field Office (CBFO) regarding a discharge on November 9, 2007 of approximately 150 gallons of brine from the Exhaust Shaft Intercept Borehole collection system into the H-19 Evaporation Pond at the Waste Isolation Pilot Plant (WIPP) that exceeded the regulatory limit of 5 mg/L for lead. NMED subsequently received a written notification of discharge dated November 20, 2007 and a written report on the incident dated November 30, 2007. On January 18, 2008, NMED requested information and supporting documentation associated with this discharge from CBFO and Washington TRU Solutions LLC (jointly, the Permittees). The response to this request (the Response) was received by NMED on February 25, 2008.

Upon review of the Response, NMED has determined that the Permittees have violated the New Mexico Hazardous Waste Management Regulations (20.4.1 NMAC), as well as the New Mexico Ground and Surface Water Protection Regulations (20.6.2 NMAC) and Condition 3 of the WIPP Ground Water Discharge Permit Renewal, dated April 29, 2003, as specified below:

1. 20.4.1.900 NMAC (incorporating 40 CFR 270.1(c)) states: "RCRA requires a permit for the 'treatment,' 'storage,' and 'disposal' of any 'hazardous waste' as identified or listed in 40 CFR part 261. The terms 'treatment,' 'storage,' 'disposal," and 'hazardous waste' are defined in §270.2. Owners and operators of hazardous waste management units must have permits during the active life (including the closure period) of the unit."

   20.4.1.900 NMAC (incorporating 40 CFR 270.10(a)) states: "Any person who is required to have a permit... shall complete, sign, and submit an application to the Director as described in this section and §§270.70 through 270.73."

   The Permittees disposed of approximately 150 gallons of characteristic hazardous waste (D008) in the H-19 Evaporation Pond, an unpermitted disposal unit in violation of 20.4.1.900 NMAC (incorporating 40 CFR 270.1(c)).

2. 20.4.1.800 NMAC (incorporating 40 CFR 268.34(a)) states: "Effective August 24, 1998, the following wastes are prohibited from land disposal: the wastes specified in 40 CFR Part 261 as EPA Hazardous Waste numbers D004–D011 that are newly identified (i.e. wastes, soil, or debris identified as hazardous by the Toxic Characteristic Leaching Procedure but not the Extraction Procedure)..."

   20.4.1.800 NMAC (incorporating 40 CFR 268.34(f)) states, "...If the waste contains constituents (including underlying hazardous constituents in characteristic waste) in excess of the applicable Universal Treatment Standard levels of §268.48 of this part, the waste is prohibited from land disposal, and all requirements of part 268 are applicable..."

   The Permittees disposed of approximately 150 gallons of characteristic hazardous waste (D008) in the H-19 Evaporation Pond without treating the waste to meet appropriate treatment standards specified in 20.4.1.800 NMAC (incorporating 40 CFR part 268, subpart D) in violation of 20.4.1.800 NMAC (incorporating 40 CFR 268.34).

3. 20.6.2.3104 NMAC states: "Unless otherwise provided by this Part, no person shall cause or allow effluent or leachate to discharge so that it may move directly or indirectly into ground water unless he is discharging pursuant to a discharge permit issued by the secretary. When a discharge permit is issued, discharges must be consistent with the terms and conditions of the permit."

   Condition 3 of the Ground Water Discharge Permit Renewal (DP-831), dated April 29, 2003 states: "The permittee is authorized to discharge up to 8,000 gallons per day of non-hazardous brine water generated from mine dewatering activities, pumping of ground water wells, and from other non-hazardous sources to the synthetically lined H-19 evaporation pond."

> The Permittees disposed of approximately 150 gallons of characteristic hazardous waste D008 in the H-19 Evaporation Pond in violation of Ground Water Discharge Permit Renewal (DP-831) Condition 3.

In accordance with 74-4-10 NMSA 1978, NMED may: (1) issue a Compliance Order requiring compliance immediately or within a specified time period, or assess a civil penalty for any past or current violations of up to $10,000 per day of non-compliance with each violation, or both; or (2) commence a civil action in District Court for appropriate relief, including a temporary or permanent injunction. Any such order may include a suspension or revocation of any permit issued by NMED.

In accordance with 74-6-10 NMSA 1978, NMED may: (1) issue a Compliance Order requiring compliance immediately or within a specified time period, or assess a civil penalty for any past or current violations of up to $15,000 per day of non-compliance with each violation, or both; or (2) commence a civil action in District Court for appropriate relief, including a temporary or permanent injunction. Any such order may include a suspension or revocation of any permit issued by NMED.

Due to the nature and extent of the violations listed above, NMED will propose a civil penalty for these violations in its settlement offer, which we are sending you by separate letter.

NMED requires that the Permittees submit to NMED within fifteen (15) days of receipt of this letter evidence that all corrective actions associated with the two findings identified in Audit I08-03, *Hydrology and Water Management,* have been completed, and that all corrective actions recommended in the *WIPP Discharge to Evaporation Pond H-19 Root Cause Analysis Report* have been implemented. NMED also requests a written description of any actions that the Permittees have taken since the Response to address the violations described above, and a schedule for implementation for any actions not yet completed.

Any action taken in response to this letter does not relieve the Permittees of their obligation to comply with any other applicable laws and regulations.

If you have any questions regarding this letter, please contact Art Vollmer of at (505) 476-6004 regarding hazardous waste regulation violations, and Clint Marshall at (505) 827-0027 regarding the Ground Water Discharge Permit violation. Please address any written response to the attention of Art Vollmer and Clint Marshall at the addresses on the letterhead.

Sincerely,

James P. Bearzi
Chief
Hazardous Waste Bureau

William C. Olson
Chief
Ground Water Quality Bureau

JPB:soz

cc: Art Vollmer, NMED HWB
Chuck Noble, NMED OGC
Mary Ann Menetrey, NMED GWQB
Clint Marshall, NMED GWQB
Steve Zappe, NMED HWB
File: Red WIPP '08 and HWB Library file #0549

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

NOV 14 2008

Clint Marshall
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

RECEIVED
NOV 19 2008
BY:.

Subject: Interim Corrective Actions

RE: October 31, 2008, Notification of Discharge

Dear Mr. Marshall:

The purpose of this letter is to provide your office with the outline of corrective action activities that DOE committed to providing you by November 14, 2008. In the letter to you dated October 31, 2008, *Notification of Discharge,* related to the loss of freeboard and overtopping of the Salt Storage Extension Basin (SSEB), the DOE proposed to provide your office an outline of activities by November 14, 2008, and a detailed schedule of activities to implement permanent corrective actions for the management of salt contact run-off in the Salt Storage Extension Evaporation Basin by December 31, 2008. The following outline the activities being conducted to permanently correct this matter:

- Develop a Statement of Work for Service Subcontract;
- Obtain a qualified Contractor;
- Contractor will evaluate run-off volume(s) and pond capacities and provide corrective action recommendations;
- Evaluate the engineered corrective measure options and select the preferred recommendation for implementation;
- Prepare a Work Package to implement the proposed corrective actions.

In addition, in our October 31, 2008, letter, *Notification of Discharge,* we stated that water would be pumped out of SSEB into an impoundment area in the Salt Storage Area to lower the water level in the SSEB. The development of the holding pond on the top of the salt pile was completed the week of November 10, 2008. Pumping of water from the SSEB was initiated on completion of the holding pond to lower the water level in the SSEB. This will allow the interim corrective actions to be accomplished.

If you have any questions on this subject, please call Jody Plum at 575-234-7462.

Sincerely,

Roger A Nelson for

David C. Moody
Manager

CBFO:AMO:HLP:KJB:08-1426:UFC5486

cc:
J. Bearzi, NMED * ED
S. Zappe, NMED ED
ED denotes electronic distribution

CBFO:AMO:HLP:KJB:08-1426:UFC5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

OCT 3 1 2008

Mr. Clint Marshall
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

RECEIVED
NOV 0 3 2008

Subject: Notification of Discharge

The purpose of this letter is to confirm the U. S. Department of Energy's (DOE), Carlsbad Field Office (CBFO) verbal report to you on the morning of October 23, 2008, following an initial phone message left on October 22, 2008. This report was made by Mr. H. L. (Jody) Plum, DOE/CBFO. On October 28, Mr. Plum again contacted you to seek an extension of time to provide this written response. You verbally granted his request, allowing for submittal of this Notification before close of business day October 31, 2008.

This information is being provided to you in accordance with the WIPP Discharge Permit (DP-831) which references 20.6.2.1203 NMAC, NOTIFICATION OF DISCHARGE-REMOVAL:

(a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility:

Person in charge of the facility:	David C. Moody, Manager 4021 National Parks Highway Carlsbad, New Mexico, 88220 (575) 234-7300
Owner of the facility:	U. S. Department of Energy
Operator of the facility:	Washington TRU Solutions LLC

(b) Name and address of the facility:

U. S. Department of Energy
Waste Isolation Pilot Plant
30 miles East of Carlsbad, New Mexico off of State Highway 128
Carlsbad, NM 88220

CBFO:AMO:HLP:KJB:08-1421:UFC5486

(c) The date, time, location, and duration of the discharge:

Date: October 16 through the present
Time: Approximately 8:00 a.m.
Location: WIPP Site, Salt Storage Extension Basin (SSEB)
Latitude: 32 22.589, Longitude 103 47.746

Duration: 17 days to date, assuming that the water level in the SSEB rose above the elevation of the spillway between the SSEB and the Salt Storage Extension (SSE) on October 15, 2008. The duration could be as long as an additional 15 days as described in the corrective actions under Item (g) of this letter.

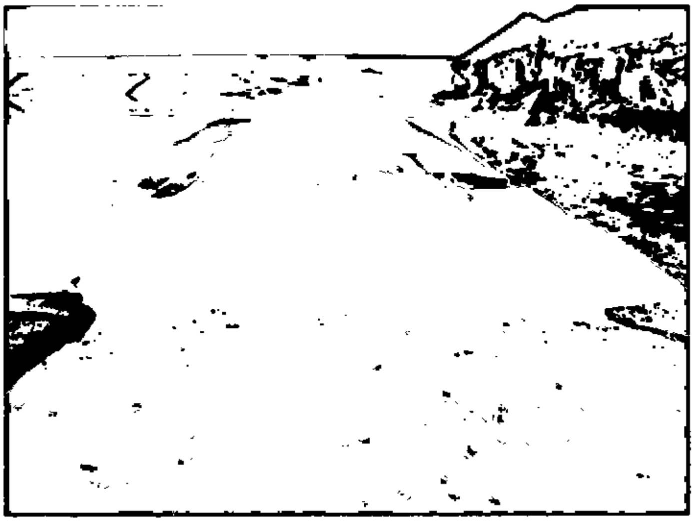
(d) The source and cause of the discharge:

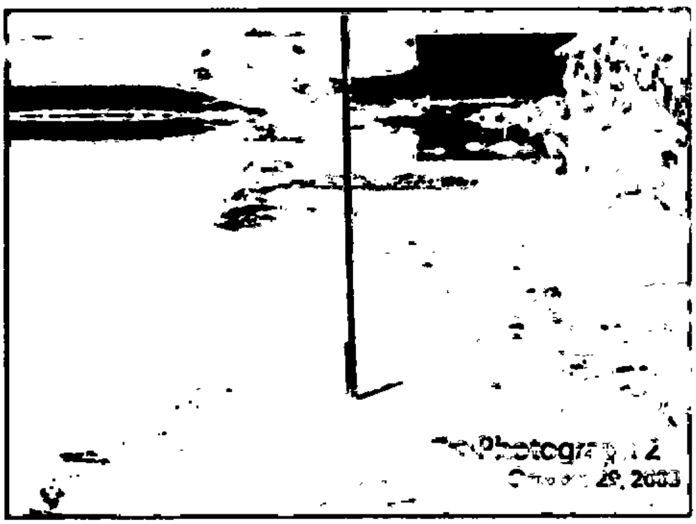
Source: 2.96 inch rainfall

Cause of discharge:

Between 5:00 p.m. Monday October 13, 2008, and 8:00 a.m. Tuesday October 14, 2008, the WIPP site received a 2.96 inch rainfall. Prior to this rainfall event, the SSEB had approximately two to two and half feet of freeboard. The 2.96 inch rain event over the 1,048,000 square foot SSE drainage area resulted in approximately 1,933,000 gallons of water entering the SSE and SSEB. By October 15, 2008, sufficient water had drained from the SSE to fill the SSEB above the one foot of freeboard required by DP-831.

In accordance with DP-831, Section III, Condition 3, a corrective action plan was being prepared for submittal to the GWQB; however, on October 22, 2008, it was discovered that further drainage caused the water level to rise above the elevation of the spillway between the SSE and the SSEB. The spillway in the center of the berm between the SSE and the SSEB is not protected from infiltration with a liner. Photograph 1 illustrates the discharge area as observed on October 16, 2008. On October 29, 2008, while preparing to protect the spillway from infiltration using high density polyethylene and sandbags it was discovered that the water level had slightly risen, enlarging the area of the berm subject to the infiltration of salt contaminated water. Photograph 2 illustrates the discharge area as observed on October 29, 2008.





(e) A description of the discharge, including chemical composition:

The discharged water is storm water that has been in contact with salt and is high in total dissolved solids and chlorides. The last discharge monitoring report for this water reported a total dissolved solids concentration of 339,500 mg/l, chlorides at 260,000 mg/l, and sulfate at 16,900 mg/l.

(f) The estimated volume of the discharge:

The unlined spillway is approximately one foot deep, 10 feet wide and 10 feet long. The discharge area initially encompassed approximately 25 feet by ten feet. The deepest water would be one foot deep over the 100 square foot spillway. The volume of water in the spillway would be approximately 800 gallons subject to infiltration for the duration of the discharge. Additional square footage along the 290 foot berm has been exposed to less than an inch of water for the duration of the discharge as illustrated in Photos 1 and 2. Upon saturation of the soil, infiltration would be minimal. All other water is contained in the SSE or SSEB and is contained by high density polyethylene liners.

(g) Any actions taken to mitigate immediate damage from this discharge:

- Upon identifying the loss of one foot of freeboard on October 15, 2008, a corrective action plan was being prepared for submittal to the NMED as required by DP-831.
- Upon discovery that the elevation of water had risen above the spillway between the SSEB and the SSE on October 22, 2008, a corrective action plan was being formulated whereby sandbags and liner material would have been emplaced to halt the discharge.
- On October 29, 2008, when it was discovered that the water level had slightly risen, it was determined that sandbagging the spillway was not going to be a practical option. Revised interim corrective actions now include; modifying the salt pile in the SSE by shoring up the existing three foot berm forming a holding pond on top of the salt pile. Water will be pumped from the SSEB into the holding pond on the salt pile. Since the water is saturated with the salt, the holding pond constructed of salt should hold the water until it evaporates. When sufficient water has been removed from the SSEB, a HDPE liner will be welded to join the liner in the SSE to the liner in the east side of the SSEB to protect the berm from infiltration in the event of any future overflow. Every effort will be made to implement this interim corrective action by November 14, 2008.
- DOE proposes to conduct an engineering evaluation to determine what permanent corrective actions can be taken to prevent the loss of freeboard in the SSEB in the future and provide adequate volume for collection of precipitation caused runoff from Cells A & B. Options available for evaluation may include, but are not limited to, construction of a new pond, enlarging the existing pond or increasing evaporation rates by pumping water into a lined or unlined holding pond constructed on the salt pile. We propose to provide to you an outline of activities by November 14, 2008, and then on or about December 31, 2008, provide a detailed schedule of activities to implement the permanent corrective actions to the Groundwater Quality Bureau.

We believe this discharge poses minimal threat to groundwater. The infiltration controls installed by the DOE at the WIPP site have greatly minimized the infiltration of salt contact storm water run-off into the subsurface. The corrective actions described in this report are intended to meet all the reporting requirements of 20.6.2.1203 NMAC and DP-831 as renewed on September 9, 2008. If you have any further questions regarding this matter or need additional information please contact H. L. Plum at (575) 234-7462.

Sincerely,

Dave Moody
Manager

cc:

J. Bearzi, NMED/HWB	*ED
S. Zappe, NMED/HWB	ED

*ED denotes electronic distribution

CBFO:AMO:HLP:KJB:08-1421:UFC5486

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

OCT 2 8 2008

NOV 0 5 2008

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Mining and Environmental Compliance Section
P.O. Box 26110
Santa Fe, NM 87502

Subject: Revised Basic Data Report for Piezometers PZ-13, PZ-14, and PZ-15 and Shallow Subsurface Water

Dear Mr. Marshall:

The purpose of this letter is to transmit to you the revised Basic Data Report for Piezometers PZ-13, PZ-14, and PZ-15 and Shallow Subsurface Water, in response to the Discharge Permit 831 Modification dated December 29, 2006. This revised report replaces the one transmitted to you on April 7, 2008.

If you have any questions about this report or require any additional information, please contact me at (575) 234-7462

Sincerely,

H. L. "Jody" Plum
RCRA Program Manager

Enclosure

cc: w/enclosure

C. Marshall, NMED	*ED
T. Kesterson, NMED	ED

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*ED denotes Electronic Distribution

CBFO:AMO:HLP:KJB:08-1416:UFC5486

DOE/WIPP-08-3375

Basic Data Report for Piezometers PZ-13, PZ-14, and PZ-15 and Shallow Subsurface Water

U.S. Department of Energy

Revision 3

October 2008

This document supersedes DOE/WIPP-08-3375, Rev. 2.

This document has been submitted as required to:

Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831
(865) 576-8401

Additional information about this document may be obtained by calling the WIPP Information Center at 1-800-336-9477. Copies may be obtained by contacting the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22101.

ABSTRACT

The Site and Preliminary Design Validation (SPDV) pile is located in the southwest corner of Section 21, Township 22 South, Range 31 East in Eddy County, New Mexico, adjacent to the Waste Isolation Pilot Plant (WIPP) operational area. During August 2007, piezometers (PZ)-13, PZ-14, and PZ-15 were drilled around the SPDV pile to determine if shallow subsurface water (SSW) existed around the SPDV pile and, if so, provide a means to monitor. These piezometers were drilled with a combination of hollow-stem auger and air-assisted hollow-stem auger drilling. Below the surficial dunes and Berino soil, piezometers PZ-13 and PZ-14 encountered in order, from shallowest to deepest, the Mescalero caliche, Gatuña Formation, Santa Rosa Formation, and Dewey Lake Formation. Piezometer PZ-15 was completed in the Gatuña Formation, having not encountered the lower formations by the time SSW was detected.

Water was encountered in all wells. Piezometers were constructed of 2-inch polyvinyl chloride casing and 15 feet of 0.020-inch slot screen. Water samples were obtained and analyzed for each well. Based on the results of the installation of the piezometers, analysis of water levels, and geological analysis, it is concluded that the water levels identified in PZ-13 and PZ-14 are the result of the SPDV pile runoff or infiltration prior to being lined. Water in PZ-15 is much shallower and chemically different that water in the other two wells, indicating another source, such as recharge and infiltration from the east of the SPDV pile.

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1.0 INTRODUCTION

The Site and Preliminary Design Validation (SPDV) pile is located in the southwest corner of Section 21, Township 22 South, Range 31 East, Eddy County, New Mexico, adjacent to the Waste Isolation Pilot Plant (WIPP) operational area (Figure 1-1). Piezometers PZ-13, PZ-14, and PZ-15 are located around the SPDV pile as indicated in Figure 1-2. These piezometers were drilled to determine if shallow subsurface water (SSW) existed around the SPDV pile and, if so, to provide a means to monitor the water level and quality.

Most drillholes near WIPP have been described after completion to provide an account of the geology, hydrology, or other basic data acquired during drilling and immediate completion of the drillhole. This basic data report provides details and descriptions of the drilling procedures and activities utilized during the installation of PZ-13, PZ-14, and PZ-15 that may be helpful to later interpretations of data or for further work in the drillhole, such as test activities and plugging and abandonment.

1.1 Purpose of WIPP and the SPDV Pile

WIPP is a transuranic mixed waste disposal facility operated by the U.S. Department of Energy (DOE). WIPP waste is disposed in the Salado Formation, a bedded salt deposit, 2,150 feet below ground surface (bgs). Salt and other mined rock materials from the construction of WIPP and currently mined salt are stored on the surface in three stockpiles. The stockpiles include, from oldest to newest, the SPDV pile closed in 2000 with an engineered cover; the salt storage area (SSA), which was used previously for mined salt and materials, but recently covered with a synthetic and earthen liner, and the Salt Storage Extension (SSE) for currently mined salt. The focus of this investigation was the SPDV pile.

The SPDV pile was created during the WIPP design validation phase for placement of construction materials resulting from drilling of two 2,150-foot shafts and the underground excavation of connecting tunnels, exploratory tunnels, and four rooms. The materials in the SPDV pile include mined tailings interspersed with soil, rock, and debris from the construction of the shafts. The SPDV pile encompasses approximately 168,000 cubic yards, which includes an area beneath the pile where soil was excavated prior to tailings placement.

The SPDV pile was characterized in 1995 by Daniel B. Stephens and Associates to determine the chemical nature of wastes within the pile and to support selection of reclamation alternatives (Daniel B. Stephens and Associates, Inc., 1996). The investigation determined that no remedial measures were required according to New Mexico Environment Department (NMED) guidelines. As a result of the study, stabilization and reclamation were recommended in order to prevent off-site transport of salt and brine solutions into the surrounding environment, and to blend the salt pile into the surrounding environment. Based on the evaluation, the SPDV pile was formally closed in 2000 by covering it with geosynthetic clay liner installed on 6 inches of bedded material and covered with a minimum of 3 feet of earthen material. The entire SPDV pile was seeded with shallow rooted plants, which have successfully established.

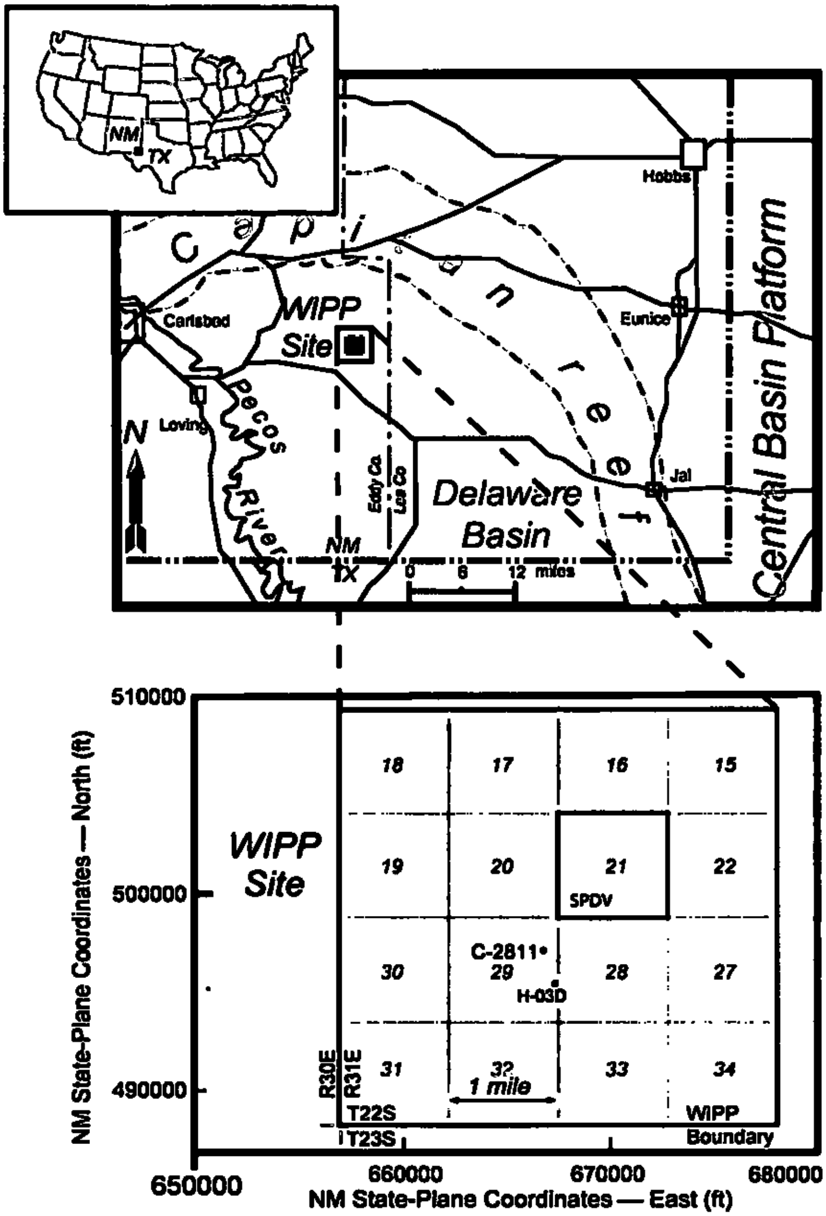

Figure 1-1 - Location Map

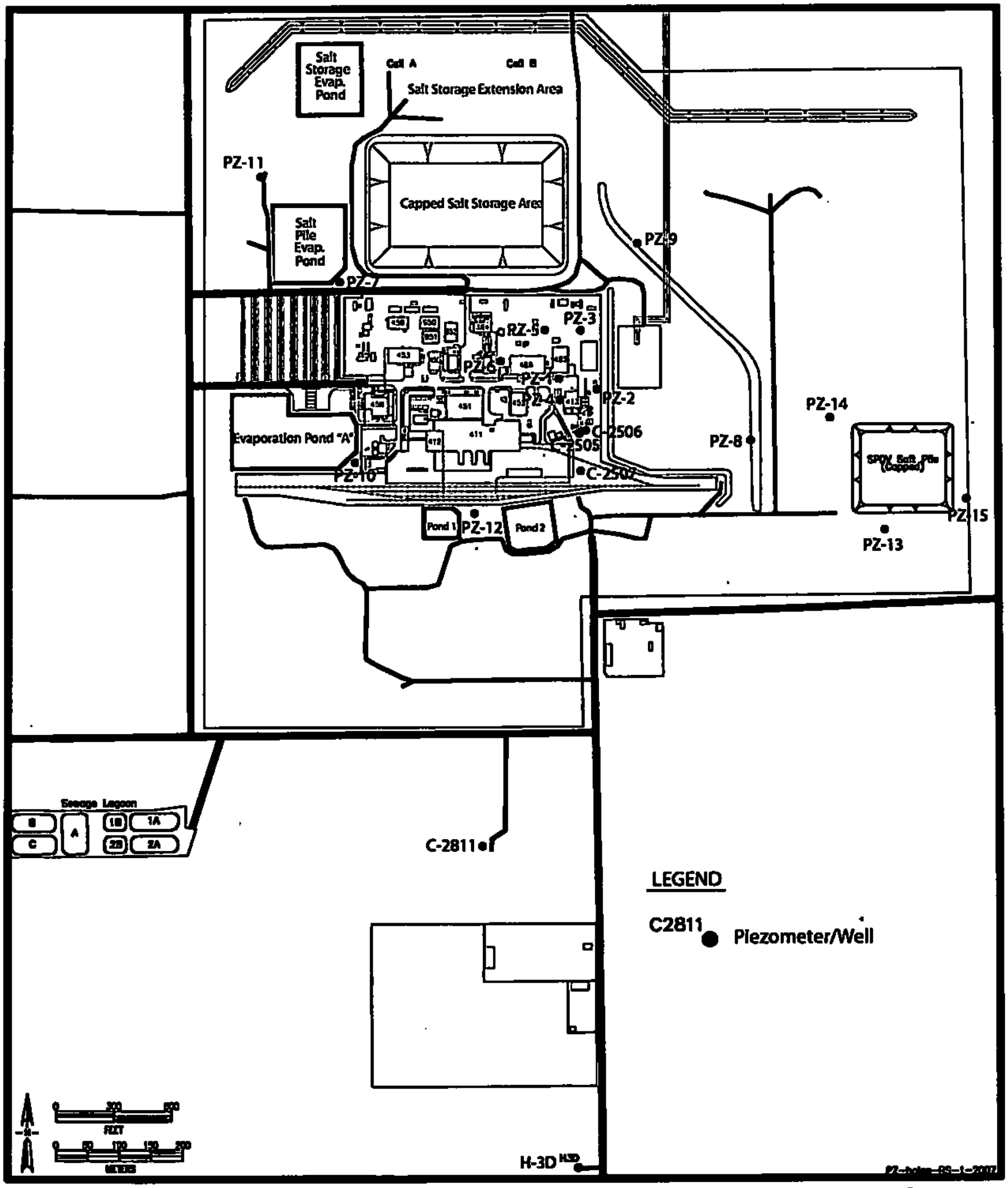

Figure 1-2 - Map of the WIPP Operational Area Showing the Location of Piezometers PZ-13, PZ-14, and PZ-15

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1.2 Purpose of PZ-13, PZ-14, and PZ-15

SSW was first detected in 1995 when a video inspection of the Exhaust Shaft detected seepage from about 50 to 80 feet bgs. After 1995, a series of hydrologic assessments were undertaken to identify the source and nature of the SSW at WIPP. Sixteen wells were installed (Figure 1-2) to assess the SSW. It is important to note that the area of interest to this assessment was the exhaust shaft and surface features such as the old salt pile, salt pile evaporation pond, and Ponds 1 and 2. The assessment excluded the SPDV pile. The SSW is a shallow perched water bearing zone that sits on a permeability change at the formational contact between the Santa Rosa Formation and the upper Dewey Lake Formation. The SSW is anthropogenic in nature, resulting from infiltration of precipitation that was captured by unlined ponds and stockpiles (see Discharge Permit (DP)-831 for details).

In December 2003, the NMED Ground Water Quality Bureau (GWQB) issued a modified DP-831 requiring that the unlined ponds and stockpiles be lined with a synthetic liner: SSA and Salt Pile Evaporation Pond (SPEP), Ponds 1 and 2, Pond A. Additionally, a new SSE was to be constructed with a synthetically lined base on which infiltration and surface runoff from this pile would be directed to a new evaporation basin. Also included in this modification was the implementation of a monitoring program of the SSW that included quarterly water level measurements from all the SSW wells and semiannual sampling of selected SSW wells for total dissolved solids (TDS), chloride, sulfate, nitrate, chromium, and selenium. This program was implemented in May 2004 and continues to date.

On December 29, 2006, the NMED GWQB issued another DP-831 modification with a condition that the SPDV pile be investigated as a possible source of shallow groundwater. The modification indicated that WIPP should install three monitoring wells adjacent to the SPDV pile. Piezometers PZ-13, PZ-14, and PZ-15 were drilled during August 2007 around the SPDV pile to investigate the possibility of SSW beneath the subsurface.

Prior to this investigation, the only other drilling in the area was by Daniel B. Stephens and Associates (1996) to characterize the content of the SPDV pile, and Sergent, Hauskins & Beckwith (1979), for geotechnical data collection and analysis. No water was detected in either of these investigations. Prior to drilling the SPDV pile piezometers, it was hypothesized that SSW, if present, would be perched on the contact between the Santa Rosa Formation and the Dewey Lake Formation, as it had at locations west of the SPDV pile. The best estimated depth for piezometers PZ-13, PZ-14, and PZ-15 was 60 feet bgs, based on PZ-8, which is located west of the SPDV pile.

This report summarizes the installation of the piezometers around the SPDV pile and correlates the data to the data for the other SSW piezometers around WIPP via interpretation of hydrology and chemistry.

2.0 GEOLOGICAL DATA

2.1 General Geological Background

The geology and hydrology of formations at the WIPP site and the surrounding area have been investigated since 1975, and the information and interpretations have been reported in numerous documents. The most thorough compilation is the Compliance Certification Application (CCA) submitted in 1996 by the DOE to the U.S. Environmental Protection Agency (U.S. DOE, 1996). Some features of the broader geological history are relevant to understanding the geology and hydrology at the location of the SPDV pile and the piezometers associated with this report (Powers,1997).

The Delaware Basin (Figure 1-1) was a large structural feature that controlled deposition through much of the Paleozoic. By late Permian, the basin was restricted, and evaporite minerals dominated. The basin filled with sediments, and it no longer significantly affected sedimentation. Near the end of the Permian, circulation with the ocean improved, and some of the Rustler Formation was deposited in saline water rather than brine. As the Permian ended and Triassic began, continental environments prevailed and significant redbeds, the Dewey Lake Formation (Figure 2-1), were deposited. Although surrounding areas accumulated variable thicknesses of later Mesozoic and Cenozoic age sediments, the WIPP area appears to have mainly been subjected to erosion during an extended period from mid-Mesozoic to mid-Cenozoic (Figure 2-1). Some basin tilting around mid-Cenozoic exposed the evaporite beds to faster solution and erosion, and weathered material accumulated. The Pecos River drainage became integrated through the region during this period, and late Cenozoic deposits reflect this sedimentary environment and sediment sources outside the local area. Although the region is still subject to evaporite dissolution and erosion, large areas have remained geologically stable for about the last half-million years, resulting in the formation and preservation of pedogenic calcrete (Mescalero caliche) deposits (Powers, 1997).

Three sources of information contribute to understanding the geology of PZ-13, PZ-14, and PZ-15: (1) the general near surface geology of this area (Powers, 1997), (2) drilling and logging of shallow piezometers in the vicinity, and (3) core samples and cuttings collected during drilling. Formation color was determined using Munsell Soil Color Charts, year 2000 revised edition.

These piezometers were drilled by hollow-stem auger with split spoon sampling and air-assisted hollow-stem auger drilling, depending on the formation and consolidation. Contact depths to each formation were predicted prior to drilling based on those identified in piezometers PZ-8 and PZ-9 (Figure 1-2).

2.2 Geological Data From PZ-13

2.2.1 Permo-Triassic Dewey Lake Formation

The Dewey Lake was encountered in PZ-13 from 75 feet deep to total depth (TD) of the piezometer at 77 feet (Figure 2-2). The Dewey Lake in PZ-13 is dominated by dark reddish brown silty mudstone with mottling of red and gray-olive gray mudstone, with greenish gray reduction spots. The formation was platy, reflecting common thin bedding or laminae of the unit, contained some moisture at the Santa Rosa contact, but dried as the drilling proceeded deeper. This indicated that the upper portion of the Dewey Lake was acting as an aquitard, and drilling was stopped. A well was installed at this location and constructed as depicted in Figure 2-2.

The Dewey Lake at PZ-13 was encountered 11 feet deeper in elevation than it was in PZ-8, indicating possible erosion during deposition of the overlying Santa Rosa Formation during predominantly fluvial environments. The Dewey Lake was deeper in elevation in PZ-13 than in PZ-9, another previously installed piezometer in the area. It was about 2 feet deeper in elevation than PZ-14 (Section 2.3).

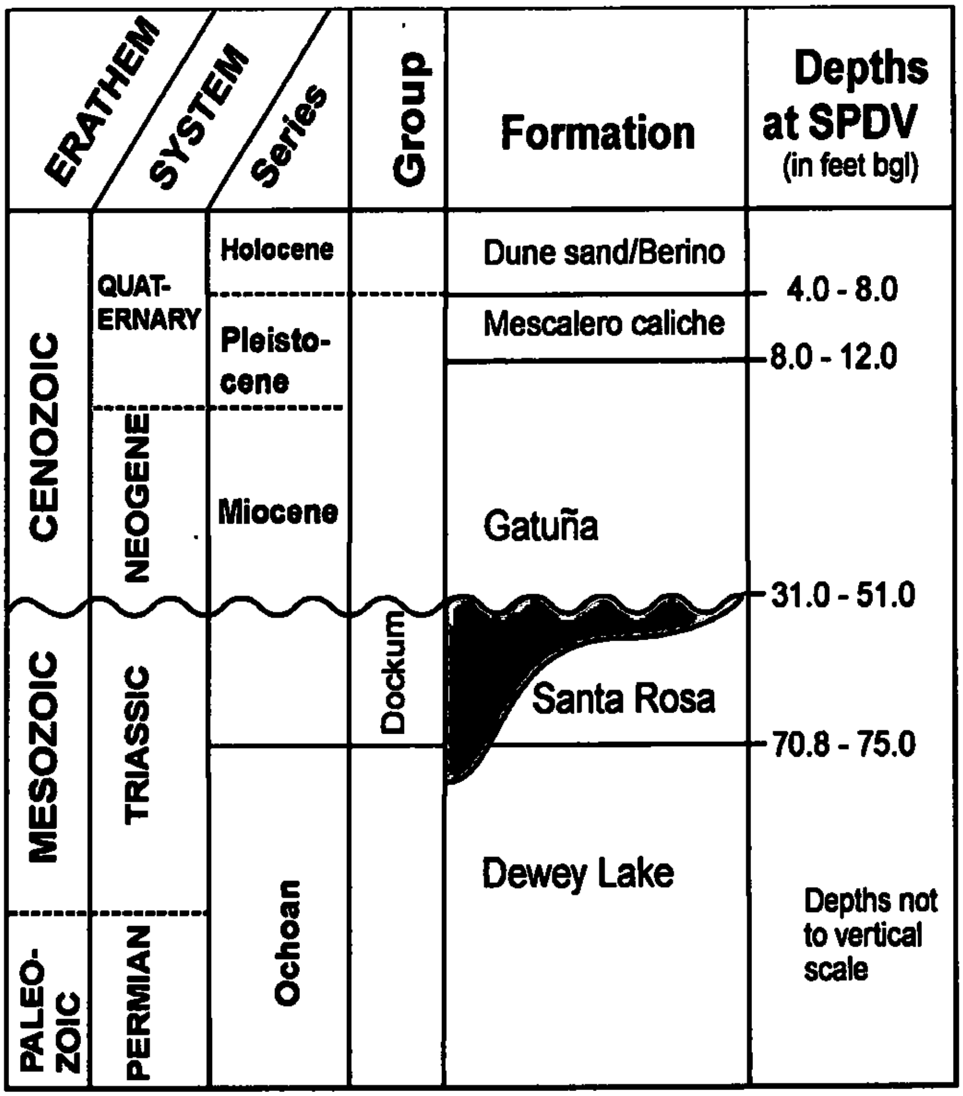

Figure 2-1 - Generalized Stratigraphy Encountered at the SPDV

CORE LOG Sheet 1 of 2

Hole ID: PZ-13	Location: WIPP Site - SPDV Pile

Drill Date: 8/13 to 8/21 2007	Drill Method: Hollow-Stem/Air Rotary	Drill Make/Model: CME 75
Drill Crew: Stewart Brothers Drilling Company	Hole Diameter: 9.88 - inch	Barrel Specs: 3-inch split spoon
	Hole Depth: 77 feet	Drill Fluid: NA
	Hole Orient: NA	Core Preserv: NA

Logged by: J. Maly, P.G./R.Salness, P.G.	Date: 8/13 to 8/21 2007	Scale: 1" = 10'

	Northing	Easting	Elevation
Survey Coordinate: (Ft)			

Comments:

Depth Number	Depth (feet)	% Recovered	Well Construction	Profile (Rock Type)	Description	Lithology
		100		Dune Sand	[5YR 6/4, LT Reddish Brown], sand, fine grained, loose, moist to dry, friable.	
5		80, 100		Berino Soil	[2.5YR 5/8 - 4/8; Red], sandy, 3' - 6' calcareous sand, 6' - 6.5' stiff, indurated, low moisture.	
		80		Mescalero Caliche	[5YR 8/3; Pink], sandy limestone or calcareous sandstone, low moisture, stiff with pebbles and weak laminar structure, at 7.5' to 9', 9'-10' Gatuna inclusions, chert pebbles throughout.	
10, 15		80, 100, 100		Gatuna Sandstone	[5YR 7/4; Pink], Gatuna Sandstone with Mescalero Caliche overprint, dry to slightly moist, loose to very stiff clasts with caliche, altered manganese oxide throughout, more argillaceous and calcareous than above.	
20, 25, 30		100, 100, 100, 100, 100, 100	Well Casing		[2.5YR 5/8; Red], Gatuna Sanstone with argillaceous matrix, chert pebbles throughout, root casts coated in manganese oxide, dry, caricareous, less argillaceous matrix dominated by sand, increased bedding structure with depth, stiff, platy structures, dry, stiff, moderately indurated.	
		100			[2.5YR 6/6, LT Red], lighter color, more indurated slightly moist.	
		100, 100			[2.5YR 4/8, Red], Carbonate intraclasts incorporated in matrix.	
35, 40, 45, 50		100, 100, <5, 100, 100, 100, 100, 100		Santa Rosa Sandstone	[2.5YR 4/8, Red], [10YR 7/1, LT Gray], interbedded Red and LT Gray sanstone, dessication cracks with carbonate fill, slickensided surfaces (subhorizontal), dry, moderately indurated. Hard at 35' - 39', 39'-39.2' very hard consolidated, well indurated sandstone, dry [2.5YR 4/4; Reddish Brown] 40'-47' Moderately indurated, moist, platy. Changed over to tricone bit on hollow-stem lead auger limiting samples. Steam and condensate apparent when drilling at 55-60' 59.5-59.7 [2.5YR 4/4; Reddish Brown] , moisture content increasing with depth, fine to med sandstone	

Figure 2-2 - Core Log for PZ-13

Hole ID: PZ-13 CORE LOG (cont. sheet) Sheet 2 of 2

Logged by: J. Maly, P.G./R.Salness, P.G. Date: 8/13 to 8/21 2007

Depth Number	Depth (ft)	% Recovered	Well Construction	Profile (Rock Type)	Description	Lithology
50		100	Well Casing	Santa Rosa Sandstone	Same as previous page	
55		100		Interbedded sandstone and siltstone in	Steam and condensate apparent when drilling at 55-60' 59.5-59.7 [2.5YR 4/4; Reddish Brown] . moisture content increasing with depth, fine to mod sandstone	
60						
65		100			[5YR 8/2, Pinkish White], sandy siltstone, poorly indurated, fine to medium sand, argillaceous, (64'-65')	
					[5YR 5/6, Yellowish Red], sandy, argillaceous siltstone, poorly indurated, fine sand, calcareous, white, yellowish, and orange grains, saturated, (65'-67.5')	
70					[10YR 6/2, Light Brownish Gray], sandy siltstone, moderately indurated, fine sand, clear, greenish gray, pink, reddish brown and black grains, saturated.	
75		100			[5YR 6/6, Reddish Yellow], silty sandstone, poorly indurated, fine to medium sand, less moisture than above.	
80			Sump		[2.5YR 5/4, Reddish Brown], silty argillaceous sandstone, well indurated, fine grains, hard layer, low moisture, similar to 50'-60' interval, softer at 72'-75'; possibly more argillaceous (thin interbedded clay layers between fine grained sandstone).	
				Dewey Lake Formation	[2.5YR 3/4, Dark Reddish Brown] 75'-75.5' mudstone, silty, micaceous with greenish gray reduction spots, moist.	
					[2.5YR 5/6 - 4/6, Red] 75.5'- 75.75' silty mudstone with greenish gray reduction spots, dryer than above.	
					[5Y 5/1 - 5/2, Gray to Olive Gray) 76.5' - 76.6' mudstone, silty, moist.	

Total Depth 77' terminated in the Dewey Lake Formation

Figure 2-2 - Core Log for PZ-13 (Continued)

2.2.2 Triassic Santa Rosa Formation

The Santa Rosa is 40 feet thick at this location, from 35 feet bgs to 75 feet bgs. The Santa Rosa and Gatuña were differentiated in this drillhole by a mottled red and light gray sandstone with slickensides as opposed to the basal Gatuña Formation lacking these features and being predominantly a red sandstone at the contact. The Santa Rosa in this piezometer consists of interbedded sandstone of variable color, grain size, induration, cementation, and clay content (Figure 2-2). The formation was well indurated and required air assisted drilling from 47 feet to 64 feet, limiting samples to cuttings. It is presumed this may be due to cementation changes from a carbonate base to a silica base.

The interval from 65 feet to 67.5 feet is a sandy argillaceous siltstone that was saturated during drilling. The saturation in the Santa Rosa was identified during drilling to extend down into a harder siltstone of similar characteristic as the overlying lithology (Figure 2-2). The saturation diminished with depth, but showed increasing induration, and clay content. The underlying Dewey Lake was moist.

Comparatively, the Santa Rosa in PZ-13 is 11 feet thicker than in PZ-8 (29 feet) and five feet thicker than in PZ-9 (35 feet), indicating a thickening trend to the south, south-east of WIPP. This thickening is suggested by Jones (1978) as a consequence of eastward formational dip and eastward rise in surface topography. The Santa Rosa was deposited in dominantly fluvial environments and lies unconformably on the Dewey Lake.

The Santa Rosa was encountered at approximately the same elevation as in PZ-8, but approximately 2 feet shallower in elevation than PZ-9. Compared to PZ-14 and PZ-15, the Santa Rosa in PZ-13 was encountered 2 feet deeper in elevation than PZ-14 and 7 feet shallower in elevation than in PZ-15, indicating possible localized Permo-Triassic erosional features likely due to fluvial activities.

2.2.3 Miocene-Pleistocene Gatuña Formation

The Gatuña Formation is about 25 feet thick at this location. The Gatuña in PZ-13 is pink (Munsell 5YR 7/4) to red (2.5YR 5/8, 6/6, 4/8) sandstone, with generally fine to medium sand grains. The Gatuña contains bluish-black manganese oxide (MnO) stains throughout. The formation at PZ-13 is friable (very loose sand) to moderately well lithified and platy (Figure 2-2). It is very calcareous in the upper part due to overprint (penetration) of pedogenic processes during early stages of the development of overlying Mescalero caliche (Powers, 2003).

The Gatuña generally increases in thickness to the west in the WIPP area, and the depositional edge of the formation is in the same general area where the Santa Rosa pinches out because of erosion that preceded Gatuña deposition (Powers and Holt, 1993). Gatuña thicknesses in nearby piezometers reflect this trend of increasing thickness to the west. The Gatuña thickness in PZ-8, west of PZ-13, is approximately 22 feet. In PZ-9, northwest of PZ-13, the Gatuña is approximately 25 feet.

The Gatuña in PZ-13 was encountered 3 feet shallower in elevation than in PZ-8 and 2 feet shallower in elevation than in PZ-9. Compared to PZ-14 and PZ-15, the Gatuña in PZ-13 was encountered at the same elevation as in PZ-14, but approximately 6 feet shallower in elevation than in PZ-15, following a possible trend of infilling of an erosional feature.

2.2.4 Pleistocene Mescalero Caliche

The Mescalero caliche is 3.5 feet thick at this location; however, the pedogenic processes that developed the Mescalero have penetrated deeper into the Gatuña Formation as defined by the overprint in Section 2.2.3 and in Figure 2-2. The Mescalero in PZ-13 is pink (5YR 7/4) sandy limestone, or calcareous sandstone with pebbles and weak laminar structure. Basal Gatuña inclusions were encountered at this location from 9 to 10 feet (Figure 2-2). Because the Mescalero is a pedogenic process (soil forming), thicknesses will vary from location to location. In the area of PZ-13, compared to other wells, the thickness varies from 2.5 to 4 feet. The Mescalero is an informal soil stratigraphic unit defined by Bachman (1973). It is widespread in southeastern New Mexico, and it is a continuous stratigraphic unit at the WIPP site.

The Mescalero in PZ-13 is approximately 7 feet higher in elevation than in PZ-8 and 5 feet higher in elevation than in PZ-9. Compared to PZ-14 and PZ-15, the Mescalero in PZ-13 was encountered approximately 2 feet higher in elevation than PZ-14 and approximately 5 feet lower in elevation than in PZ-15. This variation is not surprising as the pedogenic process will vary from location to location and generally conforms to underlying topography.

2.2.5 Pleistocene Berino Soil and Surficial Sands

Based on the continuous split spoon sample taken at SNL-13, there is a 4-foot-thick layer of unlithified dune sand and basal argillaceous sand (commonly called the Berino soil, Powers, 2002). The sand is fine grained and calcareous. The Berino soil is not a geologic unit, but defined as a pedogenic unit by local soil scientists (Chugg et al., 1971). The surface sand around WIPP is eolian, with much of it fine to medium grain, moderately well sorted, and poorly indurated. Dunes at the WIPP site are partially stabilized by vegetation (Powers, 2003).

2.3 Geological Data From PZ-14

2.3.1 Permo-Triassic Dewey Lake Formation

The Dewey Lake was encountered in PZ-14 from 70.8 feet to TD at 73 feet (Figure 2-3). In this piezometer interval (70.8 to 73 feet), the Dewey Lake is characterized by a very hard, competent gray and red siltstone, platy, and dry; a red claystone that is unconsolidated with greenish gray reduction spots; and very hard platy red siltstone with greenish gray reduction spots (Figure 2-3). The Dewey Lake in this piezometer was dry at the contact, but damp below. Based on data obtained from the overlying Santa Rosa Formation (see Section 2.3.2), the TD was based on this depth acting as an aquitard dampening vertical flow of SSW. A well was installed at this location and constructed as depicted in Figure 2-3. The sample obtained from this piezometer did indicate alternating lithologic variations of siltstone and claystone (Figure 2-3).

The Dewey Lake at PZ-14 was encountered 9 feet deeper in elevation than it was in PZ-8, indicating possible erosion during deposition of the overlying Santa Rosa Formation during predominantly fluvial environments. The Dewey Lake was only 0.5 feet deeper in elevation in PZ-14 than in PZ-9, another previously installed piezometer in the area.

2.3.2 Triassic Santa Rosa Formation

The Santa Rosa at this location is 20.8 feet thick, from 50 feet bgs to 70.8 feet bgs, but less than that identified in PZ-13. The Santa Rosa and Gatuña were differentiated in this drill hole, similarly as in PZ-13, by mottled reddish brown and light gray sandstone with slickensides as opposed to the basal Gatuña Formation lacking these features and being predominantly a red sandstone at the contact. Samples for this piezometer were not obtained continuously as the formation was very hard in places and alternative drilling techniques (air assisted) were used. Where samples were not obtained, the geology was assumed to be similar to that identified in PZ-13 where extraordinary effort was made for continuous sampling (Figures 2-2, 2-3).

From the samples obtained for 30 feet bgs to 50 feet bgs the Santa Rosa is identified as interbedded reddish and light gray sandstone to reddish brown very hard siltstone. The sandstone contained carbonate filled dessication cracks, slickensided surfaces, and was poorly to moderately indurated. At 50 feet bgs, the sample indicated a very hard competent siltstone (Figure 2-3). At 50 feet bgs to 70.8 ft bgs, the geology was assumed to be similar to PZ-13 (Figure 2-2).

From 70 to 70.8 feet in PZ-14, the formation was interbedded loose, silty sand and a layer of angular claystone and siltstone fragments. This interval was saturated throughout, but the claystone/siltstone fragments (70.5 to 70.8 feet bgs) appeared to be the primary saturation zone. As discussed in Section 2.3.1, the underlying Dewey Lake was dry, acting as an aquitard.

Comparatively, the Santa Rosa in PZ-14 is thinner than that in PZ-13, PZ-8, and PZ-9. This still correlates with thickening trend to the south-southeast of WIPP as suggested by Jones (1978) as a result of dipping and topography trends. The Santa Rosa in PZ-14 was encountered at approximately 9 feet shallower in elevation than PZ-8, and approximately 4 feet shallower in elevation than PZ-9.

2.3.3 Miocene-Pleistocene Gatuña Formation

The Gatuña is about 23 feet thick at this location. The Gatuña in PZ-14 is pink (5YR 8/4) to red (2.5YR 4/8-5/8) with some light reddish brown (2.5YR 7/4-8/4) interbedded sandstone, with generally fine to medium grains. The Gatuña contains bluish-black MnO stains in the upper and basal portions. Some sections are well lithified and platy. It is very calcareous in the upper portion due to overprinting of the overlying Mescalero caliche. Silica cementation dominates in the basal portion.

Gatuña thickness in this well compared to other nearby piezometers reflects the trend of westward increasing thickness (Powers and Holt, 1993). The Gatuña in PZ-14 is thinner than in PZ-13, PZ-8, and PZ-9. The Gatuña in PZ-14 was encountered 3 feet shallower in elevation than in PZ-8, and 2 feet shallower in elevation than in PZ-9.

2.3.4 Pleistocene Mescalero Caliche

The Mescalero caliche is 4 feet at this location, although, as described in previous sections, the processes that developed the Mescalero have penetrated deeper into the underlying Gatuña Formation. The Mescalero in PZ-14 is pinkish-white to pink (5YR 8/2-8/3) sandy limestone, with low moisture content containing calcareous pebbles with weak laminar structure. At PZ-14 the Mescalero has a very hard surface cap. The Mescalero in PZ-14 is approximately 4 feet higher in elevation as it is in PZ-8 and 3 feet higher in elevation than it is in PZ-9.

2.3.5 Pleistocene Berino Soil and Surficial Sands

Continuous samples were not taken at PZ-14 until the top of the Mescalero caliche was encountered. Until the depth of 5 feet, center bit drilling with a wireline was used. The Berino soil and surficial sands were described based on auger cuttings, and the contact was estimated based on PZ-13 and PZ-15 sampling (Figure 2-3). The surficial dune sand at this location was the same as other, unlithified, calcareous light reddish brown (5YR 6/4) sand. The Berino soil was characterized as a red (2.5YR 5/8-4/8) loose, fine grained sand.

CORE LOG

Sheet 1 of 2

Hole ID: PZ-14	Location: WIPP Site - SPDV Pile	
Drill Date: 8/24 to 8/25 2007	Drill Method: Hollow-Stem/Air Rotary	Drill Make/Model: CME 75
Drill Crew: Stewart Brothers Drilling Company	Hole Diameter: 9.88 - Inch	Barrel Specs: 3-inch split spoon
	Hole Depth: 77 feet	Drill Fluid: NA
	Hole Orient: NA	Core Preserv: NA
Logged by: J. Maly, P.G./R.Salness, P.G.	Date: 8/24 to 8/25 2007	Scale: 1" = 10'

	Northing	Easting	Elevation
Survey Coordinate: (Ft)			

Comments:

Depth Number	Depth (feet)	% Recovered	Well Construction
		30	Well Casing
5		100	
		100	
10		100	
		100	
15		100	
		100	
20		100	
		100	
25		100	
		100	
		100	
30		100	
		100	
35			
40		0%	
45			
50			

Profile (Rock Type)	Description	Lithology
Dune Sand	[5YR 6/4, LT Reddish Brown], sand, fine grained, loose.	
	? — ? — ? — ? — ?	
Berino Soil	[2.5YR 5/8 - 4/8; Red], sandy, calcareous sand.	
Mescalero Caliche	[5YR 8/2-8/3; Pinkish White to Pink] sandy limestone or calcareous sandstone, low moisture, stiff with pebbles, weak laminar structure, hard surface cap	
Gatuna Sandstone	[5YR 8/4 Pink] Gatuna Sandstone with Mescalero Caliche overprint, dry, gatuna inclusions and chert pebbles throughout, more argillaceous and clacareous than above.	
	[2.5YR 4/8-5/8, Red]; Gatuna sandstone with argillaceous calcareous matrix, chert pebbles throughout, root casts coated with manganese oxide.	
	[2.5YR 7/4-8/4; Light Reddish Brown to pink interbedded], platy, moist, Gatuna sandstone sediments, calcareous cementation.	
	[2.5YR 4/8-5/8, Red], Gatuna sandstone, platy, dry and moist alternating between layers, becomes harder with depth to 25'	
	[2.5YR 4/8; Red], Platy Gatuna sandstone, poorly indurated, moist, fine grained, argillaceous, silica cementation, root casts with manganese oxide, chert pebbles, very hard at 30'	
Santa Rosa Sandstone	[2.5YR 7/4-8/4, Pink to Light Reddish Brown], [Gley 1 8/1; Light Greenish Gray], interbedded Reddish and LT Gray sanstone, desication cracks with carbonate fill, slickensided surfaces (subhorizontal), dry, poorly to moderately indurated. Hard at 35.5'-drilled with center bit only to 40 feet; no recovery at 40 feet; drilled with center bit only to 50 feet. [5YR 5/4-4/6; Reddish Brown],Very hard, silt sandstone, argillaceous. (50'-50.5'), pulverized by sample barrel Used center bit drilling only instead of wireline to 56 feet. Hit hard, competent Sante Rosa at 56 feet then switched to air rotary until softer Dewey Lake FM. encountered at depth. Center bit at 56 feet is dry. Assume similar geology to that seen in PZ-13	

Figure 2-3 - Core Log for PZ-14

Hole ID: PZ-14 | CORE LOG (cont. sheet) | Sheet 2 of 2

Logged by: J. Maly, P.G./R.Salness, P.G. | Date: 8/24 to 8/25 2007

Depth Number	Depth (ft)	% Recovered	Well Construction	Profile (Rock Type)	Description	Lithology
50			Well Casing	Santa Rosa Sandstone		
55				Interbedded sandstone and siltstone in	Same as previous page	
60						
65						
70		80			[2.5YR 3/6, Dark Red], silty sand, very loose/unconsolidated, very argillaceous, saturated (70'-70.5').	
		90			70.5' - 70.8 ' Saturated Gravel Lens comprised of angular claystone and siltstone fragments. Claystone: [2.5YR 3/3; Dark Reddish Brown] Siltstone: [2.5YR 5/1; Reddish Gray]	
		90				
75						
80			Sump	Dewey Lake Formation	70.8 - 71 foot [5YR 5/1 and 2.5YR 4/6; Gray and Red], siltstone, very hard, competent, platy (very coarse), dry, saturation occurs ontop of this layer. 71 - 72 feet [2.5YR 5/6 - 4/6; Red], claystone, loose/unconsolidated, argillaceous with some silt with gray to greenish spots [Gley2 8/10G, Light Greenish Gray], damp, but not saturated. 72 - 73 feet [2.5YR 5/6, Red], siltstone, very hard, dry, micaceous, platy (fine to coarse with depth), friable at 72 feet, greenish gray spots.	

Total Depth 73' terminated in the Dewey Lake Formation

Figure 2-3 - Core Log for PZ-14 (Continued)

2.4 Geological Data from PZ-15

2.4.1 Triassic Santa Rosa Formation

PZ-15 was terminated in the Santa Rosa Formation where saturation was identified. As such, the Dewey Lake Formation was not encountered in this well.

The top of the Santa Rosa in the well was identified at 51 feet bgs. The entire thickness of this formation is unknown as it was not completely drilled through; however, it is assumed to be thinner than in PZ-13 and PZ-14 due to the thickening westward trend of this formation. The top of the Santa Rosa Formation was saturated.

Drilling was terminated at this point as it was apparent that just deeper, the Santa Rosa Formation dried and became very hard, acting as an aquitard. A piezometer was installed at this depth and constructed as depicted in Figure 2-4.

The 5 feet of Santa Rosa Formation penetrated in this well are characterized as two lithologic variations. The upper portion from 51 to 51.5 feet is described as red (2.5YR 4/8) to light gray (10YR 7/1) interbedded sandstone with dessication cracks that are carbonate filled (Figure 2-4) that becomes softer and sandier with depth. This upper portion was saturated at the top and became dry with depth at the lower very hard portion. The lower section sampled (51.5 to 56 feet) is described as a very hard consolidated dry reddish brown (2.5YR 4/4) sandstone.

The Santa Rosa in PZ-15 was encountered at approximately 7 feet deeper in elevation than PZ-8, and approximately 5 feet deeper in elevation than PZ-9.

2.4.2 Miocene-Pleistocene Gatuña Formation

The Gatuña Formation is about 39 feet thick at this location, indicating that it gets thicker to the east around the SPDV pile, which is non-typical of the area around the WIPP site. The Gatuña generally thickens to the west in the area of the WIPP site due to erosion of the Santa Rosa Formation, leading to thicker deposition of Gatuña (Powers and Holt, 1993).

The upper 4 feet of Gatuña at this location is pink (5YR 7/4) sandstone with overprint of pedogenic carbonate soil processes that developed the overlying Mescalero caliche. The upper 4 feet are dry to slightly moist, loose to very stiff, with clasts of caliche and altered MnO throughout (Figure 2-4). The lower portion of the Gatuña is predominantly red sandstone with chert pebbles throughout, MnO stained root casts, dominated by sand (less argillaceous) and increased bedding structure with depth (platy).

The Gatuña in PZ-15 was encountered 10 feet shallower in elevation than in PZ-8 and 9 feet shallower in elevation than in PZ-9.

CORE LOG Sheet 1 of 1

Hole ID: PZ-15	Location: WIPP Site - SPDV Pile
Drill Date: 8/21 to 8/22 2007	Drill Method: Hollow-Stem/Air Rotary
Drill Crew: Stewart Brothers Drilling Company	Hole Diameter: 9.88 - Inch
	Hole Depth: 77 feet
	Hole Orient: NA
Drill Make/Model: CME 75	Barrel Specs: 3-inch split spoon
Drill Fluid: NA	Core Preserv: NA
Logged by: J. Maly, P.G./R.Salness, P.G.	Date: 8/21 to 8/22 2007
Scale: 1" = 10'	

	Northing	Easting	Elevation
Survey Coordinate: (Ft)			

Comments:

Depth Number	Depth (feet)	% Recovered	Well Construction	Profile (Rock Type)	Description	Lithology
5		100, 100, 80	Well Casing	Dune Sand	[5YR 6/4, LT Reddish Brown], sand, fine grained, loose, moist to dry, friable.	
				Berino Soil	[2.5YR 5/4; Reddish Brown], sandy, 7.8'-8' calcareous sand, indurated, low moisture, small roots, damp. [5YR 8/3 Pink] at 7.5'	
10		80, 100, 100		Mescalero Caliche	[7.5YR 8/2-8/4; Pink], sandy limestone or calcareous sandstone, low moisture, stiff with chert pebbles and weak laminar structure (friable), moist in friable portions; pedogenic Gatuna interbedded identified by manganese oxide alterations.	
15		100, 100, 100, 100		Gatuna Sandstone	[5YR 7/4; Pink], Gatuna Sandstone with Mescalero Caliche overprint, dry to slightly moist, loose to very stiff clasts with caliche, altered manganese oxide throughout, less argillaceous/loose matrix, caliche clasts throughout.	
20, 25, 30, 35		50, 80, 80, 90, 100, 100, 100, 100			[2.5YR 4/6; Red at 16'] [2.5YR 5/8 at 16.5'], Gatuna Sandstone, chert pebbles throughout, root casts coated in manganes oxide, dry, carcareous, less argillaceous matrix dominated by sand, increased bedding structure with depth, stiff, platy structures, dry, stiff, moderately indurated. 17.5-20' damp, loose, cabonaceous, more argilloceous 20-22.5' no bedding structure, inc. manganese oxide, damp 22.5' -27.5 platy bedding structure, bcame hard at 24' 26.1'-45' [2.5YR 4/6-4/8; Red], siliceous, friable, more argellacaous matrix interbedded with loose matrix. 45'-50.5' Saturated Gatuna Formation sitting on hard Santa Rosa Formation.	
40, 45, 50		100, 100, 90, 100			[2.5YR 4/8, Red], [10YR 7/1, LT Gray], interbedded Red and LT Gray sandstone, dessication cracks with carbonate fill, slickensided surfaces (subhorizontal), dry, moderately indurated, Wet/saturated at top and dries with depth/perched. 51.3-51.5 soft sandier zone	
55		100		Santa Rosa Sandstone	51.5 Very hard Santa Rosa Sandstone, very hard consolidated, well indurated sandstone, dry [2.5YR 4/4; Reddish Brown]. Total Depth 55 feet terminated in the Santa Rosa Sandstone	

Figure 2-4 - Core Log for PZ-15

2.4.3 Pleistocene Mescalero Caliche

The Mescalero caliche at this location is 4.5 feet thick at this location, although the processes that developed the Mescalero have penetrated deeper into the Gatuña as described in previous sections. The Mescalero in PZ-15 is pink (7.5YR 8/2-8/4) sandy limestone of low moisture content. It has weak laminar structure (friable) with chert pebbles throughout. Some pedogenic Gatuña is interbedded as defined by MnO alterations.

The Mescalero in PZ-15 is approximately 11 feet higher in elevation than it is in PZ-8 and 10 feet higher in elevation than it is in PZ-9.

2.4.4 Pleistocene Berino Soil and Surficial Sands

Based on continuous split spoon samples taken at PZ-15, there is 8 feet of unlithified dune sand and basal argillaceous sand (commonly called Berino soil, Powers, 2002). The sand is fine grained and calcareous. The Berino soil is fined grained, calcareous, and damp with small roots.

2.5 Geologic Significance, Discussion, and Correlation with Other Piezometers

The early SSW piezometers were drilled with air rotary and logged by examination of cuttings from the drill stem. The use of hollow stem augers in PZ-13, PZ-14, and PZ-15 allowed for close examination of the lithology and exactly where saturation occurred. Based on the information from the SPDV pile piezometers, it is clear that no one single lithologic zone can be isolated as being the predominant location for the SSW to reside or flow as the geology is vertically and spatially heterogeneous.

Figure 2-5 presents two cross-section across the site trending west to east (A-A') and northwest to southeast (B-B'). Cross-section A-A' presents a fairly consistent Gatuña thickness that undulates along the top of the Santa Rosa surface, dipping to the west. The Gatuña begins then to noticeably thicken at the point of PZ-15. The Santa Rosa Formation, on the other hand, is variable in thickness, thinning at the location of C-2507 and thickening east C-2507, along the deepening Dewey Lake contact.

Cross-section B-B' also presents a fairly consistent Gatuña thickness that mimics the Santa Rosa depositional surface along this trend. The Santa Rosa Formation from roughly north to south is relatively consistent in thickness (± 5 feet), with the thicker portion to the south. Structurally, the Santa Rosa dips to the west and east from the PZ-8/PZ-14 area, similar to the Gatuña, and the thickening trends with the deepening Dewey Lake. The top of the Dewey Lake appears to have a structural divide around PZ-8 where the surface dips gently to the west and sharply to the east, possibly an erosional feature.

Figure 2-6 is a wireframe map showing the upper surface of the Dewey Lake Formation for all SSW piezometers that encountered the Dewey Lake contact. Superimposed on this map are the contours of this surface. This figure shows that the surface of the Dewey Lake in the area of interest is comprised of high areas, valleys, and bowls. Sitting on top of this surface is the Santa Rosa Formation. The Dewey Lake has a lower permeability than overlying formations such that vertical flow is impeded, creating a perched water zone at or near the contact.

These characteristics of the Dewey Lake surface (highs, valleys, ridges, bowls) play an important role in defining geological control of SSW accumulation and movement.

Figure 2-7 depicts the same contours of the Dewey Lake surface superimposed onto a shaded relief map of the Dewey Lake surface. This figure highlights the surficial features identified in previous figures and discussed in the above paragraphs. Low areas (depressions) on the Dewey Lake surface are associated with PZ-4, PZ-5, PZ-7, PZ-12, PZ-14, and C-2507. High points are associated with PZ-6, PZ-8, PZ-10, and C-2505/2506. Between these points are ridges, valleys, and plateaus.

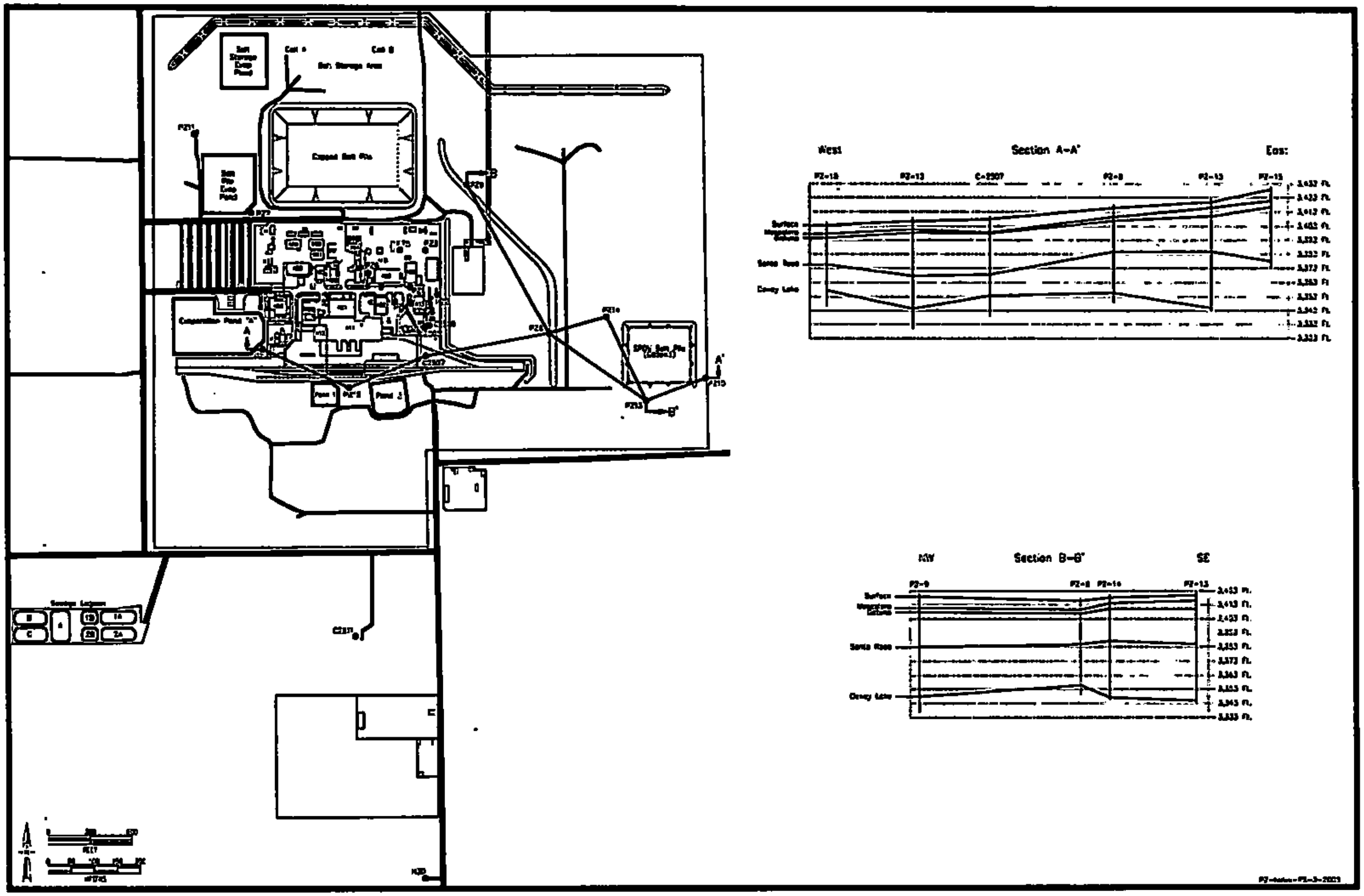

Figure 2-5 - Site Cross-Sections

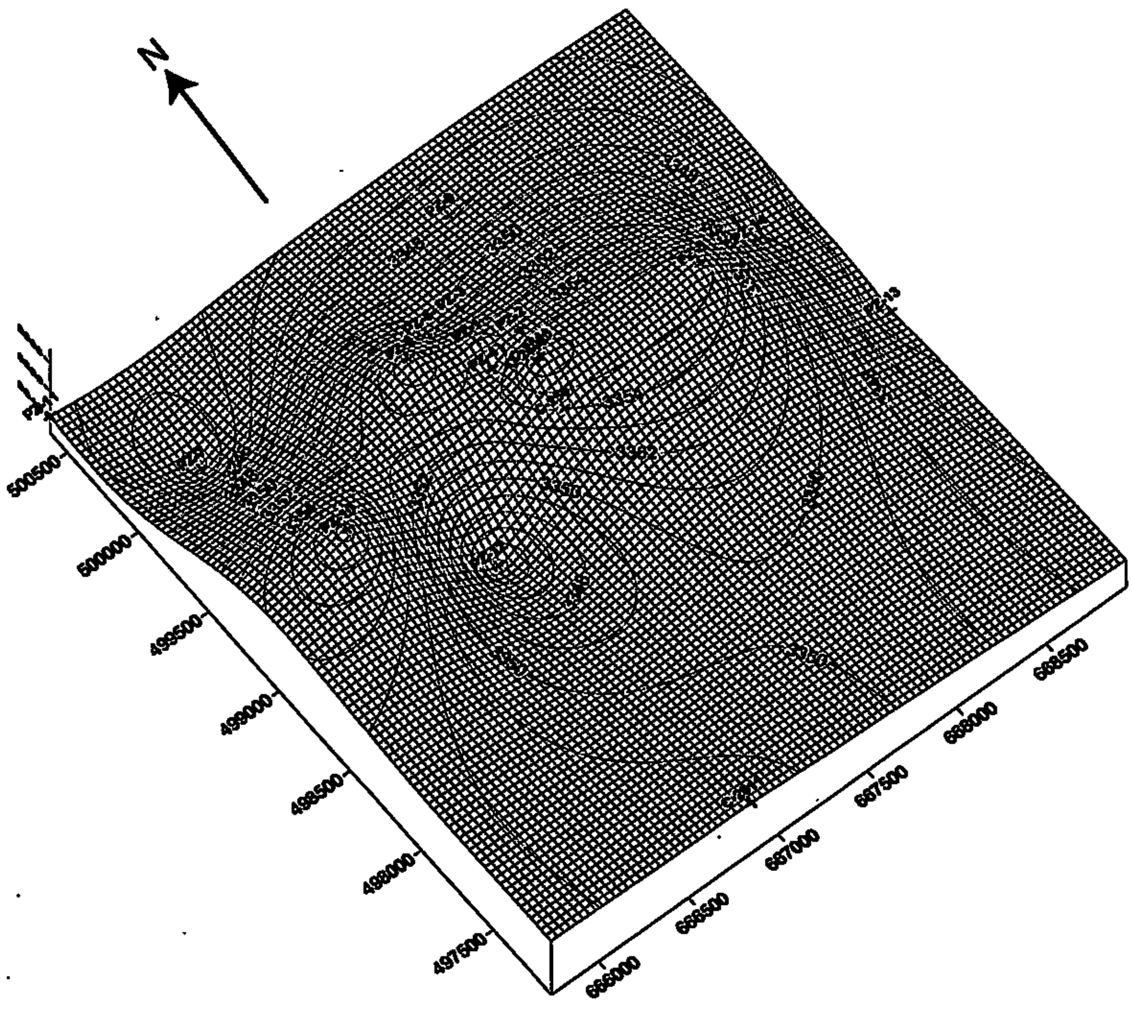

Figure 2-6 - Wireframe Structure Map of Dewey Lake Surface

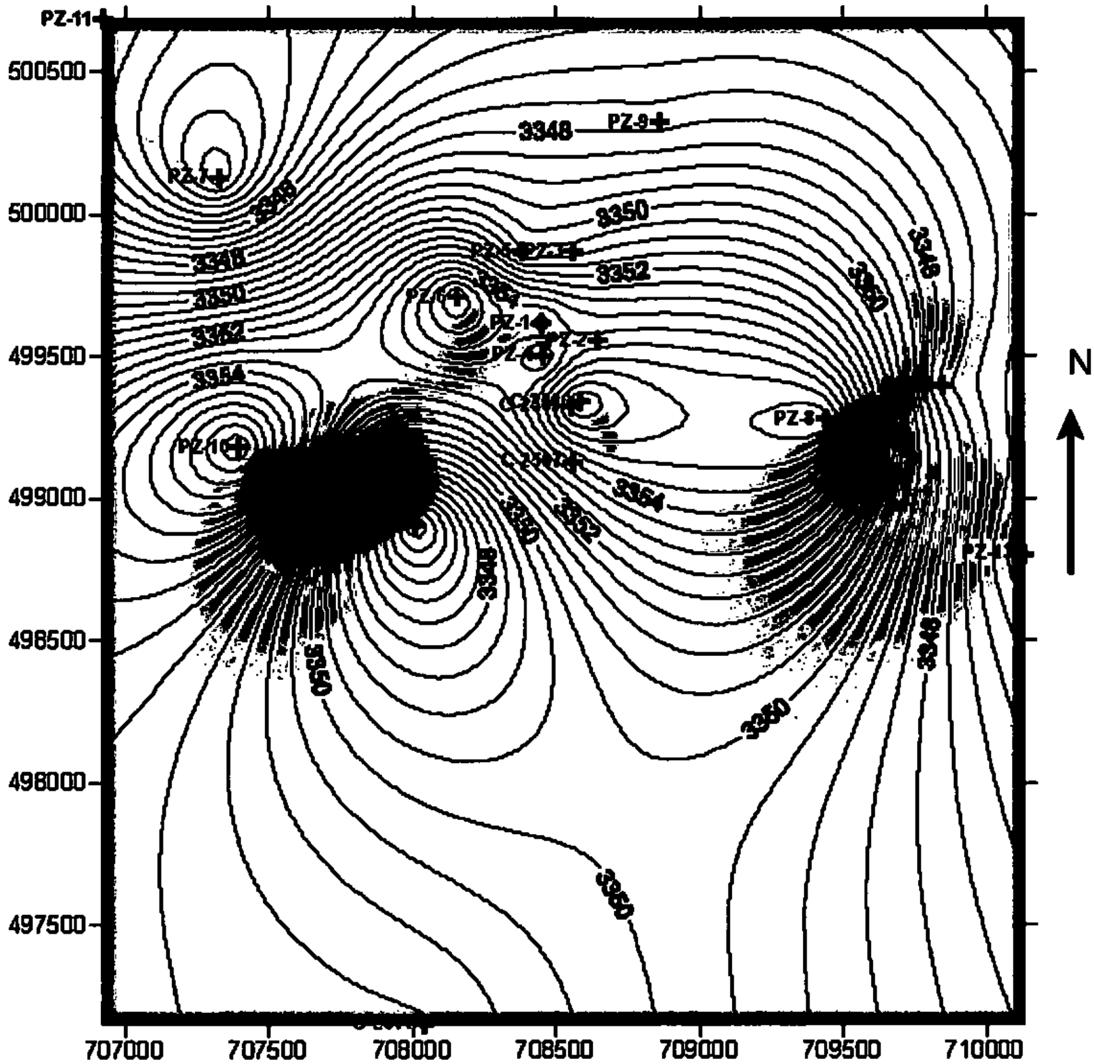

Figure 2-7 - Shaded Relief Structure Map of Dewey Lake Surface

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Based of the geologic data obtained from the piezometers around the SPDV pile, there can be some conclusions made at this point:

- The SSW appears to be isolated in different and variable zones around the SPDV pile based on examination of split spoon samples obtained during drilling.
- Structural features of the Santa Rosa/Dewey Lake contact play an important role in accumulation and movement of SSW.
- The stratigraphy overlying the Santa Rosa/Dewey Lake contact is heterogeneous and tortuous.

3.0 HYDROLOGICAL DATA

3.1 Description of Shallow Subsurface Water in the Santa Rosa and Upper Dewey Lake Formations

SSW was first detected in 1995 when a video inspection of the Exhaust Shaft detected seepage through the shaft liner from approximately 50 to 80 feet bgs. After 1995, a series of hydrologic assessments was undertaken to identify the source and nature of the SSW at WIPP. Sixteen wells were installed around the site to assess the SSW. The SSW was detected in all but one well, PZ-8, which was dry until March 2007. The SSW is a shallow-perched, water-bearing zone that sits on a permeability change at the formational contact between the Santa Rosa Formation and the upper Dewey Lake Formation. The SSW is believed to be entirely anthropogenic in nature, resulting in part from historical natural discharges from locations at WIPP.

In December 2003, the NMED GWQB issued a modified DP-831 indicating that the unlined ponds and stockpiles be lined with a synthetic liner: SSA and SPEP, Ponds 1 and 2, Pond A. Additionally, a new SSE was to be constructed with a synthetically lined base on which infiltration and surface runoff from this pile would be directed to a new evaporation basin. Also included in this modification was a monitoring program that included quarterly water level measurements from all the SSW wells and semiannual sampling of selected SSW wells for TDS, chloride, sulfate, nitrate, chromium, and selenium. This program was implemented in May 2004 and continues to date.

On December 29, 2006, the NMED GWQB issued another DP-831 modification with a condition that the SPDV pile be investigated as a possible source of shallow groundwater. The modification indicated that WIPP should install three monitoring wells adjacent to the SPDV pile. This report has documented the installation of these wells and the data obtained.

Isolated saturated sections were detected in all three piezometer boreholes installed around the SPDV pile, although at differing elevations and lithology. The following sections describe the water levels and chemistry in these wells and a discussion of each as it correlates to the SSW on the WIPP site and the other 16 piezometers.

3.2 Water Levels in Piezometers PZ-13, PZ-14, and PZ-15 and Comparison to WIPP Site Piezometers

In October 2007 a survey of the piezometer top of casing and ground surface elevation was performed by a New Mexico licensed surveyor. All data reported herein are referenced to coordinate systems NAD27/NAVD29 survey.

Water was detected in all three piezometers around the SPDV pile at differing horizons and, in one case, a differing formation. Water saturation in PZ-13 was detected while drilling in the lower Santa Rosa at a depth of 65 feet bgs, an elevation of 3,355 feet above mean sea level (AMSL). Saturation in PZ-13 was confined to a 2.5-foot vertical section of the Santa Rosa characterized by interbedded sandy argillaceous siltstone and sandy siltstone. The water in this boring appeared to be perched upon much harder, consolidated Santa Rosa at the contact with the Dewey Lake Formation. The permeability change of the harder sandstone and underlying Dewey Lake mudstone act as an aquitard perching the water at this elevation. Lithologic intervals above the saturated interval were moist, but not saturated.

Water saturation in PZ-14 was detected while drilling in the lower Santa Rosa at a depth of 70 feet bgs, an elevation of 3,348 feet AMSL. Saturation in this borehole was confined to a thin lense (0.80 foot) of the Santa Rosa, characterized as loose argillaceous sand and a section of interbedded angular claystone and sandstone fragments/pebbles. The saturated lens was sitting upon the contact with the Dewey Lake Formation (mudstone). This permeability contrast allowed the perching of water at this depth as the Dewey Lake acted as an aquitard. Samples were not obtained above this interval as air assisted drilling was employed; however, steam or other indicators of moisture were not apparent.

Water saturation in PZ-15 was detected while drilling in the lower Gatuña Formation at a depth of 45 to 55.5 feet bgs, an elevation of 3,384 feet AMSL. Saturation was in the lower Gatuña, where it became more friable, sitting on the Santa Rosa contact. The upper Santa Rosa Formation in this borehole is very hard at 51.5 feet bgs (3,377 feet AMSL) acting as an aquitard and perching the water at this interval.

Geologically, the underlying formations are very heterogeneous between piezometers (spatially) as well as between formations and within formations (vertically). Heterogeneity in the horizontal and vertical directions is significant as characterized by careful and mostly continuous sampling while drilling. This heterogeneity leads to preferential and tortuous flow paths. The detected saturation, as discussed above, occurred in different horizons of variable thickness and lithologic structure, lending to preferential flow and tortuosity.

The heterogeneity and tortuous flow affects the ability for saturated lenses to develop or connect with one another. An attempt was made to sample piezometers PZ-8, PZ-13, PZ-14, and PZ-15 on October 10, 2007, by low-flow sampling methods using a small diameter submersible pump. Typical sustained flow rates during sampling for the SSW piezometers at WIPP range from 400 milliliters per minute (mpm) to 1,500 mpm while keeping water levels stable and drawdown to a minimum. This could only be achieved for PZ-13, which pumped at an average rate of 1,050 mpm, but was pumped dry as the sample was obtained. Piezometers PZ-8, PZ-14, and PZ-15 could not sustain enough flow to measure before pumping dry. These wells were later sampled using a Teflon™ hand bailer (see Section 2.3). This indicates not only low permeability in the formation but, due to the small saturated lenses, a low volume of SSW in storage around the SPDV pile.

Figure 3-1 is a potentiometric surface map of the SSW at the WIPP site inclusive of the wells at the SPDV pile based on the water levels presented in Table 3-1, and is superimposed on a shaded relief structure map of the Dewey Lake surface. Well H-3d (Figure 1-2) was converted to a shallow monitoring well during the *WIPP Fiscal Year 2005 Plugging, Abandonment, and Well Reconfiguration Program* (DOE/WIPP 05-3326) and is not included in this map. Water levels in Well H-3d are monitored quarterly and to date there has been no SSW impact at this location. Therefore, the southern extent of SSW at the WIPP likely lies between PZ-12 and H-3d. Figure 3-1 does not include PZ-15, as it was completed in the Gatuña Formation.

Based on Figure 3-1, it appears that the surface of the Dewey Lake has an influence on the potentiometric surface and flow system of the SSW. Low points in the contact, such as at PZ-7, appear to create a radial flow, when water from the SPEP was contributing to infiltration. A ridge aligned with PZ-5 and south to C-2507 tends to direct water east and west. Low points in the surface structure are variable depending upon how much water has perched in these areas. The primary flow direction is south.

The water around the SPDV pile is defined by PZ-13, PZ-14, and PZ-15. Water levels for these wells were obtained approximately four months after they were installed. As discussed in previous sections, PZ-15 was completed in a different geologic horizon than PZ-13 and PZ-14, and is reflected in the differing water level elevations (Table 3-1). Hydrographs compiled for the WIPP site piezometers indicate an interconnection by having similar time series responses in water elevation fluctuation. Not enough data have been accumulated to determine connectivity between SPDV pile piezometers or between site piezometers and SPDV pile piezometers. However, based on the small lenses with water identified during drilling, lack of storage identified during sampling and low permeability, vertical and spatial heterogeneity, and tortuous media, the tentative conclusion at this point is that the water identified in PZ-13, PZ-14, and PZ-15 are all isolated from each other. Some of this can be seen with chemical differences (Section 3.3).

Table 3-1 - Measured Water Elevations
December 5, 2007

Well I.D.	Top of Casing Elevation	Water Level	Water Level Elevation
PZ-1	3,413.28	39.98	3,373.30
PZ-2	3,413.36	40.09	3,373.27
PZ-3	3,416.12	41.62	3,374.50
PZ-4	3,412.01	43.24	3,368.77
PZ-5	3,415.24	39.95	3,375.29
PZ-6	3,413.33	40.98	3,372.35
PZ-7	3,413.84	35.30	3,378.54
PZ-8	3,418.19	63.49	3,354.70
PZ-9	3,421.09	56.20	3,364.89
PZ-10	3,405.73	33.51	3,372.22
PZ-11	3,418.78	43.28	3,375.50
PZ-12	3,408.92	48.82	3,360.10
PZ-13	3,422.24	63.95	3,358.29
PZ-14	3,420.58	66.60	3,353.98
PZ-15	3,430.86	45.28	3,385.58
C-2505	3,412.93	42.91	3,370.02
C-2506	3,412.84	42.33	3,370.51
C-2507	3,409.91	42.80	3,367.11
C-2811	3,398.84	51.34	3,347.50

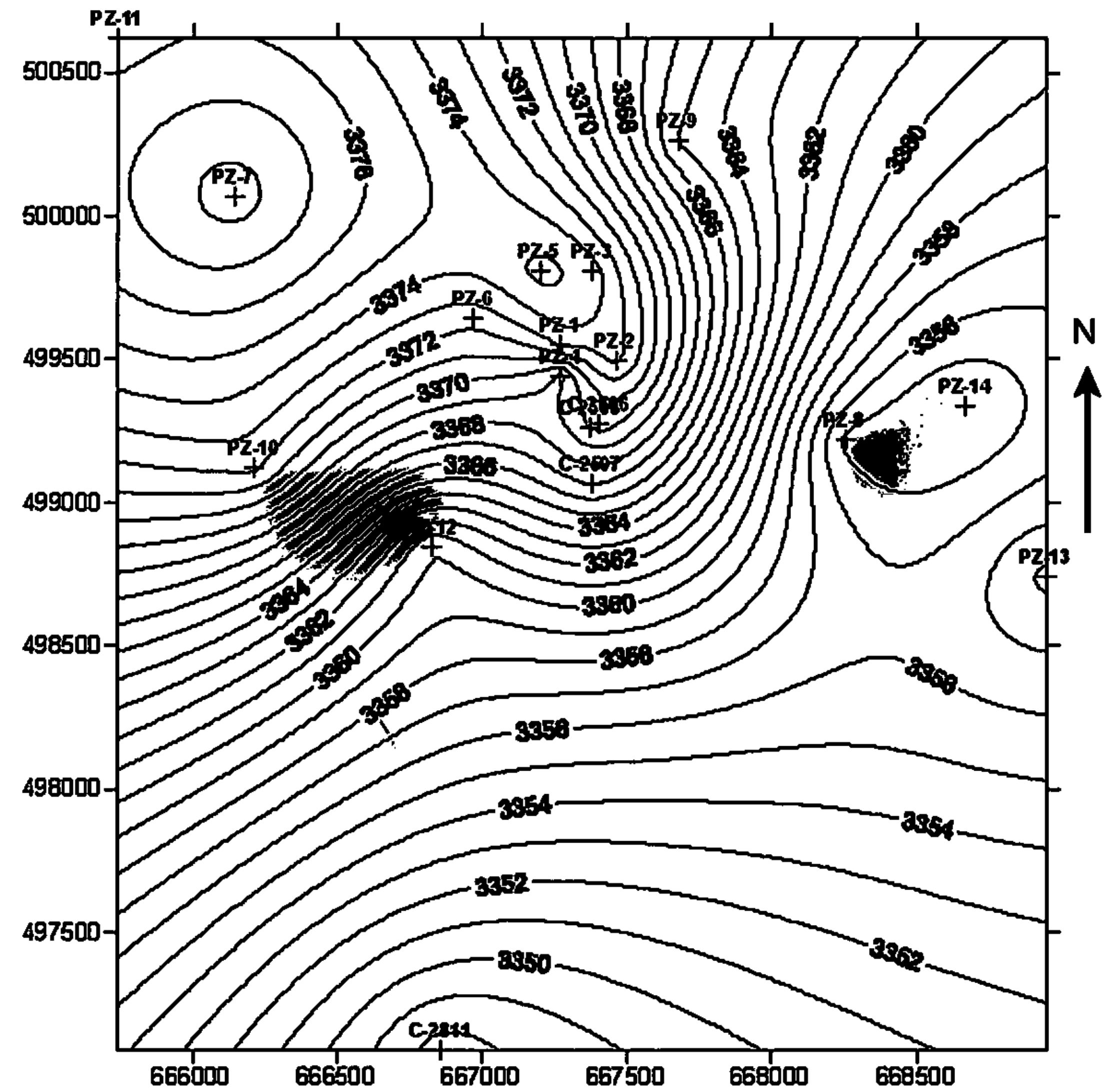

Figure 3-1 - Potentiometric Surface Map Superimposed on Dewey Lake Surface

02300

Overall, the water levels in the WIPP piezometers have been rising in all wells through December 2007, although at differing rates. One well, PZ-9, has been decreasing in elevation since March of 2005. This decreasing water level may be the first sign that lining the salt pile is having an effect on the SSW elevation. The decreasing water levels at PZ-9 began shortly after the conveyance ditches around the Salt Storage Area were lined. This conclusion is preliminary, it is too soon to tell what impact the liner systems at the site have had on water levels in the piezometers.

3.3 Water Quality in Piezometers PZ-13, PZ-14, and PZ-15 and Comparison to WIPP Site Piezometers

SSW samples have been obtained semiannually from the site piezometers as part of DP-831 since 2004. The quarterly sampling event for DP-831 was performed in October 2007, and included the three new piezometers. Since the piezometers around the SPDV pile were new, parameters beyond those required by the permit were analyzed to characterize the water (Table 3-2).

Low-flow sampling techniques are typically employed to sample the piezometers at WIPP. This involves using a small diameter submersible pump with typical sustained flow rates during sampling of 400 mpm to 1500 mpm, while keeping water levels stable and drawdown to a minimum. The water is field analyzed for temperature, conductivity, and pH until these parameters stabilize, then a laboratory sample is obtained. This could only be achieved for PZ-13, which pumped at an average rate of 1,050 mpm, but was pumped dry as the sample was obtained. Piezometers PZ-8, PZ-14, and PZ-15 could not sustain enough flow to measure before pumping dry. Piezometers PZ-8, PZ-14, and PZ-15 were pumped dry on October 10, 2007, and allowed to recover until October 15, 2007, where they were sampled using a Teflon™ hand bailer. PZ-8 was installed in 1997 and remained dry until this 2007. This was the first time PZ-8 was sampled. Results for wells PZ-8, PZ-14, and PZ-15 are presented in Table 3-2. Table 3-3 presents results for the DP-831 required parameters for all the sampled WIPP SSW piezometers.

Table 3-2 presents three different geochemical zones:

1.0 PZ-15, carbonate-based alkalinity. PZ-15 is near is a topographic depression to the east. During heavy rainfall this depression holds water for a period of time; enough such that cattle congregate to drink. The alkalinity in PZ-15 is predominantly carbonate based while the others are bicarbonate based. This is due to the infiltration of rainwater through the upper Mescalero caliche and higher surficial calcium carbonate dissolution.

2.0 PZ-13 and PZ-14, bicarbonate-based alkalinity. These wells may be affected by recharge from the SPDV pile more than rainwater going through caliche at PZ-15. Alkalinity is likely due to the dissolution of sulfates (gypsum and anhydrite) in the SPDV pile. As discussed in Section 1.1, the SPDV pile was used to store mined tailings interspersed with soil, rock, and debris from the construction of the shafts. All formations to the depth of the shafts were mined; therefore, minerals such as gypsum ($CaSO_4 \cdot 2H_20$), anhydrite ($CaSO_4$), halite ($NaCl$), sylvite (KCl), carnallite ($KMgCl_3 \cdot 6H_20$), and soda niter ($NaNO_3$) associated with gypsum and halite were included in the SPDV pile cuttings and explain the chemical differentiation.

Dissolved potassium is significantly higher in PZ-13 and PZ-14 than the other two piezometers, which can likely be attributed to the dissolution of sylvite and carnallite (potash salts). Sulfate concentrations in PZ-13 and PZ-14 are significantly higher and can be attributed to dissolution of anhydrite and gypsum found in formations above the Salado Formation.

3.0 PZ-8, low TDS, low potassium and sulfate, intermediate sodium, and chloride. Dissolved sodium and chloride can be associated with the dissolution of halite, predominantly found in the Salado Formation. While halite is almost exclusive to the salt pile, the SPDV pile also contains halite. Thus, sodium and chloride concentrations are greater in PZ-13 and PZ-14 than in PZ-8, due to SPDV pile proximity. Lacking potassium and sulfate, it is difficult to conclude the source of water in PZ-8 based on a single sample.

To summarize, the document titled *Exhaust Shaft: Phase III Hydraulic Assessment Data Report October 1997 - October 1998* (DOE-WIPP Draft 2302) presents analytical data from piezometers PZ-1 through PZ-12, C-2505, C-2506, and C-2507 for these years. In it the concentration for sulfate range was 404 - 2910 mg/L, nitrate was 4.2 - 46.6 mg/L, sodium 183 - 50,900 mg/L, potassium 3.7 - 356 mg/L, and calcium 270 - 4580 mg/L. Table 3-2 fingerprints SPDV pile PZ-13 and PZ-14 by high potassium concentration, indicating a different source of groundwater than the wells within the operational area.

Table 3-2 - SPDV Piezometer Water Quality

Parameter	ID/Sample Date	PZ-8/ 10-15-07	PZ-13/ 10-10-07	PZ-14/ 10-15-07	PZ-15/ 10-15-07*
Hydroxide Alk. (mg/L)	[redacted]	<1.00	<1.00	<1.00	<1.00
Carbonate Alk. (mg/L)	[redacted]	<1.00	<1.00	<1.00	1100
Bicarbonate Alk. (mg/L)	[redacted]	150	144	146	<4.00
Total Alk. (mg/L)	[redacted]	150	144	146	550
Dissolved Ca (mg/L)	[redacted]	1530	2220	1060	14.2
Dissolved K (mg/L)	[redacted]	17.2	618	649	7.15
Dissolved Mg (mg/L)	[redacted]	1260	1250	696	10.1
Dissolved Na (mg/L)	[redacted]	842	86100	41500	779
Specific Conductance (µMHOs/cm)	[redacted]	18100	366000	184000	3380
Chloride (mg/L)	[redacted]	7440	150000	71500	764
Fluoride (mg/L)	[redacted]	<1.00	22.2	<1.00	9.01
Sulfate (mg/L)	[redacted]	500	2670	2140	169
Nitrate (mg/L)	[redacted]	0.677	12.4	1.41	2.97
pH (s.u.)	[redacted]	7.26	6.09	6.74	8.66

Table 3-2 - SPDV Piezometer Water Quality

Parameter	ID/Sample Date	PZ-8/ 10-15-07	PZ-13/ 10-10-07	PZ-14/ 10-15-07	PZ-15/ 10-15-07*
TDS (mg/L)		15000	245500	106000	2060
Diss. Silver (mg/L)		<0.00200	<0.00200	<0.00200	<0.00200
Diss. Arsenic (mg/L)		<0.0100	<0.0100	<0.0100	<0.0100
Diss. Barium (mg/L)		0.251	0.116	0.298	0.051
Diss Cadmium (mg/L)		<0.00100	<0.00100	<0.00100	<0.00100
Diss. Chromium (mg/L)		<0.00500	<0.00500	<0.00500	<0.00500
Diss. Mercury (mg/L)		<0.000200	<0.000200	<0.000200	<0.000200
Diss. Lead (mg/L)		<0.0100	0.25	<0.0100	<0.0100
Diss. Selenium (mg/L)		0.039	<0.0100	<0.0100	0.022

(*) PZ-15 installed in the Gatuña Formation rather than Santa Rosa/Upper Dewey Lake contact

Table 3-3 - Water Quality Results for All WIPP Piezometers

	Water Level Monitoring (Ft AMSL)		Field Parameters October 2007			General Chemistry Parameters					Trace Metals	
Monitoring Site	9/19/07	12/5/07	pH (SU)	Temp. (°C)	Specific Conductivity @25 °C (µS/cm)	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-1	3373.26	3374.94	6.34	22.6	113500	39363	<1.00	2820	83200	99500	<0.100	<0.0250
PZ-2	3372.99	3374.9	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA
PZ-3	3374.29	3376.14	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA
PZ-4	3368.61	3370.41	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA
PZ-5	3375.2	3376.93	6.8	21.2	37500	39363	<1.00	1880	19400	28700	0.071	<0.00500
PZ-6	3372.17	3373.98	6.3	21.4	128000	39363	<1.00	3080	8100	105000	<0.100	<0.0250
PZ-7	3378.47	3380.17	6.44	22.2	78700	39362	<1.00	2660	45600	65000	0.064	<0.00500
PZ-8	3355.59	3356.34	Bailed	Bailed	Bailed	39369	0.677	500	7440	15000	0.039	<0.00500
PZ-9	3364.93	3366.53	6.22	20	155000	39363	<200	4720	116000	144000	<0.0200	<0.00500
PZ-10	3372.29	3373.86	7.08	22.3	1450	39362	<1.00	211	186	968	<0.0200	<0.00500
PZ-11	3375.52	3377.13	6.34	23.4	127100	39362	<1.00	2970	94400	108000	<0.0200	<0.00500
PZ-12	3359.72	3361.73	6.85	20.7	10760	39362	<1.00	958	4310	6200	0.026	<0.00500
PZ-13	3359.91	3359.93	6.09	22.8	>200000	39364	12.4	2670	150000	245500	<0.100	<0.00500
PZ-14	3355.31	3355.62	Bailed	Bailed	Bailed	39369	1.41	2140	71500	106000	<0.0100	<0.00500
PZ-15	3387.19	3387.22	Bailed	Bailed	Bailed	39369	2.97	169	764	2060	0.022	<0.00500
C-2811	3347.07	3349.13	7.05	20.3	6400	39362	<1.00	635	2980	3860	0.051	<0.00500
C-2505	3369.96	3371.66	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA
C-2506	3370.36	3372.15	NS	NS	NS	NS	NA	NA	NA	NA	NA	NA
C-2507	3367.03	3368.74	6.88	20	9410	39363	<1.00	1220	3500	5540	0.055	0.007

4.0 CONCLUSIONS

Piezometers PZ-13, PZ-14, and PZ-15 indicated saturated sections in all three locations at differing horizons and, in one case, a differing formation. Based on the geologic data obtained the SSW appears to be isolated in different and variable zones around the SPDV pile based on examination of split spoon samples obtained during drilling. Structural features of the Santa Rosa/Dewey Lake contact play an important role in accumulation and movement of SSW and the stratigraphy overlying the Santa Rosa/Dewey Lake contact is heterogeneous and tortuous. The heterogeneity and tortuosity leads to preferential flow and a vertical dampening affect. The heterogeneity, small saturated lenses, and tortuous flow affects the ability for flow to readily occur in the unsaturated zone around the SPDV pile.

It is believed that the water detected around the SPDV pile is limited in volume and spatial distribution based on the ability to bail the wells dry and slow recovery. Hence, there will be no realized benefit of further areal characterization of the SPDV pile, and no risk of not detecting a continuous, flowing, saturated zone.

Overall the water levels in the WIPP piezometers are rising, although at differing rates. One well, PZ-9, has been decreasing in elevation since March of 2005. The decreasing water levels at PZ-9 began shortly after the conveyance ditches around the Salt Storage Area were lined. It is too soon to consider this a cause and effect, or to tell other impacts of the liner systems at the site on water levels in the piezometers.

Three geochemical zones have been identified based on the data obtained from PZ-13, PZ-14, PZ-15, and PZ-8. One being associated with PZ-15, the second associated with PZ-13 and PZ-14, and the third associated with PZ-8. PZ-13 and PZ-14 are believed to be associated with the SPDV pile. The data are inconclusive with regard to PZ-8. Water detected in PZ-15 is believed to be associated with shallow infiltration from a topographic depression east of the SPDV pile.

It is recommended that the additional wells (PZ-13, PZ-14, and PZ-15) be included in the semiannual sampling and quarterly monitoring program as defined by the WIPP DP-831 permit.

5.0 REFERENCES

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Sergent, Hauskins, & Beckwith, 1979, *Phase III Waste Isolation Pilot Plant Subsurface Exploration & Laboratory Testing.*

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

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Jose R. Franco, Manag
US Dept. of Energy
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

PS Form 3800, August 2006

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

May 24, 2013

Jose R. Franco, Manager
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, NM 88221

RE: Response to Notice of Intent to Discharge; Discharge Permit Required for Proposed Discharge of Water from Pump Test at Well SNL-16, Waste Isolation Pilot Plant, DP-831

Dear Mr. Franco:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) received a Notice of Intent from you on February 27, 2013. The notice describes your intent to discharge approximately 978,000 gallons of water generated from a pump test from Well SNL-16 (OSE File # C-3220). The notice satisfies the requirements of Subsection A of 20.6.2.1201 NMAC of the New Mexico Water Quality Control Commission (WQCC) Regulations (20.6.2 NMAC). The proposed discharge is located in Section 33, Township 22S, Range 30E, Eddy County.

NMED has reviewed the information provided in accordance with Subsection D of 20.6.2.1201 NMAC. **You are hereby notified that a Discharge Permit is required for the proposed discharge.**

To apply for a Discharge Permit, you must complete and submit three copies of the enclosed Discharge Permit application, along with the $100 filing fee. Please be advised that any discharge from this facility without prior written approval from NMED would be a violation of the WQCC Regulations.

Any appeal of this determination that a Discharge Permit is required must be made to the New Mexico WQCC within 30 days of receipt of this letter, in accordance with Subsection B of 20.6.2.3112 NMAC. A copy of the WQCC Regulations, 20.6.2 NMAC, is available at http://www.nmcpr.state.nm.us/nmac/_title20/T20C006.htm.

If you have any questions, please contact Clint Marshall, Program Manager of the Mining Environmental Section, at (505) 827-0027.

Sincerely,

Clint Marshall

FOR Jerry Schoeppner, Chief
Ground Water Quality Bureau

JS:CLM

Enc: Applying for a Discharge Permit: General Information
Discharge Permit Application

cc: Michael Kesler, Acting District Manager, NMED District III (w/o enclosure)
James Hogan, Chief, SWQB (w/o enclosure)
NMED Carlsbad Field Office (w/o enclosure)
DP Required File

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
FEB 2 6 2013

GROUND WATER
FEB 2 7 2013
BUREAU

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Mining and Environmental Compliance Section
P.O. Box 26110
Santa Fe, NM 87502

Subject: Notice of Intent for the Proposed Surface Discharge of Water from the Pump Test at Well SNL-16

Dear Mr. Marshall:

The purpose of this letter is to provide the Notice of Intent Form including supporting information for the proposed one-time surface discharge of water from a pumping test at Well SNL-16 (OSE File # C-3220) for your review. It is our intent to obtain authorization to discharge and be exempt from the discharge permit application process for testing purposes. The test will be conducted by Sandia National Laboratories to study the hydrogeologic characteristics in the Culebra Member of the Rustler Formation in Nash Draw to the southwest of the WIPP site boundary. The total water pumped would be approximately 978,000 gallons (3 acre feet) over a 3-4 week time frame to test the double-porosity and unconfined responses of the Culebra at this location. The water will be dispersed from a temporary holding tank at a controlled rate to prevent erosion. The test is to be conducted during the current federal fiscal year.

Primary reasons for this request for a variance are the cost associated with storage and disposal of the generated water and risks associated with increased heavy traffic around the well and between the well and the disposal site. The cost would be approximately $800,000 to store, haul, and dispose of the water, while a one-time surface discharge would cost approximately $10,000. The increased traffic accident risk is associated with an estimated 180 round-trips to haul the water to an approved discharge site such as the H-19 evaporation pond near the WIPP facility.

The water quality in this well was sampled in 2006 following well completion activities and the main constituents are: Chloride: 8,600 mg/L, Sulfate: 2,500 mg/L, TDS: 18,000 mg/L. The water quality of the pumped water is expected to be similar to these values. The complete water quality data from SNL-16, photographs, and maps showing the surrounding area where the water would be discharged are part of the Notice of Intent.

CBFO:OESH:GTB:ANC:13-0717:UFC 5486.00

If you have any questions about this report or require any additional information, please contact Mr. George T. Basabilvazo at (575) 234-7488.

Sincerely,

George T. Basabilvazo for
Jose R. Franco, Manager
Carlsbad Field Office

Enclosure

CBFO:OESH:GTB:ANC:13-0717:UFC 5486.00

1. Name and mailing address of person proposing to discharge:

Jose Franco – Manager

U.S. Dept. of Energy – Carlsbad Field Office

P.O. Box 3090

Carlsbad, NM 88220

Work Phone: (575) 234-7300

Cell/Home Phone: NA

Fax: (575) 234-7027

Email: Jose.Franco@wipp.ws

2. Name of facility:

Waste Isolation Pilot Plant (WIPP), Monitoring Well SNL-16 (OSE# C-3220)

3. Physical location of discharge (if applicable, give street address, township, range, section, distance from closest town or landmark, directions to facility, location map):

SNL-16 is located in the Southeast quarter of Sec. 33, Twp. 22S, Rge. 30E. New Mexico State Plane (NAD27) coordinates are: 489396.00 North, 639328.28 East. UTM coordinates (NAD27, Zone 13): 605191.79 East, 3578999.71 North. See attached maps.

4. Type of operation generating the discharge (e.g., truck wash, food processing plant, restaurant, etc.):

Aquifer pumping test of the Culebra Member of the Rustler Formation.

5. Source(s) of the discharge. Describe how the wastewater, sludge, or other discharges processed and/or disposed at your facility are generated. Identify all sources. Attach additional pages if needed:

One-time discharge of water from the Culebra Member of the Rustler Formation derived from a pumping test in 2013, additional information attached.

6. Expected contaminants in the discharge (e.g., nitrate-nitrogen, metals, organic compounds, salts, etc.) Include estimated concentration if known, and copies of results of laboratory analyses, if available:

Main constituents of the discharge water would be Chloride: 8600 mg/L, Sulfate: 2500 mg/L, Calcium: 1400 mg/L, Sodium: 4400 mg/L, TDS: 18,000 mg/L. See additional information attached.

7. Describe all components of wastewater processing, treatment, storage, and disposal system (e.g., grease interceptor, lagoon, septic tank/leachfield, etc.) Include sizes, site layout map, plans and specifications, etc. if available:

A submersible pump will be placed in the well to bring the water to the surface where it will be held in a storage container, then discharged 350 feet to the west of the well pad through a pipe. The ground will be protected with rip-rap to prevent surface erosion. See additional details and photos below.

8. Estimated maximum daily discharge volume in gallons per day (or other units):

20-30 day test generating 3 acre feet (977,553 gallons), daily discharge estimated at 30,000-40,000 gallons per day

9. Estimated depth to ground water (ft): 193 ft below ground level (Culebra)

Signature: George T. Basabilvazo for J.F. **Date:** 2-25-13

Printed name: George T. Basabilvazo for J.F. **Title:** Director, ES&H

Please return this form to:
NMED Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, New Mexico 87502-5469

Telephone: 505-827-2900
Fax: 505-827-2965

Additional Information

A variance is being sought from obtaining a discharge permit to allow a one-time discharge to the surface surrounding WIPP monitoring well SNL-16 (OSE# C-3220). Sandia National Laboratories (SNL) would like to perform a large scale pumping test to study the Culebra Member of the Rustler Formation at this location. The well is located in the southeastern area of Nash Draw; approximately 3 miles west of the WIPP Site boundary (see Figure 1 below).

This test will focus on investigating the double-porosity and unconfined response in the Culebra at SNL-16. The double-porosity response typically occurs quickly (a few hours), while the unconfined response would likely occur over longer time scales (a few days). SNL is also hoping to collect geophysical data during the test (gravity and streaming potential), to maximize the value of this test. All these data together will help understand the nature of the Rustler and Culebra in Nash Draw, where there are many different processes going on. Understanding these processes will help answer questions about how connected the Culebra is to recharge in Nash Draw, which is a perennial WIPP stakeholder question.

The primary reason for the variance request is based on the cost of storage and disposal of generated water from this test. The current increase in oil and gas activity in southeast New Mexico has driven up the cost of the frac tanks used for holding the water and the trucking and disposal rates to dispose of water. The estimated cost to store and dispose of the 3 acre-feet of water is approximately $800,000 based on pricing from subcontractors. Being able to perform the surface discharge would cost approximately $10,000.

WIPP maintains a high level of safety standards for all projects and this test will be no exception. The primary safety concerns related to this test would be hauling and disposing of the water from the pad to a disposal location. Increased traffic and associated risk resulting from transporting water for disposition, estimated at 180 round-trips, could be eliminated with surface discharge authorization.

SNL-16 was rotary drilled and cored to a depth of 299.3 ft below ground level (bgl) to investigate the geology of this area. SNL-16 was completed in the Culebra Member with the screened interval at 193-217 feet bgl, Figure 2 below. Culebra transmissivity is expected to be relatively high due to the many fractures and vugular porosity that occur in this area. SNL-16 is in an area where the halite units in the Tamarisk and Forty-niner members have been dissolved and the mudflat facies remain. The Magenta Dolomite displays normal bedding and laminae, but the typically porous water bearing zone was not identifiable. No water was observed in the Magenta. The upper parts of the Rustler, Dewey Lake and Santa Rosa formations have been eroded in this location, see Table 1.

General chemistry samples were collected for this well by SNL on June 9, 2006 during development activities following well completion. The analytical results are summarized in Table 2 below and the complete data package is attached. The produced water from this test is expected to be of the same quality.

Table 1 – Geology at SNL-16

System/ Period/Epoch		Formation or unit	Member *Informal units*	Depth below surface (ft)[1] *log depths*	*core marks*
Cenozoic	Holocene	surface dune sand and pad fill		0 - 6 ft	
Cenozoic	Pleistocene	Mescalero caliche		6 ft - 10 ft	
Cenozoic	Miocene-Pleistocene	Gatuña		10 ft - 37 ft	36.3 ft - 37.6 ft
Mesozoic	Triassic	Santa Rosa[2]		eroded	
Mesozoic	Triassic	Dewey Lake[3]		eroded	
Paleozoic	Permian	Rustler	Forty-niner *A-5* *M-4/H-4* *A-4*	37 ft - 46 ft *eroded* *eroded* *37 ft - 46 ft*	37.6 ft - 44.4 ft *eroded* *eroded* *37.6 ft - 44.4 ft*
Paleozoic	Permian	Rustler	Magenta Dolomite	46 ft - 78 ft	
Paleozoic	Permian	Rustler	Tamarisk *A-3* *M-3/H-3* *A-2*	78 ft - 193 ft *78 ft - 170 ft* *170 ft - 186 ft* *186 ft - 193 ft*	*184 ft - 190.6 ft*
Paleozoic	Permian	Rustler	Culebra Dolomite	193 ft - 217 ft	190.6 ft - 215.3 ft
Paleozoic	Permian	Rustler	Los Medaños[4] *M-2/H-2* *A-1* *M-1/H-1*	217 ft - 299.3 ft *217 ft - 228 ft* *228 ft - 240 ft*	215.3 ft - 299.3 ft *215.3 ft - 226.2 ft* *226.2 ft - 239 ft* *239 ft - 299.3 ft* [5]

Table 2 – SNL-16 Water Quality

Parameter	Concentration	Parameter	Concentration
Chloride	8,600 mg/L	Magnesium	430 mg/L
Fluoride	2.5 mg/L	Potassium	290 mg/L
Sulfate	2,500 mg/L	Sodium	440 mg/L
Calcium	1,400 mg/L	pH	7.19
Iron	0.024 mg/L	Total Dissolved Solids	18,000 mg/L

The planned test will be 20-30 days of pumping generating no more than 3 acre-feet (977,553 gallons) of water. The Culebra at this location is expected to support a continuous pumping rate of 20-30 gallons per minute, although previous testing indicates the potential to pump at a higher rate during shorter periods. The pumping strategy may be adjusted to a series of high rate, short time events instead of one long term steady pump rate event. Water will be held on the surface for a short time then discharged to the surrounding area through a series of pipes to prevent erosion to the surface. This method of discharge was used during a similar large scale pump test in 2012 and the water flowed for approximately 200 feet with no erosion to the surface.

An assessment of the area surrounding the well pad revealed a natural drainage channel about 50 feet north of the pad that would provide a route to place the discharge pipe, Figure 3. This drainage feature extends about 400 yards to the west of the well, eventually running into a culvert at the railroad tracks to the southwest, Figure 4. A drainage line will be placed from the storage tank on the north end of the pad, through a culvert under Nash Draw Road (Figure 4), and out to a discharge point 350 feet west of the pad. Rip-rap will be used to prevent surface erosion at the discharge location.

Figure 1 – SNL-16 General Location

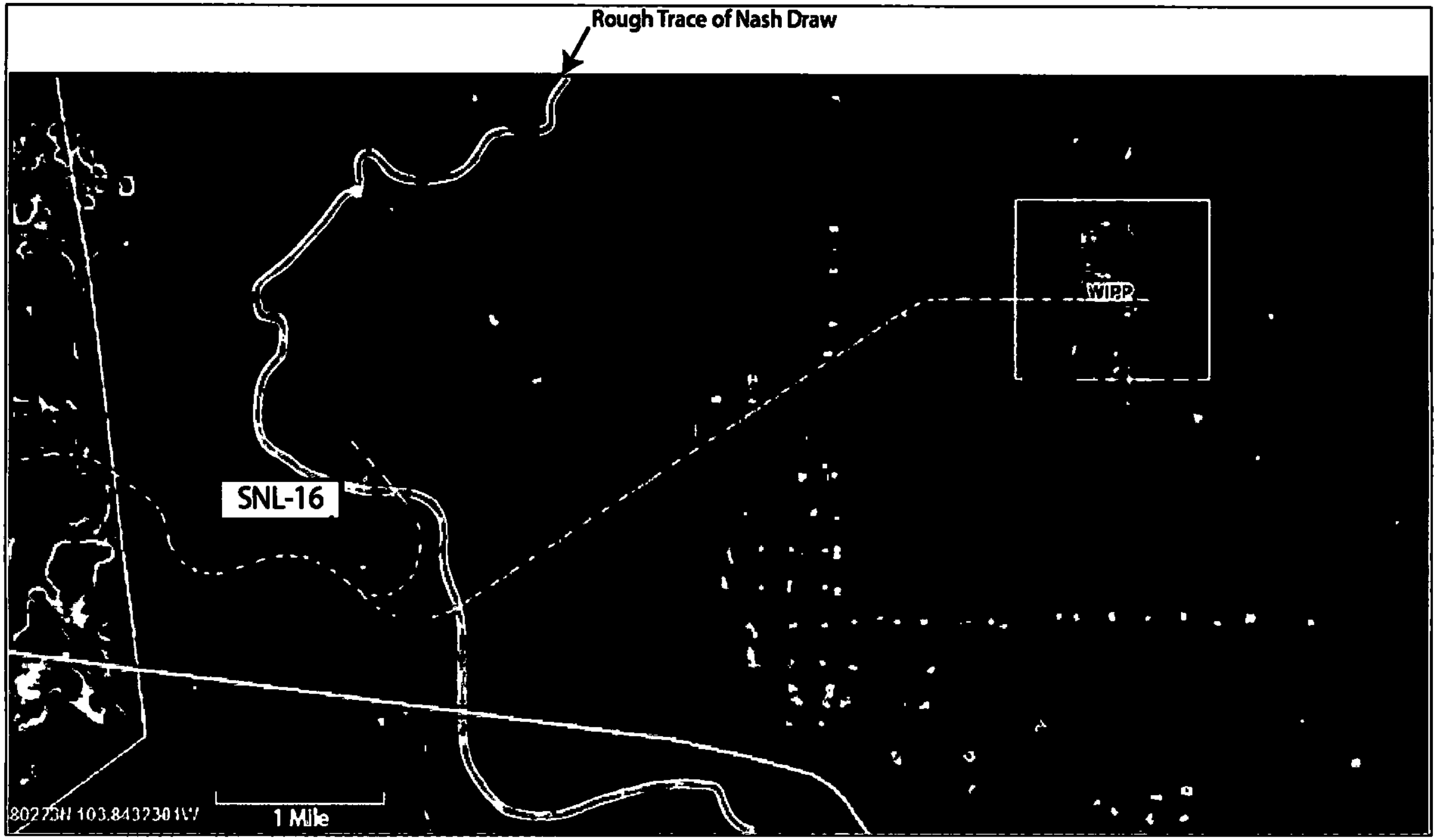
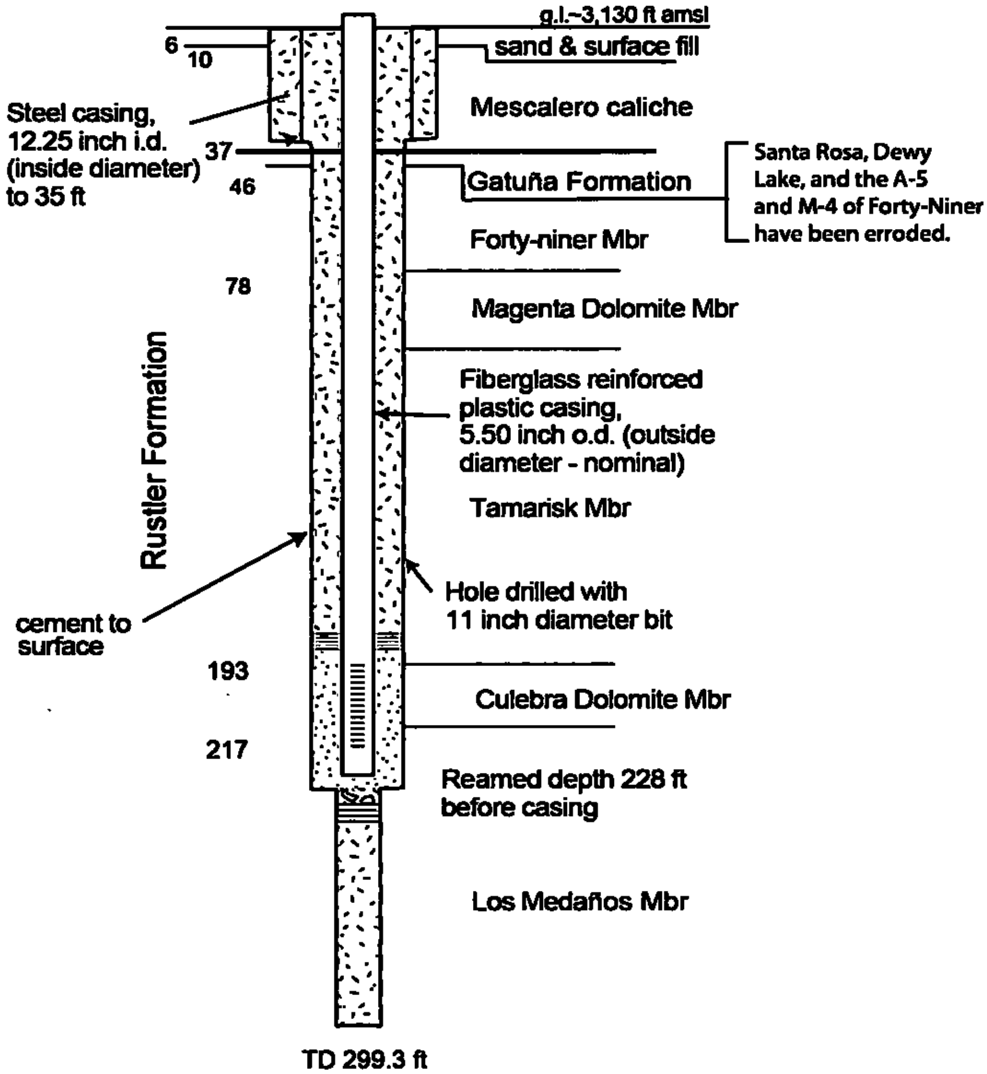
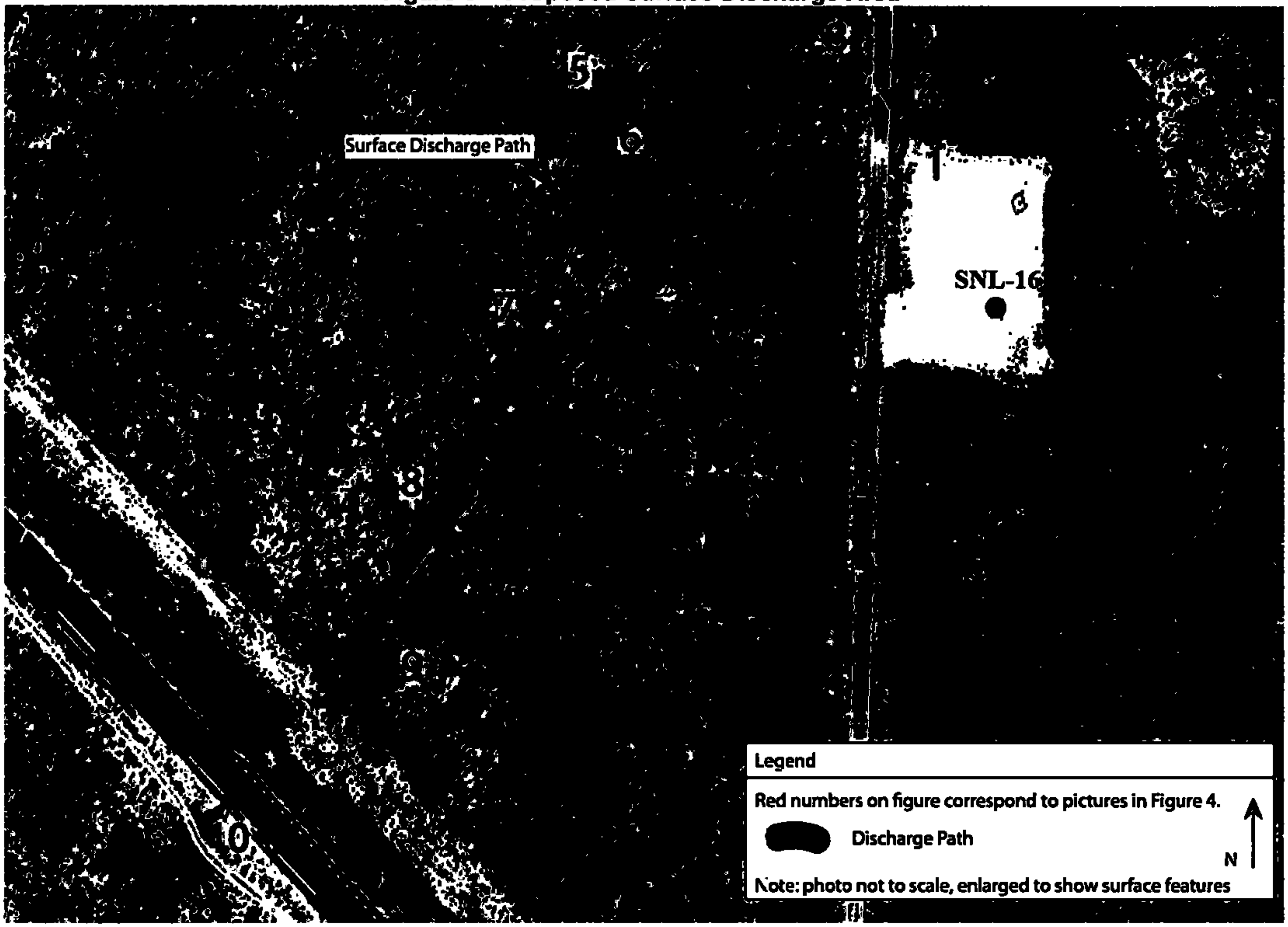


Figure 2 – SNL-16 As-Built Diagram



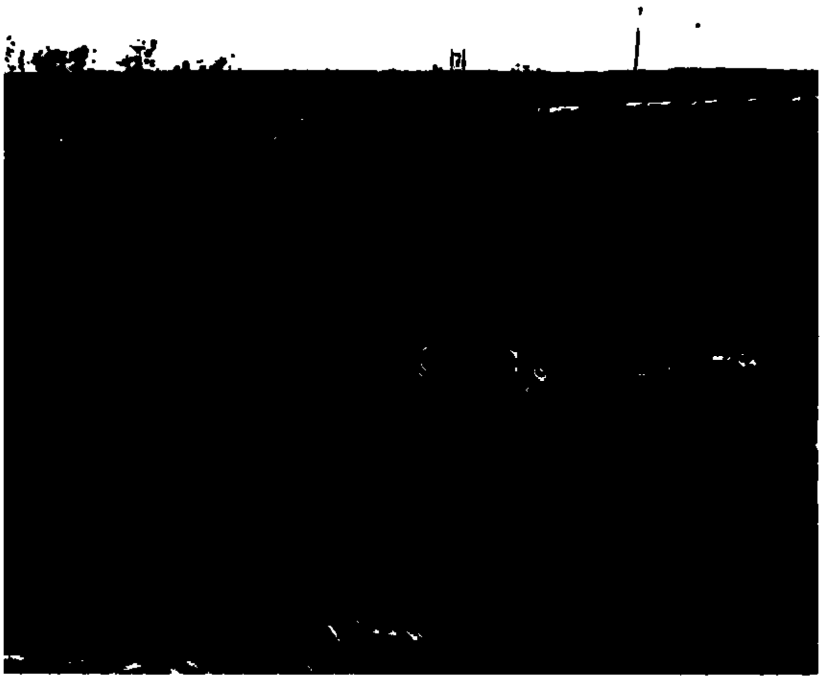
Note: Depths for drilling, geophysical logs, and completion are referenced to the top of the steel connector on the surface conductor casing, which is at the surface of the drilling pad at SNL-16 and is taken as 3,130 ft amsl.

Figure 3 – Proposed Surface Discharge Area



02316

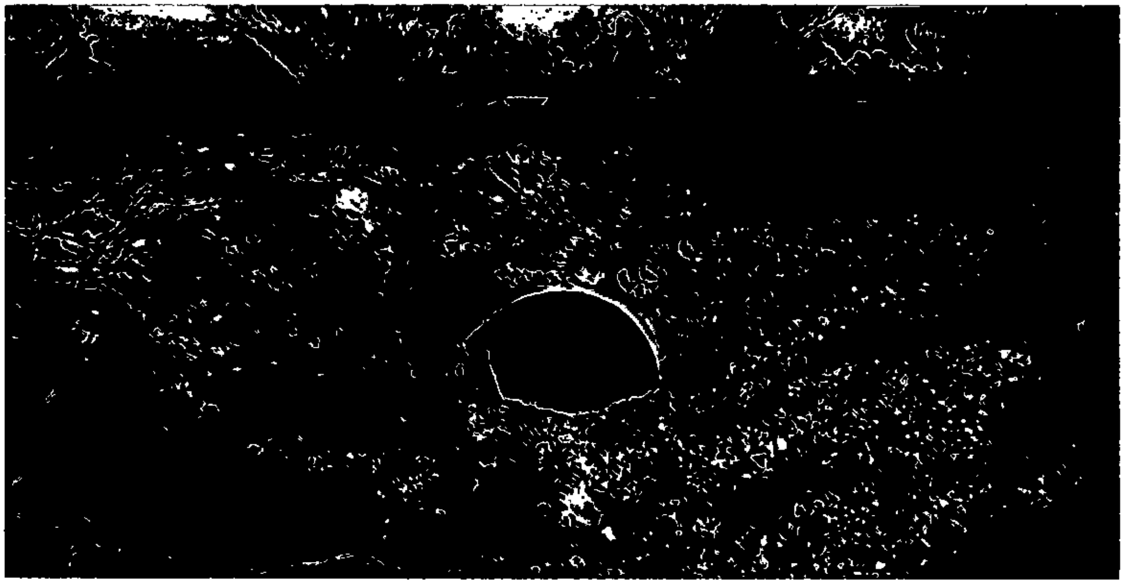
Figure 4 – Discharge Path Photos



1 **View from SNL-16 pad to culvert under road.**

2 **View of culvert from east side of road.**

Figure 4 – Discharge Path Photos (con't)



3 View of culvert from west side of road.

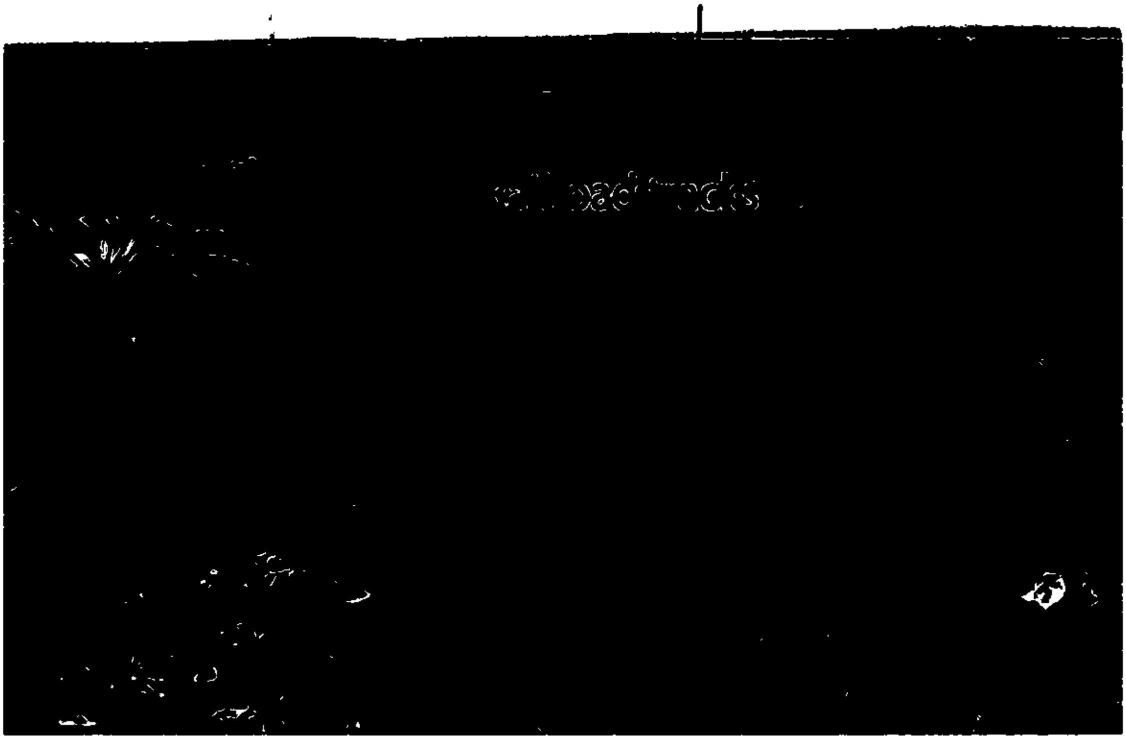
4 View from culvert west of the road.

Figure 4 – Discharge Path Photos (con't)

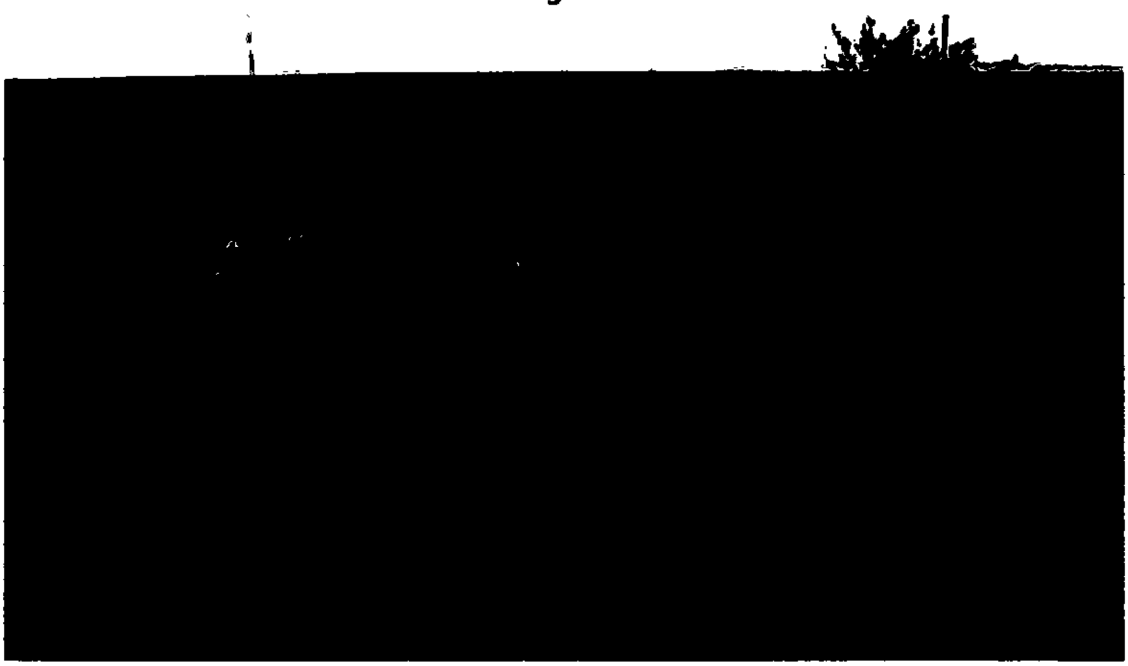
5 Proposed discharge location, approximately 350 feet west of SNL-16 well pad.

6 View to the southwest from the discharge location.

Figure 4 – Discharge Path Photos (con't)



7 View towards railroad tracks southwest of discharge location.



8 Drainage area approximately 200 yards from discharge location.

Figure 4 – Discharge Path Photos (con't)

9 View of north side of railroad tracks, possible end of drainage path.

10 View from railroad tracks back toward SNL-16.

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

Wednesday, July 05, 2006

Rick Beauheim
Sandia National Lab
4100 National Parks Hwy.
MS1395
Carlsbad, NM 88220

TEL: (505) 234-0006
FAX (505) 234-0061

RE: WIPP

Order No.: 0606131

Dear Rick Beauheim:

Hall Environmental Analysis Laboratory, Inc. received 1 sample(s) on 6/13/2006 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

AZ license # AZ0682
ORELAP Lab # NM100001

Hall Environmental Analysis Laboratory, Inc.

Date: *05-Jul-06*

CLIENT:	Sandia National Lab	**Client Sample ID:**	SNL-16(C)_060906
Lab Order:	0606131	**Collection Date:**	6/9/2006 1:59:00 PM
Project:	WIPP	**Date Received:**	6/13/2006
Lab ID:	0606131-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: MAP
Bromide	ND	5.0		mg/L	10	6/20/2006 7:51:27 AM
Chloride	8600	50		mg/L	500	6/21/2006 10:40:11 PM
Fluoride	2.5	1.0		mg/L	10	6/20/2006 7:51:27 AM
Nitrate (As N)+Nitrite (As N)	ND	5.0		mg/L	50	6/29/2006 8:24:50 AM
Phosphorus, Orthophosphate (As P)	ND	5.0		mg/L	10	6/20/2006 7:51:27 AM
Sulfate	2500	25		mg/L	50	6/20/2006 8:08:52 AM
EPA METHOD 6010/6020: DISS METALS						Analyst: NMO
Calcium	1400	100		mg/L	100	6/23/2006 10:34:57 AM
Iron	0.024	0.020		mg/L	1	6/23/2006 10:21:15 AM
Magnesium	430	100		mg/L	100	6/23/2006 10:34:57 AM
Potassium	290	100		mg/L	100	6/23/2006 10:34:57 AM
Sodium	4400	100		mg/L	100	6/23/2006 10:34:57 AM
EPA METHOD 310.1: ALKALINITY						Analyst: ks
Alkalinity, Total (As CaCO3)	97	2.0		mg/L CaCO3	1	6/22/2006
Carbonate	ND	2.0		mg/L CaCO3	1	6/22/2006
Bicarbonate	97	2.0		mg/L CaCO3	1	6/22/2006
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: TES
Specific Conductance	35000	0.10		µmhos/cm	10	6/30/2006
EPA METHOD 150.1: PH						Analyst: ks
pH	7.19	0.010		pH units	1	6/14/2006
EPA METHOD 160.1: TDS						Analyst: ks
Total Dissolved Solids	18000	20		mg/L	1	6/13/2006

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

LABORATORY ANALYTICAL REPORT

Client: Hall Environmental
Project: 0606131
Lab ID: C06060752-001
Client Sample ID: SNL-16 (C)_060906

Report Date: 06/23/06
Collection Date: 06/09/06 13:59
Date Received: 06/14/06
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - DISSOLVED							
Strontium	18.2	mg/L		0.1		SW6020	06/21/06 07:43 / bws

Report Definitions: RL - Analyte reporting limit. QCL - Quality control limit. MCL - Maximum contaminant level. ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Hall Environmental
Project: 0606131

Report Date: 06/23/06
Work Order: C06060752

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Batch: R67870
Sample ID: LRB	Method Blank				Run: ICPMS1-C_060620A				06/21/06 03:07
Strontium	ND	mg/L	3E-05						
Sample ID: LFB	Laboratory Fortified Blank				Run: ICPMS1-C_060620A				06/21/06 03:15
Strontium	0.0512	mg/L	0.10	102	75	125			
Sample ID: C06060736-001FMS4	Post Digestion Spike				Run: ICPMS1-C_060620A				06/21/06 03:37
Strontium	9.59	mg/L	0.10		75	125			A
Sample ID: C06060736-001FMSD4	Post Digestion Spike Duplicate				Run: ICPMS1-C_060620A				06/21/06 03:44
Strontium	9.85	mg/L	0.10		75	125	2.6	20	A

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

CATION/ANION BALANCE SHEET FOR WATER ANALYSES

HEAL LAB NUMBER	SNL-16(C)_060906 0606131-1											
CATIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L
Sodium	4400	191.39										
Potassium	290	7.42										
Calcium	1400	69.86										
Magnesium	430	35.39										
Total Cations		304.06										
ANIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L
Sulfate	2500	52.05										
Chloride	8600	242.60										
Bicarbonate (CaCO3)	97	1.94										
Carbonate (CaCO3)	ND	*										
Phosphate (P)	ND	*										
Nitrite (N)	ND	*										
Nitrate (N)	ND	*										
Fluoride	2.5	0.13										
Bromide	ND	*										
Total Anions		296.72										
Elect. Cond. (µMhos/cm)	35000											
CATION/ANION RATIO		1.02										
% Difference		1										
TOTAL DISSOLVED SOLIDS RATIOS												
TDS (measured)	18000											
TDS (calculated)	17681											
Ratio meas TDS:calc TDS		1.0										
Ratio Meas. TDS:EC		0.51										
Ratio Calc. TDS:EC		0.51										
Ratio of anion sum:EC		0.8										
Ratio of cation sum:EC		0.9										

* Analyte not detected (below method detection limit).

** Values below 0.55 can be obtained in waters containing appreciable concentrations of free acid or alkalinity, or not within pH 6 to 9. Values much higher than 0.7 are possible in highly saline waters.

GENERALLY ACCEPTED RANGES

Cation/Anion balance: 0-3 meq/L- 0.2 meq/L, 3-10 meq/L- 2%, >10 meq/L - 5%

Ratio measured TDS:calculated TDS – 1.0-1.2. Ratio Calculated TDS:EC – 0.55-0.7. Ratio Measured TDS:EC–0.55-0.7. Ratio of anion sum:EC – 0.9-1.1.

Ratio of cation sum:EC – 0.9-1.1

QA/QC SUMMARY REPORT

Client: Sandia National Lab
Project: WIPP
Work Order: 0606131

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: E300								Batch ID:	R19622
Sample ID: MBLK		*MBLK*						Analysis Date:	6/13/2006
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*						Analysis Date:	6/19/2006
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*						Analysis Date:	6/19/2006
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*						Analysis Date:	6/21/2006
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*						Analysis Date:	6/20/2006
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*						Analysis Date:	6/28/2006
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*						Analysis Date:	6/28/2006
Fluoride	ND	mg/L	0.10						

Qualifiers:

- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc. Date: *05-Jul-06*

QA/QC SUMMARY REPORT

Client: Sandia National Lab
Project: WIPP
Work Order: 0606131

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: E300									Batch ID: R19622
Sample ID: MBLK		*MBLK*							Analysis Date: 6/28/2006
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: LCS ST300-06007		*LCS*							Analysis Date: 6/13/2006
Fluoride	0.5098	mg/L	0.10	102	90	110			
Chloride	4.761	mg/L	0.10	95.2	90	110			
Bromide	2.472	mg/L	0.10	98.9	90	110			
Nitrate (As N)+Nitrite (As N)	3.401	mg/L	0.10	97.2	90	110			
Phosphorus, Orthophosphate (As P)	4.950	mg/L	0.50	99.0	90	110			
Sulfate	9.771	mg/L	0.50	97.7	90	110			
Sample ID: LCS ST300-06007		*LCS*							Analysis Date: 6/19/2006
Fluoride	0.4988	mg/L	0.10	99.8	90	110			
Chloride	4.817	mg/L	0.10	96.3	90	110			
Bromide	2.500	mg/L	0.10	100	90	110			
Nitrate (As N)+Nitrite (As N)	3.422	mg/L	0.10	97.8	90	110			
Phosphorus, Orthophosphate (As P)	4.892	mg/L	0.50	97.8	90	110			
Sulfate	9.841	mg/L	0.50	98.4	90	110			
Sample ID: LCS ST300-06007		*LCS*							Analysis Date: 6/19/2006
Fluoride	0.4929	mg/L	0.10	98.6	90	110			
Chloride	4.872	mg/L	0.10	97.4	90	110			
Bromide	2.495	mg/L	0.10	99.8	90	110			
Nitrate (As N)+Nitrite (As N)	3.465	mg/L	0.10	99.0	90	110			
Phosphorus, Orthophosphate (As P)	5.008	mg/L	0.50	100	90	110			
Sulfate	10.04	mg/L	0.50	100	90	110			
Sample ID: LCS ST300-06008		*LCS*							Analysis Date: 6/21/2006
Fluoride	0.5090	mg/L	0.10	102	90	110			
Chloride	4.760	mg/L	0.10	95.2	90	110			
Bromide	2.513	mg/L	0.10	101	90	110			
Nitrate (As N)+Nitrite (As N)	3.474	mg/L	0.10	99.3	90	110			
Phosphorus, Orthophosphate (As P)	4.898	mg/L	0.50	98.0	90	110			
Sulfate	9.776	mg/L	0.50	97.8	90	110			
Sample ID: LCS ST300-06007		*LCS*							Analysis Date: 6/20/2006
Fluoride	0.4991	mg/L	0.10	99.8	90	110			
Chloride	4.898	mg/L	0.10	98.0	90	110			
Bromide	2.530	mg/L	0.10	101	90	110			
Nitrate (As N)+Nitrite (As N)	3.481	mg/L	0.10	99.5	90	110			
Phosphorus, Orthophosphate (As P)	5.072	mg/L	0.50	101	90	110			
Sulfate	10.01	mg/L	0.50	100	90	110			
Sample ID: LCS ST300-06008		*LCS*							Analysis Date: 6/28/2006
Fluoride	0.4778	mg/L	0.10	95.6	90	110			
Chloride	4.840	mg/L	0.10	96.8	90	110			

Qualifiers:

- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Sandia National Lab
Project: WIPP   **Work Order:** 0606131

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: E300									Batch ID: R19622
Sample ID: LCS ST300-06008		LCS							Analysis Date: 6/28/2006
Bromide	2.549	mg/L	0.10	102	90	110			
Nitrate (As N)+Nitrite (As N)	3.432	mg/L	0.10	98.0	90	110			
Phosphorus, Orthophosphate (As P)	4.860	mg/L	0.50	97.2	90	110			
Sulfate	9.908	mg/L	0.50	99.1	90	110			
Sample ID: LCS ST300-06008		LCS							Analysis Date: 6/28/2006
Fluoride	0.5002	mg/L	0.10	100	90	110			
Chloride	4.896	mg/L	0.10	97.9	90	110			
Bromide	2.592	mg/L	0.10	104	90	110			
Nitrate (As N)+Nitrite (As N)	3.498	mg/L	0.10	100	90	110			
Phosphorus, Orthophosphate (As P)	5.010	mg/L	0.50	100	90	110			
Sulfate	10.09	mg/L	0.50	101	90	110			
Method: E310.1									Batch ID: R19666
Sample ID: MB		MBLK							Analysis Date: 6/22/2006
Alkalinity, Total (As CaCO3)	2.000	mg/L CaC	2.0						
Carbonate	ND	mg/L CaC	2.0						
Bicarbonate	2.000	mg/L CaC	2.0						
Method: SW6010A									Batch ID: R19682
Sample ID: MB		MBLK							Analysis Date: 6/23/2006
Calcium	ND	mg/L	1.0						
Iron	ND	mg/L	0.020						
Magnesium	ND	mg/L	1.0						
Potassium	ND	mg/L	1.0						
Sodium	ND	mg/L	1.0						
Sample ID: LCS		LCS							Analysis Date: 6/23/2006
Calcium	45.44	mg/L	1.0	90.0	80	120			
Iron	0.4932	mg/L	0.020	98.6	80	120			
Magnesium	45.60	mg/L	1.0	90.3	80	120			
Potassium	49.73	mg/L	1.0	90.0	80	120			
Sodium	48.70	mg/L	1.0	96.4	80	120			
Method: E160.1									Batch ID: 10612
Sample ID: MB-10612		MBLK							Analysis Date: 6/13/2006
Total Dissolved Solids	ND	mg/L	20						
Sample ID: LCS-10612		LCS							Analysis Date: 6/13/2006
Total Dissolved Solids	971.0	mg/L	20	97.1	80	120			

Qualifiers:

- E   Value above quantitation range
- J   Analyte detected below quantitation limits
- R   RPD outside accepted recovery limits
- H   Holding times for preparation or analysis exceeded
- ND   Not Detected at the Reporting Limit
- S   Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name SANDIA CARLSBAD | Date and Time Received: 6/13/2006

Work Order Number 0606131 | Received by GLS

Checklist completed by [signature] 6-13-06
Signature | Date

Matrix | Carrier name FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐	Not Shipped ☐
Custody seals intact on sample bottles?	Yes ☑	No ☐	N/A ☐	
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Water - VOA vials have zero headspace?	No VOA vials submitted ☑	Yes ☐	No ☐	
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐	

Container/Temp Blank temperature? 3° *4°C ± 2 Acceptable*
If given sufficient time to cool.

COMMENTS:

Client contacted ____________ Date contacted: ____________ Person contacted ____________

Contacted by: ____________ Regarding ____________

Comments: ____________

Corrective Action ____________

CHAIN-OF-CUSTODY RECORD

Accreditation Applied:

NELAC ☐ USACE ☐

Other:

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

Client: Sandia National Labs (David Chace)

Address: 4100 National Parks Hwy Carlsbad, NM 88220

Phone #: 505-234-0065

Fax #: 505-234-0061

Project Name: WIPP

Project #: 97695/1.4.2.3

Project Manager: Rick Beauheim

Sampler: DeYonge/Toll

Sample Temperature: 3°

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative: None $HgCl_2$	Preservative: HNO_3	Preservative: H_2SO_4	HEAL No. 0606131	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO_3, NO_2, PO_4, SO_4)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)	Cation/Anion Balance	Dissolved Iron	pH	Strontium	Air Bubbles or Headspace (Y or N)
6/9/06	1359	H_2O	SNL-16(C)_060906	1/500mL	X			1													X	X	X	X	
6/9/06	1359	H_2O	SNL-16(C)_060906	2/500mL			X	1													X	X	X	X	
6/~~4~~ 9/06	1359	H_2O	SNL-16(C)_060906	3/125mL		X		1													X	X	X	X	
6/~~4~~ 9/06	1359	H_2O	SNL-16(C)_060906	4/125mL		X		1													X	X	X	X	
End of Samples																									

Number/Volume note: and 6/13

Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)
6/12/06	1230	Wesley J. DeYonge	[signature] 6-13-06 1055
Date:	Time:	Relinquished By: (Signature)	Received By: (Signature)

Remarks:
- Samples #3 and #4 Filtered
- Samples may contain high salts

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Appendix A

ACTIVITY/ PROJECT SPECIFIC PROCEDURE Sandia National Laboratories	Chain of Custody	Form Number: SP 13-1-1 Page ____ of ____ Attach more forms as needed

1. **Initial Sample Custodian** Wesley F. DeYonge (Printed Name) Organization: 6822 Date: 6/9/06

2. **Sample Collection or Creation Information** Scientific Notebook ID: WSWT-08
Test Plan ID: TP 03-01 Field Log ID: N/A
Sample Location: WIPP Monitoring Well SNL-16 (i.e. borehole/core no./lab bldg. no./etc...)

Sample Team Members/Organization.
Wesley F. DeYonge / 6822-RESPEC
Nate J. Toll / 6822
enter n/a if none

3. Sample Identification Sample/Sub-Sample #	Date Collected	Container Type	Container Volume	Preser-vative	Analysis Request	Sample Description
SNL-16(C)_060906	6/09/06	PE Bottle	500 mL	N/A	Cation/Anion Bal,	SNL-16 Culebra (C) Water Sample- Unpreserved
SNL-16(C)_060906	6/09/06	PE Bottle	500 mL	H2SO4	Dissolved Iron,	SNL-16 (C) Water Sample- Preserved w/ Sulfuric Acid
SNL-16(C)_060906	6/09/06	PE Bottle	125 mL	HNO3	Strontium,	SNL-16 (C) Water Sample- Filtered/Preserved w/Nitric Acid
SNL-16(C)_060906	6/09/06	PE Bottle	125 mL	HNO3	and pH	SNL-16 (C) Water Sample- Filtered/Preserved w/Nitric Acid
END OF SAMPLE LIST						

enter n/a if none

4. **Sample Requirements**

Handling: Keep Sealed Until Use
Storage & Preservation: Keep Chilled / Refrigerated
Shipping: Hand Carry / Federal Express
Archive: N/A
Disposition: Dispose of as Non-hazardous Waste
Expiration Date: 7/09/2006

5. Custody Transfer	Printed Name	Signature	Organization/Company	Date-Time	Sample Condition
a. Relinquished by:	Wesley F. DeYonge	Wesley F. DeYonge	6822-RESPEC	6/12/06 12:30	Containers Intact & Sealed
a. Received by:					
b. Relinquished by:					
b. Received by:					
c. Relinquished by:					
c. Received by:					

Upon sample receipt, note condition. This form (copy for your records) shall follow samples through its life, until final disposition, then send original to WIPP Records Center. For samples that are potentially hazardous & require packaging and shipping, contact Center 6800 ES&H Coordinator or see SNL ES&H Manual, Chpt. 12.

New Mexico Environment Department
Ground Water Quality Bureau

Ground Water Quality Bureau – Pollution Prevention Section Notice of Intent

1. Name and mailing address of person proposing to discharge:

Jose Franco – Manager

U.S. Dept. of Energy – Carlsbad Field Office

P.O. Box 3090

Carlsbad, NM 88220

Work Phone: (575) 234-7300

Cell/Home Phone: NA

Fax: (575) 234-7027

Email: Jose.Franco@wipp.ws

2. Name of facility:

Waste Isolation Pilot Plant (WIPP), Monitoring Well SNL-16 (OSE# C-3220)

3. Physical location of discharge (if applicable, give street address, township, range, section, distance from closest town or landmark, directions to facility, location map):

SNL-16 is located in the Southeast quarter of Sec. 33, Twp. 22S, Rge. 30E. New Mexico State Plane (NAD27) coordinates are: 489396.00 North, 639328.28 East. UTM coordinates (NAD27, Zone 13): 605191.79 East, 3578999.71 North. See attached maps.

4. Type of operation generating the discharge (e.g., truck wash, food processing plant, restaurant, etc.):

Aquifer pumping test of the Culebra Member of the Rustler Formation.

5. Source(s) of the discharge. Describe how the wastewater, sludge, or other discharges processed and/or disposed at your facility are generated. Identify all sources. Attach additional pages if needed:

One-time discharge of water from the Culebra Member of the Rustler Formation derived from a pumping test in 2013, additional information attached.

6. Expected contaminants in the discharge (e.g., nitrate-nitrogen, metals, organic compounds, salts, etc.) Include estimated concentration if known, and copies of results of laboratory analyses, if available:

Main constituents of the discharge water would be Chloride: 8600 mg/L, Sulfate: 2500 mg/L, Calcium: 1400 mg/L, Sodium: 4400 mg/L, TDS: 18,000 mg/L. See additional information attached.

7. Describe all components of wastewater processing, treatment, storage, and disposal system (e.g., grease interceptor, lagoon, septic tank/leachfield, etc.) Include sizes, site layout map, plans and specifications, etc. if available:

A submersible pump will be placed in the well to bring the water to the surface where it will be held in a storage container, then discharged 350 feet to the west of the well pad through a pipe. The ground will be protected with rip-rap to prevent surface erosion. See additional details and photos below.

8. Estimated maximum daily discharge volume in gallons per day (or other units):

20-30 day test generating 3 acre feet (977,553 gallons), daily discharge estimated at 30,000-40,000 gallons per day

9. Estimated depth to ground water (ft): 193 ft below ground level (Culebra)

Signature: George T. Basabilvazo for J.F. Date: 2-25-13

Printed name: George T. Basabilvazo for J.F. Title: Director, ES&H

<u>Please return this form to:</u>
NMED Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, New Mexico 87502-5469

Telephone: 505-827-2900
Fax: 505-827-2965

Additional Information

A variance is being sought from obtaining a discharge permit to allow a one-time discharge to the surface surrounding WIPP monitoring well SNL-16 (OSE# C-3220). Sandia National Laboratories (SNL) would like to perform a large scale pumping test to study the Culebra Member of the Rustler Formation at this location. The well is located in the southeastern area of Nash Draw; approximately 3 miles west of the WIPP Site boundary (see Figure 1 below).

This test will focus on investigating the double-porosity and unconfined response in the Culebra at SNL-16. The double-porosity response typically occurs quickly (a few hours), while the unconfined response would likely occur over longer time scales (a few days). SNL is also hoping to collect geophysical data during the test (gravity and streaming potential), to maximize the value of this test. All these data together will help understand the nature of the Rustler and Culebra in Nash Draw, where there are many different processes going on. Understanding these processes will help answer questions about how connected the Culebra is to recharge in Nash Draw, which is a perennial WIPP stakeholder question.

The primary reason for the variance request is based on the cost of storage and disposal of generated water from this test. The current increase in oil and gas activity in southeast New Mexico has driven up the cost of the frac tanks used for holding the water and the trucking and disposal rates to dispose of water. The estimated cost to store and dispose of the 3 acre-feet of water is approximately $800,000 based on pricing from subcontractors. Being able to perform the surface discharge would cost approximately $10,000.

WIPP maintains a high level of safety standards for all projects and this test will be no exception. The primary safety concerns related to this test would be hauling and disposing of the water from the pad to a disposal location. Increased traffic and associated risk resulting from transporting water for disposition, estimated at 180 round-trips, could be eliminated with surface discharge authorization.

SNL-16 was rotary drilled and cored to a depth of 299.3 ft below ground level (bgl) to investigate the geology of this area. SNL-16 was completed in the Culebra Member with the screened interval at 193-217 feet bgl, Figure 2 below. Culebra transmissivity is expected to be relatively high due to the many fractures and vugular porosity that occur in this area. SNL-16 is in an area where the halite units in the Tamarisk and Forty-niner members have been dissolved and the mudflat facies remain. The Magenta Dolomite displays normal bedding and laminae, but the typically porous water bearing zone was not identifiable. No water was observed in the Magenta. The upper parts of the Rustler, Dewey Lake and Santa Rosa formations have been eroded in this location, see Table 1.

General chemistry samples were collected for this well by SNL on June 9, 2006 during development activities following well completion. The analytical results are summarized in Table 2 below and the complete data package is attached. The produced water from this test is expected to be of the same quality.

Table 1 – Geology at SNL-16

System/ Period/Epoch		Formation or unit	Member *Informal units*	Depth below surface (ft)[1] *log depths*	*core marks*
Cenozoic	Holocene	surface dune sand and pad fill		0 - 6 ft	
	Pleistocene	Mescalero caliche		6 ft - 10 ft	
	Miocene-Pleistocene	Gatuña		10 ft - 37 ft	36.3 ft - 37.6 ft
Mesozoic	Triassic	Santa Rosa[2]		eroded	
		Dewey Lake[3]		eroded	
Paleozoic	Permian	Rustler	Forty-niner *A-5* *M-4/H-4* *A-4*	37 ft - 46 ft *eroded* *eroded* *37 ft - 46 ft*	37.6 ft - 44.4 ft *eroded* *eroded* *37.6 ft - 44.4 ft*
			Magenta Dolomite	46 ft - 78 ft	
			Tamarisk *A-3* *M-3/H-3* *A-2*	78 ft - 193 ft *78 ft - 170 ft* *170 ft - 186 ft* *186 ft - 193 ft*	 *184 ft - 190.6 ft*
			Culebra Dolomite	193 ft - 217 ft	190.6 ft - 215.3 ft
			Los Medaños[4] *M-2/H-2* *A-1* *M-1/H-1*	217 ft - 299.3 ft *217 ft - 228 ft* *228 ft - 240 ft*	215.3 ft - 299.3 ft *215.3 ft - 226.2 ft* *226.2 ft - 239 ft* *239 ft - 299.3 ft* [5]

Table 2 – SNL-16 Water Quality

Parameter	Concentration	Parameter	Concentration
Chloride	8,600 mg/L	Magnesium	430 mg/L
Fluoride	2.5 mg/L	Potassium	290 mg/L
Sulfate	2,500 mg/L	Sodium	440 mg/L
Calcium	1,400 mg/L	pH	7.19
Iron	0.024 mg/L	Total Dissolved Solids	18,000 mg/L

The planned test will be 20-30 days of pumping generating no more than 3 acre-feet (977,553 gallons) of water. The Culebra at this location is expected to support a continuous pumping rate of 20-30 gallons per minute, although previous testing indicates the potential to pump at a higher rate during shorter periods. The pumping strategy may be adjusted to a series of high rate, short time events instead of one long term steady pump rate event. Water will be held on the surface for a short time then discharged to the surrounding area through a series of pipes to prevent erosion to the surface. This method of discharge was used during a similar large scale pump test in 2012 and the water flowed for approximately 200 feet with no erosion to the surface.

An assessment of the area surrounding the well pad revealed a natural drainage channel about 50 feet north of the pad that would provide a route to place the discharge pipe, Figure 3. This drainage feature extends about 400 yards to the west of the well, eventually running into a culvert at the railroad tracks to the southwest, Figure 4. A drainage line will be placed from the storage tank on the north end of the pad, through a culvert under Nash Draw Road (Figure 4), and out to a discharge point 350 feet west of the pad. Rip-rap will be used to prevent surface erosion at the discharge location.

Figure 1 – SNL-16 General Location

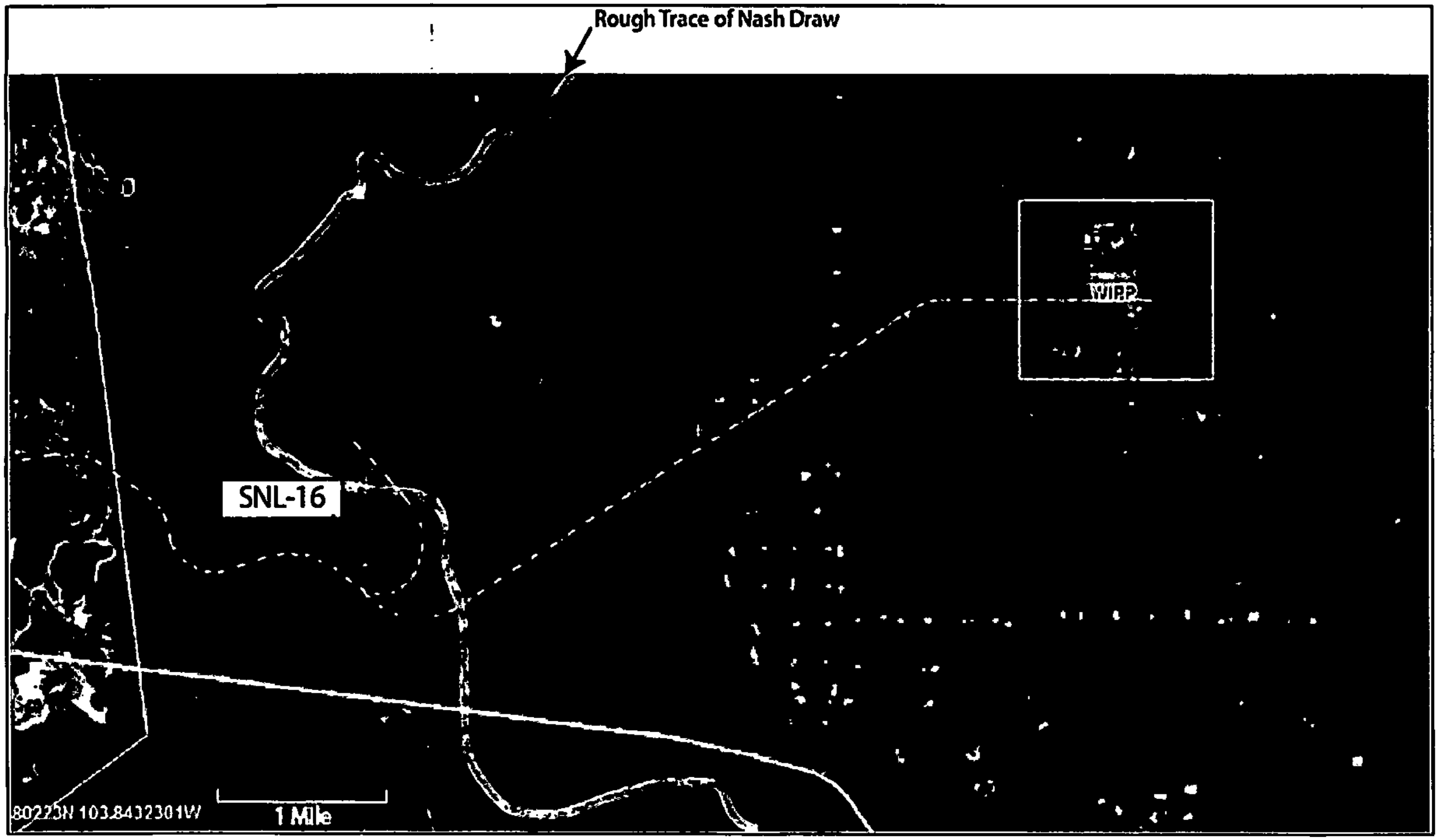
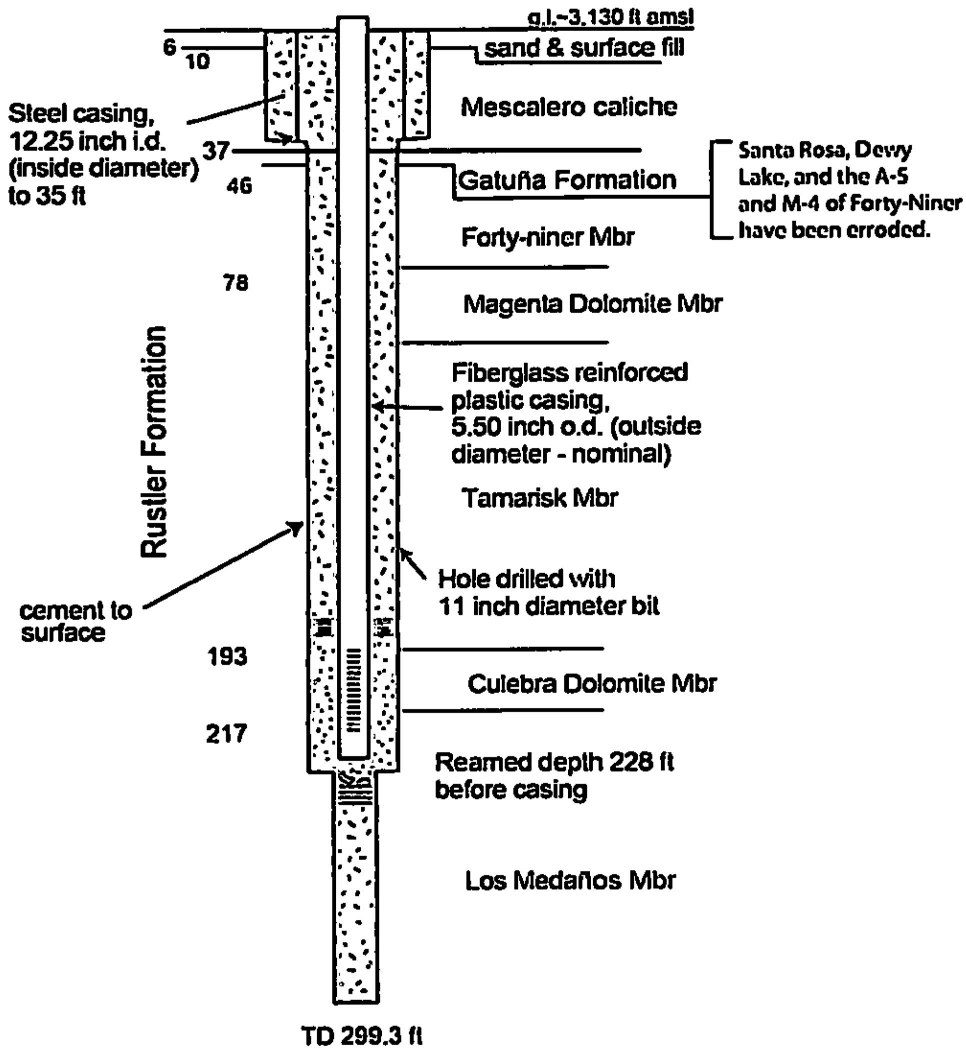


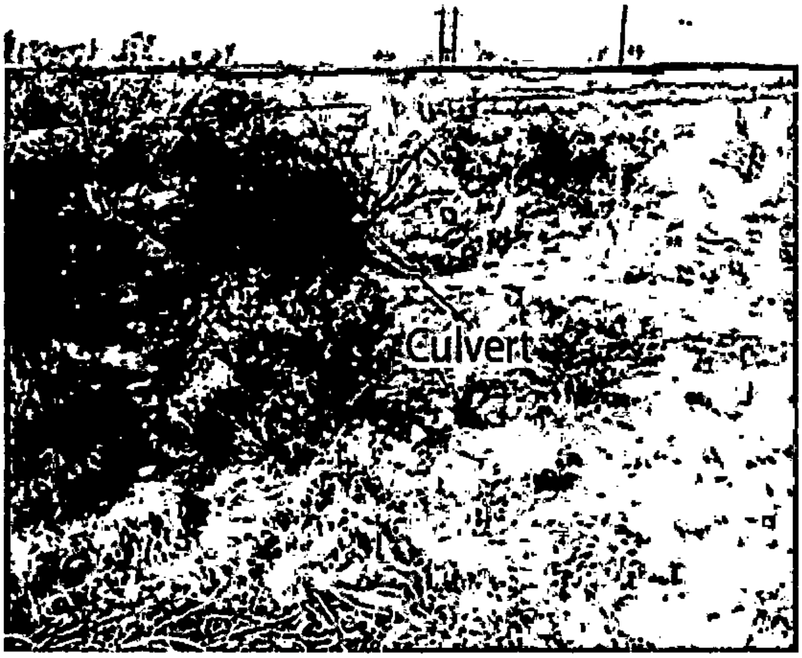
Figure 2 – SNL-16 As-Built Diagram



Note: Depths for drilling, geophysical logs, and completion are referenced to the top of the steel connector on the surface conductor casing, which is at the surface of the drilling pad at SNL-16 and is taken as 3,130 ft amsl.

Figure 3 – Proposed Surface Discharge Area

Figure 4 – Discharge Path Photos



1 View from SNL-16 pad to culvert under road.

2 View of culvert from east side of road.

Figure 4 – Discharge Path Photos (con't)

3 View of culvert from west side of road.

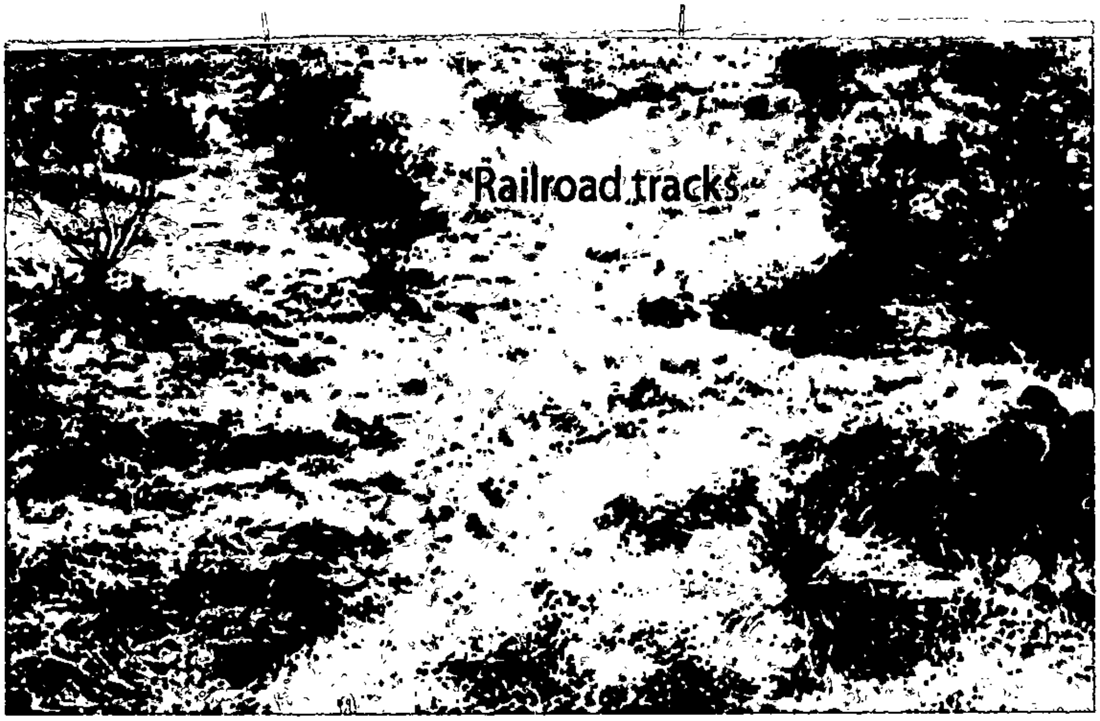
4 View from culvert west of the road.

Figure 4 – Discharge Path Photos (con't)

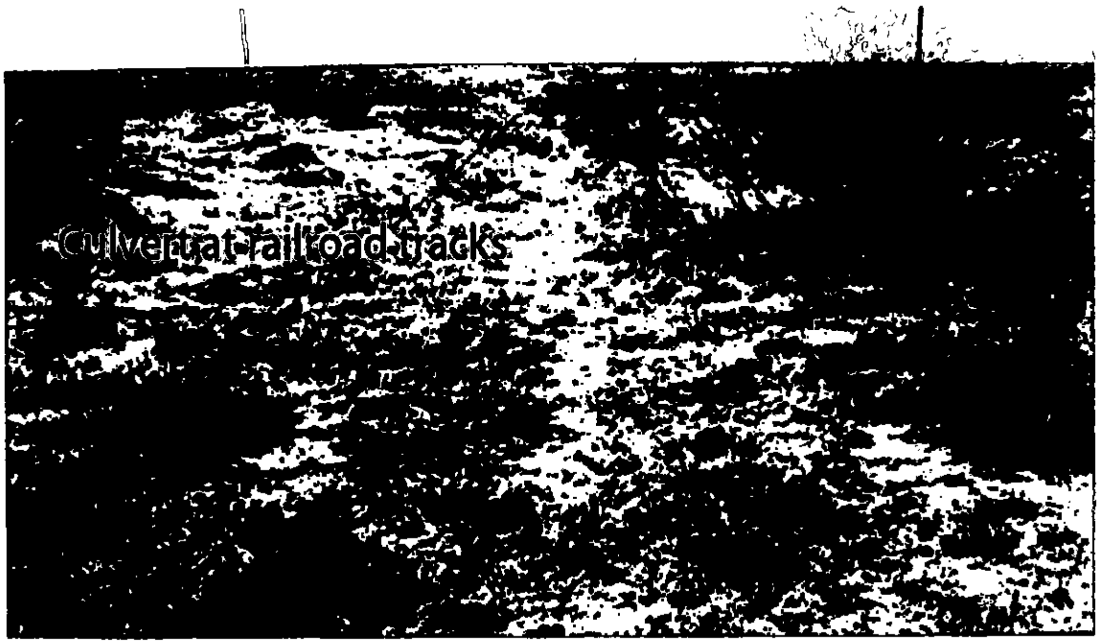
5 Proposed discharge location, approximately 350 feet west of SNL-16 well pad.

6 View to the southwest from the discharge location.

Figure 4 – Discharge Path Photos (con't)



7 View towards railroad tracks southwest of discharge location.



8 Drainage area approximately 200 yards from discharge location.

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Figure 4 – Discharge Path Photos (con't)

9 View of north side of railroad tracks, possible end of drainage path.

10 View from railroad tracks back toward SNL-16.

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

COVER LETTER

Wednesday, July 05, 2006

Rick Beauheim
Sandia National Lab
4100 National Parks Hwy.
MS1395
Carlsbad, NM 88220

TEL: (505) 234-0006
FAX (505) 234-0061

RE: WIPP

Order No.: 0606131

Dear Rick Beauheim:

Hall Environmental Analysis Laboratory, Inc. received 1 sample(s) on 6/13/2006 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

AZ license # AZ0682
ORELAP Lab # NM100001

Hall Environmental Analysis Laboratory, Inc.

Date: *05-Jul-06*

CLIENT:	Sandia National Lab	**Client Sample ID:**	SNL-16(C)_060906
Lab Order:	0606131	**Collection Date:**	6/9/2006 1:59:00 PM
Project:	WIPP	**Date Received:**	6/13/2006
Lab ID:	0606131-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: MAP
Bromide	ND	5.0		mg/L	10	6/20/2006 7:51:27 AM
Chloride	8800	50		mg/L	500	6/21/2006 10:40:11 PM
Fluoride	2.5	1.0		mg/L	10	6/20/2006 7:51:27 AM
Nitrate (As N)+Nitrite (As N)	ND	5.0		mg/L	50	6/28/2006 8:24:50 AM
Phosphorus, Orthophosphate (As P)	ND	5.0		mg/L	10	6/20/2006 7:51:27 AM
Sulfate	2500	25		mg/L	50	6/20/2006 8:08:52 AM
EPA METHOD 6010/6020: DISS METALS						Analyst: NMO
Calcium	1400	100		mg/L	100	6/23/2006 10:34:57 AM
Iron	0.024	0.020		mg/L	1	6/23/2006 10:21:15 AM
Magnesium	430	100		mg/L	100	6/23/2006 10:34:57 AM
Potassium	290	100		mg/L	100	6/23/2006 10:34:57 AM
Sodium	4400	100		mg/L	100	6/23/2006 10:34:57 AM
EPA METHOD 310.1: ALKALINITY						Analyst: ks
Alkalinity, Total (As CaCO3)	97	2.0		mg/L CaCO3	1	6/22/2006
Carbonate	ND	2.0		mg/L CaCO3	1	6/22/2006
Bicarbonate	97	2.0		mg/L CaCO3	1	6/22/2006
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: TES
Specific Conductance	35000	0.10		µmhos/cm	10	6/30/2006
EPA METHOD 150.1: PH						Analyst: ks
pH	7.18	0.010		pH units	1	6/14/2006
EPA METHOD 160.1: TDS						Analyst: ks
Total Dissolved Solids	18000	20		mg/L	1	6/13/2006

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits		

LABORATORY ANALYTICAL REPORT

Client: Hall Environmental
Project: 0606131
Lab ID: C06060752-001
Client Sample ID: SNL-16 (C)_060906

Report Date: 06/23/06
Collection Date: 06/09/06 13:59
Date Received: 06/14/06
Matrix: Aqueous

Analyses	Result	Units	Qual	RL	MCL/ QCL	Method	Analysis Date / By
METALS - DISSOLVED							
Strontium	18.2	mg/L		0.1		SW6020	06/21/06 07:43 / bws

Report Definitions: RL - Analyte reporting limit. QCL - Quality control limit. MCL - Maximum contaminant level. ND - Not detected at the reporting limit.

QA/QC Summary Report

Client: Hall Environmental
Project: 0606131

Report Date: 06/23/06
Work Order: C06060752

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6020									Batch: R67870
Sample ID: LRB	Method Blank				Run: ICPMS1-C_060620A				06/21/06 03:07
Strontium	ND	mg/L	3E-05						
Sample ID: LFB	Laboratory Fortified Blank				Run: ICPMS1-C_060620A				06/21/06 03:15
Strontium	0.0512	mg/L	0.10	102	75	125			
Sample ID: C06060736-001FMS4	Post Digestion Spike				Run: ICPMS1-C_060620A				06/21/06 03:37
Strontium	9.59	mg/L	0.10		75	125			A
Sample ID: C06060736-001FMSD4	Post Digestion Spike Duplicate				Run: ICPMS1-C_060620A				06/21/06 03:44
Strontium	9.85	mg/L	0.10		75	125	2.6	20	A

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

CATION/ANION BALANCE SHEET FOR WATER ANALYSES

HEAL LAB NUMBER	SNL-16(C)_060806 0606131-1											
CATIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L
Sodium	4400	191.39										
Potassium	290	7.42										
Calcium	1400	69.86										
Magnesium	430	35.39										
Total Cations		304.06										
ANIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L
Sulfate	2500	52.05										
Chloride	8600	242.60										
Bicarbonate (CaCO3)	97	1.94										
Carbonate (CaCO3)	ND	*										
Phosphate (P)	ND	*										
Nitrite (N)	ND	*										
Nitrate (N)	ND	*										
Fluoride	2.5	0.13										
Bromide	ND	*										
Total Anions		296.72										
Elect. Cond. (µMhos/cm)	35000											
CATION/ANION RATIO		1.02										
% Difference		1										
TOTAL DISSOLVED SOLIDS RATIOS												
TDS (measured)	18000											
TDS (calculated)	17681											
Ratio meas TDS:calc TDS		1.0										
Ratio Meas. TDS:EC		0.51										
Ratio Calc. TDS:EC		0.51										
Ratio of anion sum:EC		0.8										
Ratio of cation sum:EC		0.9										

* Analyte not detected (below method detection limit).

** Values below 0.55 can be obtained in waters containing appreciable concentrations of free acid or alkalinity, or not within pH 6 to 9. Values much higher than 0.7 are possible in highly saline waters.

GENERALLY ACCEPTED RANGES

Cation/Anion balance: 0-3 meq/L- 0.2 meq/L, 3-10 meq/L- 2%, >10 meq/L - 5%

Ratio measured TDS:calculated TDS – 1.0-1.2. Ratio Calculated TDS:EC – 0.55-0.7. Ratio Measured TDS:EC–0.55-0.7. Ratio of anion sum:EC – 0.9-1.1.

Ratio of cation sum:EC – 0.9-1.1

QA/QC SUMMARY REPORT

Client: Sandia National Lab
Project: WIPP
Work Order: 0606131

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: E300								Batch ID: R19622	
Sample ID: MBLK		*MBLK*						Analysis Date: 6/13/2006	
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*						Analysis Date: 6/18/2006	
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*						Analysis Date: 6/19/2006	
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*						Analysis Date: 6/21/2006	
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*						Analysis Date: 6/20/2006	
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*						Analysis Date: 6/28/2006	
Fluoride	ND	mg/L	0.10						
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: MBLK		*MBLK*						Analysis Date: 6/28/2006	
Fluoride	ND	mg/L	0.10						

Qualifiers:

- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Sandia National Lab
Project: WIPP
Work Order: 0606131

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: E300									Batch ID: R19822
Sample ID: MBLK		MBLK							Analysis Date: 6/28/2006
Chloride	ND	mg/L	0.10						
Bromide	ND	mg/L	0.10						
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.10						
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50						
Sulfate	ND	mg/L	0.50						
Sample ID: LCS ST300-06007		LCS							Analysis Date: 6/13/2006
Fluoride	0.5098	mg/L	0.10	102	90	110			
Chloride	4.761	mg/L	0.10	95.2	90	110			
Bromide	2.472	mg/L	0.10	98.9	90	110			
Nitrate (As N)+Nitrite (As N)	3.401	mg/L	0.10	97.2	90	110			
Phosphorus, Orthophosphate (As P)	4.950	mg/L	0.50	99.0	90	110			
Sulfate	9.771	mg/L	0.50	97.7	90	110			
Sample ID: LCS ST300-06007		LCS							Analysis Date: 6/19/2006
Fluoride	0.4988	mg/L	0.10	99.8	90	110			
Chloride	4.817	mg/L	0.10	96.3	90	110			
Bromide	2.500	mg/L	0.10	100	90	110			
Nitrate (As N)+Nitrite (As N)	3.422	mg/L	0.10	97.8	90	110			
Phosphorus, Orthophosphate (As P)	4.892	mg/L	0.50	97.8	90	110			
Sulfate	9.841	mg/L	0.50	98.4	90	110			
Sample ID: LCS ST300-06007		LCS							Analysis Date: 6/19/2006
Fluoride	0.4929	mg/L	0.10	98.6	90	110			
Chloride	4.872	mg/L	0.10	97.4	90	110			
Bromide	2.485	mg/L	0.10	99.8	90	110			
Nitrate (As N)+Nitrite (As N)	3.465	mg/L	0.10	99.0	90	110			
Phosphorus, Orthophosphate (As P)	5.008	mg/L	0.50	100	90	110			
Sulfate	10.04	mg/L	0.50	100	90	110			
Sample ID: LCS ST300-06008		LCS							Analysis Date: 6/21/2006
Fluoride	0.5090	mg/L	0.10	102	90	110			
Chloride	4.760	mg/L	0.10	95.2	90	110			
Bromide	2.513	mg/L	0.10	101	90	110			
Nitrate (As N)+Nitrite (As N)	3.474	mg/L	0.10	99.3	90	110			
Phosphorus, Orthophosphate (As P)	4.898	mg/L	0.50	98.0	90	110			
Sulfate	9.778	mg/L	0.50	97.8	90	110			
Sample ID: LCS ST300-06007		LCS							Analysis Date: 6/20/2006
Fluoride	0.4991	mg/L	0.10	99.8	90	110			
Chloride	4.898	mg/L	0.10	98.0	90	110			
Bromide	2.530	mg/L	0.10	101	90	110			
Nitrate (As N)+Nitrite (As N)	3.481	mg/L	0.10	99.5	90	110			
Phosphorus, Orthophosphate (As P)	5.072	mg/L	0.50	101	90	110			
Sulfate	10.01	mg/L	0.50	100	90	110			
Sample ID: LCS ST300-06008		LCS							Analysis Date: 6/28/2006
Fluoride	0.4778	mg/L	0.10	95.6	90	110			
Chloride	4.840	mg/L	0.10	96.8	90	110			

Qualifiers:

- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Sandia National Lab
Project: WIPP
Work Order: 0606131

Analyte	Result	Units	PQL	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: E300								Batch ID:	R19622
Sample ID: LCS ST300-06006		LCS						Analysis Date:	6/28/2006
Bromide	2.549	mg/L	0.10	102	90	110			
Nitrate (As N)+Nitrite (As N)	3.432	mg/L	0.10	98.0	90	110			
Phosphorus, Orthophosphate (As P)	4.860	mg/L	0.50	97.2	90	110			
Sulfate	9.908	mg/L	0.50	99.1	90	110			
Sample ID: LCS ST300-06006		LCS						Analysis Date:	6/28/2006
Fluoride	0.5002	mg/L	0.10	100	90	110			
Chloride	4.896	mg/L	0.10	97.9	90	110			
Bromide	2.592	mg/L	0.10	104	90	110			
Nitrate (As N)+Nitrite (As N)	3.498	mg/L	0.10	100	90	110			
Phosphorus, Orthophosphate (As P)	5.010	mg/L	0.50	100	90	110			
Sulfate	10.09	mg/L	0.50	101	90	110			
Method: E310.1								Batch ID:	R19668
Sample ID: MB		MBLK						Analysis Date:	6/22/2006
Alkalinity, Total (As CaCO3)	2.000	mg/L CaC	2.0						
Carbonate	ND	mg/L CaC	2.0						
Bicarbonate	2.000	mg/L CaC	2.0						
Method: SW6010A								Batch ID:	R19682
Sample ID: MB		MBLK						Analysis Date:	6/23/2006
Calcium	ND	mg/L	1.0						
Iron	ND	mg/L	0.020						
Magnesium	ND	mg/L	1.0						
Potassium	ND	mg/L	1.0						
Sodium	ND	mg/L	1.0						
Sample ID: LCS		LCS						Analysis Date:	6/23/2006
Calcium	45.44	mg/L	1.0	90.0	80	120			
Iron	0.4932	mg/L	0.020	98.6	80	120			
Magnesium	45.60	mg/L	1.0	90.3	80	120			
Potassium	49.73	mg/L	1.0	90.0	80	120			
Sodium	48.70	mg/L	1.0	96.4	80	120			
Method: E160.1								Batch ID:	10612
Sample ID: MB-10612		MBLK						Analysis Date:	6/13/2006
Total Dissolved Solids	ND	mg/L	20						
Sample ID: LCS-10612		LCS						Analysis Date:	6/13/2006
Total Dissolved Solids	971.0	mg/L	20	97.1	80	120			

Qualifiers:

- E Value above quantitation range
- J Analyte detected below quantitation limits
- R RPD outside accepted recovery limits
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- S Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name SANDIA CARLSBAD | Date and Time Received: 6/13/2006

Work Order Number 0606131 | Received by GLS

Checklist completed by [signature] Signature | 6-13-06 Date

Matrix | Carrier name FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐	Not Shipped ☐
Custody seals intact on sample bottles?	Yes ☑	No ☐	N/A ☐	
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Water - VOA vials have zero headspace?	No VOA vials submitted ☑	Yes ☐	No ☐	
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐	

Container/Temp Blank temperature? 3° *4°C ± 2 Acceptable* If given sufficient time to cool.

COMMENTS:

Client contacted ______ Date contacted: ______ Person contacted ______

Contacted by: ______ Regarding ______

Comments: ______

Corrective Action ______

CHAIN-OF-CUSTODY RECORD

Accreditation Applied:

NELAC ☐ USACE ☐

Other:

Client: Sandia National Labs (David Chace)

Address: 4100 National Parks Hwy Carlsbad, NM 88220

Phone #: 505-234-0065

Fax #: 505-234-0061

Project Name: WIPP

Project #: 97695/1.4.2.3

Project Manager: Rick Beauheim

Sampler: DeYonge/Toll

Sample Temperature: 3°

HALL ENVIRONMENTAL ANALYSIS LABORATORY
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com

ANALYSIS REQUEST

Date	Time	Matrix	Sample I.D. No.	Number/Volume	Preservative: None HgCl$_2$	Preservative: HNO$_3$	Preservative: H$_2$SO$_4$	HEAL No. 0606131	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gasoline Only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	EDC (Method 8021)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F, Cl, NO$_3$, NO$_2$, PO$_4$, SO$_4$)	8081 Pesticides / PCB's (8082)	8260B (VOA)	8270 (Semi-VOA)	Cation/Anion Balance	Dissolved Iron	pH	Strontium	Air Bubbles or Headspace (Y or N)
6/9/06	1359	H$_2$O	SNL-16(C)_060906	1/500mL	X			1													X	X	X	X	
6/9/06	1359	H$_2$O	SNL-16(C)_060906	2/500mL			X	1													X	X	X	X	
6/9/06	1359	H$_2$O	SNL-16(C)_060906	3/125mL		X		1													X	X	X	X	
6/9/06	1359	H$_2$O	SNL-16(C)_060906	4/125mL		X		1													X	X	X	X	
End	of	Samples																							

Date: 6/12/06 Time: 1230 Relinquished By: (Signature) Wesley S. DeYonge

Received By: (Signature) 6-13-06 1055

Date: Time: Relinquished By: (Signature)

Received By: (Signature)

Remarks:
- Samples #3 and #4 Filtered
- Samples may contain high salts

02353

Appendix A

ACTIVITY/ PROJECT SPECIFIC PROCEDURE (Sandia National Laboratories)	Chain of Custody	Form Number: SP 13-1-1 Page ____ of ____ Attach more forms as needed

1. Initial Sample Custodian Wesley F. DeYonge (Printed Name) Organization: 6822 Date: 6/9/06

2. Sample Collection or Creation Information Scientific Notebook ID: WSWT-08

Test Plan ID: TP 03-01 Field Log ID: N/A

Sample Location: WIPP Monitoring Well SNL-16 (i.e. borehole/core no./lab bldg. no./etc...)

Sample Team Members/Organization.
Wesley F. DeYonge / 6822-RESPEC
Nate J. Toll / 6822
enter n/a if none

3. Sample Identification Sample/Sub-Sample #	Date Collected	Container Type	Container Volume	Preservative	Analysis Request	Sample Description
SNL-16(C) 060906	6/09/06	PE Bottle	500 mL	N/A	Cation/Anion Bal,	SNL-16 Culebra (C) Water Sample- Unpreserved
SNL-16(C) 060906	6/09/06	PE Bottle	500 mL	H2SO4	Dissolved Iron,	SNL-16 (C) Water Sample- Preserved w/ Sulfuric Acid
SNL-16(C) 060906	6/09/06	PE Bottle	125 mL	HNO3	Strontium,	SNL-16 (C) Water Sample- Filtered/Preserved w/Nitric Acid
SNL-16(C) 060906	6/09/06	PE Bottle	125 mL	HNO3	and pH	SNL-16 (C) Water Sample- Filtered/Preserved w/Nitric Acid
END OF SAMPLE LIST						

enter n/a if none

4. Sample Requirements

Handling: Keep Sealed Until Use
Storage & Preservation: Keep Chilled / Refrigerated
Shipping: Hand Carry / Federal Express
Archive: N/A
Disposition: Dispose of as Non-hazardous Waste
Expiration Date: 7/09/2006

5. Custody Transfer	Printed Name	Signature	Organization/Company	Date-Time	Sample Condition
a. Relinquished by:	Wesley F. DeYonge	Wesley F. DeYonge	6822-RESPEC	6/12/06 12:30	Containers Intact & Sealed
a. Received by:					
b. Relinquished by:					
b. Received by:					
c. Relinquished by:					
c. Received by:					

Upon sample receipt, note condition. This form (copy for your records) shall follow samples through its life, until final disposition, then send original to WIPP Records Center. For samples that are potentially hazardous & require packaging and shipping, contact Center 6800 ES&H Coordinator or see SNL ES&H Manual, Chpt. 12.

PUBLIC INFORM...ION MEETINGS

GROUND WATER

APR 15 2013

BUREAU

On Requested Modification to the Hazardous Waste Facility Permit for the Waste Isolation Pilot Plant

WHO: U.S. Department of Energy (DOE) Carlsbad Field Office and Nuclear Waste Partnership LLC (NWP)

WHAT: DOE and NWP will conduct public meetings to provide information on the following permit modification request to the WIPP Hazardous Waste Facility Permit (Permit).

WHEN:
Tuesday, May 14, 2013
3 – 5 p.m.

WHERE:
Courtyard by Marriott
3347 Cerrillos Road
Santa Fe, New Mexico

WHEN:
Thursday, May 16, 2013
5 – 6 p.m.

WHERE:
Skeen-Whitlock Building
4021 National Parks Highway
Carlsbad, New Mexico

WHY: On April 8, 2013, DOE submitted a Class 2 permit modification request to the New Mexico Environment Department (NMED). The permit modification requests the following change and proposes to:

Revise the WIPP permit to modify the prohibition with respect to "excluded waste." Excluded waste is transuranic (TRU) waste that has been managed as high-level waste and waste from specific tanks identified in the Permit. In some instances, TRU waste tanks were located in the same tank farm that stored high-level waste and were managed with the same radioactive waste management practices. The radioactive characteristics, including the radioactive classification, of the wastes are not regulated by the Resource Conservation and Recovery Act (RCRA) hazardous waste regulations that govern the Permit. The prohibition for disposal of high-level waste at the WIPP facility is stipulated in the WIPP Land Withdrawal Act. Therefore, the excluded waste prohibition in the Permit is inappropriate and unnecessary because it is outside of the RCRA hazardous waste regulations. The Permit already requires the Permittees to verify that all waste disposed of at the WIPP facility meets the WIPP Waste Acceptance Criteria prior to being shipped to the WIPP facility.

HOW: To obtain additional information about this permit modification request, contact Mr. Bobby St. John, NWP, at 1-800-336-9477. The permit modification request is also available on the WIPP web site at http://www.wipp.energy.gov and at the WIPP Information Center, Skeen-Whitlock Building, 4021 National Parks Highway, Carlsbad, N.M. A copy of the permit modification request may also be obtained from NMED at the address listed below.

COMMENTS: Written comments for the record must be sent to the NMED contact person at the address below and received no later than 5 p.m. on June 10, 2013:

Ms. Trais Kliphuis
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, N.M. 87505
Phone: 505-476-6051
Fax: 505-476-6060
E-mail: trais.kliphuis@state.nm.us

The Permittees' compliance history during the life of the permit being modified is available from Ms.Kliphuis at the New Mexico Environment Department.

QUESTIONS: Any questions or comments to the Permittees regarding this permit modification may be sent to Mr. Bobby St. John, P.O. Box 2078, Carlsbad, N.M. 88221, no later than May 28, 2013.

<u>WIPP Permit Community Relations Plan</u>

On-line: http://www.wipp.energy.gov / toll-free: 1-866-271-9640 / e-mail: communityrelations@wipp.ws

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

GROUND WATER
JUL 16 2012
BUREAU

MAY - 3 2012

Mr. John Kieling, Acting Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Subject: Notification of Class 1 Permit Modification to the Hazardous Waste Facility Permit, Number: NM4890139088-TSDF

Dear Mr. Kieling:

Enclosed is the following Class 1 Permit Modification Notification:

- Various Editorial Changes

We certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact Mr. George T. Basabilvazo at (575) 234-7488.

Sincerely,

Jose R. Franco

Jose R. Franco, Manager
Carlsbad Field Office

Wes Bryan for M.F. Sharif

M. F. Sharif, General Manager
Washington TRU Solutions LLC

Enclosure

cc: w/enclosure

T. Kliphuis, NMED	*ED
J. Davis, NMED	ED
C. Walker, Trinity Engineering	ED

*ED denotes electronic distribution

02356

CBFO:OESH:GTP:ANC:12-0735:UFC 5486.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAY 24 2012

Mr. John Kieling, Acting Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Subject: Notification of Class 1 Permit Modification to the Hazardous Waste Facility Permit, Number: NM4890139088-TSDF

Dear Mr. Kieling:

Enclosed is the following Class 1 Permit Modification Notification:

- Update Emergency Coordinator Address and Telephone Numbers

We certify under penalty of law that this document and the enclosure were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact Mr. George T. Basabilvazo at (575) 234-7488.

Sincerely,

for

José R. Franco, Manager
Carlsbad Field Office

for M.F. Sharif

M. F. Sharif, General Manager
Washington TRU Solutions LLC

Enclosure

cc: w/enclosure

T. Kliphuis, NMED	*ED
J. Davis, NMED	ED
C. Walker, Trinity Engineering	ED
CBFO M&RC	

*ED denotes electronic distribution

02357

CBFO:OESH:GTB:ANC:12-0744:UFC 5487.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
JUN 2 5 2012

Mr. John Kieling, Acting Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Subject: Notification of Class 1 Permit Modification to the Hazardous Waste Facility Permit, Number: NM4890139088-TSDF

Dear Mr. Kieling:

Enclosed is the following Class 1 Permit Modification Notification which requires prior approval by the NMED:

- Change Related to Operational Control of the WIPP Hazardous Waste Facility

We certify under penalty of law that this document and the attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact Mr. George T. Basabilvazo at (575) 234-7488.

Sincerely,

Jose R. Franco, Manager
Carlsbad Field Office

M. F. Sharif, General Manager
Washington TRU Solutions LLC

Enclosure

cc: w/enclosure
T. Kliphuis, NMED *ED
J. Davis, NMED ED
C. Walker, Trinity Engineering ED
CBFO M&RC
*ED denotes electronic distribution

02358

CBFO:OESH:GTB:ANC:12-0751:UFC 5486.00

Waste Isolation Pilot Plant

July 12, 2012

Fact Sheet

DOE Proposes Modification To Hazardous Waste Facility Permit

Changes to the WIPP Hazardous Waste Facility Permit

Background

The U.S. Department of Energy Carlsbad Field Office (DOE) and Washington TRU Solutions LLC (WTS) submitted a Class 2 permit modification request to the New Mexico Environment Department (NMED) to change the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (Permit). The NMED issued the Permit (Permit Number: NM4890139088-TSDF) in November 2010.

What is Proposed?

The proposed modification submitted to NMED on July 5, 2012 is:

Addition of a Shielded Container

The generator/storage sites are proposing to package a portion of the remote-handled (RH) transuranic (TRU) mixed waste inventory in shielded containers for disposal at the WIPP facility. The use of the shielded containers will enable the WIPP facility to have an approved container to manage, store, and dispose RH TRU mixed waste as CH TRU mixed waste. Shielded containers will be transported to the WIPP in 3-pack assemblies in the HalfPACT transportation package and comply with the U.S. Department of Transportation requirements for a Type 7A container. The RH TRU mixed waste that will be packaged in these containers is the same type of waste that is currently being disposed at the WIPP. This waste will continue to count against the total RH TRU waste volume allowed for disposal at the WIPP facility, as specified in the Permit.

The shielded containers are similar to a 55-gallon drum, however, they consist of approximately one-inch of lead shielding that is located between a three-inch inner and outer steel wall. A shipment will consist of a three-shielded container assembly. Once they arrive at the WIPP facility, employees will unload and process the shipment in the using existing CH-TRU mixed waste shipment equipment and procedures.

Comments

Comments for the record must be sent to Ms. Trais Kliphaus, New Mexico Environment Department, 2905 Rodeo Park Drive, Building 1, Santa Fe, NM 87505. They also may be e-mailed: trais.kliphuis@state.nm.us or faxed to 505-476-6060. Only written comments will be accepted and must be received no later than 5 p.m. (MDT) on

September 10, 2012. A copy of the permit modification may be viewed or copied at the NMED offices of Ms. Kliphuis. To be placed on the WIPP mailing list, contact Ms. Kliphuis at the address above.

For more Information

For more information about transuranic waste shipments and procedures, call the WIPP Information Center at 1-800-336-WIPP (9477). This permit modification request is available for review in the Information Repository located on the WIPP home page at www.wipp.energy.gov. Comments to the Permittees regarding this permit modification may be sent to Mr. Bobby St. John, Washington TRU Solutions LLC, P.O. Box 2078, Carlsbad, NM 88221.

PUBLIC INFORMATION MEETINGS

On a Requested Modification to the Hazardous Waste Facility Permit for the Waste Isolation Pilot Plant

WHO: U.S. Department of Energy (DOE) Carlsbad Field Office and Washington TRU Solutions LLC (WTS)

WHAT: DOE and WTS will conduct public meetings to provide information on the following permit modification request to the WIPP Hazardous Waste Facility Permit.

WHEN:	Tuesday, August 14, 2012 5 – 6 p.m.	Thursday, August 16, 2012 2 – 4 p.m. & 6 – 8 p.m.
WHERE:	Skeen-Whitlock Building 4021 National Parks Highway Carlsbad, New Mexico	Courtyard by Marriott 3347 Cerrillos Road Santa Fe, New Mexico

WHY: On July 5, 2012, DOE submitted a Class 2 permit modification request to the New Mexico Environment Department (NMED). The permit modification request proposes to:

Add a shielded container for use at WIPP

This request is to add an additional container to the list of approved containers for disposal at WIPP. The container will allow the Permittees to handle waste that is packaged in a shielded container.

HOW: To obtain additional information about this permit modification request, contact Mr. Bobby St. John, WTS, at 1-800-336-9477. The permit modification is also available on the WIPP web site at http://www.wipp.energy.gov and at the WIPP Information Center, Skeen-Whitlock Building, 4021 National Parks Highway, Carlsbad, N.M. A copy of the requested permit modification also may be obtained from NMED at the address listed below.

COMMENTS: Written comments for the record must be sent to the NMED contact person at the address below and received no later than 5 p.m. on September 10, 2012:

Ms. Trais Kliphuis
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, N.M. 87505
Phone: 505-476-6051
Fax: . 505-476-6060
E-mail: trais.kliphuis@state.nm.us

The Permittees' compliance history during the life of the permit being modified is available from Ms. Kliphuis at the New Mexico Environment Department.

QUESTIONS: Any questions or comments to the Permitees regarding this permit modification may be sent to Mr. Bobby St. John, P.O. Box 2078, Carlsbad, N.M. 88221, no later than August 27, 2012.

<u>WIPP Permit Community Relations Plan</u>

On-line: http://www.wipp.energy.gov / toll-free: 1-866-271-9640 / e-mail: communityrelations@wipp.ws

U.S. Department of Energy
Waste Isolation Pilot Plant
Hazardous Waste Facility Permit-Related Community Relations Plan

GROUND WATER
MAY 31 2012
BUREAU

PURPOSE: The U.S. Department of Energy and Washington TRU Solutions LLC (the Permittees) are seeking public comments and suggestions to improve the Waste Isolation Pilot Plant Hazardous Waste Facility Permit Community Relations Plan as part of the WIPP Hazardous Waste Facility Permit (Permit Number: NM4890139088-TSDF) issued by the New Mexico Environment Department.

The Community Relations Plan is designed to inform communities and interested members of the public about WIPP Hazardous Waste Facility Permit activities and opportunities for public participation in those activities. Permit-related activities include waste management, closure, post-closure and corrective actions, as specified in 20.4.1.900 New Mexico Administrative Code (NMAC) (incorporating 40 Code of Federal Regulations (CFR)§270.32(b)(2)).

WHERE: The Permittees have updated the Plan which will be mailed to individuals on the WIPP Facility Mailing List on May 24, 2012, for comment. Community Relations Plan updates will also be available online:http://www.wipp.energy.gov/WIPPCommunityRelations/index.html.

New Mexico residents, organizations, special interest groups, federal, state and local government entities, tribal governments and tribal members are encouraged to provide comments or suggestions to the Permittees to enhance the Plan so that it continues to meet public needs for permit-related information.

PLAN ELEMENTS: Part 1, Section 1.15.2 of the WIPP Hazardous Waste Facility Permit identifies six key elements of the Permittees' Community Relations Plan:

1. Establish working relationships with communities and interested members of the public.
2. Establish productive government to government relations between the U.S. Department of Energy and affected tribes and pueblos.
3. Inform communities and interested parties of permit activities.
4. Minimize disputes and resolve differences with communities and interested members of the public.
5. Provide timely responses to individual requests for information.
6. Establish mechanisms for communities and interested members of the public to provide feedback and input to the Permittees.

HOW YOU CAN PARTICIPATE:

Contact the Permittees by e-mail, telephone or by mail to receive a copy of the updated WIPP Hazardous Waste Facility Permit Community Relations Plan and comment/suggestion form. Comments and suggestions can be made online by accessing the Plan at: http://www.wipp.energy.gov/WIPPCommunityRelations/index.html and clicking on "Comments."

- E-mail: communityrelations@wipp.ws
- Toll free telephone number: 1-800-234-7280 – available during normal business hours, Monday through Friday, 7:30 a.m.-4:30 p.m. MST
- Mailing address: Bobby St. John, P.O. Box 2078, Carlsbad, NM 88221

Waste Isolation Pilot Plant Hazardous Waste Facility Permit
Community Relations Plan Updates

The Waste Isolation Pilot Plant (WIPP) Permittees (U. S. Department of Energy and Washington TRU Solutions LLC) are seeking comments from members of the public to improve the WIPP Hazardous Waste Facility Permit Community Relations Plan, as well as comments to Plan updates proposed by the Permittees. Based on public comments, text changes to the Plan will become effective June 25, 2012.

Updates proposed by the Permittees include:

- Change to New Mexico Environment Department WIPP staff manager contact information
- Language to clarify that the Plan is specific to the WIPP Hazardous Waste Facility Permit and does not address non permit- related WIPP project programs or activities (See Comment form attachment)
- Consistency in capitalization

The updates are identified with red text and a double underline for new text and a strikeout font for deleted information.

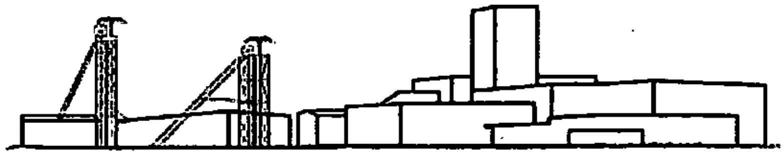
As part of the WIPP Hazardous Waste Facility Permit Community Relations Plan, the Permittees are required to document and publish permit-related comments, consultations, communications, agreements and disagreements between the Permittees and members of the public regarding the Community Relations Plan on the Community Relations Plan Web page. The Permittees do not publish individual communications or correspondence without the consent of the contributor.

Published comments can be found by accessing the Community Relations Plan Web page at: http://www.wipp.energy.gov/WIPPCommunityRelations/index.html. Click on the "Comments" tab and view the "Community Comments."

The one-page comment and consent form can be completed on the Community Relations Plan Web page or requested by mail from Bobby St. John at P.O. Box 2078, Carlsbad, NM 88221, or by calling toll-free (1-866-271-9640) and requesting the comment form. Copies of published public comments are also available by request.

Thank you for your interest in the WIPP Hazardous Waste Facility Permit
Community Relations Plan.

Welcome to the
Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit
Community Relations Plan



Welcome to the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit Community Relations Plan Web page. We trust that the information provided here will be of value to you. The New Mexico Environment Department renewed the WIPP Hazardous Waste Facility Permit with the U.S. Department of Energy and Washington TRU Solutions LLC in November 2010 for a ten year period.

As part of the ~~renewed~~ permit, we are committed to providing you background information about the Permit, offering updated information on permit actions, and keeping you informed about public opportunities to participate in the permit process.

Our commitment to you goes well beyond this Community Relations Plan Web page. Our pledge is to operate WIPP in a safe, compliant manner that protects workers, the public and the environment.

Waste Isolation Pilot Plant Draft Community Relations Plan
Comment/Suggestion Form

The WIPP Hazardous Waste Facility Permit Community Relations Plan specifically addresses Permit-related activities and information. Non Hazardous Waste Facility Permit comments, suggestions or questions may be directed to the WIPP Information toll-free telephone number at 1-800-336-9477

*First Name | *Last Name

*required

Phone Number, E-mail Address, or New Mexico Mailing Address

If you would like a response to your comments, be sure to include your contact information.

Write your comments here

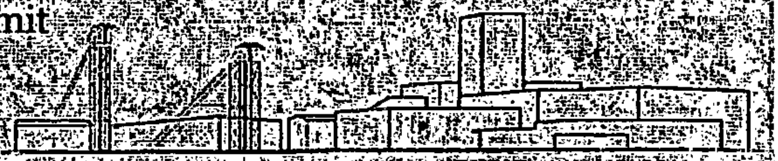
If you choose to have your comments and suggestions posted to the WIPP Community Plan Web Page, you can provide your written consent by checking the "Yes" box and include your contact information. If you do not want your comments posted, check "no." If you don't check any box, we will assume you do not want your comments posted.

☐ Yes ☐ No

Submit by Email | Print Form

WIPP Hazardous Waste Facility Permit

Community Relations Plan



Print the Plan (PDF)

GROUND WATER
MAY 31 2012
BUREAU

1.0 Introduction
- 1.1 Plan Required by ~~Renewed~~ Permit
- 1.2 Participants
- 1.3 Purpose

2.0 Overview of the Waste Isolation Pilot Plant
- 2.1 Location and Facility
- 2.2 TRU Waste
- 2.3 Regulatory Background and the Hazardous Waste Facility Permit

3.0 How to Use this Plan
- 3.1 Elements of the WIPP Community Relations Plan
- 3.2 A Broad Approach to Communicating Permit Activities
- 3.3 Community Relations Plan Web Page
- 3.4 Notifications in Major Newspapers
- 3.5 Facility Mailing List
- 3.6 Email Notification Service
- 3.7 Public Meetings
- 3.8 Community Relations Plan Email Address
- 3.9 Toll-Free Telephone Number
- 3.10 Public Outreach Products

4.0 Community Relations Plan Goals
- 4.1 Changes to the Plan
- 4.2 Resolving Differences Between the Public and Permittees Regarding the Community Relations Plan

5.0 Resources

6.0 Records Management

1.0 Introduction

1.1 Plan Required by Renewed Permit

This Community Relations Plan is a requirement of the Hazardous Waste Facility Permit for the U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP) facility. The New Mexico Environment Department (NMED) re-issued the ten year permit to the U.S. Department of Energy and Washington TRU Solutions LLC (the Permittees) in November

2010.

1.2 Participants

The intended participants to this Community Relations Plan are interested members of the public who reside within the state of New Mexico, and include individuals, organizations, special interest groups, federal, state and local government entities, tribal governments and tribal members.

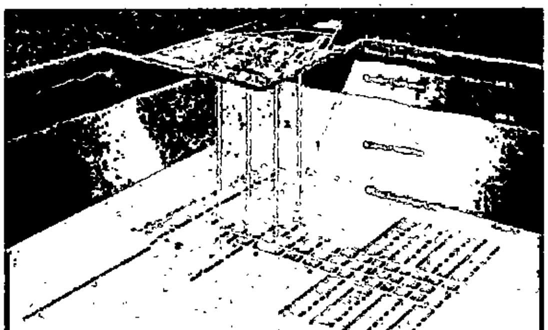
1.3 Purpose

The purpose of the WIPP Hazardous Waste Facility Permit Community Relations Plan (the Plan) is to provide permit-related information to communities and interested members of the public and to alert the public to opportunities for participation in the permit process. Permit-related activities include waste disposal operations, facility closure, post-closure and permit-driven corrective actions.

The U.S. Department of Energy (DOE) operates the WIPP facility in a transparent manner. The DOE has conducted WIPP outreach programs in New Mexico for more than two decades to establish open working relationships with communities, tribal governments and residents statewide. The Permittees view this Plan as an opportunity to expand public participation and dialogue in the WIPP facility permit process.

The Plan is web-based to reach a broad spectrum of New Mexico residents and tribal governments. Alternate methods to disseminate permit-related information to members of the public who may not have computer access are included in this Plan. These avenues of communication are further discussed in Section 3.0 How to Use this Plan.

2.0 Overview of the Waste Isolation Pilot Plant


WIPP Surface and Underground Facilities

So that members of the public may better understand the WIPP mission and hazardous waste facility permit, this Plan begins with an overview of the WIPP facility.

The WIPP facility is owned and operated by the DOE through its Carlsbad Field Office (CBFO). Washington TRU Solutions LLC (WTS) is the co-operator of the WIPP facility and performs day-to-day plant operation. The DOE and WTS are co-Permittees to the Permit.

2.1 Location and Facility

The WIPP facility is located 26 miles southeast of Carlsbad, New Mexico. It is designed and operated for the safe disposal of transuranic, or TRU, radioactive waste resulting from U.S. nuclear defense programs.

In 1992, Congress withdrew 16 sections of land from the public domain to be used by the DOE for the WIPP facility. The WIPP facility consists of surface facilities to receive and prepare waste for disposal and an underground repository that includes disposal rooms excavated from a geologically stable salt formation nearly one-half mile underground.

2.2 TRU Waste

TRU waste is solid material such as protective clothing, rags, tools, soils and residues contaminated with radioactive elements-mostly plutonium. The majority of this waste resulted from government research and the production of nuclear weapons. TRU waste will also be generated as

some DOE sites are decommissioned.

Some TRU waste contains non-radioactive chemicals such as solvents which are classified as hazardous waste under federal and state law. A hazardous waste facility permit is required to manage and dispose of these TRU and hazardous "mixed" wastes.

The NMED regulates the management and disposal of the hazardous waste contained in TRU mixed waste. In 1999, NMED issued the initial WIPP hazardous waste facility permit that allowed the DOE to receive its first waste shipment from Los Alamos National Laboratory in northern New Mexico for disposal at the WIPP facility. The hazardous waste facility permit was renewed for a ten year period in 2010.

The project life cycle and the amount of waste to be disposed at the WIPP facility is detailed in the permit as follows: "During the disposal phase of the facility, which is expected to last 25 years, the total amount of waste received from off-site generators (**see map**) and any derived waste will be limited to 175,600 cubic meters of TRU waste, of which up to 7080 cubic meters may be remote-handled TRU (RH-TRU) mixed waste. For purposes of the WIPP Permit, all TRU waste is managed as though it were mixed."

2.3 Regulatory Background and the Hazardous Waste Facility Permit

In 1976, the U.S. Congress passed the Resource Conservation and Recovery Act (RCRA) to regulate "cradle to grave" management of hazardous waste. In accordance with RCRA, the U.S. Environmental Protection Agency (EPA) can authorize states to implement their own hazardous waste regulatory programs in lieu of the federal program. The State of New Mexico is authorized to implement and enforce its own hazardous waste management program which includes regulating the hazardous components in TRU mixed waste that are disposed at the WIPP facility.

The EPA certifies DOE compliance with environmental standards for the disposal of radioactive materials such as the TRU waste disposed 2,150 feet underground. At five year intervals, the DOE must demonstrate to EPA through a recertification process that the WIPP underground repository will continue to safely contain radionuclides for 10,000 years.

This Plan is specific to the New Mexico Hazardous Waste Management Program.

3.0 How to use this Plan

3.1 Elements of the WIPP Community Relations Plan

The Permit identifies six objectives that this Plan is to address:

- Establish working relationships with communities and interested members of the public.
- Establish productive government to government relations between the U.S. Department of Energy and affected tribes and pueblos.
- Inform communities and interested parties of permit activities.
- Minimize disputes and resolve differences with communities and interested members of the public.
- Provide timely responses to individual requests for information.
- Establish mechanisms for communities and interested members of the public to provide feedback and input to

the Permittees.

3.2 A Broad Approach to Communicating Permit Activities

The Permittees determined that the most effective way to meet Permit objectives is a universal approach to communications with individuals, organizations, special interest groups, federal, state and local government entities, tribal governments and tribal members in New Mexico. The Plan makes Permit-related information available to interested New Mexicans through various points of access.

Tribal governments and tribal members will be provided information about WIPP permit-related actions in the same manner as that outlined in this Plan for communities, the general public and interested parties.

3.3 Community Relations Plan Web page

This Web page provides information on current permit activities and public meeting schedules, and includes a link to the *WIPP Permit Information Repository* where members of the public can access specific documents related to the current permit and other permit resources.

To assure public access, the Web page includes instructions for software required to view documents in the WIPP Permit Information Repository and provides free downloads to public reviewers, as needed.
Documents available in the WIPP Information Repository include: (link)

- WIPP Hazardous Waste Facility Permit renewal application, Parts A and B
- A complete copy of the Permit, as it may be modified
- Permit modification notifications and requests associated with the Permit and any associated responses from the NMED
- Waste Minimization Report submitted per Permit Part 2, Section 2.4
- Extensions of time submitted per Permit Part 1, Section 1.10.3
- Corrective action documents submitted per Permit Part 8
- Written reports, such as notifications of planned changes, submitted per the Permit Part 1, Sections 1.7.11 and 1.7.13
- Notices of Deficiency or disapproval, responses, final approval letters and directives from the NMED associated with renewal permit applications, permit modifications and corrective action documents
- Notices of Violation or administrative compliance orders, and responses to such required by the NMED and directives from the NMED associated with the Permit
- Biennial Reports submitted per Permit Section Part 2, Section 2.14.2

3.4 Notifications in major newspapers

Notifications regarding substantive (Class 2 and 3) requests by the Permittees to modify the Permit are published in major local newspapers. Included in the notification is a description of the proposed permit change, dates for a public comment period, contact information at NMED and the WIPP project, and the time, dates and locations for public meetings.

3.5 Facility mailing list

The facility mailing list consists of individuals, organizations, special interest groups, federal, state and local government entities, tribal governments and tribal members who have expressed interest in being notified by mail of WIPP permit-related actions. By regulation, the NMED maintains the WIPP facility mailing list; the Permittees are responsible for mail-outs to subscribers.

The facility mailing list benefits infrequent users of the Community Relations Web page and members of the public who do not have computer access. There are a number of opportunities to subscribe to the facility mailing list below. Please include your name, mailing address, phone number and organization, if any, when you subscribe to the list.

- Subscribe on this Community Relations Plan Web page http://www.nmenv.state.nm.us/wipp/index.html#list
- Email communityrelations@wipp.ws and request to be added to the list
- The New Mexico Environment Department WIPP Web page at ~~timothy.hall@state.nm.us~~ trais.kliphuis@state.nm.us
- Call 1-866-271-9640 and request Bobby St. John, Washington TRU Solutions, to add your name to the list
- Mail a request to subscribe:

Bobby St. John
Washington TRU Solutions
P.O. Box 2078
Carlsbad, N.M. 88221

OR

~~Timothy Hall~~ Trais Kliphuis
New Mexico Environment Department
2905 Rodeo Park Drive East
Building 1
Santa Fe, N.M. 87505

- Sign up at WIPP public meetings

3.6 Email Notification Service

The Permittees also maintain an email notification service. Subscribers to this service are assured timely email notification for a specific set of permit actions. Adding your name to the email notification service is quick and easy.

Just click here http://www.wipp.energy.gov/Stakeholders/Notice.aspx and follow the directions for sign up.

3.7 Public meetings

Federal and state regulations require hazardous waste facilities to schedule public meetings for proposed Class 2 and 3 permit modification requests. These public meetings provide the Permittees a forum to explain the purpose of the permit modification request and for members of the public to ask questions and express their views. The general public is notified of public meeting schedules in major local newspapers.

Interested members of the public are encouraged to monitor the Community Relations Web page, subscribe to the WIPP facility mailing list and email notification system for public meeting schedules related to Permit modification requests.

3.8 Community Relations Plan email address

A dedicated Community Relations Plan email address provides the public direct communication to Permittee staff for inquiries related to the permit. The email account is monitored by staff members during normal business hours, Monday through Friday, 7:30 a.m. to 4:30 p.m. The Permittees will respond to requests as quickly as possible, within the constraints of applicable regulations such as those involving dissemination of security or personal information.

That email address is communityrelations@wipp.ws.

3.9 Toll-free telephone number

A Community Relations Plan toll free telephone number is a convenient way to contact Permittee staff for permit-related information or questions. The toll free number will be staffed during normal business hours, Monday through Friday from 7:30 a.m.to 4:30 p.m.

The toll-free number is 1-866-271-9640.

3.10 Public outreach products

To increase public awareness of the Plan, the Community Relations Plan Web page address, toll-free telephone number and dedicated e-mail address will be printed on WIPP information products and permit-related public notifications in major local newspapers.

4.0 Community Relations Plan Goals

4.1 Changes to the Plan

The goal of this Plan is to provide timely information to members of the public about Permit actions and opportunities for participation in the Permit process so that they can make informed decisions about Permit actions.

The Plan is intended to be useful and responsive to public information needs related to the Permit. It is a "living" document which is expected to change throughout the 10 year Permit period to accommodate public and Permittee input, ~~and~~ as well as new communication technologies.

In May of each year of the current Permit period, the Permittees will solicit comments and suggestions regarding the Community Relations Plan from interested stakeholders. Periodic changes may be made to the Plan to enhance functionality and content. Members of the public are encouraged to send comments or suggestions to improve the Plan at any time. Comments may be sent by email (see **Comments** on the Web page menu), or by mail to:
Bobby St. John, Washington TRU Solutions, P.O. Box, 2078, Carlsbad, N.M., 88221

4.2 Resolving Differences Between the Public and Permittees Regarding the Community Relations Plan

The Permittees will give careful consideration to public comments and suggestions, and work in consultation with communities and with interested members of the public to avoid disputes and to resolve differences regarding the Community Relations Plan.

The Permittees will address comments that require a response and provide the response to the community or individual who originated it. Responses specific to this Plan will be posted to the Community Relations Plan Web page, with the consent of the parties involved.

5.0 Resources

The Permittees will provide the resources necessary to maintain the Plan for as long as the Plan is a requirement of the Permit.

6.0 Records Management

Consistent with Permit requirements, the Permittees will document all Permit-related consultations, communications, agreements and disagreements between the Permittees and members of the public related to the development and administration of the Plan.

These communications and responses will become part of the WIPP facility operating record and will be posted annually to the Plan Web page, with the express consent of the commenting individual or group.

Thank you for your interest in the WIPP Hazardous Waste Facility Permit.

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

Harold Runnels Building
1190 St. Francis Drive
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us

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Jose R. Franco, Manager
US Department of Energ
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

PS Form 3800, August 2006

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

May 15, 2012

Jose R. Franco, Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221

RE: Response to Notice of Intent to Discharge; Discharge Permit Not Required for Pumping Test on Well H-9bR, U.S. Department of Energy Waste Isolation Pilot Plant, AI: 318

Dear Mr. Franco:

The New Mexico Environment Department (NMED) received a Notice of Intent on May 11, 2012 to discharge approximately 977,533 gallons of produced ground water associated with a pumping test on Well H-9bR located south of the Waste Isolation Pilot Plant (WIPP). The notice satisfies the requirements of Subsection A of 20.6.2.1201 NMAC of the New Mexico Water Quality Control Commission (WQCC) Regulations (20.6.2 NMAC). The proposed discharge is located approximately 8 miles south of the WIPP facility in Section 4, Township 24S, Range 31E, Eddy County.

Based on the information provided in your Notice of Intent, NMED has determined that a Discharge Permit is not required as long as the discharge is as described. A Discharge Permit is not required at this time because the information and data provided indicates it is unlikely that the discharge will adversely affect ground water quality.

The proposed discharge is briefly described as follows:

Sandia National Laboratories proposes to conduct an aquifer pumping test on Well H-9bR (OSE File # C-2783-POD2) to study the hydrogeologic characteristics in the Culebra Member of the Rustler Formation. Approximately 978,000 gallons of water will be pumped over a 3 to 4 week timeframe to test responses in nearby wells. The water will be dispersed by a series of fanned piping or from a temporary holding tank at a controlled rate to prevent erosion.

Although a Discharge Permit is not being required for this discharge at this time, you are not relieved of liability should your operation result in actual pollution of surface or ground waters. Further, this decision by NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, such as zoning requirements, plumbing codes and nuisance ordinances.

If at some time in the future you intend to change the amount, character or location of your discharge, or if observation or monitoring shows that the discharge is not as described in your Notice of Intent, you must file a revised Notice of Intent with the Ground Water Quality Bureau.

If you have any questions, please contact Clint Marshall, Program Manager of the Ground Water Pollution Prevention Section, at (505) 827-0027.

Sincerely,

Jerry Schoeppner, Chief
Ground Water Quality Bureau

JS:CLM

cc: Michael Kesler, Acting District Manager, NMED District III
NMED Carlsbad Field Office
NOI File
County File

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
MAY 1 0 2012

GROUND WATER

MAY 1 1 2012

BUREAU

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Mining and Environmental Compliance Section
P.O. Box 26110
Santa Fe, New Mexico 87502

Subject: Notice of Intent for the Proposed Surface Discharge

Dear Mr. Marshall:

The purpose of this letter is to provide the Notice of Intent Form and supporting information (totaling 20 pages) for the proposed one-time surface discharge of water from a pumping test at Well H-9bR (OSE File # C-2783-POD2) for your review. It is our intent to obtain authorization to discharge and be exempt from the discharge permit application process for testing purposes. The test will be conducted by Sandia National Laboratories to study the hydrogeologic characteristics in the Culebra Member of the Rustler Formation to the south of the WIPP site boundary. The total water pumped would be approximately 978,000 gallons (3 acre feet) over a 3-4 week timeframe to test the responses in nearby wells. The water will be dispersed from the wellhead by a series of fanned piping or from a temporary holding tank at a controlled rate to prevent erosion.

The water quality in the original Culebra well (H-9b-OSE File # C-2783) at this location was: Chloride: 160-320 mg/L Sulfate: 1600-2220 mg/L, TDS: 2800-3590 mg/L. Samples collected from the water generated while performing water quality testing of the new well had Chlorides: 170 mg/L, Sulfate: 2000 mg/L, and TDS: 3330 mg/L. The water quality of the pumped water is expected to be similar to these values.

The complete historical water quality data from H-9b, analytical data of the water quality testing of H-9bR, a photograph, and a topographical map showing the surrounding area where the water would be discharged are part of the Notice of Intent.

If you have any questions about this report or require any additional information, please contact Mr. Dan Ferguson at (575) 234-7018.

Sincerely,

Jose R. Franco, Manager
Carlsbad Field Office

Enclosure

CBFO:OESH:DJF:ANC:12-0734:UFC 5486.00

1. **Name and mailing address of person proposing to discharge:**

Jose Franco – Manager Carlsbad Field Office, Waste Isolation Pilot Plant **Work Phone:** (575) 234-7300

U.S. Department of Energy – Carlsbad Field Office **Cell/Home Phone:** NA

Fax: (575) 234-7027
Email: Jose.Franco@wipp.ws

2. **Name of facility:**

Waste Isolation Pilot Plant (WIPP) Monitoring Well H-9bR

3. **Physical location of discharge (if applicable, give street address, township, range, section, distance from closest town or landmark, directions to facility, location map):**

WIPP monitoring well H-9bR (C-2783-POD2) located at T24S, R31E, S4; NAD27 State Plane Coordinates:

eastings 667,850.39, northings 454,083.79) Latitude: 32 deg. 14 min. 49.4 sec. North Longitude: 103 deg. 47 min. 26.9 sec. West, (See attached figure); 8 miles south of the WIPP facility

4. **Type of operation generating the discharge (e.g., truck wash, food processing plant, restaurant, etc.):**

Aquifer pumping test of the Culebra Member of the Rustler Formation

5. **Source(s) of the discharge. Describe how the wastewater, sludge, or other discharges processed and/or disposed at your facility are generated. Identify all sources. Attach additional pages if needed:**
One-time discharge of water from the Culebra Member of the Rustler Formation derived from pumping test

6. **Expected contaminants in the discharge (e.g., nitrate-nitrogen, metals, organic compounds, salts, etc.) Include estimated concentration if known, and copies of results of laboratory analyses, if available:**

The water quality in the original Culebra well, H-9b, at this location was: Chloride: 160-320 mg/L, Sulfate: 1600-2220 mg/L, TDS: 2800-3590 mg/L. Samples collected from the new well for water quality testing showed Chlorides: 170 mg/L, Sulfate: 2000 mg/L and TDS: 3330 mg/L. The water quality of the pumped water is expected to be similar to these values. No hazardous constituents are expected. Lab results are attached that show the most recent water quality sampling results.

7. **Describe all components of wastewater processing, treatment, storage, and disposal system (e.g., grease interceptor, lagoon, septic tank/leachfield, etc.) Include sizes, site layout map, plans and specifications, etc. if available:**

Water derived from pumping test will be removed from the well by a submersible pump to the surface.

Discharge will be plumbed to a series of PVC pipes to disperse the flow to prevent erosion.

8. **Estimated maximum daily discharge volume in gallons per day (or other units):**

23-day test generating 977,533 gallons. Test will produce 42, 501 gallons per day.

9. **Estimated depth to ground water (ft):** See attached summary Culebra (644) Magenta (527)

Signature: Jose Franco **Date:** 5/8/2012

Printed name: JOSE FRANCO **Title:** CBFO Manager

Please return this form to:
NMED Ground Water Quality Bureau Telephone: 505-827-2900

P.O. Box 5469
Santa Fe, New Mexico 87502-5469

Fax: 505-827-2965

ATTACHED ADDITIONAL INFORMATION

The discharge from this well is a one-time only operation to test aquifer parameters. An exemption is sought from a Discharge Permit Application for this test. The well identified for aquifer testing, H-9bR (C-2783-POD2), is located in Township 24 South, Range 31 East, Section 4 in Eddy County, New Mexico. It is located about 8 miles south of the Waste Isolation Pilot Plant (WIPP) (Figure 1). The well is completed (screened) in the Culebra Member (Culebra) of the Rustler Formation (Rustler) (Figure 2).

Water bearing zones in this area are identified in the Magenta and Culebra Members of the Rustler Formation (Figure 2). The first water bearing zone beneath the discharge point is the Magenta, between 527-558 feet below ground surface.

The pumping test is planned to be performed for 23 continuous days at a flow rate of 29-30 gallons per minute. Flow will be dispersed through a series of fanned piping from the wellhead or a temporary holding tank, to reduce any surface erosion. The point of discharge is identified in Figure 3 in relation to the well pad.

Sandia National Laboratories (SNL) performed historical sampling of a well that was plugged and replaced by H-9bR on the same pad. Results from this testing indicated concentrations below those identified in 20.6.2.3103 NMAC, for the parameters analyzed. The table of results is attached as Appendix A showing all historical testing of this well.

Following well completion and development, the new well was tested for water quality by SNL with results similar to the historical data collected from the Culebra at this location. These results are included as an attachment to this document.

WIPP Site and H-9 Pad

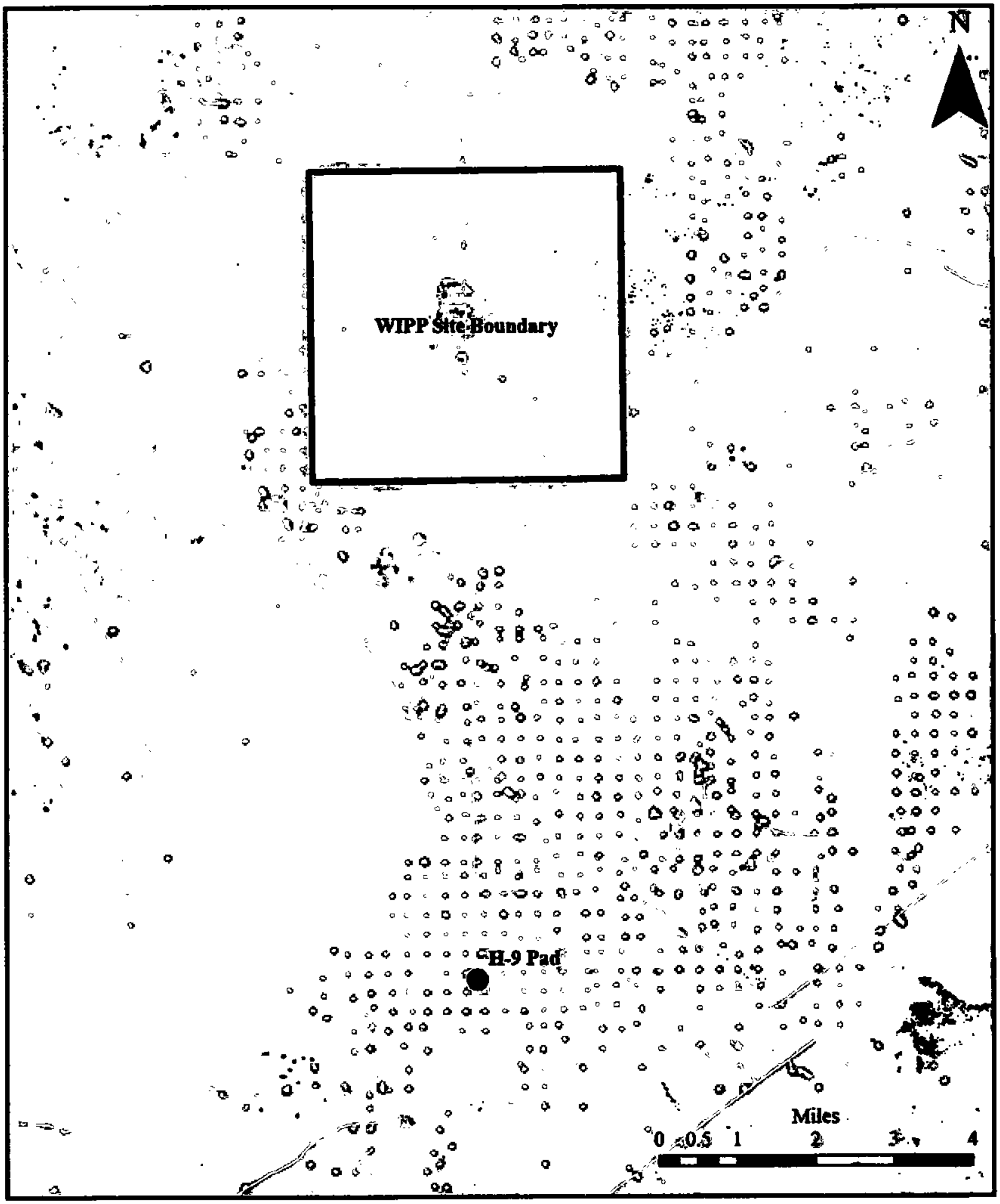
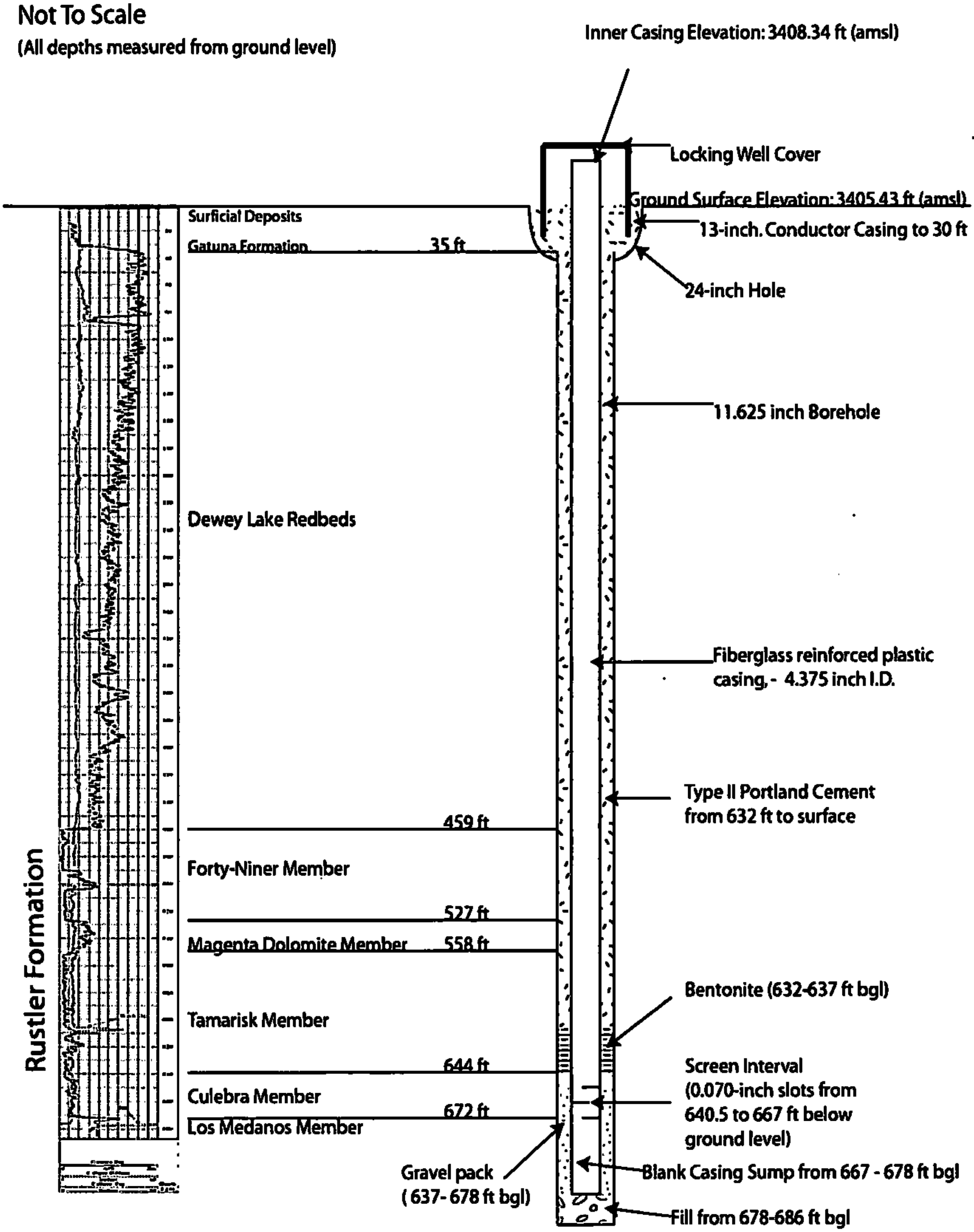


Figure 1

Figure 2
Well H-9bR Configuration
Not To Scale
(All depths measured from ground level)



H-9 Pad Aerial and Contours

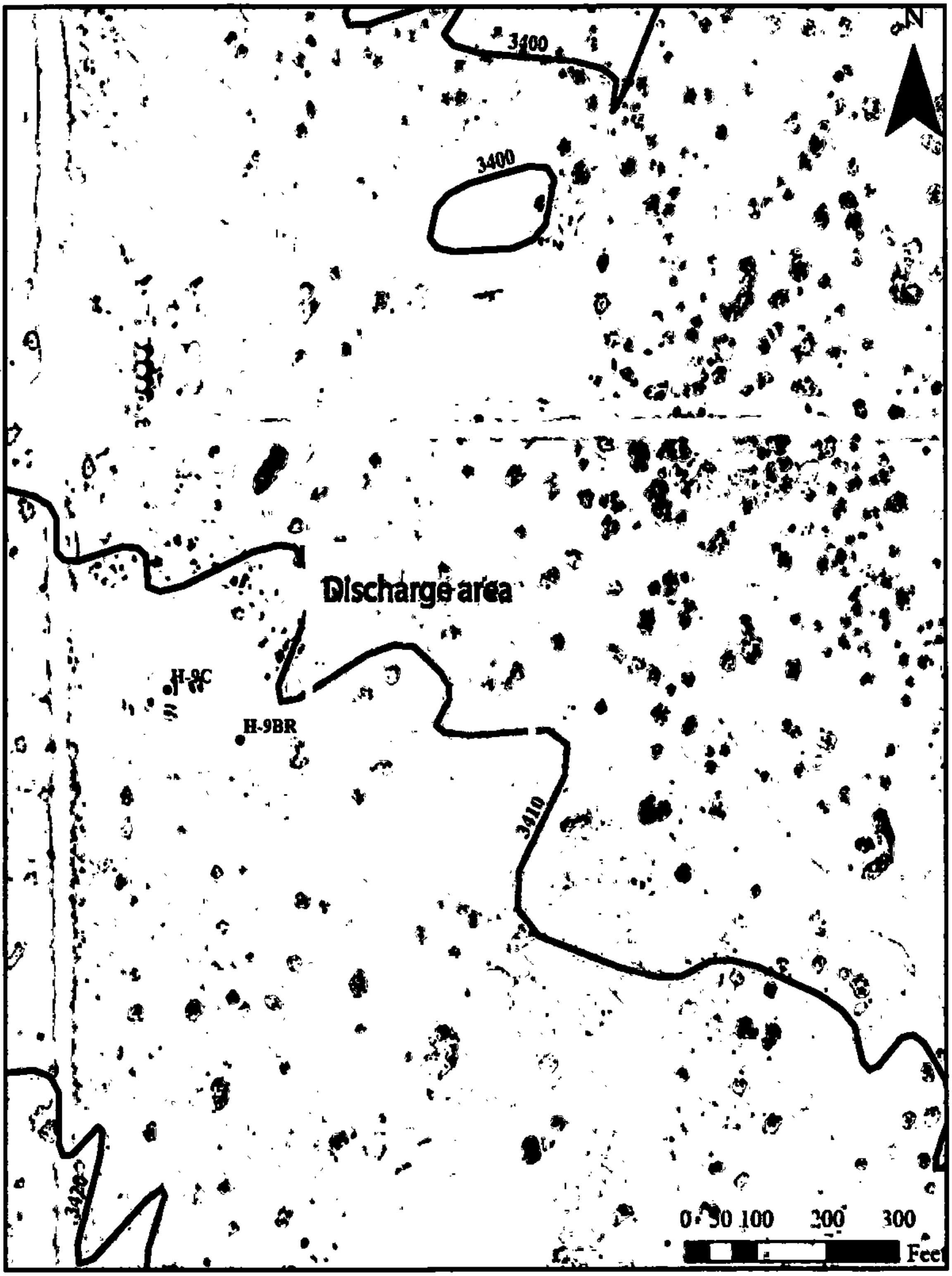


Figure 3

Appendix A-Historical Data from Culebra at H-9b

Well ID	Sample Name	Sample Date	pH (pH units)	SPEC COND (umhos/cm@25C)	FLUORIDE (mg/L)	CHLORIDE (mg/L)	BROMIDE (mg/L)	SULFATE (mg/L)	CALCIUM (mg/L)	IRON (mg/L)
H-9B	Culebra_H-9B_1980_Q1	2/5/1980	7.3		3	320		2000	580	
H-9B	Culebra_H-9B_1985_Q4	11/1/1985				181				
H-9B	Culebra_H-9B_1985_Q4	11/2/1985	7.35	3400		178				0
H-9B	Culebra_H-9B_1985_Q4	11/3/1985				177				0.15
H-9B	Culebra_H-9B_1985_Q4	11/4/1985				180				0.13
H-9B	Culebra_H-9B_1985_Q4	11/5/1985	7.47	3500		187				0.09
H-9B	Culebra_H-9B_1985_Q4	11/6/1985	7.43	3500		188				0.07
H-9B	Culebra_H-9B_1985_Q4	11/7/1985	7.4			182				0.11
H-9B	Culebra_H-9B_1985_Q4	11/10/1985				187				0.2
H-9B	Culebra_H-9B_1985_Q4	11/13/1985	7.39			194				0.15
H-9B	Culebra_H-9B_1985_Q4_RPT	11/14/1985			3.3	194	0.24	1900	590	0.032
H-9B	Culebra_H-9B_1985_Q4_SS	11/14/1985	7.45	3300		196				0.13
H-9B	Culebra_H-9B_1985_Q4	11/14/1985	7.5	3860	2.6	200	1	1600	560	<0.1
H-9B	Culebra_H-9B_1985_Q4_UNC	11/14/1985								0.16
H-9B	Culebra_H-9B_1987_Q1	1/22/1987	7.2	3500		174		2090		0.17
H-9B	Culebra_H-9B_1987_Q1	1/23/1987	7.3			174		2160		0.12
H-9B	Culebra_H-9B_1987_Q1	1/24/1987				174		2210		0.13
H-9B	Culebra_H-9B_1987_Q1	1/25/1987	7.27			175		2190		0.19
H-9B	Culebra_H-9B_1987_Q1	1/26/1987	7.33			176		2180		0.16
H-9B	Culebra_H-9B_1987_Q1	1/27/1987	7.3			174		2220		0.1
H-9B	Culebra_H-9B_1987_Q1_SS	1/28/1987	7.29	3500		176		2200		0.19
H-9B	Culebra_H-9B_1987_Q1	1/28/1987	7.44	4900	3.2	190	<1	1700	630	<0.1
H-9B	Culebra_H-9B_1987_Q1_UNC	1/28/1987								<0.1
H-9B	Culebra_H-9B_1988_Q2	6/16/1988	7.27	3390		170				0.13
H-9B	Culebra_H-9B_1988_Q2	6/17/1988	7.27			172				0.15
H-9B	Culebra_H-9B_1988_Q2	6/18/1988				171				0.11
H-9B	Culebra_H-9B_1988_Q2	6/19/1988	7.24			171				0.1
H-9B	Culebra_H-9B_1988_Q2	6/20/1988	7.26			172				0.12
H-9B	Culebra_H-9B_1988_Q2_SS	6/21/1988	7.27	3400		172				0.12
H-9B	Culebra_H-9B_1988_Q2	6/21/1988	7.03	3420	3.1	180	<2	1600	690	0.12
H-9B	Culebra_H-9B_1988_Q2_UNC	6/21/1988								0.54
H-9B	Culebra_H-9B_1990_Q1	1/19/1990	7.41	3590	3.5	160	<2	1800	650	<0.1
H-9B	Culebra_H-9B_1994_Q3	9/27/1994	7.16	3350	<3	173	<2	2060	634	<0.5

Well ID	Sample Name	Sample Date	MAGNESIUM (mg/L)	POTASSIUM (mg/L)	SODIUM (mg/L)	STRONTIUM (mg/L)	ALKALINITY (CACO3) (mg/L)	ALKALINITY (HCO3) (mg/L)	TDS (mg/L)	SILICA (mg/L)
H-9B	Culebra_H-9B_1980_Q1	2/5/1980	150	1400	210		90		3590	26
H-9B	Culebra_H-9B_1985_Q4	11/1/1985					121			
H-9B	Culebra_H-9B_1985_Q4	11/2/1985					114			
H-9B	Culebra_H-9B_1985_Q4	11/3/1985					113			
H-9B	Culebra_H-9B_1985_Q4	11/4/1985					112			
H-9B	Culebra_H-9B_1985_Q4	11/5/1985					114			
H-9B	Culebra_H-9B_1985_Q4	11/6/1985					114			
H-9B	Culebra_H-9B_1985_Q4	11/7/1985					110			
H-9B	Culebra_H-9B_1985_Q4	11/10/1985					114			
H-9B	Culebra_H-9B_1985_Q4	11/13/1985					114			
H-9B	Culebra_H-9B_1985_Q4_RPT	11/14/1985	137	6.85	146	7.5		110	308	27
H-9B	Culebra_H-9B_1985_Q4_SS	11/14/1985					116			
H-9B	Culebra_H-9B_1985_Q4	11/14/1985	140	7.7	150	7.2		120		18
H-9B	Culebra_H-9B_1985_Q4_UNC	11/14/1985								
H-9B	Culebra_H-9B_1987_Q1	1/22/1987					112			
H-9B	Culebra_H-9B_1987_Q1	1/23/1987					112			
H-9B	Culebra_H-9B_1987_Q1	1/24/1987					111			
H-9B	Culebra_H-9B_1987_Q1	1/25/1987					111			
H-9B	Culebra_H-9B_1987_Q1	1/26/1987					111			
H-9B	Culebra_H-9B_1987_Q1	1/27/1987					112			
H-9B	Culebra_H-9B_1987_Q1_SS	1/28/1987					112			
H-9B	Culebra_H-9B_1987_Q1	1/28/1987	150	7	150	7.2		120		30
H-9B	Culebra_H-9B_1987_Q1_UNC	1/28/1987								
H-9B	Culebra_H-9B_1988_Q2	6/16/1988					117			
H-9B	Culebra_H-9B_1988_Q2	6/17/1988					117			
H-9B	Culebra_H-9B_1988_Q2	6/18/1988					116			
H-9B	Culebra_H-9B_1988_Q2	6/19/1988					116			
H-9B	Culebra_H-9B_1988_Q2	6/20/1988					118			
H-9B	Culebra_H-9B_1988_Q2_SS	6/21/1988					118			
H-9B	Culebra_H-9B_1988_Q2	6/21/1988	140	8.2	140	8		120		12
H-9B	Culebra_H-9B_1988_Q2_UNC	6/21/1988								
H-9B	Culebra_H-9B_1990_Q1	1/19/1990	160	8.3	100	7.5		120		12
H-9B	Culebra_H-9B_1994_Q3	9/27/1994	144	6.49	130		92.8		2800	28.1

Well ID	Sample Name	Sample Date	ALUMINUM (mg/L)	ANTIMONY (mg/L)	ARSENIC (mg/L)	BARIUM (mg/L)	BERYLLIUM (mg/L)	BORON (mg/L)	CADMIUM (mg/L)	CESIUM (mg/L)
H-9B	Culebra_H-9B_1980_Q1	2/5/1980						0.78		
H-9B	Culebra_H-9B_1985_Q4	11/1/1985								
H-9B	Culebra_H-9B_1985_Q4	11/2/1985								
H-9B	Culebra_H-9B_1985_Q4	11/3/1985								
H-9B	Culebra_H-9B_1985_Q4	11/4/1985								
H-9B	Culebra_H-9B_1985_Q4	11/5/1985								
H-9B	Culebra_H-9B_1985_Q4	11/6/1985								
H-9B	Culebra_H-9B_1985_Q4	11/7/1985								
H-9B	Culebra_H-9B_1985_Q4	11/10/1985								
H-9B	Culebra_H-9B_1985_Q4	11/13/1985								
H-9B	Culebra_H-9B_1985_Q4_RPT	11/14/1985						0.63		<0.01
H-9B	Culebra_H-9B_1985_Q4_SS	11/14/1985								
H-9B	Culebra_H-9B_1985_Q4	11/14/1985	<0.01		<0.01	<0.1	<0.005	<0.1		0.2
H-9B	Culebra_H-9B_1985_Q4_UNC	11/14/1985			<0.005					
H-9B	Culebra_H-9B_1987_Q1	1/22/1987								
H-9B	Culebra_H-9B_1987_Q1	1/23/1987								
H-9B	Culebra_H-9B_1987_Q1	1/24/1987								
H-9B	Culebra_H-9B_1987_Q1	1/25/1987								
H-9B	Culebra_H-9B_1987_Q1	1/26/1987								
H-9B	Culebra_H-9B_1987_Q1	1/27/1987								
H-9B	Culebra_H-9B_1987_Q1_SS	1/28/1987								
H-9B	Culebra_H-9B_1987_Q1	1/28/1987	<1	<0.5	<0.005	<0.05	<0.05	0.7	<0.05	<0.1
H-9B	Culebra_H-9B_1987_Q1_UNC	1/28/1987			<0.0005					
H-9B	Culebra_H-9B_1988_Q2	6/16/1988								
H-9B	Culebra_H-9B_1988_Q2	6/17/1988								
H-9B	Culebra_H-9B_1988_Q2	6/18/1988								
H-9B	Culebra_H-9B_1988_Q2	6/19/1988								
H-9B	Culebra_H-9B_1988_Q2	6/20/1988								
H-9B	Culebra_H-9B_1988_Q2_SS	6/21/1988								
H-9B	Culebra_H-9B_1988_Q2	6/21/1988	<0.1	0.08	<0.005	<0.05	<0.05	0.7	<0.005	0.03
H-9B	Culebra_H-9B_1988_Q2_UNC	6/21/1988			<0.001					
H-9B	Culebra_H-9B_1990_Q1	1/19/1990	<0.2	0.09	<0.01	<0.2	<0.005	0.6	0.009	<0.2
H-9B	Culebra_H-9B_1994_Q3	9/27/1994			<0.006	0.011	<0.005	<0.13	<0.0013	

Well ID	Sample Name	Sample Date	CHROMIUM (mg/L)	COBALT (mg/L)	COPPER (mg/L)	CYANIDE (mg/L)	DENSITY (g/cm)	DIVALENT CATIONS (meq/L)	Eh (mV)	IRON FERROUS (mg/L)
H-9B	Culebra_H-9B_1980_Q1	2/5/1980								
H-9B	Culebra_H-9B_1985_Q4	11/1/1985						41.6		
H-9B	Culebra_H-9B_1985_Q4	11/2/1985						41.7	266	0.08
H-9B	Culebra_H-9B_1985_Q4	11/3/1985						41.6		0.05
H-9B	Culebra_H-9B_1985_Q4	11/4/1985						41.7		0.04
H-9B	Culebra_H-9B_1985_Q4	11/5/1985						41.7	385	0.05
H-9B	Culebra_H-9B_1985_Q4	11/6/1985						41.7	289	0.08
H-9B	Culebra_H-9B_1985_Q4	11/7/1985						41.9	292	0.05
H-9B	Culebra_H-9B_1985_Q4	11/10/1985						41.4		
H-9B	Culebra_H-9B_1985_Q4	11/13/1985						41.2	311	0.07
H-9B	Culebra_H-9B_1985_Q4_RPT	11/14/1985								
H-9B	Culebra_H-9B_1985_Q4_SS	11/14/1985						41.3	280	0.04
H-9B	Culebra_H-9B_1985_Q4	11/14/1985	0.04	0.11	0.03	<0.02			452	
H-9B	Culebra_H-9B_1985_Q4_UNC	11/14/1985								<0.2
H-9B	Culebra_H-9B_1987_Q1	1/22/1987						43.6	260	0.02
H-9B	Culebra_H-9B_1987_Q1	1/23/1987						43.8	213	<0.02
H-9B	Culebra_H-9B_1987_Q1	1/24/1987						43.2		<0.02
H-9B	Culebra_H-9B_1987_Q1	1/25/1987						43.2	201	0.06
H-9B	Culebra_H-9B_1987_Q1	1/26/1987						43.4	227	<0.02
H-9B	Culebra_H-9B_1987_Q1	1/27/1987						43.3	279	<0.02
H-9B	Culebra_H-9B_1987_Q1_SS	1/28/1987						43.9	245	<0.02
H-9B	Culebra_H-9B_1987_Q1	1/28/1987	<0.1	<0.1	<0.1	0.24				
H-9B	Culebra_H-9B_1987_Q1_UNC	1/28/1987								<0.1
H-9B	Culebra_H-9B_1988_Q2	6/16/1988						41	202	0.1
H-9B	Culebra_H-9B_1988_Q2	6/17/1988						40.8	203	0.08
H-9B	Culebra_H-9B_1988_Q2	6/18/1988						41.2		0.07
H-9B	Culebra_H-9B_1988_Q2	6/19/1988						41.9	213	0.09
H-9B	Culebra_H-9B_1988_Q2	6/20/1988						41.3	214	0.09
H-9B	Culebra_H-9B_1988_Q2_SS	6/21/1988						41.4	213	0.08
H-9B	Culebra_H-9B_1988_Q2	6/21/1988	0.04	<0.01	<0.01	<0.01				
H-9B	Culebra_H-9B_1988_Q2_UNC	6/21/1988								0.44
H-9B	Culebra_H-9B_1990_Q1	1/19/1990	0.02	<0.05	<0.025	<0.01				
H-9B	Culebra_H-9B_1994_Q3	9/27/1994	<0.01				0.984			

Well ID	Sample Name	Sample Date	LEAD (mg/L)	LITHIUM (mg/L)	MANGANESE (mg/L)	MERCURY (mg/L)	MOLYBDENUM (mg/L)	NICKEL (mg/L)	NITRATE (mg/L)	ORGANIC CARBON TOTAL (mg/L)
H-9B	Culebra_H-9B_1980_Q1	2/5/1980								
H-9B	Culebra_H-9B_1985_Q4	11/1/1985								
H-9B	Culebra_H-9B_1985_Q4	11/2/1985								
H-9B	Culebra_H-9B_1985_Q4	11/3/1985								
H-9B	Culebra_H-9B_1985_Q4	11/4/1985								
H-9B	Culebra_H-9B_1985_Q4	11/5/1985								
H-9B	Culebra_H-9B_1985_Q4	11/6/1985								
H-9B	Culebra_H-9B_1985_Q4	11/7/1985								
H-9B	Culebra_H-9B_1985_Q4	11/10/1985								
H-9B	Culebra_H-9B_1985_Q4	11/13/1985								
H-9B	Culebra_H-9B_1985_Q4_RPT	11/14/1985		0.18	0.015					
H-9B	Culebra_H-9B_1985_Q4_SS	11/14/1985								
H-9B	Culebra_H-9B_1985_Q4	11/14/1985	0.12		0.06	0.0041	0.04	0.13	0.2	2
H-9B	Culebra_H-9B_1985_Q4_UNC	11/14/1985							<1	
H-9B	Culebra_H-9B_1987_Q1	1/22/1987								
H-9B	Culebra_H-9B_1987_Q1	1/23/1987								
H-9B	Culebra_H-9B_1987_Q1	1/24/1987								
H-9B	Culebra_H-9B_1987_Q1	1/25/1987								
H-9B	Culebra_H-9B_1987_Q1	1/26/1987								
H-9B	Culebra_H-9B_1987_Q1	1/27/1987								
H-9B	Culebra_H-9B_1987_Q1_SS	1/28/1987								
H-9B	Culebra_H-9B_1987_Q1	1/28/1987	<0.5	0.17	<0.05	<0.0002	0.01	<0.3	0.5	3
H-9B	Culebra_H-9B_1987_Q1_UNC	1/28/1987							0.5	
H-9B	Culebra_H-9B_1988_Q2	6/16/1988								
H-9B	Culebra_H-9B_1988_Q2	6/17/1988								
H-9B	Culebra_H-9B_1988_Q2	6/18/1988								
H-9B	Culebra_H-9B_1988_Q2	6/19/1988								
H-9B	Culebra_H-9B_1988_Q2	6/20/1988								
H-9B	Culebra_H-9B_1988_Q2_SS	6/21/1988								
H-9B	Culebra_H-9B_1988_Q2	6/21/1988	<0.05	0.2	0.018	0.0002	0.05	<0.03	0.11	<1
H-9B	Culebra_H-9B_1988_Q2_UNC	6/21/1988							<1	
H-9B	Culebra_H-9B_1990_Q1	1/19/1990	0.06	0.2	0.21	<0.0002	0.05	<0.04	0.11	1
H-9B	Culebra_H-9B_1994_Q3	9/27/1994	<0.013	0.15		<0.002				<0.5

Well ID	Sample Name	Sample Date	ORTHOPHOSPHATE (AS P) (mg/L)	PHOSPHATE (mg/L)	RESIDUE FILTERABLE @180 C (mg/L)	RESIDUE NONFILTERABLE @105 C (mg/L)	SELENIUM (mg/L)	SELENIUM IV (mg/L)	SILVER (mg/L)	SULFIDE (mg/L)
H-9B	Culebra_H-9B_1980_Q1	2/5/1980								
H-9B	Culebra_H-9B_1985_Q4	11/1/1985								
H-9B	Culebra_H-9B_1985_Q4	11/2/1985								
H-9B	Culebra_H-9B_1985_Q4	11/3/1985								
H-9B	Culebra_H-9B_1985_Q4	11/4/1985								
H-9B	Culebra_H-9B_1985_Q4	11/5/1985								
H-9B	Culebra_H-9B_1985_Q4	11/6/1985								
H-9B	Culebra_H-9B_1985_Q4	11/7/1985								
H-9B	Culebra_H-9B_1985_Q4	11/10/1985								
H-9B	Culebra_H-9B_1985_Q4	11/13/1985								
H-9B	Culebra_H-9B_1985_Q4_RPT	11/14/1985								
H-9B	Culebra_H-9B_1985_Q4_SS	11/14/1985								
H-9B	Culebra_H-9B_1985_Q4	11/14/1985		0.02	3300	9	<0.01			
H-9B	Culebra_H-9B_1985_Q4_UNC	11/14/1985								0
H-9B	Culebra_H-9B_1987_Q1	1/22/1987								
H-9B	Culebra_H-9B_1987_Q1	1/23/1987								
H-9B	Culebra_H-9B_1987_Q1	1/24/1987								
H-9B	Culebra_H-9B_1987_Q1	1/25/1987								
H-9B	Culebra_H-9B_1987_Q1	1/26/1987								
H-9B	Culebra_H-9B_1987_Q1	1/27/1987								
H-9B	Culebra_H-9B_1987_Q1_SS	1/28/1987								
H-9B	Culebra_H-9B_1987_Q1	1/28/1987		0.01	3300	10	0.012		<0.1	
H-9B	Culebra_H-9B_1987_Q1_UNC	1/28/1987					0.018	0.0072		
H-9B	Culebra_H-9B_1988_Q2	6/16/1988								
H-9B	Culebra_H-9B_1988_Q2	6/17/1988								
H-9B	Culebra_H-9B_1988_Q2	6/18/1988								
H-9B	Culebra_H-9B_1988_Q2	6/19/1988								
H-9B	Culebra_H-9B_1988_Q2	6/20/1988								
H-9B	Culebra_H-9B_1988_Q2_SS	6/21/1988								
H-9B	Culebra_H-9B_1988_Q2	6/21/1988		0.02	3100	<4	<0.5		<0.01	
H-9B	Culebra_H-9B_1988_Q2_UNC	6/21/1988					<0.001			
H-9B	Culebra_H-9B_1990_Q1	1/19/1990			3300	<4	<0.05		0.02	
H-9B	Culebra_H-9B_1994_Q3	9/27/1994	<0.02				<0.006		<0.013	

Well ID	Sample Name	Sample Date	TSS (mg/L)	TEMPERATURE (C)	THALLIUM (mg/L)	TITANIUM (mg/L)	VANADIUM (mg/L)	ZINC (mg/L)
H-9B	Culebra_H-9B_1980_Q1	2/5/1980						
H-9B	Culebra_H-9B_1985_Q4	11/1/1985		22				
H-9B	Culebra_H-9B_1985_Q4	11/2/1985		20.4				
H-9B	Culebra_H-9B_1985_Q4	11/3/1985						
H-9B	Culebra_H-9B_1985_Q4	11/4/1985						
H-9B	Culebra_H-9B_1985_Q4	11/5/1985		22.7				
H-9B	Culebra_H-9B_1985_Q4	11/6/1985		22				
H-9B	Culebra_H-9B_1985_Q4	11/7/1985		21.3				
H-9B	Culebra_H-9B_1985_Q4	11/10/1985						
H-9B	Culebra_H-9B_1985_Q4	11/13/1985		20.7				
H-9B	Culebra_H-9B_1985_Q4_RPT	11/14/1985						
H-9B	Culebra_H-9B_1985_Q4_SS	11/14/1985		23.3				
H-9B	Culebra_H-9B_1985_Q4	11/14/1985				0.06		0.02
H-9B	Culebra_H-9B_1985_Q4_UNC	11/14/1985						
H-9B	Culebra_H-9B_1987_Q1	1/22/1987		21.5				
H-9B	Culebra_H-9B_1987_Q1	1/23/1987		21.4				
H-9B	Culebra_H-9B_1987_Q1	1/24/1987						
H-9B	Culebra_H-9B_1987_Q1	1/25/1987		21.8				
H-9B	Culebra_H-9B_1987_Q1	1/26/1987		22				
H-9B	Culebra_H-9B_1987_Q1	1/27/1987		22.1				
H-9B	Culebra_H-9B_1987_Q1_SS	1/28/1987		22.1				
H-9B	Culebra_H-9B_1987_Q1	1/28/1987			<0.5	<0.3		<0.1
H-9B	Culebra_H-9B_1987_Q1_UNC	1/28/1987						
H-9B	Culebra_H-9B_1988_Q2	6/16/1988		22.4				
H-9B	Culebra_H-9B_1988_Q2	6/17/1988		22.5				
H-9B	Culebra_H-9B_1988_Q2	6/18/1988						
H-9B	Culebra_H-9B_1988_Q2	6/19/1988		22.2				
H-9B	Culebra_H-9B_1988_Q2	6/20/1988		22.3				
H-9B	Culebra_H-9B_1988_Q2_SS	6/21/1988		22.2				
H-9B	Culebra_H-9B_1988_Q2	6/21/1988			<0.05	0.13	0.03	<0.01
H-9B	Culebra_H-9B_1988_Q2_UNC	6/21/1988						
H-9B	Culebra_H-9B_1990_Q1	1/19/1990			<10	0.01	<0.05	<0.02
H-9B	Culebra_H-9B_1994_Q3	9/27/1994	<5					

HALL ENVIRONMENTAL ANALYSIS LABORATORY

COVER LETTER

Friday, July 15, 2011

Michael Schuhen
Sandia National Lab
4100 National Parks Hwy.
MS1395
Carlsbad, NM 88220

TEL: (505) 234-0006
FAX (505) 234-0061

RE: WIPP/H-9bR (C)

Order No.: 1106C12

Dear Michael Schuhen:

Hall Environmental Analysis Laboratory, Inc. received 1 sample(s) on 6/30/2011 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. Below is a list of our accreditations. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please do not hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Laboratory Manager

NM Lab # NM9425 NM0901
AZ license # AZ0682

ACCREDITED IN ACCORDANCE WITH nelac

4901 Hawkins NE ■ Suite D ■ Albuquerque, NM 87109
505.345.3975 ■ Fax 505.345.4107
www.hallenvironmental.com

Hall Environmental Analysis Laboratory, Inc.

Date: *15-Jul-11*

Analytical Report

CLIENT:	Sandia National Lab	**Client Sample ID:**	H-9bR(C)_062811
Lab Order:	1106C12	**Collection Date:**	6/28/2011 11:30:00 AM
Project:	WIPP/H-9bR (C)	**Date Received:**	6/30/2011
Lab ID:	1106C12-01	**Matrix:**	AQUEOUS

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 300.0: ANIONS						Analyst: LJB
Fluoride	3.2	0.10		mg/L	1	6/30/2011 5:04:02 PM
Chloride	170	50		mg/L	100	7/7/2011 5:38:24 PM
Bromide	0.26	0.10		mg/L	1	6/30/2011 5:04:02 PM
Nitrate (As N)+Nitrite (As N)	ND	1.0		mg/L	5	7/6/2011 11:21:56 PM
Phosphorus, Orthophosphate (As P)	ND	2.5	H	mg/L	5	7/7/2011 5:20:59 PM
Sulfate	2000	50		mg/L	100	7/7/2011 5:38:24 PM
EPA METHOD 6010B: DISSOLVED METALS						Analyst: RAGS
Calcium	590	10		mg/L	10	7/12/2011 12:39:31 PM
Magnesium	150	10		mg/L	10	7/12/2011 12:39:31 PM
Potassium	6.9	1.0		mg/L	1	7/12/2011 12:37:43 PM
Sodium	140	10		mg/L	10	7/12/2011 12:39:31 PM
Strontium	7.2	0.60		mg/L	100	7/7/2011 7:48:43 AM
SM 2320B: ALKALINITY						Analyst: IC
Alkalinity, Total (As CaCO3)	100	20		mg/L CaCO3	1	6/30/2011 6:04:00 PM
Carbonate	ND	2.0		mg/L CaCO3	1	6/30/2011 6:04:00 PM
Bicarbonate	100	20		mg/L CaCO3	1	6/30/2011 6:04:00 PM
EPA 120.1: SPECIFIC CONDUCTANCE						Analyst: IC
Specific Conductance	3400	0.010		µmhos/cm	1	6/30/2011 6:04:00 PM
SM4500-H+B: PH						Analyst: IC
pH	7.98	0.100	H	pH units	1	6/30/2011 6:04:00 PM
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: KS
Total Dissolved Solids	3330	20.0		mg/L	1	7/2/2011 4:38:00 PM

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	MCL	Maximum Contaminant Level
NC	Non-Chlorinated	ND	Not Detected at the Reporting Limit
PQL	Practical Quantitation Limit	S	Spike recovery outside accepted recovery limits

HALL ENVIRONMENTAL ANALYSIS LABORATORY

CATION/ANION BALANCE SHEET FOR WATER ANALYSES

HEAL LAB NUMBER	H-9bR(C)_062811 1106C12-01										
CATIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L
Sodium	140	6.09									
Potassium	6.9	0.18									
Calcium	590	29.44									
Magnesium	150	12.35									
Total Cations		48.05									
ANIONS	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L	meq/L	mg/L
Sulfate	2000	41.64									
Chloride	170	4.80									
Bicarbonate (CaCO3)	100	2.00									
Carbonate (CaCO3)											
Phosphate (P)											
Nitrite (N)											
Nitrate (N)											
Fluoride	3.2	0.17									
Bromide	0.26	0.00									
Total Anions		48.61									
Elect. Cond. (µMhos/cm)	3400										
CATION/ANION RATIO		0.99									
% Difference		1									
TOTAL DISSOLVED SOLIDS RATIOS											
TDS (measured)	3330										
TDS (calculated)	3120										
Ratio meas TDS:calc TDS		1.1									
Ratio Meas. TDS:EC		0.98									
Ratio Calc. TDS:EC		0.92									
Ratio of anion sum:EC		1.4									
Ratio of cation sum:EC		1.4									

* Analyte not detected (below method detection limit).

** Values below 0.55 can be obtained in waters containing appreciable concentrations of free acid or alkalinity, or not within pH 6 to 9. Values much higher than 0.7 are possible in highly saline waters.

GENERALLY ACCEPTED RANGES

Cation/Anion balance: 0-3 meq/L- 0.2 meq/L, 3-10 meq/L- 2%, >10 meq/L - 5%

Ratio measured TDS:calculated TDS -- 1.0-1.2. Ratio Calculated TDS:EC -- 0.55-0.7. Ratio Measured TDS:EC--0.55-0.7. Ratio of anion sum:EC -- 0.9-1.1.

Ratio of cation sum:EC -- 0.9-1.1

QA/QC SUMMARY REPORT

Client: Sandia National Lab
Project: WIPP/H-9bR (C) **Work Order:** 1106C12

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: EPA Method 300.0: Anions											
Sample ID: MB		*MBLK*				Batch ID:	R46355	Analysis Date:		6/30/2011 3:36:59 PM	
Fluoride	ND	mg/L	0.10								
Chloride	ND	mg/L	0.50								
Bromide	ND	mg/L	0.10								
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.20								
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50								
Sulfate	ND	mg/L	0.50								
Sample ID: MB		*MBLK*				Batch ID:	R46368	Analysis Date:		7/6/2011 12:55:07 PM	
Fluoride	ND	mg/L	0.10								
Chloride	ND	mg/L	0.50								
Bromide	ND	mg/L	0.10								
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.20								
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50								
Sulfate	ND	mg/L	0.50								
Sample ID: MB		*MBLK*				Batch ID:	R46406	Analysis Date:		7/7/2011 3:36:32 PM	
Fluoride	ND	mg/L	0.10								
Chloride	ND	mg/L	0.50								
Bromide	ND	mg/L	0.10								
Nitrate (As N)+Nitrite (As N)	ND	mg/L	0.20								
Phosphorus, Orthophosphate (As P)	ND	mg/L	0.50								
Sulfate	ND	mg/L	0.50								
Sample ID: LCS		*LCS*				Batch ID:	R46355	Analysis Date:		6/30/2011 3:54:23 PM	
Fluoride	0.4895	mg/L	0.10	0.5	0	97.9	90	110			
Chloride	4.644	mg/L	0.50	5	0	92.9	90	110			
Bromide	2.346	mg/L	0.10	2.5	0	93.8	90	110			
Nitrate (As N)+Nitrite (As N)	3.304	mg/L	0.20	3.5	0	94.4	90	110			
Phosphorus, Orthophosphate (As P)	4.478	mg/L	0.50	5	0	89.6	90	110			S
Sulfate	9.509	mg/L	0.50	10	0	95.1	90	110			
Sample ID: LCS		*LCS*				Batch ID:	R46368	Analysis Date:		7/6/2011 1:12:31 PM	
Fluoride	0.4842	mg/L	0.10	0.5	0	96.8	90	110			
Chloride	4.780	mg/L	0.50	5	0	95.6	90	110			
Bromide	2.455	mg/L	0.10	2.5	0	98.2	90	110			
Nitrate (As N)+Nitrite (As N)	3.427	mg/L	0.20	3.5	0	97.9	90	110			
Phosphorus, Orthophosphate (As P)	5.030	mg/L	0.50	5	0	101	90	110			
Sulfate	9.690	mg/L	0.50	10	0	96.9	90	110			
Sample ID: LCS		*LCS*				Batch ID:	R46406	Analysis Date:		7/7/2011 3:53:56 PM	
Fluoride	0.5134	mg/L	0.10	0.5	0	103	90	110			
Chloride	5.076	mg/L	0.50	5	0	102	90	110			
Bromide	2.590	mg/L	0.10	2.5	0	104	90	110			
Nitrate (As N)+Nitrite (As N)	3.636	mg/L	0.20	3.5	0	104	90	110			
Phosphorus, Orthophosphate (As P)	5.219	mg/L	0.50	5	0	104	90	110			
Sulfate	10.26	mg/L	0.50	10	0	103	90	110			

Qualifiers:

E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	NC	Non-Chlorinated
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

QA/QC SUMMARY REPORT

Client: Sandia National Lab
Project: WIPP/H-9bR (C)
Work Order: 1106C12

Analyte	Result	Units	PQL	SPK Va	SPK ref	%Rec	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Method: SM 2320B: Alkalinity											
Sample ID: MB-R46271		*MBLK*				Batch ID:	R46271	Analysis Date:		6/30/2011 5:47:00 PM	
Alkalinity, Total (As CaCO3)	ND	mg/L Ca	20								
Carbonate	ND	mg/L Ca	2.0								
Bicarbonate	ND	mg/L Ca	20								
Sample ID: LCS-R46271		*LCS*				Batch ID:	R46271	Analysis Date:		6/30/2011 5:53:00 PM	
Alkalinity, Total (As CaCO3)	80.76	mg/L Ca	20	80	0	101	98.7	102			
Method: EPA Method 6010B: Dissolved Metals											
Sample ID: MB		*MBLK*				Batch ID:	R46361	Analysis Date:		7/7/2011 7:26:30 AM	
Calcium	ND	mg/L	1.0								
Magnesium	ND	mg/L	1.0								
Potassium	ND	mg/L	1.0								
Sodium	ND	mg/L	1.0								
Strontium	ND	mg/L	0.0060								
Sample ID: MB		*MBLK*				Batch ID:	R46464	Analysis Date:		7/12/2011 12:33:46 PM	
Calcium	ND	mg/L	1.0								
Magnesium	ND	mg/L	1.0								
Potassium	ND	mg/L	1.0								
Sodium	ND	mg/L	1.0								
Sample ID: LCS		*LCS*				Batch ID:	R46361	Analysis Date:		7/7/2011 7:29:08 AM	
Calcium	48.64	mg/L	1.0	50	0	97.3	80	120			
Magnesium	50.13	mg/L	1.0	50	0	100	80	120			
Potassium	49.19	mg/L	1.0	50	0	98.4	80	120			
Sodium	49.83	mg/L	1.0	50	0	99.7	80	120			
Strontium	0.09007	mg/L	0.0060	0.1	0	90.1	80	120			
Sample ID: LCS		*LCS*				Batch ID:	R46464	Analysis Date:		7/12/2011 12:35:55 PM	
Calcium	51.23	mg/L	1.0	50	0.0699	102	80	120			
Magnesium	51.64	mg/L	1.0	50	0.0739	103	80	120			
Potassium	50.21	mg/L	1.0	50	0	100	80	120			
Sodium	51.49	mg/L	1.0	50	0	103	80	120			
Method: SM2540C MOD: Total Dissolved Solids											
Sample ID: MB-27457		*MBLK*				Batch ID:	27457	Analysis Date:		7/2/2011 4:38:00 PM	
Total Dissolved Solids	ND	mg/L	20.0								
Sample ID: LCS-27457		*LCS*				Batch ID:	27457	Analysis Date:		7/2/2011 4:38:00 PM	
Total Dissolved Solids	1021	mg/L	20.0	1000	0	102	80	120			

Qualifiers:

E	Estimated value	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	NC	Non-Chlorinated
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

Sample Receipt Checklist

Client Name SANDIA CARLSBAD — Date Received: 6/30/2011

Work Order Number 1106C12 — Received by: AT

Sample ID labels checked by: AT (Initials)

Checklist completed by: [signature] (Signature) 06/30/11 (Date)

Matrix: — Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐	Not Shipped ☐
Custody seals intact on sample bottles?	Yes ☑	No ☐	N/A ☐	
Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Samples in proper container/bottle?	Yes ☑	No ☐		
Sample containers intact?	Yes ☑	No ☐		
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		Number of preserved bottles checked for pH:
Water - VOA vials have zero headspace?	No VOA vials submitted ☑	Yes ☐	No ☐	
Water - Preservation labels on bottle and cap match?	Yes ☑	No ☐	N/A ☐	2
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐	<2 >12 unless noted below.
Container/Temp Blank temperature?	2.1°	<6° C Acceptable If given sufficient time to cool.		

COMMENTS:

Client contacted ______ Date contacted: ______ Person contacted ______

Contacted by: ______ Regarding: ______

Comments: ______

Corrective Action ______

Chain-of-Custody Record

Client: Sandia National Laboratories

Mailing Address: 4100 National Parks Highway
Carlsbad, NM 88220

Phone #: (575) 234-0107

email or Fax#: (575) 234-0061

QA/QC Package:
X Standard ☐ Level 4 (Full Validation)
☐ Other ______
☐ EDD (Type) ______

Turn-Around Time:
☐ Standard ☐ Rush ______

Project Name:
WIPP / H-9bR (C)

Project #:
98806 / 1.4.2.3

Project Manager:
Mike Schuhen

Sampler: W. DeYonge, D. Bowman

On Ice: X Yes ☐ No

Sample Temperature: 2/

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1106C17	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Cation / Anion Balance	pH, Cond, TDS, Alkalinity	$NO_2 + NO_3$	Metals / Strontium / Cations	Air Bubbles (Y o
6/28/11	11:30	H_20	H-9bR(C)_062811	#1: 500 mL	NONE	-1												X	X			
6/28/11	11:30	H_20	H-9bR(C)_062811	#2: 125 mL	H_2SO_4	-1														X		
6/28/11	11:30	H_20	H-9bR(C)_062811	#3: 125 mL	HNO_3	-1															X	
			END OF SAMPLE LIST																			

Date:	Time:	Relinquished by:	Received by:	Date	Time
6/29/11	11:30	Wesley F. DeYonge (signature: Wesley F. DeYonge)	[signature]	06/30/11	0730
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:
Container #3 was filtered.
Samples may contain high levels of salts.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Appendix A

ACTIVITY/ PROJECT SPECIFIC PROCEDURE
Sandia National Laboratories

Chain of Custody

HEAL# 1106C12

Form Number: SP 13-1-1
Page 1 of 1
Attach more forms as needed

1. Initial Sample Custodian Wesley F. DeYonge (Printed Name) Organization: 6212 Date: 6/28/2011

2. Sample Collection or Creation Information Scientific Notebook ID: WSWT-14
Test Plan ID: TP 03-01 Field Log ID: N/A
Sample Location: WIPP Monitoring Well H-9bR (i.e. borehole/core no./lab bldg. no./etc.)

Sample Team Members/Organization.
Wes DeYonge/ 6212
Dale Bowman/ 6212
enter n/a if none

3. Sample Identification Sample/Sub-Sample #	Date Collected	Container Type	Container Volume	Preser-Vative	Analysis Request	Sample Description
H-9bR(C)_062811	06/28/11	PE Bottle	500 ml	None	Anions, pH, TDS, Cond., Alk.	H-9bR Culebra water unpreserved
H-9bR(C)_062811	06/28/11	PE Bottle	125 ml	H2SO4	NO2+NO3	H-9bR Culebra water preserved w/ sulfuric acid
H-9bR(C)_062811	06/28/11	PE Bottle	125 ml	HNO3	Cations, Metals	H-9bR Culebra water filtered & preserved w/ nitric acid
–End of Sample List–					Strontium	

enter n/a if none

4. Sample Requirements
Handling: Keep sealed until use
Storage & Preservation: Keep chilled/refrigerated
Shipping: Hand carry/Fed Ex
Archive: N/A
Disposition: Discard samples upon completion of testing
Expiration Date: 07/28/11

5. Custody Transfer	Printed Name	Signature	Organization/Company	Date-Time	Sample Condition
a. Relinquished by:	Wesley F. DeYonge	Wesley F. DeYonge	6212 / RESPEC	6/29/11 – 1130	Containers intact & sealed
a. Received by:	Anne Thorne	[signature]	HEAL	6/30/11 0730	yes 2.1°
b. Relinquished by:					
b. Received by:					
c. Relinquished by:					
c. Received by:					

Upon sample receipt, note condition. This form (copy for your records) shall follow samples through its life, until final disposition, then send original to WIPP Records Center.
For samples that are potentially hazardous & require packaging and shipping, contact Center 6700 ES&H Coordinator or see SNL ES&H Manual, Chpt. 12.

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

Harold Runnels Building
1190 St. Francis Drive
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us

DAVE MARTIN
Secretary

BUTCH TONGATE
Deputy Secretary

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Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	

7011 3500 0000 0326 4073

M. Daniel J. Ferguson
US Dept. of Energy
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

PS Form 3800, August 2006

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

May 2, 2012

M. Daniel J. Ferguson
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, NM 88221

RE: Corrective Action Plan Approval, Waste Isolation Pilot Plant, DP-831

Dear Mr. Ferguson:

On April 11, 2012, the Ground Water Quality Bureau of the New Mexico Environment Department (NMED) received oral notification of an unauthorized discharge at the Waste Isolation Pilot Plant (WIPP). Written notification of the discharge and a Corrective Action Plan were received on April 19, 2012. The information submitted satisfies the reporting requirements of Subsection A of 20.6.2.1203 NMAC of the Water Quality Control Commission Regulations (20.6.2 NMAC).

According to the information submitted, the unauthorized discharge and the corrective actions taken are described as follows:

A rubber coupling on a sewer line at a portable building on the site is believed to have been damaged during cleanout by a cleaning subcontractor. Black and gray water leaked on to the ground under the building whenever the facilities were used from March 13, 2012 to April 10, 2012. The leak was discovered when water was discovered running out from under the building. The volume of the discharge taken from meter readings is conservatively estimated to be 3,350 gallons assuming all water used in the building during the suspected period went to the ground.

As a corrective action, water to the building was shut off immediately upon discovery of the leak. The skirting to the building was removed and on April 12, 2012, the sewer line was repaired with a compression fitting. Impacted soil in the area of the pipe disconnection was disposed of and the area sanitized.

The corrective actions taken are acceptable to NMED, and the Corrective Action Plan is satisfactory.

Additional corrective actions may be required if additional information becomes available indicating that the corrective actions taken are inadequate and/or ground water contamination occurs as a result of the described discharge. The DOE may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC, if the corrective action plan will not result in compliance with the standards and requirements set forth in Section 20.6.2.4103 NMAC within 180 days of confirmation of ground water contamination.

If you have any questions regarding these issues, please contact Clint Marshall, Program Manager of the Pollution Prevention Section, at (505) 827-0027.

Sincerely,

Jerry Schoeppner, Chief
Ground Water Quality Bureau

JS:CLM

cc: Michael Kesler, Acting District Manager, NMED District III
NMED Carlsbad Field Office

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

APR 1 7 2012

Mr. Clint Marshall
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

GROUND WATER
APR 1 9 2012
BUREAU

Subject: Notification of Discharge / Corrective Action Report

The purpose of this letter is: 1) to document the U. S. Department of Energy, Carlsbad Field Office call to you (via subcontractor) on the morning of April 11, 2012 and to provide your office a Notification of Discharge within seven days; and 2) to describe the corrective actions relative to the notification within 15 days. This information is being provided to you per your direction.

1. Notification

(a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility:

Person in charge of the facility:	Jose R. Franco, Manager 4021 National Parks Highway Carlsbad, New Mexico, 88220 (575) 234-7300
Owner of the facility:	U. S. Department of Energy
Operator of the facility:	URS Washington TRU Solutions, LLC

(b) Name and address of the facility:

U. S. Department of Energy
Waste Isolation Pilot Plant
30 miles east of Carlsbad, New Mexico off of State Highway 128
Carlsbad, NM 88220

(c) The date, time, location, and duration of the discharge:

Date:	March 13, 2012 to April 10, 2012
Time:	N/A
Location:	WIPP Site, Building 953

CBFO:OESH:DJF:ANC:12-0731:UFC 5486.00

- Once it was noted that the sewer line connection fitting was damaged, work orders were placed on a high priority level to reconnect the building sewer drain pipe.

2. Corrective Action Report - 20.6.2.1203.A. (3) & (6)

On April 12, 2012 a subcontractor completed the reconnection of the sewer line with a compression fitting. Work orders are being finalized with a contractor to remove residue left from the water accumulation under the building. Replacement of the connector fitting was completed in approximately 48 hours after detection of the discharge. Stained soil in the area of the pipe disconnection will be properly disposed of and the area will be sanitized.

In the future when drain cleaning is conducted the plumbing line will be evaluated confirming that there was no damage during the cleaning process. If any additional actions are needed, that are not described in the correspondence, they will be provided to your office in the next semi-annual DP – 831 report that is due to your office by July 31, 2012.

Upon review of this matter it is believed that this loss of sewage containment did not pose a threat to human health and environment. The corrective actions described are intended to meet all notification requirements of 20.6.2.1203 NMAC and DP-831.

If you have any further questions regarding this matter or need additional information, please contact me at (575) 234-8128.

Sincerely,

Mr. Daniel J. Ferguson,
Carlsbad Field Office

cc:
T. Kliphuis, NMED *ED
CBFO M&RC ED
*ED denotes electronic distribution

CBFO:OESH:DJF:ANC:12-0731:UFC 5486.00

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

DAVE MARTIN
Secretary

BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

November 9, 2011

GROUND WATER
JAN 27 2012
BUREAU

Edward Ziemianski, Acting Manager
Carlsbad Field Office
Department of Energy
P. O. Box 3090
Carlsbad, New Mexico 88221-3090

Farok Sharif
Washington TRU Solutions LLC
P. O. Box 2078
Carlsbad, New Mexico 88221-5608

**RE: WIPP HAZARDOUS WASTE FACILITY PERMIT
REVISED NOVEMBER 2, 2011
EPA I.D. NUMBER NM4890139088**

Dear Messrs. Ziemianski and Sharif:

On November 2, 2011, the New Mexico Environment Department (NMED) revised the WIPP Hazardous Waste Facility Permit, incorporating the following specific submittal:

- Notification of Class 1 Pemit Modification (Revise Table 4.1.1 and Table G-1), Letter Dated 8/8/11, Rec'd 8/9/11

NMED made the following corrections to the Permittees' submittal:

- Table 4.1.1:
  - NMED rounded the cubic feet (ft^3) final volume for contact-handled (CH) waste in Panel 5 to the nearest 100 ft^3 to maintain consistency with the volumes reported in Panels 1 through 4.
  - NMED changed the final volume for remote-handled (RH) waste in Panel 5 to 8,300 ft^3 (235 m^3) to maintain consistency with the calculations used to report the RH volume for Panel 4. In their submittal, the Permittees reported the RH volume based on the volume of the containers within the RH canisters emplaced in Panel 5. The corrected RH volume is based on the volume of the RH canisters (264 canisters * 0.89 m^3 per canister = 235 m^3).

- NMED rounded the cubic feet (ft^3) final volume for RH waste in Panel 5 to the nearest 100 ft^3 to maintain consistency with the volumes reported in Panel 4.

- Table G-1:
  - NMED added asterisks (*) to the Panel 5 "Operations End" and "Closure Start" dates, and to the Panel 6 "Operations Start" date to indicate actual dates.

Attached is an electronic copy of the revised Permit Part 4 and Attachment G that contains the corrected tables. Because NMED made corrections to the PMR, NMED encourages the Permittees to notify the facility mailing list of the corrections and post this letter and the revised Permit Part 4 and Attachment G on its website.

If you have any questions regarding this matter, please contact me at (505) 476-6035 or Tim Hall at (505) 476-6049.

Sincerely,

[signature] for

John E. Kieling
Acting Bureau Chief
Hazardous Waste Bureau

Enclosure

cc: Tim Hall, NMED HWB
Susan McCauslin, DOE CBFO (w/o enclosure)
Wille Most, WRES (w/o enclosure)
File: Red WIPP '11

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
August 17, 2011

GROUND WATER
AUG 18 2011
BUREAU

~NOTICE~

Waste Isolation Pilot Plant
Class 1 Permit Modification Notifications

The U.S. Department of Energy and Washington TRU Solutions LLC hereby inform you of the following Class 1 Permit Modification Notifications to the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (Permit), Permit Number: NM4890139088-TSDF.

The New Mexico Environment Department (NMED) was notified of the following Class 1 permit modifications on the dates indicated below. Summary of the changes follows.

June 2, 2011

- Update Emergency Coordinator List

Two individuals are being added as primary emergency coordinators and one person is being removed from the list. Table D-2 is being updated to indicate that change.

July 5, 2011

- Update Emergency Coordinator List

One person is being deleted as the primary emergency coordinator from the list. Table D-2 is being updated to indicate that change.

July 11, 2011

- Editorial Corrections

Make various editorial corrections/changes to clarify specific items in the current WIPP Permit.

August 8, 2011

- Revise Table 4.1.1

Revise Table 4.1.1 to indicate final waste volume in Panel 5.

- Revise Table G-1

Revise Table G-1 to reflect the actual operations end and closure start and estimated closure end dates for Panel 5. Revise the actual operations start date of Panel 6.

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
June 9, 2011

GROUND WATER
JUN 13 2011
BUREAU

~NOTICE~

Waste Isolation Pilot Plant
Class 1 Permit Modifications Notification

The U.S. Department of Energy and Washington TRU Solutions LLC hereby inform you of the following Class 1 Permit Modifications to the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), Permit Number: NM4890139088-TSDF.

The New Mexico Environment Department (NMED) was notified of the following Class 1 permit modifications on the dates indicated below. Summary of the changes follows.

March 17, 2011

- Add South Access Road for Transportation of TRU Mixed Waste

The South Access Road was reconstructed to be equivalent in construction to the North Access Road, thereby allowing it to be used for the transport of trucks carrying transuranic mixed waste. The Class 1 Permit Modification Notification removed language that indicated that only the North Access Road could be used for waste and updated other information.

May 24, 2011

- Revise TRUPACT-III Management Language

Language in the Permit was revised to provide the option to remove TRUPACT III bolts either using the Bolting Robot or manually if needed.

- Revise Procedure Reference for the Bolting Station in Table E-1

A procedure number was updated in the inspection schedule because one procedure, instead of two, will be used for inspecting both the Bolting Station and the Bolting Robot.

CBFO:OESH:GS:11-0776:UFC 1010.00

U.S. Department of Energy
Waste Isolation Pilot Plant

GROUND WATER
JAN 31 2011
BUREAU

Notice of Information Repository

Background

The U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP) received its Hazardous Waste Facility Permit (Permit) renewal from the New Mexico Environment Department on November 30, 2010. The Permit effective date is December 30, 2010.

Information Repository

Beginning December 30, 2010, the new permit requires the Permittees to establish and maintain an electronic Information Repository on the WIPP Homepage. The Information Repository will be located at: http://www.wipp.energy.gov/library/information_repository. The Information Repository will include the following information:

- The Part A and Part B permit applications associated with the Permit
- A complete copy of the Permit, including any modifications
- Permit modification notifications and requests associated with the Permit
- The Annual Waste Minimization Report
- Any requests for time extensions associated with Permit Section 1.10.3
- Corrective action documents associated with Permit Part 8
- Reports required by Permit Sections 1.7.11 and 1.7.13 that must be submitted in writing
- Notices of deficiency or disapproval, associated responses, final approval letters and directives from the Secretary associated with specific documents
- Notices of violation, administrative compliance orders, responses to these documents required by the Secretary and any directives from the Secretary associated with the Permit
- Biennial Report submitted to NMED pursuant to Section 2.14.2

The Information Repository will contain an index of the documents included in the repository.

Questions regarding the Information Repository should be directed to Mr. Bobby St. John at:

	E-Mail	Mailing Address
	Bobby.stjohn@wipp.ws	PO Box 2078 Carlsbad, NM 88221

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000   Fax (505) 476-6030
www.nmenv.state.nm.us

DAVE MARTIN
Secretary

RAJ SOLOMON, P.E.
Deputy Secretary

April 18, 2011

RE: FINAL PERMIT DECISION AND RESPONSE TO COMMENTS, CLASS 2 MODIFICATION REQUEST
WIPP HAZARDOUS WASTE FACILITY PERMIT
EPA I.D. NUMBER NM4890139088

Dear Interested Person:

On April 15, 2011, the New Mexico Environment Department (**NMED**) took final administrative action on a Class 2 permit modification request (**PMR**) to the Waste Isolation Pilot Plant (**WIPP**) Hazardous Waste Facility Permit. The Department of Energy Carlsbad Field Office and Washington TRU Solutions LLC (**the Permittees**) submitted this PMR to the Hazardous Waste Bureau on January 11, 2011, seeking to add the TRUPACT-III as a shipping package and the Standard Large Box 2 (**SLB2**) as a storage and disposal container, to add Room 108 and Airlock 107 as part of the Contact-Handled Bay in the Waste Handling Building Storage Unit, and to add equipment to the facility to allow for the handling of the TRUPACT-III and SLB2.

NMED approved this PMR with changes for the reasons specified in the response to comments. This Class 2 PMR was subject to a 60-day public comment period running from January 17, 2011 through March 17, 2011, during which NMED received written specific comments from a total of four individuals and organizations.

Further information on this administrative action, including the response to comments, may be found on the NMED WIPP Information Page at <http://www.nmenv.state.nm.us/wipp/>. Please contact Steve Zappe at (505) 476-6051 or via e-mail at <steve.zappe@state.nm.us> if you have further questions or need additional information.

Sincerely,

John E. Kieling
Manager
Permits Management Program

Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6306

016H26523547
$00.44^0
04/18/2011
Mailed From 87505
US POSTAGE
Hasler

Bill Olson
NMED/GWQB
P.O. Box 5469
Santa Fe, NM 87502

GROUND WATER
APR 19 2011
BUREAU

87502S5469 B015

PUBLIC INFORMATION MEETINGS

On a Requested Modification to the Hazardous Waste Facility Permit for the Waste Isolation Pilot Plant

GROUND WATER

JAN 21 2011

BUREAU

WHO: U.S. Department of Energy (DOE) Carlsbad Field Office and Washington TRU Solutions LLC (WTS)

WHAT: DOE and WTS will conduct public meetings to provide information on the following permit modification request to the WIPP Hazardous Waste Facility Permit. There will be a 60-day public comment period beginning on January 17, 2011.

WHEN:	Tuesday, February 8, 2011 5 – 6 p.m.	Thursday, February 10, 2011 2 – 4 p.m. & 6 – 8 p.m.
WHERE:	Skeen-Whitlock Building 4021 National Parks Highway Carlsbad, New Mexico	Courtyard by Marriott 3347 Cerrillos Road Santa Fe, New Mexico

WHY: On January 10, 2011, DOE submitted a Class 2 permit modification request to the New Mexico Environment Department (NMED). The proposed modification is requesting that the items listed below be added to the WIPP Permit for use at the site.

- Allow for the receipt of the TRUPACT-III shipping package at the WIPP facility. This package is a Nuclear Regulatory Commission certified Type B package as required for transporting transuranic (TRU) waste to the WIPP facility. It is designed to transport TRU waste in a large container known as the Standard Large Box 2 (SLB2).
- Add the SLB2 as an approved storage and disposal container at the WIPP facility. This container is necessary to accommodate items that exceed the volume capacity of existing approved TRU waste containers.
- Add Airlock 107 and Room 108 as part of the Contact-Handled Bay. These additional areas are necessary to manage TRUPACT-III and will increase the size of the CH Bay by 6,156 square feet. This increase in size does not include an increase in the amount of storage capacity for TRU waste in the CH Bay.
- Add equipment for handling TRUPACT-III and the SLB2. The equipment will consist of an automated yard transfer vehicle, payload transfer station, bolting robot and vent hood. The yard transfer vehicle will be used to move the TRUPACT-III from the parking area unit into Room 108 inside the CH Bay. Additionally, a payload transfer station, bolting robot and vent hood will be added to the permit to facilitate the removal of the SLB2 from the TRUPACT-III.

HOW: Additional information about this permit modification request can be obtained from Mr. Bobby St. John, WTS, at 1-800-336-9477. The permit modification is also available in the Information Repository located on the WIPP web site at www.wipp.energy.gov and at the WIPP Information Center, Skeen-Whitlock Building, 4021 National Parks Highway, Carlsbad, N.M. A copy of the requested permit modification also may be obtained from NMED at the address listed below.

COMMENTS: Written comments for the record must be sent to the NMED contact person at the address below and received no later than 5 p.m. on March 17, 2011:

Mr. Steve Zappe
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, N.M. 87505
Phone: 505-476-6051
Fax: 505-476-6060
E-mail: steve.zappe@state.nm.us

The Permittees' compliance history during the life of the permit being modified is available from Mr. Steve Zappe at the New Mexico Environment Department.

QUESTIONS: Any questions or comments to the Permitees regarding this permit modification may be sent to Mr. Bobby St. John, P.O. Box 2078, Carlsbad, N.M. 88221, no later than March 10, 2011.

Waste Isolation Pilot Plant

January 16, 2011

Fact Sheet

DOE Proposes Modification To Hazardous Waste Facility Permit

Changes to WIPP Hazardous Waste Facility Permit

Background

The U.S. Department of Energy Carlsbad Field Office (DOE) and Washington TRU Solutions LLC (WTS) submitted a Class 2 permit modification request to the New Mexico Environment Department (NMED) to change the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (Permit). NMED issued the Permit (Permit Number: NM4890139088-TSDF) in November 2010.

What is Proposed?

The proposed modification submitted to NMED on January 10, 2011, is requesting specific items be added to the Permit for use at the site. The modification is requesting the addition of:

1. TRUPACT-III as a shipping package
2. Standard Large Box 2 as a storage and disposal container
3. Room 108 and Airlock 107 as part of the contact-handled (CH) bay
4. Equipment to the facility to allow for the handling of TRUPACT-III and Standard Large Box 2

The shipping package, container and handling equipment will be used to manage CH transuranic (TRU) mixed waste that is approved for shipment and disposal at the WIPP facility.

TRUPACT-III

The first request would allow for the receipt of the TRUPACT-III shipping package at the WIPP facility. This package is a Nuclear Regulatory Commission certified Type B package as required for transporting TRU waste to the WIPP facility. The TRUPACT-III is designed to transport TRU waste in a large container known as the Standard Large Box 2. When loaded with TRU waste, TRUPACT-III will consist of a single Standard Large Box 2. Shipments made in TRUPACT-III will meet applicable Department of Transportation requirements.

Standard Large Box 2
This container is necessary to accommodate items that exceed the volume capacity of existing TRU waste containers approved for management at the WIPP facility. These large boxes will not fit inside either the TRUPACT-II or the HalfPACT, which are currently the only two CH waste shipping containers approved for use at the WIPP facility.

Room 108 and Airlock 107
Additional areas are necessary to manage TRUPACT-III in the CH Bay. These areas are designated as Airlock 107 and Room 108. These areas will increase the total area of the CH Bay by 6,156 square feet. This increase in size does not include an increase in the amount of storage capacity for TRU waste.

Additional Equipment for Handling TRUPACT-III and Standard Large Box 2

- Facility Transfer Vehicle and Yard Transfer Vehicle
  The Facility Transfer Vehicle is currently described in the Permit in Table A1-2. The Yard Transfer Vehicle is an automated guided vehicle that will transport the TRUPACT-III shipping container from parking area unit into Room 108. It will travel on a pre-programmed path and will communicate with the computer guidance system via wireless transmission. There are numerous safety features on the Yard Transfer Vehicle to ensure the vehicle will not bump something or deviate from the pre-determined path.

- Bolting Robot
  The Bolting Robot is used to remove and/or install the TRUPACT-III overpack cover and closure lid bolts. The Bolting Robot is an electro-mechanical system with an end-of-arm tool used to de-tension, remove, install and re-tension the TRUPACT-III overpack cover and closure lid bolts.

- Vent Hood
  The Bolting Station has an exhaust system that consists of a vent system. The system is similar to the one used for the TRUPACT-II and HalfPACT. The system will tie into the existing exhaust system in the Waste Handling Building. The vent hood operation routes air through a high efficiency particulate air filter prior to discharging it to the atmosphere.

- Payload Transfer Station
  The Payload Transfer Station consists of a payload lifter, transfer table or Facility Transfer Vehicle with roller table and a control system. This location allows for the removal of the Standard Large Box 2 from the TRUPACT-III. The Standard Large

Box 2 sits on a pallet inside the TRUPACT-III and the pallet slides out. The SLB2 is placed on a Facility Pallet for movement to the underground.

- Drum Age Criteria (DAC)
  Since a new container is being added to the Permit, it is necessary to identify appropriate DAC values for the Standard Large Box 2. The Permittees have determined these DAC values for the Standard Large Box 2 and are proposing to put them into the Permit.

- Waste Emplacement
  The Standard Large Box 2 will be emplaced in the same manner as other TRU mixed waste containers. The SLB2 does not use slipsheets as described for smaller containers. Instead, the SLB2 is handled in the underground using a standard fork lift.

Comments

Comments for the record must be sent to Mr. Steve Zappe, New Mexico Environment Department, 2905 Rodeo Park Drive, Building 1, Santa Fe, NM 87505. They also may be e-mailed: steve.zappe@state.nm.us or faxed to 505-476-6060. Only written comments will be accepted and must be received no later than 5 p.m. (MDT) on March 17, 2011. A copy of the permit modification may be viewed or copied at the NMED offices of Mr. Zappe. To be placed on the WIPP mailing list, contact Mr. Zappe at the address above

For more Information

For more information about transuranic waste shipments and procedures, call the WIPP Information Center at 1-800-336-WIPP (9477). This permit modification request is available for review in the Information Repository located on the WIPP home page at www.wipp.energy.gov. Comments to the Permittees regarding this permit modification may be sent to Mr. Bobby St. John, Washington TRU Solutions LLC, P.O. Box 2078, Carlsbad, NM 88221.

Marshall, Clint, NMENV

From: Zappe, Steve, NMENV

Sent: Tuesday, January 25, 2011 11:21 AM

To: Clark, Anne, EMNRD; Basabilvazo, George; Farok Sharif; Bearzi, James, NMENV; Kesterson, Thomas L, NMENV; Marshall, Clint, NMENV; Skibitski, Thomas, NMENV; Tom Peake; Ziemianski, Edward - DOE

Cc: Birch, Barry, NMENV; Cook, Dennis - WTS; Chavez, Rick; 'Hellstrom, George'; Stone, Anthony; McCauslin, Susan - DOE; Kehrman, Bob - WRES; Christopher M. Timm; Griswold, Jim, EMNRD; Baca, Dolores, PRC; lopez, bobby, NMENV; Madrid, Roseanne J., DPS; Shainin, Don, DHSEM; Trujillo, Geno H., DPS; Wilson, Todd C., NMDOT; Yackey, Tim, DOH

Subject: Attendance list for 113th Quarterly Meeting, action items

Attachments: Attendance 113th.pdf; AMWTP Incident 10_28_10.pdf

All -

As promised, here is the attendance list from last week's WIPP quarterly meeting.

Here are the action items we discussed at the end of the meeting:

1. NMED HWB - provide Joni with a copy of the WSPF for LANL waste stream LA-MHD01.001
2. CBFO - provide all a copy of the 1/20/11 response letter to DNFSB regarding work planning and control deficiencies.
3. CBFO - address presentation of shipments and emplacements by fiscal year (instead of ,or in addition to, calendar year) at future quarterly meetings
4. CBFO - address Goals 3 and 4 in DOE EM's "Roadmap: Journey to Excellence" at the next quarterly meeting
5. NMED - provide all a copy of the AMWTP incident in suggested agenda topic #4
6. CBFO - identify to all the appropriate venue to talk about suggested agenda topics #12 and 13 (WTS award fees under the WIPP contract)
7. CBFO - defer suggested agenda topics #6 (ARRA) and #14 (amount of waste not meeting WAC by year) until after Casey Gadbury has had a chance to address, defer topic #15 (sodium- and potassium-bearing waste) for a future meeting

Scott Kovac provided me with a link to the response to DNFSB, so action item #2 is complete by the link below:
http://www.hss.energy.gov/deprep/
January 20, 2011, Department letter transmitting the response to the Board's October 22, 2010 report regarding work planning and control at the Waste Isolation Pilot Plant. [PDF]

Also attached is a copy of the letter from AMWTP notifying Idaho Department of Environmental Quality of the incident in October, so action item #5 is also complete.

Finally, at some point CBFO will set the date of the next quarterly meeting, tentatively set for Thursday, April 28, 2011.\

Steve

================================

Steve Zappe
NMED WIPP Project Leader
2905 Rodeo Park Drive E, Building 1
Santa Fe, NM 87505
Office: (505) 476-6051
Cell: (505) 660-0353
Fax: (505) 476-6060

113th WIPP QUARTERLY REVIEW MEETING
January 20, 2011

New Mexico Environment Department, Host
NMED Hazardous Waste Bureau
Conference Room A
2905 Rodeo Park Dr E, Building 1
Santa Fe, NM

Name	Affiliation	Phone	E-mail
Tim Yackey	NM Dept. of Health	476-8251	Tim.Yackey@state.nm.us
Don Shainin	DHSEM	476-9628	Don.Shainin@state.nm.us
Barry Birch	NMED/DOE OB	845-5933	barry.birch@state.nm.us
TOM Skibitski	NMED/DOE-OB	845-5932	thomas.skibitski@state.nm.us
Steve Zappe	NMED/HWB	505 476-6051	steve.zappe@state.nm.us
Dennis H. Cook	WTS	575-234-7116	dennis.cook@wipp.ws
Rick [illegible]	WTS/WRES	575-234-7405	rick.chavez@wipp.ws
George Hellstrom	DOE/CBFO	575-234-7010	george.hellstrom@wipp.ws
Anthony Stone	DOE/CBFO	575 234 7471	anthony.stone@wipp.ws
Susan McCauslin	DOE/CBFO	575-234-7349	Susan.mccauslin@wipp.ws
George Basabilvazo	DOE/CBFO	575-234-7488	george.basabilvazo@wipp.us
Bob Kehrman	WRES	575-234-7210	bob.kehrman@wipp.ws
JONI ARENDS	CCNS	986-1973	jarends@nuclearactive.org

Name	Affiliation	Phone	E-mail
Don Hancock	SRIC	505-262-1862	sricdon@earthlink.net
Scott Kovac	NWNM	505-989-7342	scott@nukewatch.org
Ricardo Maestas	NMED/HWB	505-476-6050	ricardo.maestas@state.nm.us
Tim Hall	NMED/HWB	505-476-6049	timothy.hall@state.nm.us
Chris Timm	Pecos Mgt Svcs	505-323-8355	ctimm@pecosmanagement.com
Henry "Geno" Trujillo	New Mexico State Police	505 476-0436	geno.trujillo@state.nm.us
Anne deLain W. Clark	EMNRD	505-476-3224	anne.clark@state.nm.us
Bobby Lopez	NMED-RCB	" 476-3219	bobby.lopez@ " " "
Steve Holmes	NMED HWB	" 476-6047	steve.holmes@
Jim Griswold	OCD	867-3465	jim.griswold@state.nm.us

02413

AMWTP
Advanced Mixed Waste Treatment Project
Bechtel BWXT Idaho, LLC

RECEIVED
NOV 15 2010
DEPT. OF ENVIRONMENTAL QUALITY
WASTE PROGRAM

November 11, 2010

NOV 2010

C-2010-0392

Mr. Brian Monson
Hazardous Waste Program Manager
Waste Management and Remediation Division
Idaho Department of Environmental Quality
1410 North Hilton
Boise, Idaho 83706-1255

Subject: 15-Day Written Incident Report for the Advanced Mixed Waste Treatment Project's Mixed Waste Incident in the Supercompactor Glovebox at the Advanced Mixed Waste Treatment Facility on October 28, 2010 – LSS-20-10

Dear Mr. Monson:

This letter provides the 15-day written report required by the Idaho Administrative Procedures Act (IDAPA) 58.01.05.008 [Title 40 of the Code of Federal Regulations (CFR) Part 264.56(j)] and Section G-8 of Attachment 7 of the Advanced Mixed Waste Treatment Project (AMWTP) Hazardous Waste Management Act (HWMA)/Resource Conservation Recovery Act (RCRA) Permit (EPA ID Number ID4890008952) for the response to a pressure event that occurred on October 28, 2010, in the Supercompactor Glovebox. This incident was originally reported by telephone on October 28, 2010, to Natalie Clough of the Idaho Department of Environmental Quality (IDEQ) at approximately 2:30 p.m.

- *Name, address, and telephone number of the Mixed Waste Management Unit (MWMU) owner or operator:*
  Bechtel BWXT Idaho, LLC (facility operator)
  Jeffrey D. Mousseau, P.E.
  President and General Manager
  850 Energy Drive, Suite 200
  Idaho Falls, ID 83401-1502
  (208) 557-6404

  DOE-ID Operations Office (facility owner)
  Rick Provencher, Manager
  U.S. Department of Energy
  1955 N. Fremont
  Idaho Falls, ID 83401
  (208) 526-5665

- *Name, address, and telephone number of the MWMU:*
  Bechtel BWXT Idaho, LLC
  Ted Griffith, Acting Plant Manager
  Transuranic Storage Area
  Scoville, ID 83415
  (208) 557-6456

- *Date, time, and type of incident:*
  On October 28, 2010, at approximately 1111 hours, the Supercompactor Glovebox in WMF-676 experienced alarms for low-inflow flow and low depression, followed by a trip of the light curtain that shut down compactor operation. This condition was created by a release of pressure from a drum undergoing supercompaction at the time.

- *Location and cause of the incident:*
  The incident occurred in the Supercompactor Glovebox located in WMF-676. Cause has been determined as a sudden release of pressure from a pressurized fire extinguisher in the drum being compacted.

- *Name and quantity of material(s) involved:*
  One confirmed and probably two other fire extinguishers (approximately 30-pound units) were in the silver drum being compressed. The waste stream in the silver drum was from Box 10010056, which was an IDC 480 box (miscellaneous metals) from Rocky Flats.

- *Extent of Injuries, if any:*
  No personnel were injured.

- *Assessment of any actual or potential hazards to human health or the environment:*
  The event was contained in the Supercompactor Glovebox, with an indication of minor potential release to the ventilation-controlled area/room which contains the glovebox. Four personnel were present in the room at the time the Continuous Air Monitors (CAMs) alarmed (approximately 1130 hours). All personnel were screened out of the room by Radiation Control Technicians, with no contamination found on them. The rooms were subsequently characterized with swipes and air samples. Over 300 swipes were performed, and three were determined to show contamination above 20 dpm (all below 100 dpm and none were repeatable). One swipe was from a known, controlled Contamination Area. Air samples were also pulled and analyzed. The maximum potential airborne exposure to any individual was determined as 13.2 DAC (Derived Air Concentration) hours. This potential exposure is below all health and regulatory thresholds (i.e., a potential exposure of 40 DAC hours requires bioassay monitoring for an actual exposure determination). The four individuals involved will be bioassayed. Upgraded characterization was also conducted with11.7 electrovolt Photoionization Detectors for detection of potential chemical vapors, and none were detected. The room was determined cleared and released back to normal operations.

The glovebox was evaluated by engineering for integrity, and no abnormal conditions or breaches were discovered. All installed gloves were inspected, and two gloves were determined to have minor contamination and one glove had a pinhole (outside the knot). These gloves were replaced. This is not an unusual result for a quarterly glove inspection. The Supercompactor Glovebox also received a complete criticality/incompatible clean-out. No liquids were in the collection sump at the time of the clean-out.

Based on the data from the event, the upgraded characterization activities, and subsequent inspections of the systems, there are no determined hazards to human health or the environment.

- *Estimated quantity and disposition of material recovered from the incident:*
  No additional waste was generated from this incident.

- *General Description of the Incident:*
  At 1111 hours on Thursday, October 28, 2010, the Supercompactor Glovebox in WMF-676 experienced alarms for low-inflow flow and low depression, followed by a trip of the light curtain that shut down compactor operation. Operations personnel went to the supercompactor to determine the issue and reset the light curtain in accordance with established procedures. This was accomplished and compaction completed on the drum in the supercompactor when a CAM on the third level of the room alarmed, followed by a CAM on the first level. This was at 1130 hours. Operations were secured and Radiation Control technicians contacted to perform full-body screens on the four personnel to exit the room. These screens found no contamination on any of the personnel.

  Upgraded characterization, with Radiation Control personnel and Safety personnel, was initiated to identify any contamination and hazard within the room. Plant Shift Manager and Emergency Action Manager, Mike Loftus, along with the Acting Plant Manager, Ted Griffith, initiated a review of the tapes of the glovebox and determined that there had been an unexpected pressure release from the drum during the compaction cycle that had resulted in the identified alarms and tripped light curtain. They issued a Step Back/Stop Work for the supercompactor and boxline operations. Notifications were made to the Nuclear Facility Manager, David Griggs, and the Department of Energy representative of the incident status. Emergency actions required were reviewed with the Emergency Manager, and no Emergency Action Limits were exceeded. The upgraded characterization found three swipes with detectable concentrations of contamination out of over 300 swipes performed. None of the swipes were repeatable (any contamination present was removed by the swipe). One swipe was from the third level at 33 dpm. A second swipe was from the first level at 90 dpm. The third swipe was from an area between the second and third level in a posted Contamination Area at 55 dpm. Air monitoring was also conducted for both organic vapors and radiological contamination and was negative. Initial readings of the filters from the CAMs indicated some Radon present. A long-term count of the filters ultimately showed a small amount of contamination present for a maximum potential exposure to the four individuals of 13.2 DAC hours. This potential exposure is below all health and regulatory thresholds (i.e., a potential exposure of 40 DAC hours requires bioassay monitoring for an actual exposure determination).

Based on upgraded characterization, the room was returned to general access. At this time engineering performed a glovebox integrity inspection and determined no breach of integrity. A complete inspection of the inserted gloves was also conducted. This found two gloves with some minor contamination and one glove with a pinhole to the outside of the knot (all were replaced). This is a normal result for a quarterly glove inspection. In addition, a close inspection of the suspect compacted puck was completed; and no scorching, burns, or other indication of any deflagration was observed on the puck or in the glovebox.

A review of the boxline tapes was initiated for the drum involved in the incident. This review ultimately confirmed that one fire extinguisher and two other packages that probably contained fire extinguishers were placed in the drum being compacted.

Immediate actions as a result of this incident included a Stop Work for boxline operations and supercompactor operations until corrective actions could be determined. In addition, a complete review by Visual Examination Experts (VEE) of all the silver drums filled that shift by the Operators/Visual Exam (VE) technicians involved in loading the drum with the fire extinguishers was completed. This was a total of 18 silver drums. Of these 18 drums, eight had been compacted, including the drum involved in the incident, and ten remained uncompacted. This resulted in the identification of six compacted drums (including the one involved in the incident) that contained fire extinguishers. Of the ten uncompacted drums, one drum was identified with a potential for issues due to the placement of an unopened bag in the container. These drums were all placed on Nonconformance Reports for remediation and resolution prior to disposition.

As a result of the determination of inadequate/improper job performance by these two operators, a larger review was conducted of all uncompacted silver drums currently in the facility with available recordings. This involved 48 additional silver drums for which boxline recordings were reviewed by the VEEs. As a result of these reviews (which included the drums packaged by the majority of the other operators/VE technicians for the boxline), there were two more silver drums that were placed on Nonconformance Reports for further investigation of items (a bag and a pipe) that the VEEs were unable to determine the status from the limited view of the recording.

As a result of this larger review and two recent surveillances of this operation (one in July and one in October by Quality Assurance personnel) with no findings or issues, it was determined that there was not a programmatic issue but that clearly the two operators involved had not performed in accordance with training and procedural requirements. This has resulted in additional corrective actions that include a minor change in procedure to further reinforce the requirement for intrusive investigation (e.g., opening all bags) and an additional briefing (two hours) to all the affected crews on the procedural requirements and review of this incident to reinforce why these requirements are in place. In addition, an Operator Proficiency Program for VE operators is being developed, and there is an emphasis on additional surveillance and oversight of the VE operators by the VEEs. The VE qualifications for the two operators involved have been removed, and an additional action is under consideration. Finally, Corrective Action Report (CAR) 56646 has been opened on this incident to track all short- and long-term corrective actions, and it will require a formal root-cause analysis.

Based on these corrective actions, the boxline and supercompactor operations were restarted on November 5, 2010, with additional Senior Supervisory oversight for at least the first 30 days of operation.

The Contingency Plan has been evaluated to be adequate for this response, and no updates or changes to the Contingency Plan are required.

The AMWTP appreciates your attention and efforts. Please contact either me at (208) 557-6320 or Mr. Neil Brill at (208) 557-7316 with any questions and comments.

Sincerely,

Leonard Sygitowicz
ESS&H Manager
Bechtel BWXT Idaho, LLC
Advanced Mixed Waste Treatment Project

NAB:vh

cc: Neil Brill, BBWI
Nicole Brooks, DOE-ID
Natalie Clough, IDEQ
Ted Griffith, BBWI
William Lattin, DOE-ID
Charles Ljungberg, DOE-ID
Jeffrey Mousseau, BBWI
AMWTP Records Management

Inspection Report
Ground Water Quality Bureau

Start Date: 11/17/2010 03:30 PM **End Date:** 11/17/2010 05:00 PM

Facility Information
Facility Name: Waste Isolation Pilot Plant, DP-831 Type of Operation: Federal Agency
Contact: Dan Ferguson (DOE), Parrish Rousch (WRES), Rick Salness (WRES), Stuart Jones (WRES) Location: Carlsbad

Inspector(s): Clint Marshall

Inspection Summary
Purpose: Facility Inspection (GWB)

Activities
Samples Taken: No

Observations and Information Obtained
Inspected stormwater ponds, sewage lagoons, salt basins and salt pile.

Salt Storage Extension Basin (SSEB) I has been mucked out and is now operational. Construction of the SSEB II is finished and it is also operational. NMED did not receive the as-builts for SSEB II so DOE is resending them.

The low spot on the southeast corner of the Salt Pile Evaporation Pond (SPEP) has been completed raising the maximum operating level of the pond by 12 inches. The Salt Pile cover has been refurbished. New chutes have been installed on the west and south slopes. Mesh has been installed on the cover after amendment with cow manure, and then reseeded. Vegetation is being established quite successfully for the first time since the cover was installed.

Stormwater Pond A is still holding stormwater from last summer. WIPP has permission to transfer some of the water to Pond 2 where a transfer station exists to truck water offsite for road construction. Pond 1 has about a foot of water in the bottom.

We did not enter the fenced area to look at the sewage lagoons. We looked through the fence from the north side. Pond C has just been relined and was the last of the ponds to be relined.

H-19 pond is not receiving much liquid. There is quite a bit of wind blown sand in the bottom. A leak detection survey was conducted in 2005 and only one leak found.

Action Required

Have DOE resend as-builts for SSEB II.

Water Quality Inspection & Sampling Checklist

Reference: Regulation No. HED 86 – 14 (NMED)

Entry Conference:

☐ Was facility representative informed of NMED's right of entry and authority: (To access records, inspect monitoring equipment or methods and sample effluents under Sections 74-6-9.E of the New Mexico Water Quality Act NMSA 1978)?

☐ Was NMED identification presented?

☐ Were other potential or suspected violations which prompted inspections listed?

☐ During the inspection, was the facility representative immediately advised or addition potential violations?

Exit Conference:

☐ Were the preliminary inspection results summarized?

☐ Was the facility representative advised if violations discussed during the entry conference remain under investigation?

☐ Were other potential violations discovered during the inspection discussed?

☐ Was a date provided as to when NMED expects to complete consideration of potential violation?

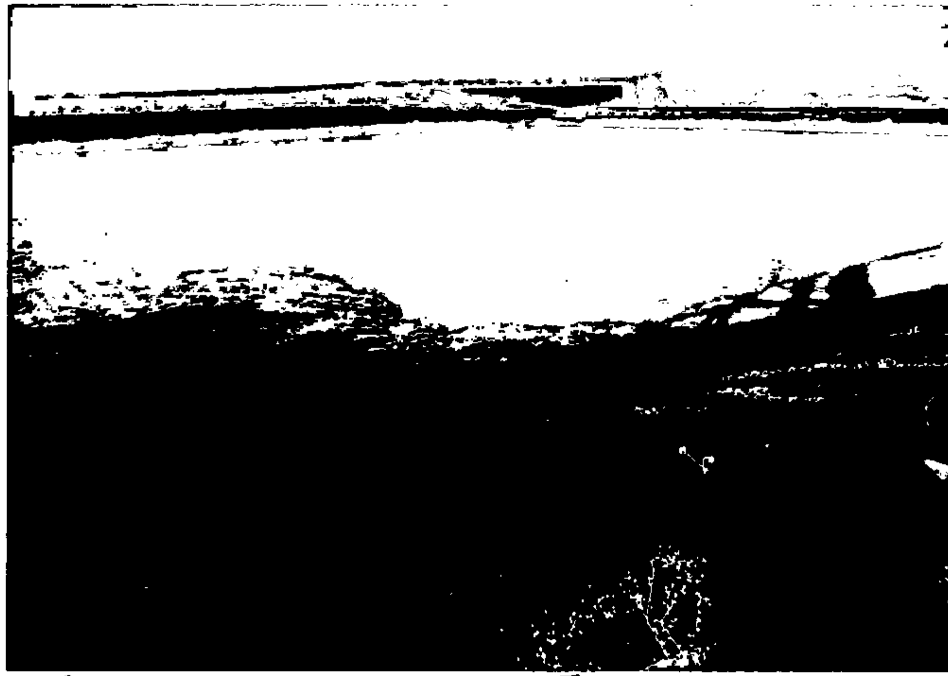
Water Quality Sampling:

☐ Was the facility representative offered a reasonable opportunity to obtain split/replicate samples, perform simultaneous tests, measurements or photographs?

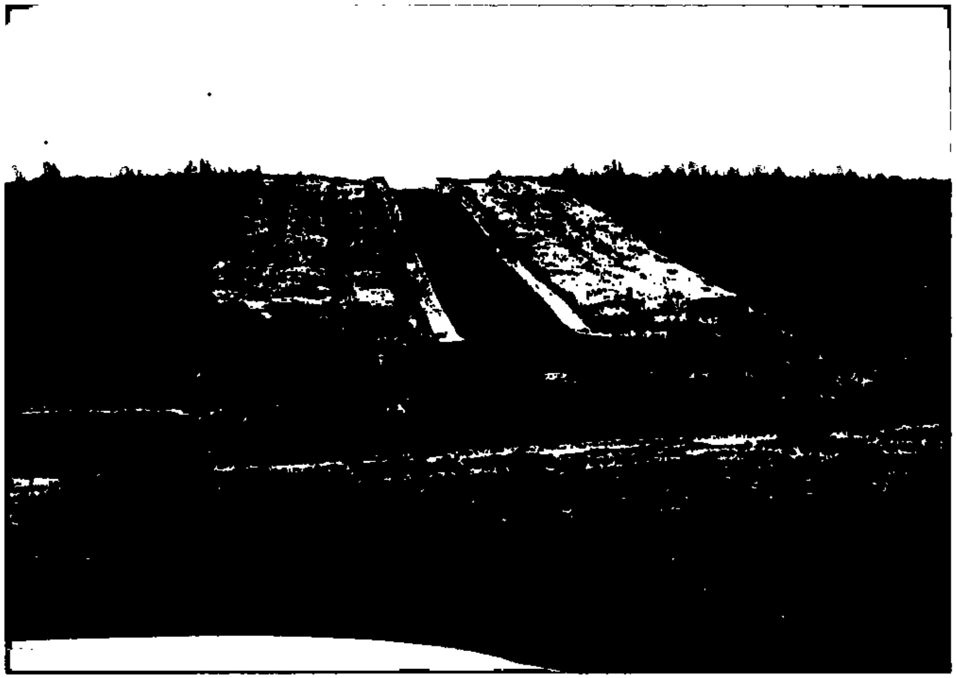
☐ Were copies of NMED's results (sampling, testing, photos) requested? If yes, copies must be provided within ten working days after such results are in NMED's possession.

FACILITY INSPECTION 11-17-2010 WIPP

SPEP LOOKING EAST AT SALT PILE



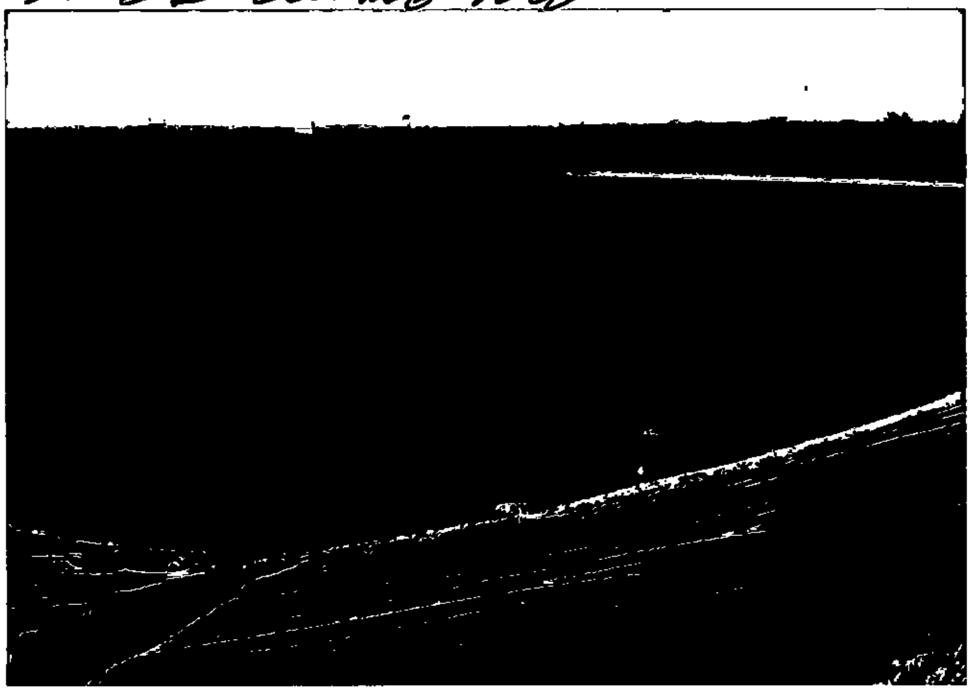
SSEB I LOOKING NE



NEW DOWNDRAIN ON WEST SIDE OF SALT PILE

VIEW FROM TOP OF SALT PILE LOOKING WEST ON TO THE SPEP.

SSEB II LOOKING NW



SAME AS ABOVE

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
December 9, 2010

GROUND WATER
DEC 13 2010
BUREAU

~NOTICE~

Waste Isolation Pilot Plant
Class 1 Permit Modification Notification

The U.S. Department of Energy and Washington TRU Solutions LLC hereby inform you of the following Class 1 Permit Modifications to the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), Permit Number: NM4890139088-TSDF.

The New Mexico Environment Department (NMED) was notified of the following Class 1 permit modifications on the dates indicated below. Summary of the changes follow.

<u>October 12, 2010</u>

- Change the Department of Energy, Carlsbad Field Office Manager

<u>October 14, 2010</u>

- Revise Panel Figures to Include Panel 6

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

1190 St. Francis Drive
P.O. Box 5469, Santa Fe, NM 87502
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us
William C. Olson, Bureau Chief

RON CURRY
Secretary
SARAH COTTRELL
Deputy Secretary

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David C. Moody, Manager
US Dept. of Energy
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

PS Form 3800, August 2006

7008 1830 0003 4177 5019

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

November 9, 2010

David C. Moody, Manager
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, New Mexico 88221

RE: Approval to Transfer Brine from Pond B to the Salt Storage Extension Basin II, DP-831, U.S. Department of Energy Waste Isolation Pilot Plant

Dear Mr. Moody:

The New Mexico Environment Department has reviewed the request, dated January 14, 2010, from the U.S. Department of Energy (DOE) for approval to transfer approximately 150,000 gallons of brine from Pond B at the Sewage Treatment Facility to the Salt Storage Extension Basin II (SSEB-II) at the Waste Isolation Pilot Plant (WIPP). The purpose of the transfer is to minimize salt build-up and extend the life of the newly lined Pond B. The WIPP facility is located approximately 26 miles east of Carlsbad, New Mexico in Sections 20, 21, 28 and 29, T22S, R31E, Eddy County.

The SSEB-II and Pond B are both synthetically lined and permitted to hold brine under the Discharge Permit Renewal and Modification dated September 9, 2008, and the Discharge Permit Modification dated February 15, 2010. DOE's request to transfer brine from Pond B to the SSEB-II is hereby approved.

This approval does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, such as zoning requirements and nuisance ordinances. Also, this approval does not relieve you of liability should your operation result in actual pollution of surface or ground waters.

If you have any questions, please contact Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027.

Sincerely,

Mary Ann Menetrey

Mary Ann Menetrey, Program Manager
Mining Environmental Compliance Section
Ground Water Quality Bureau

MAM:CLM

cc: DP-831 File

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

November 04, 2010

NOV 05 2010

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Request to Transfer Brine from Pond B at the Sewage Treatment Facility to the Salt Storage Extension Basin-II

Dear Mr. Marshall:

The purpose of this letter is to request authorization to transfer approximately 150,000 gallons of brine from Pond B at the Sewage Treatment Facility to the Salt Storage Extension Basin (SSEB)-II. Brine was transferred from the SSEB-I to Ponds B and C at the Sewage Treatment Facility as authorized in the Ground Water Quality Bureau Corrective Action Approval dated December 05, 2008 to mitigate the overflowing of the berm in the SSEB-I following significant precipitation events. The salt water in Pond C at the Sewage Treatment Facility was transferred to Pond B in order to prepare Pond C for liner replacement in 2010. Fresh water has been added to Pond B to keep the salt in solution and to provide a less concentrated salt solution for transfer to the SSEB-II. The purpose of this request is to minimize the build-up of salt in the newly lined pond and extend the life of Pond B in the Sewage Treatment Facility.

At your request, we have had the water from the Sewage Treatment Facility Pond B analyzed for Nitrate (As N)+Nitrite (As N) and total Kjeldahl nitrogen (TKN). The nitrate and nitrite concentrations were below the method detection limit and the TKN concentration was 45 mg/l.

Thank you for your consideration of this request. If you have any questions regarding this request to transfer brine, please call me at (575) 234-8128.

Sincerely,

Daniel J. Ferguson
Site Regulatory Specialist

cc:
M. Menetrey, NMED *ED
W. Olsen, NMED ED
*ED denotes electronic distribution

CGFO:ORC:DJF:MDA:10-1656:UFC 5486.00

Marshall, Clint, NMENV

From: Marshall, Clint, NMENV
Sent: Tuesday, September 28, 2010 11:06 AM
To: 'Ferguson, Daniel - DOE'
Cc: stewart.jones@wipp.ws
Subject: RE: Use of Storm Water

Dan,

As stated by phone on August 6, 2010, NMED approves the use of storm water from Ponds A, 1 and 2 for use on road construction activities on the WIPP South Access Road. I a phone conversation with Stuart Jones this morning, it is now NMED's understanding that the storage pond that was previously mentioned for temporary storage of the storm water will not be constructed. The storm water will be pumped directly from Ponds A, 1 and 2 into tanker trucks for use on road construction. If additional questions arise, feel free to contact me.

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
505-827-0027

From: Ferguson, Daniel - DOE [mailto:daniel.ferguson@wipp.ws]
Sent: Tuesday, September 28, 2010 9:28 AM
To: Marshall, Clint, NMENV
Cc: Jones, Stewart - WRES; Roush, Parrish - WRES; Basabilvazo, George - DOE
Subject: Use of Storm Water

Clint,

The purpose of this email is to comply with your request via phone message on August 6, 2010, to inform you when the storm water from Ponds A, 1 and 2 would be used for the road construction activities associated with the WIPP South Access Road. It is anticipated that the construction contractor will be begin removing the storm water on or about September 28, 2010.

Prior to the release of this storm water, a full hazardous waste characterization was conducted on the water. The storm water did not exhibit any characteristic of hazardous waste. As previously discussed with you, this analytical suite confirmed a chloride range from 140 to 630 mg/l varying among the three ponds.

Please respond if you concur that the Ground Water Quality Bureau has no additional requirements or restrictions for the use of this storm water for the road construction project.

If you have any questions, please call me at (575) 234-8128.

Thank you,

Dan Ferguson

(575) 234-8128

(575) 234-7018

Marshall, Clint, NMENV

From: Ferguson, Daniel - DOE [daniel.ferguson@wipp.ws]
Sent: Tuesday, August 03, 2010 3:36 PM
To: Marshall, Clint, NMENV
Cc: Jones, Stewart; Roush, Parrish; McCauslin, Susan
Subject: FW: Article in Carlsbad Current Argus noting sale of WIPP salt
Attachments: DSCN3670.jpg

Clint,

Attached is the article about the WIPP salt sale which appeared in the Carlsbad newspaper this morning. We are all very excited about the sale of the salt and everyone involved should be coming out ahead.

Thanks,
Dan

From: Jones, Stewart
Sent: Tuesday, August 03, 2010 2:27 PM
To: Ferguson, Daniel - DOE
Cc: Roush, Parrish
Subject: FW: Article in Carlsbad Current Argus noting sale of WIPP salt

Dan, this is the article and the photograph in today's *Carlsbad Current Argus* edition. Please forward this to Clint Marshall, of the NMED-GWQB, as we discussed this morning.

Thanks,

Stewart

==

WIPP salt headed to feed cattle in West Texas

From the Current-Argus
Posted: 08/02/2010 09:14:36 PM MDT

From the Current-Argus

CARLSBAD — Having spent the past 250 million years or so half a mile underground, salt excavated at the Waste Isolation Pilot Plant is now on its way to help feed cattle in Texas.

The U.S. Department of Energy's Carlsbad Field Office has worked out an agreement to transfer 300,000 tons of run-of-mine salt from WIPP to Magnum Blue Ribbon Feeds over a five-year period. On July 26, the first truckload of stored salt left the WIPP facility for Hereford, Texas, which is located southwest of Amarillo.

"This is an excellent arrangement for all government parties, for Magnum Blue Ribbon Feeds, and for the taxpayer," said Stewart Jones, environmental manager.

Salt tailings have accumulated on the surface of the WIPP site since mining began in the 1980s. In 2008, Magnum successfully responded to a request for interest in the salt tailings with a business plan to remove up to 10 truckloads of salt a day from the site.

As part of the agreement, the Carlsbad Soil and Water Conservation District is administering the agreement, allowing proceeds provided by Magnum to remain in southeast New Mexico for educational and range improvement projects within the district. The Bureau of Land Management was instrumental in coordinating the multi-agency agreement. Magnum has provided all of the infrastructure improvements for the project, and the salt removal process has no adverse impact on WIPP's mission as a waste repository.

Magnum specializes in providing

Advertisement

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minerals and feed for the livestock industry. The WIPP salt will mostly be used to add a mineral supplement to cattle feed.

The salt excavated from the 250 million-year-old salt beds 2,150 feet below the surface is currently placed in piles adjacent to the WIPP site, but the DOE will eventually have to dispose of the salt, as required by the WIPP Land Withdrawal Act. Magnum is taking its salt from a pile to the north of the WIPP facility, referred to as cells A and B. Cells A and B are not covered, but storm water from the cells is managed by collection and evaporation in lined ponds

"If Magnum Blue Ribbon Feeds removes all the salt that is allowable under this agreement, about one-third of that uncovered salt will be taken," Jones said.

A second, older salt pile also adjacent to the site has been covered with a poly-liner and a layer of top soil.

The Carlsbad Field Office has estimated that it would cost $15 per ton to haul the salt to a municipal landfill, meaning the agreement with Magnum could be saving the taxpayer about $4.5 million in disposal costs. It is estimated that it will take Magnum five years to haul the 300,000 tons of salt.

BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

NEW MEXICO ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

RON CURRY
Secretary

SARAH COTTRELL
Deputy Secretary

GROUND WATER

JUL 14 2010

BUREAU

July 12, 2010

RE: FINAL PERMIT DECISION AND RESPONSE TO COMMENTS, CLASS 2 MODIFICATION REQUEST
WIPP HAZARDOUS WASTE FACILITY PERMIT
EPA I.D. NUMBER NM4890139088

Dear Interested Person:

On July 2, 2010, the New Mexico Environment Department (**NMED**) took final administrative action on a Class 2 permit modification request (**PMR**) to the Waste Isolation Pilot Plant (**WIPP**) Hazardous Waste Facility Permit. The Department of Energy Carlsbad Field Office and Washington TRU Solutions LLC (**the Permittees**) submitted this PMR to the Hazardous Waste Bureau on April 14, 2010, seeking to revise volatile organic compound concentrations of concern and update these values using current EPA IRIS data.

NMED approved this PMR with changes for the reasons specified in the response to comments. This Class 2 PMR was subject to a 60-day public comment period running from April 19, 2010 through June 18, 2010, during which NMED received written specific comments from a total of six individuals and organizations.

Further information on this administrative action, including the response to comments, may be found on the NMED WIPP Information Page at <http://www.nmenv.state.nm.us/wipp/>. Please contact Steve Zappe at (505) 476-6051 or via e-mail at <steve.zappe@state.nm.us> if you have further questions or need additional information.

Sincerely,

John E. Kieling
Manager
Permits Management Program

Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6306

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Hasler
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07/13/2010
Mailed From 87505
US POSTAGE

Bill Olson
NMED/GWQB
P.O. Box 5469
Santa Fe, NM 87502

87502$5469 B015

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
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Phone (505) 476-6000   Fax (505) 476-6030
www.nmenv.state.nm.us

BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary

SARAH COTTRELL
Deputy Secretary

GROUND WATER

JUN 07 2010

BUREAU

June 4, 2010

SUBJECT: PUBLIC HEARING NOTICE ON A DRAFT HAZARDOUS WASTE PERMIT FOR WASTE ISOLATION PILOT PLANT

Dear Interested Person:

The New Mexico Environment Department **(Department)** is providing the attached Notice on a public hearing, and the opportunity for the public to comment on, a pending action before the Department for the Waste Isolation Pilot Plant **(WIPP)**. Specifically, the Department intends to issue a hazardous waste permit to WIPP to manage, store, and dispose hazardous waste, and to close hazardous waste disposal units, in accordance with the New Mexico Hazardous Waste Act and its implementing regulations. The proposed activity is more fully described in the attached notice.

The Notice provides information on how to submit public comment and the public hearing process. Public comment will be received through the end of the public hearing. The public hearing on the draft Permit will begin **Monday, August 9, 2010** at **9:00 AM MDT** and continue as necessary through **Friday, August 20, 2010**. The public hearing will be held at the Santa Fe Community College located at 6401 S. Richards Avenue, Santa Fe, NM 87508, in the Board Room (Room 223), with one day for non-technical oral public comment in Carlsbad, NM on **Monday, August 16, 2010** at **2:00 PM to 4:00 PM and 6:00 PM to 8:00 PM** at the Best Western Stevens Inn located at 1829 S. Canal Street, Carlsbad, NM 88220.

Any person seeking additional information regarding this notice may contact:

Steve Zappe, WIPP Project Manager
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

E-mail: steve.zappe@state.nm.us
Phone: (505) 476-6000
Fax: (505) 476-6060

Sincerely,

John E. Kieling
Manager
Permits Management Program
Hazardous Waste Bureau

BILL RICHARDSON
Governor

DIANE DENISH
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

RON CURRY
Secretary

SARAH COTTRELL
Deputy Secretary

PUBLIC NOTICE No. 10-03

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS WASTE BUREAU
SANTA FE, NEW MEXICO
June 4, 2010

NOTICE OF PUBLIC COMMENT AND A PUBLIC HEARING ON THE DRAFT HAZARDOUS WASTE PERMIT FOR THE WASTE ISOLATION PILOT PLANT EPA ID NUMBER: NM4890139088

The New Mexico Environment Department (**Department**) is providing this public notice on a public hearing, and the opportunity for the public to comment on, a pending action before the Department for the Waste Isolation Pilot Plant (**WIPP**, or the **Facility**). Specifically, the Department intends to issue a hazardous waste permit (**Permit**) to WIPP to manage, store, and dispose hazardous waste, and to close hazardous waste disposal units, in accordance with the New Mexico Hazardous Waste Act (**HWA**) and its implementing regulations. The Department is charged with issuing a permit that will ensure that WIPP's hazardous waste operations are managed in a manner protective of human health and the environment.

WIPP is a hazardous waste facility currently operating under a Permit issued by the Department on October 27, 1999, which authorizes the management, storage, and disposal of transuranic (**TRU**) mixed waste at the Facility. Mixed waste is radioactive waste that is also a hazardous waste as defined by the HWA, and is thus subject to regulation by the Department. The U.S. Department of Energy Carlsbad Field Office (**DOE**) owns and operates the Facility, and Washington TRU Solutions LLC (**WTS**) co-operates the Facility. These entities are collectively referred to as "Applicants" in this public notice.

WIPP manages wastes that are regulated under the federal Resource Conservation and Recovery Act (**RCRA**), the HWA (Chapter 74, Article 4 NMSA 1978), and their implementing regulations.

WIPP is located north of Jal Highway (State Highway 128) in Eddy County, New Mexico, approximately 26 miles east of Carlsbad. The Applicants are located at the following mailing addresses: DOE Carlsbad Field Office, P.O. Box 3090, Carlsbad, New Mexico 88221-3090; and Washington TRU Solutions LLC, P.O. Box 2078, Carlsbad, New Mexico 88221-5608. The Permittees' primary contact for this permitting action is: George Basabilvazo, Regulatory Compliance Director, DOE Carlsbad Field Office, P.O. Box 3090, Carlsbad, New Mexico 88221-3090.

I. NOTICE OF HEARING AND OPPORTUNITY TO COMMENT ON THE DRAFT PERMIT

On September 25, 2009, the Applicants submitted to the Department a permit renewal application to manage, store, and dispose of TRU mixed wastes at WIPP under the HWA. The Department issued a draft Permit for WIPP for public comment on April 27, 2010, which it is proposing to approve.

The draft Permit, when finalized, would allow WIPP to continue hazardous waste management operations in much the same manner as those authorized by the existing Permit, such as: requiring generator/storage sites to implement applicable waste characterization requirements prior to the receipt of TRU mixed waste at WIPP; conducting waste characterization audits at generator storage sites to ensure their implementation of and compliance with applicable requirements; safely managing, storing, and disposing contact-handled and remote-handled TRU mixed waste upon receipt at WIPP; performing required environmental monitoring of air and groundwater at WIPP to ensure protection of human health and the environment; closing all permitted storage and disposal units following final receipt of waste; conducting required post-closure care activities after final closure of WIPP; and complying with corrective action requirements related to any release of hazardous waste or hazardous constituents from the Facility.

Through this notice the Department announces a public hearing to accept additional public comment and provide persons a reasonable opportunity to present data, views, and arguments, as well as to examine witnesses on the draft Permit prior to issuance of a final Permit. See *II. Public Hearing*, below, which addresses the public hearing and submission of public comment on this action.

II. PUBLIC HEARING

The public hearing on the draft Permit will begin **Monday, August 9, 2010** at **9:00 AM MDT** and continue as necessary through **Friday, August 20, 2010**. The public hearing will provide interested persons a reasonable opportunity to present data, views, and arguments, as well as to examine witnesses. The hearing will afford an opportunity for all persons to present comment. Except for one day as noted below, the public hearing will be held at the Santa Fe Community College (SFCC) located at 6401 S. Richards Avenue, Santa Fe, NM 87508, in the Board Room (Room 223). The hearing will convene for one day for non-technical oral public comment in Carlsbad, NM on **Monday, August 16, 2010** at **2:00 PM to 4:00 PM and 6:00 PM to 8:00 PM** at the Best Western Stevens Inn located at 1829 S. Canal Street, Carlsbad, NM 88220. The hearing will then return to Santa Fe the following day at the SFCC location noted above. The hearing will be conducted in accordance with the Hazardous Waste Management Regulations, 20.4.1.901.F NMAC, the Environment Department Permit Procedures, 20.1.4 NMAC, and any scheduling and procedural orders as may be entered by the Hearing Officer.

Any person, including the Applicants, wishing to submit written public comment or present oral public comment at the public hearing for Department's consideration, shall do so according to the procedures set forth below. The public comment period continues through the close of the public hearing.

A. WRITTEN PUBLIC COMMENT

The Department will accept written public comment on the draft Permit. Written comments shall be based on all reasonably available information and include, to the extent practicable, all referenced factual materials. Documents in the Administrative Record need not be re-submitted if expressly referenced by the commenter. Written comment must be filed with the Hearing Clerk on or before the close of the public hearing at the New Mexico Environment Department, Room N-2153, 1190 S. St. Francis Drive, PO Box 5469, Santa Fe, NM, 87502-5469. Written public comments may also be submitted at the public hearing.

B. TECHNICAL TESTIMONY AND ORAL PUBLIC COMMENTS

At the public hearing, the Department will accept technical testimony and non-technical oral comments. The Hearing Officer may set reasonable limits upon the time allowed for technical testimony and oral comments. Technical testimony and oral comments on the draft Permit shall be accepted at the public hearing, in accordance with Department regulations, as set forth below:

1. Technical Written Statements and Oral Testimony: Any person who intends to provide a technical written statement or oral testimony concerning a Draft Permit, Application or Petition shall file a Statement of Intent to Present Technical Testimony on or before **July 16, 2010** with Hearing Clerk at the address provided above.

(a) Content of Statement of Intent: The Statement of Intent to Present Technical Testimony shall:

(i) identify the person filing the statement;

(ii) state whether the person filing the statement supports or opposes the Draft Permit, Application, or Petition, or in the case of the Division, the Division's recommended decision to approve, deny, or approve with conditions the Draft Permit, Application, or Petition;

(iii) identify each witness, including name, address, affiliation(s), and educational and work background;

(iv) estimate the length of the direct testimony of each witness;

(v) identify all exhibits which are part of the Record Proper and, for exhibits not part of the Record Proper, attach a copy;

(vi) list or make available all technical materials relied upon by each witness in making statement of technical of fact or opinion contained in his or her direct testimony; and

(vii) attach a summary of the testimony of each witness, stating any opinion(s) to be offered by such witness, and an explanation of the basis for such opinion(s).

2. Effect of Failure to File: Failure to file a timely Statement of Intent to Present Technical Testimony meeting the requirements above, pursuant to 20.1.4.300.B NMAC, shall preclude a person from presenting technical testimony, and if the person has not filed a timely Entry of Appearance, pursuant to 20.1.4.300.A NMAC, from being a party in the proceeding, but shall not preclude a person from presenting a general written or oral statement or non-technical testimony in the proceeding.

3. General Written and Oral Statements; Non-Technical Testimony: Any person may provide a general written statement concerning the draft Permit at or before the hearing. Any person may provide a general oral statement or non-technical testimony concerning the draft Permit at the hearing.

PROCEDURE FOR ISSUANCE OF FINAL PERMIT DECISION

The Department must ensure that the approved final Permit is consistent with the New Mexico Hazardous Waste Management Regulations (20.4.1 NMAC). All written comments submitted on the draft Permit will be considered in formulating a decision on issuance of a final Permit, and may cause the draft Permit to be modified.

The Department will respond in writing to all public comments. This response will specify which provisions, if any, of the draft Permit have been changed in the final Permit, the reasons for the changes, and briefly describe and respond to all public comments on the draft Permit raised during the public comment period. All persons presenting written comments or who requested notification in writing will be notified of the Department's decision by mail. These responses will also be posted on the Department's website.

After consideration of all the written public comments received, the Department will issue, modify and issue, or not issue a final Permit. If the Department modifies and issues the Permit, the Applicants shall be provided by mail a copy of the modified documents and a detailed written statement of reasons for the modifications.

The Secretary of the Department or his designee will make the final decision on this draft Permit be publicly available, and will notify the Applicants by certified mail. The Secretary's decision shall constitute a final agency decision and may be appealed as provided by the HWA.

ARRANGEMENTS FOR PERSONS WITH DISABILITIES

Persons having a disability and requiring assistance or auxiliary aid to participate in this process should contact Judy Bentley at the New Mexico Environment Department, Human Resources Bureau, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, New Mexico, 87502, telephone number: (505) 827-9872. TDY users please access her number via the New Mexico Relay Network at 1-800-659-8331.

ADDITIONAL INFORMATION

Any person seeking additional information regarding this action, or who would like to arrange for review of the draft Permit, Fact Sheet, or the Administrative Record, may contact Mr. Steve Zappe at the Hazardous Waste Bureau, 2905 Rodeo Park Drive East, Building 1, Santa Fe, New Mexico 87505, (505) 476-6000. A copy of the draft Permit, Fact Sheet, the index to the Administrative Record, and this Public Notice are also available on the Department website at: www.nmenv.state.nm.us/wipp/index.html. The Department will provide copies, or portions thereof, of the Administrative Record at a cost to the requestor.

Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6306

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Mailed From 87505
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Bill Olson
NMED/GWQB
P.O. Box 5469
Santa Fe, NM 87502

87502+5469

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
June 10, 2010

GROUND WATER

JUN 1 4 2010

BUREAU

~NOTICE~

Waste Isolation Pilot Plant
Class 1 Permit Modification Notification

The U.S. Department of Energy and Washington TRU Solutions LLC hereby inform you of the following Class 1 Permit Modifications to the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP), Permit Number: NM4890139088-TSDF.

The New Mexico Environment Department (NMED) was notified of the following Class 1 permit modifications on the dates indicated below. Summary of the changes follow.

March 17, 2010

- Modify Waste Isolation Pilot Plant South Access Road Information and Update Active Environmental Permits
- Modify the Fire Suppression System Description

June 7, 2010

- Revise Laboratory Accuracy Standards

CBFO:ORC:MDA:10-0988:UFC 5487.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
June 10, 2010

WIPP PERMIT RENEWAL APPLICATION
INFORMATION AVAILABILITY

In order for the public to easily access information regarding the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit Renewal Application, the Department of Energy, Carlsbad Field Office and Washington TRU Solutions LLC, collectively referred to as the Applicants have made the following documents available:

- Applicants Permit Renewal Application
- Draft WIPP Permit Issued by the New Mexico Environment Department (NMED)
- Draft Permit Public Notices
- Draft Permit Fact Sheets
- Comments Submitted or Received on the Draft Permit
- Class 1 Modifications Submitted Since Renewal Application Submittal
- Class 2 Modifications Submitted Since Renewal Application Submittal
- Approval of Any Class 1 or 2 Modifications
- Information Sent to the Facility Mailing List Regarding the Draft Permit
- Link to the NMED WIPP Web Page
- Link to Request Documents

This information can be accessed through the following link:
http://www.wipp.energy.gov/library/rcrapermit/WIPP_Permit_Renewal.htm
For those that do not have computer access most public libraries offer free computer usage. There is generally no charge to use these computers. If you require hard copies of large documents there is a link which will allow you to request the documents you desire from the Applicants.

If you have questions or concern please contact Mr. Bobby St. John at (575) 234-7348.

CBFO:ORC:MDA:10-0989:UFC 5487.00

GROUND WATER

APR 27 2010

BUREAU

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

April 26, 2010

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Record of Communication for March 26, 2010, Telephone Conversation

Dear Mr. Marshall:

The purpose of this letter is to document the content of a March 26, 2010 telephone conversation between you and members of the Waste Isolation Pilot Plant (WIPP) Project Staff. During this call, the WIPP Project Staff described the planned routine maintenance activities for the Salt Storage Extension Basin (SSEB)-I. This includes removing approximately three of the four feet of salt that has accumulated in the pond using heavy equipment and soil ramps constructed for access to the pond. The salt that is removed will be loaded into a dump truck and transported to the Salt Storage Extension Area where salt from current mining operations is disposed. Plans are to leave sufficient salt in the bottom of the SSEB-I to protect the liner from the heavy equipment. In the event that any damage to the liner occurs, the Department of Energy will implement the appropriate corrective actions in accordance with the discharge permit, DP-831.

Additionally, I wish to inform you that construction of the connection between the SSEB-I and SSEB-II was completed on April 1, 2010 and the pond was released for standard operations on April 5, 2010. This completes the construction of the SSEB-II and closes the corrective actions committed to in the document submitted to your office on May 28, 2009 entitled "Proposed Engineering Corrective Actions for Salt Contact Run-Off into the Salt Storage Extension."

If you have any questions or wish to discuss these activities, please feel free to contact me at (575) 234-8128.

Sincerely,

Daniel J. Ferguson

Daniel J. Ferguson
Site Regulatory Specialist

cc:
S. Zappe, NMED *ED
*ED denotes electronic distribution

CGFO:ORC:DJF:MDA:10-0964:UFC 5486.00

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 St. Francis Drive
P.O. Box 26110, Santa Fe, NM 87502
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us
William C. Olson, Bureau Chief

BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary
SARAH COTTRELL

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David C. Moody, Manag
Waste Isolation Pilot Pla
US Dept. of Energy
PO Box 3090
Carlsbad, NM 88221-30

PS Form 3800, August 2006

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

April 5, 2010

Mr. David C. Moody, Manager
Waste Isolation Pilot Plant
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

RE: Discharge Permit Modification, Waste Isolation Pilot Plant, DP-831, U.S. Department of Energy

Dear Mr. Moody:

The New Mexico Environment Department (NMED) issues the enclosed Discharge Permit Modification, DP-831 for the Waste Isolation Pilot Plant (WIPP) to the U.S. Department of Energy (DOE) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978§§74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

The Discharge Permit Modification contains terms and conditions that shall be complied with by DOE and are enforceable by NMED pursuant to WQCC 20.6.2.3104, WQA, NMSA 1978 § 74-6-5 and §74-6-10. Issuance of this Discharge Permit Modification does not relieve the DOE of its responsibility to comply with the WQA, WQCC Regulations, or any other applicable federal, state and/or local laws and regulations, including zoning requirements and nuisance ordinances.

Pursuant to 20.6.2.3109.H.4 NMAC, this Discharge Permit Renewal and Modification shall expire on **September 9, 2013**, the same date as the current Discharge Permit Renewal and Modification. You must submit an application for renewal at least 120 days before the permit expiration date.

Sincerely,

William C. Olson, Chief
Ground Water Quality Bureau

WCO:clm

Enclosure: Discharge Permit Modification, DP-831

cc: Mary Ann Menetrey, Program Manager, MECS (encl)
Gary Beatty, District Manager, NMED District 4, Roswell (encl)
James Smith, HPM, Carlsbad Field Office (encl)
Steve Zappe, HWB (encl)

GROUND WATER DISCHARGE PERMIT MODIFICATION
U.S. DEPARTMENT OF ENERGY, DP-831
WASTE ISOLATION PILOT PLANT
April 5, 2010

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Discharge Permit Modification, DP-831, to the U.S. Department of Energy (DOE) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§ 74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

The NMED's purpose in issuing this Discharge Permit Modification, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the Waste Isolation Pilot Plant (WIPP) that may move directly or indirectly into ground and surface water, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses; to abate pollution of ground and surface water; and to protect public health. In issuing this Discharge Permit, NMED has determined that the requirements of 20.6.2.3109.C NMAC have been met.

Facility Description

The WIPP is a hazardous and radioactive waste disposal facility operated by the U.S. Department of Energy (DOE). The WIPP is constructed in a bedded salt formation 2,150 feet below ground surface. DP-831 covers the discharge of domestic effluent, storm water and miscellaneous process waters to various lined impoundments at the facility.

Domestic wastewater from the facility and industrial wastewaters from two compressed air systems are discharged to seven synthetically lined facultative sewage lagoons (Facultative Lagoon System) that include Evaporation Ponds A, B and C; Polishing Ponds 1B and 2B; and Settling Ponds 1A and 2A. Brine, purge waters and miscellaneous non-hazardous process waters are discharged to the H-19 Evaporation Pond and Evaporation Ponds B and C of the Facultative Lagoon System. Storm water runoff at the facility is collected in the synthetically lined Storm Water Infiltration Control (SWIC) Ponds A, 1 and 2.

Salt and other subsurface materials mined during construction as well as currently mined salt are stored on the surface in three stockpiles. The stockpiles include the Salt Storage Extension (SSE) Cells A and B that are being used to store salt currently, or in the future, as it is mined out from the underground panels at the WIPP. Storm water runoff from the SSE is collected in the synthetically lined Salt Storage Extension Basin (SSEB) and will hereby be referred to in the future as Salt Storage Extension Basin I (SSEB-I). The existing Salt Pile that was previously used has been capped with a synthetic liner and earthen cover. Storm water runoff from the Salt Pile is collected in synthetically lined diversion ditches and diverted to the synthetically lined Salt Pile Evaporation Pond (SPEP). The Site and Preliminary and Design Validation (SPDV) material pile was constructed as the shafts were excavated when construction first began at the WIPP site. The SPDV material pile was closed in the year 2000 with a cover consisting of a geosynthetic liner installed on 6 inches of bedding material and covered with a minimum of two feet of earthen material.

Description of Permit Modification

The permit modification to DP-831 includes the expansion of the storm water runoff storage capacity from the SSE by constructing an additional storm water storage basin immediately west of SSEB-I, referred to as Salt Storage Extension Basin II (SSEB-II). The SSEB-II is synthetically double-lined with 60 mil high density polyethylene (HDPE) and a 200 mil geonet leak detection layer. The SSEB-II is connected by two overflow pipes from the SSEB-I, approximately two feet above the SSEB-I basin floor. The maximum operating capacity of the new basin with one foot of freeboard is 17,489,456 gallons (2,338,000 cubic feet).

Location of Discharge

The newly constructed SSEB-II is located approximately 26 miles east of Carlsbad in Section 20, T22S, R31E, Eddy County.

Quantity, Quality, and Flow Characteristics of the Discharge

The designed discharge rate of storm water runoff to the interconnected SSEB-I and SSEB-II is 2,752,831 gallons per day (368,000 cubic feet per day) based on a 25 year/24 hour storm event (3.90 inches). The intended maximum operating elevation for both basins is approximately 3414 feet above mean sea level (msl) providing an operating capacity of 9,851,845 gallons (1,317,000 cubic feet). The basins have a drainage area of approximately 26 acres which includes the surface area of the SSE Cells A and B, and the north section of the covered Salt Pile. The storm water comes in contact with mined salt stored in the cells resulting in a discharge with contaminant concentrations that may exceed water quality standards set forth in WQCC Regulations 20.6.2.3103 NMAC for chloride, sulfate and total dissolved solids.

Characteristics of Ground Water

Regional ground water beneath the WIPP site exists in the Culebra and Magenta Members of the Rustler Formation at approximate depths of 374 feet and 257 feet below ground level, respectively. Ground water also exists in the Dewey Lake Formation in the southwest portion of the WIPP site at well WQSP-6A, and as discontinuous lenses in the region beneath and surrounding the WIPP Site (16 Sections of the WIPP Land Withdrawal Area). Depth to ground water in the Dewey Lake Formation in well WQSP-6A is approximately 164 feet below ground surface and contains a total dissolved solids concentration of approximately 3,400 mg/L. A zone of shallow anthropogenic subsurface water (SSW) located underneath the WIPP facility at a depth of approximately 60-70 feet below ground surface has a TDS concentration ranging from approximately 1,500 to 255,000 mg/L.

General

The DOE's Discharge Plan consists of letters and documents submitted by WIPP to NMED dated November 19, 2009 and May 28, 2009. In addition, the discharge plan includes, in part, information and materials submitted as part of the original discharge plan approved on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998, amended on January 24, 2000, renewed on April 29, 2003, modified on December 22, 2003, modified on December 29, 2006, and renewed and modified on September 9, 2008. The discharges at this facility approved in this Discharge Permit Modification shall be managed in accordance with the Discharge Permit Modification Application dated November 19, 2009 as conditioned by this Discharge Permit Modification.

Pursuant to 20.6.2.3109.E NMAC, NMED reserves the right to modify permit requirements in the event NMED determines that the requirements of 20.6.2 NMAC are being, or may be, violated or standards of 20.6.2.3103 NMAC are being, or may be, violated. This may include a determination by NMED that operational practices approved under this Discharge Plan are not protective of ground and surface water quality, and that a modification is necessary to protect water quality or abate water pollution. Permit modifications may include but are not limited to lining or relining impoundments, changing discharge locations, changing waste management practices, expanding monitoring requirements and/or implementing abatement of water pollution.

Issuance of this Discharge Permit Modification does not relieve the DOE of its responsibility to comply with all conditions or requirements of the WQA, WQCC Regulations, and any other applicable federal, state, and/or local laws and regulations such as zoning requirements and nuisance orders.

II. FINDINGS

In issuing this Discharge Permit Modification, NMED finds:

1. The DOE is discharging effluent or impacted water at the WIPP Facility so that such effluent may move directly or indirectly into ground water within the meaning of 20.6.2.3104 NMAC.

2. Ground water (located at well WQSP 6A) in the Southwest portion of the WIPP Land Withdrawal Area has an existing concentration of 10,000 milligrams per liter or less of total dissolved solids within the meaning of 20.6.2.3101.A NMAC.

3. The discharges at the WIPP Facility are not subject to any of the exemptions of 20.6.2.3105 NMAC.

4. The WIPP Facility is located at a place of withdrawal of water for present or reasonably foreseeable future use within the meaning of 20.6.2.3101A NMAC.

III. PERMIT CONDITIONS

In addition to the conditions specified in the September 9, 2008 Discharge Permit Renewal and Modification, the DOE shall comply with the following conditions, which shall be added to DP-831 and are enforceable by NMED.

Permitted Discharge Flow Rate

1. The DOE is permitted to collect storm water runoff from the Salt Storage Extension to the Salt Storage Extension Basin II (SSEB II) at a designed flow of 2,752,831 gallons per day based on a 25 year/24 hour storm event (3.90 inches). The basin capacity is 17,489,456 gallons (2,338,000 cubic feet) allowing for one foot of freeboard. The combined capacities of the SSEB I and SSEB II are 22,254,547 gallons (2,975,000 cubic feet) allowing for one foot of freeboard. [20.6.2.3109 NMAC]

Operation and Maintenance

2. The DOE shall properly operate and maintain the hydraulically connected SSEB I and SSEB II to store and evaporate the maximum daily discharge volume allowed by this Discharge Permit Modification while maintaining a minimum of one foot of freeboard at all times. In the event that a minimum of one foot of freeboard can not be maintained at all times, the DOE shall submit a corrective action plan to manage discharge volumes to the NMED for approval. [20.6.2.3109 NMAC]

Monitoring and Reporting

3. The DOE shall measure the water depth monthly to the nearest tenth of a foot (0.1 ft) in the SSEB II. The approximate volume of storm water shall be calculated annually consistent with Condition 10.a of the September 9, 2008 Discharge Permit Renewal and Modification. The water levels and volume calculations shall be reported to NMED as required in Condition 14 of the September 9, 2008 Discharge Permit Renewal and Modification. [20.6.2.3107 NMAC]

IV. GENERAL TERMS AND CONDITIONS

In addition to any other requirements provided by law, approval of this Discharge Permit Modification is subject to the General Requirements as specified in the Discharge Permit Renewal and Modification approved on September 9, 2008. Refer to the Discharge Permit, DP-831, for specific information on the following General Requirements

Monitoring and Reporting
Record Keeping
Inspection and Entry
Duty to Provide Information
Spills, Leaks and Other Unauthorized Discharges
Retention of Records
Enforcement
Modification and/or Amendments

Compliance with Other Laws

4. Nothing in this Discharge Permit shall be construed in any way as relieving the DOE of its obligation to comply with all applicable Federal, State, and local laws, regulations, permits, or orders. [74-5-5.K WQA]

Liability

5. The approval of this Discharge Permit does not relieve the DOE of liability should the operation result in actual pollution of surface or ground water which may be actionable under other laws and/or regulations. [20.6.2.1220 NMAC]

Right to Appeal

6. The DOE may file a petition for a hearing before the WQCC on this Discharge Permit. Such petition must be made in writing to the WQCC within thirty (30) days after the DOE receives this Discharge Permit. Unless a timely petition for a hearing is made, the decision of NMED shall be final. [74-6-5.N WQA]

Transfer

7. Prior to any transfer of ownership, control, or possession of the permitted facility or any portion thereof, The DOE shall notify the proposed transferee in writing of the existence of this Discharge Permit and include a copy of this Permit with the notice. The DOE shall deliver or send by certified mail to the NMED a copy of the notification and proof that such notification has been received by the proposed transferee. [20.6.2.3111 NMAC]

Term

8. The effective date of this Discharge Permit Modification is the date it is issued and signed by the Chief of the Ground Water Quality Bureau. The term of this Discharge Permit Modification is the same as the September 9, 2008 Discharge Permit Renewal and Modification and will automatically expire on September 9, 2013. To renew this Discharge Permit, the DOE must submit an application for renewal at least 120 days before that date. [74-6-5.H and 20.6.2.3109.H NMAC]

Issued this 5th day of April, 2010

William C. Olson, Chief
Ground Water Quality Bureau
New Mexico Environment Department

Under authority delegated by the Secretary of the New Mexico Environment Department

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
March 01, 2010

GROUND WATER

MAR 0 4 2010

BUREAU

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Response to the Administrative Completeness Determination and Applicants Public Notice Requirements for the Renewal and Modification of Discharge Plan 831

Dear Mr. Marshall:

The purpose of this letter is to provide proof of the completion of the public notice requirements for Discharge Permit 831 in accordance with your instructions dated December 31, 2009, and received January 7, 2010. The New Mexico Environmental Department (NMED) Public Notice Requirements require that within 15 days of the completion of the public notice requirements, the Permittee must submit proof of notice to NMED containing:

1. Affidavit regarding the sign posting and mailing
2. List of names and addresses to whom the public notice flyer was mailed
3. List of name and addresses of owners of discharge sites
4. Copy of the *Carlsbad Current Argus* newspaper ad
5. Public notice documentation

Therefore, enclosed are the items requested by NMED to document the public notice requirements.

If you have any questions or require additional information, please contact Daniel J. Ferguson at (575) 234-7018.

Sincerely,

David C. Moody

David C. Moody
Manager

Enclosure(s)

cc: w/enclosures
J. Bearzi, NMED *ED
J. Kieling, NMED ED
CBFO M&RC
*ED denotes electronic distribution

CGFO:ORC:DJF:MDA:10-0933:UFC 5486.00

Check Date: Feb/22/2010		ndor Number: 0000002475					Check No. 022998
Invoice Number	**Invoice Date**	**Voucher ID**	**PO Number**	**Gross Amount**	**Discount Taken**	**Late Charge**	**Paid Amount**
Expense: ER00003030	Feb/22/2010	00050143		15.00	0.00	0.00	15.00

DP-831

For Inquiries: please call 1-888-234-3181

Check Number	Date	Total Gross Amount	Total Discounts	Total Late Charges	Total Paid Amount
022998	Feb/22/2010	15.00	0.00	0.00	15.00

WASHINGTON TRU SOLUTIONS LLC
P.O. Box 2078
Carlsbad, NM 88221

CARLSBAD NATIONAL BANK
PO Box 1359
Carlsbad, NM 88220

022998

Date Feb/22/2010 Pay Amount 15.00

Pay ***FIFTEEN AND XX / 100 DOLLAR***

To the Order Of
NEW MEXICO ENVIRONMENT DEPT
PO BOX 5469
SANTA FE, NM 87502-5469

Authorized Signature

⑈022998⑈ ⑆112201797⑆ 51225⑈

St: New Mexico Environment Department
Ground Water Quality Bureau
1190 St. Francis Drive
Santa Fe, NM 87505

Telephone:(505) 827-2905 Fax: (505) 827-2965

INVOICE

Primary Billing Party:
U.S. DOE
PO Box 3090
Carlsbad, NM 88221
DP-831 Poster Fee (cm)

Agency Interest:
318 - Waste Isolation Pilot Plant
32 Miles E of Carlsbad on the Jal Highway
33 miles E/SE of Carlsbad
Carlsbad, NM 88220

INVOICE ID: 71153

INVOICE DATE: 12/31/2009
INVOICE DUE DATE: 01/30/2010

ASSESSMENTS

Ground Water, PRD20090001, 341 - Public Notice Poster Fee	$15.00
INVOICED AMOUNT	$15.00
BALANCE DUE	$15.00

Cut Here and Include Lower Portion with Payment

Primary Billing Party:
U.S. DOE
PO Box 3090
Carlsbad, NM 88221
DP-831 Poster Fee (cm)

Agency Interest:
318 - Waste Isolation Pilot Plant
32 Miles E of Carlsbad on the Jal Highway
33 miles E/SE of Carlsbad
Carlsbad, NM 88220

INVOICE ID: 71153
Invoice Amount: $15.00

INVOICE DUE DATE: 01/30/2010
Amount Enclosed____________________

Please make checks payable to:
Mail payments to:
NMED Federal Tax ID#: 85-6000565

New Mexico Environment Department
Ground Water Quality Bureau
PO Box 5469
Santa Fe, NM 87502-5469
Telephone: (505) 827-2905 **Fax:** (505) 827-2965

Enclosure 1

GROUND WATER

MAR 04 2010

BUREAU

Affidavit

(1 page)

GROUND WATER

MAR 04 2010

BUREAU

AFFIDAVIT OF PUBLIC NOTICE COMPLETION
New Permit or Permit Modification

DP-831

I certify, under penalty of law, that I have completed the actions below for the Ground Water Discharge Permit public notice.

I posted a sign for 30 days displaying a synopsis of the public notice in English and in Spanish at or near the proposed facility in a conspicuous public location (or multiple locations) approved by NMED.

I posted a public notice flyer at a conspicuous off-site location approved by NMED.

I placed a synopsis of the public notice in English and in Spanish in a newspaper approved by NMED. A copy of the newspaper page containing the synopsis is enclosed.

I sent the public notice flyer via 1st class mail to (*check box*):

- ✓ owners of all properties within a 1/3 mile of the boundary of the property of the proposed discharge locations-mailing list is enclosed.
- ☐ owners of all adjacent property (if applicant owns all property within 1/3 mile)-mailing list is enclosed.
- ☐ owner of the property of the proposed discharge locations (if applicant is not the owner)-mailing address is enclosed.

I am aware that there are significant penalties for false certification including the possibility of fines.

David C. Moody
Signature of Applicant

David C. Moody
Printed Name

CBFO Manager
Title

3/1/10
Date

GROUND WATER
MAR 0 4 2010
BUREAU

Enclosure 2

Public Notice Mailing List

(1 page)

Public Notice Mailing List

Kenneth Smith
267 Smith Ranch Road
Hobbs, NM 88240

Stacey Mills
P.O. Box 1358
Loving, NM 88256

Patrick Lyons
New Mexico State Land Office
P.O. Box 1148
Santa Fe, NM 87504

Jim Stovall, Field Manager
U.S. Department of the Interior
Bureau of Land Management
Carlsbad Field Office
620 E. Greene St.
Carlsbad, NM 88220

Enclosure 3

Owner's Name and Address

(1 page)

Owner's Name and Address

Dr. David C. Moody
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221-3090

Enclosure 4

Carlsbad Current Argus Newspaper Ad

(1 page)

10A | Saturday February 13, 2010
Current-Argus

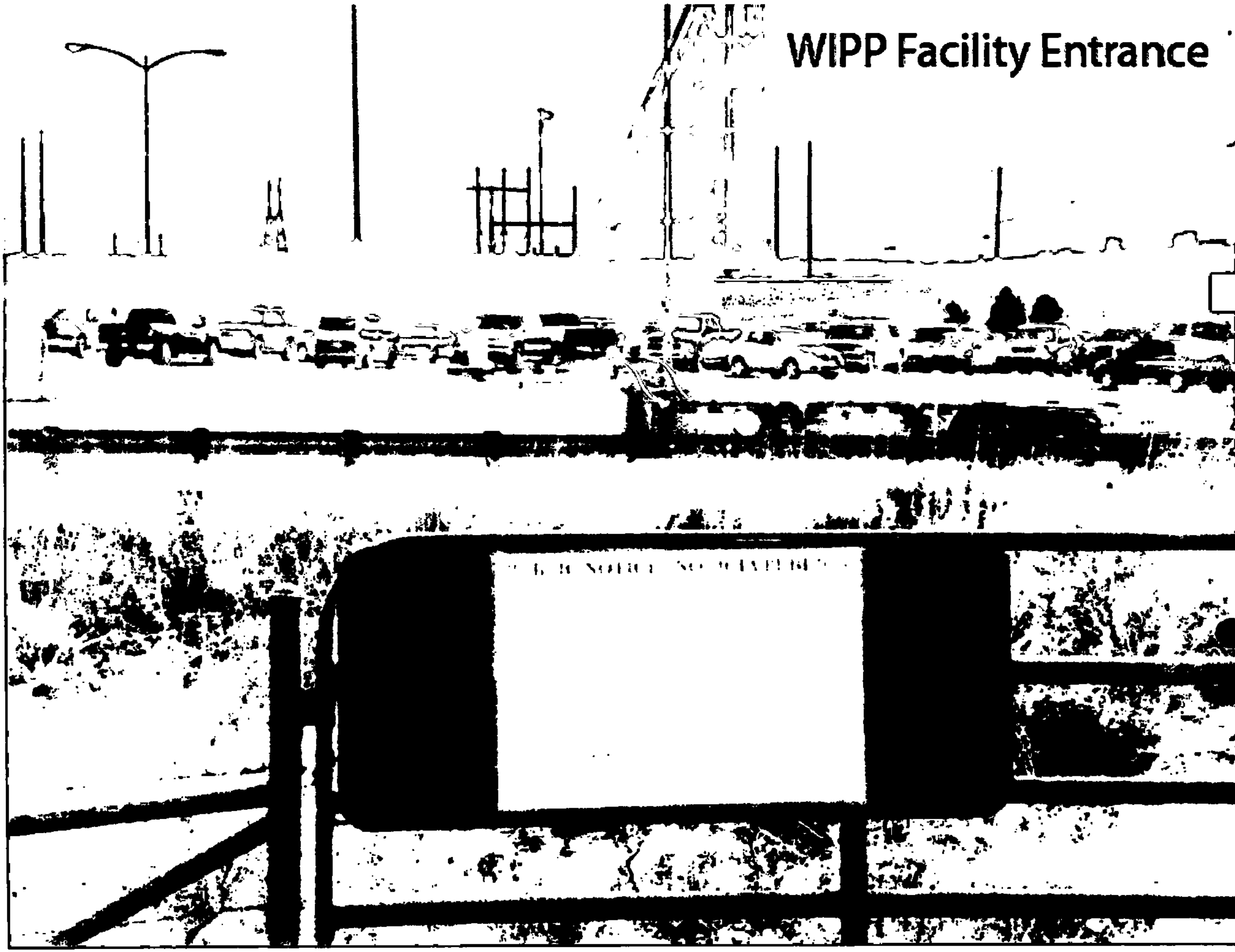
PUBLIC NOTICE/NOTICIA PUBLICA

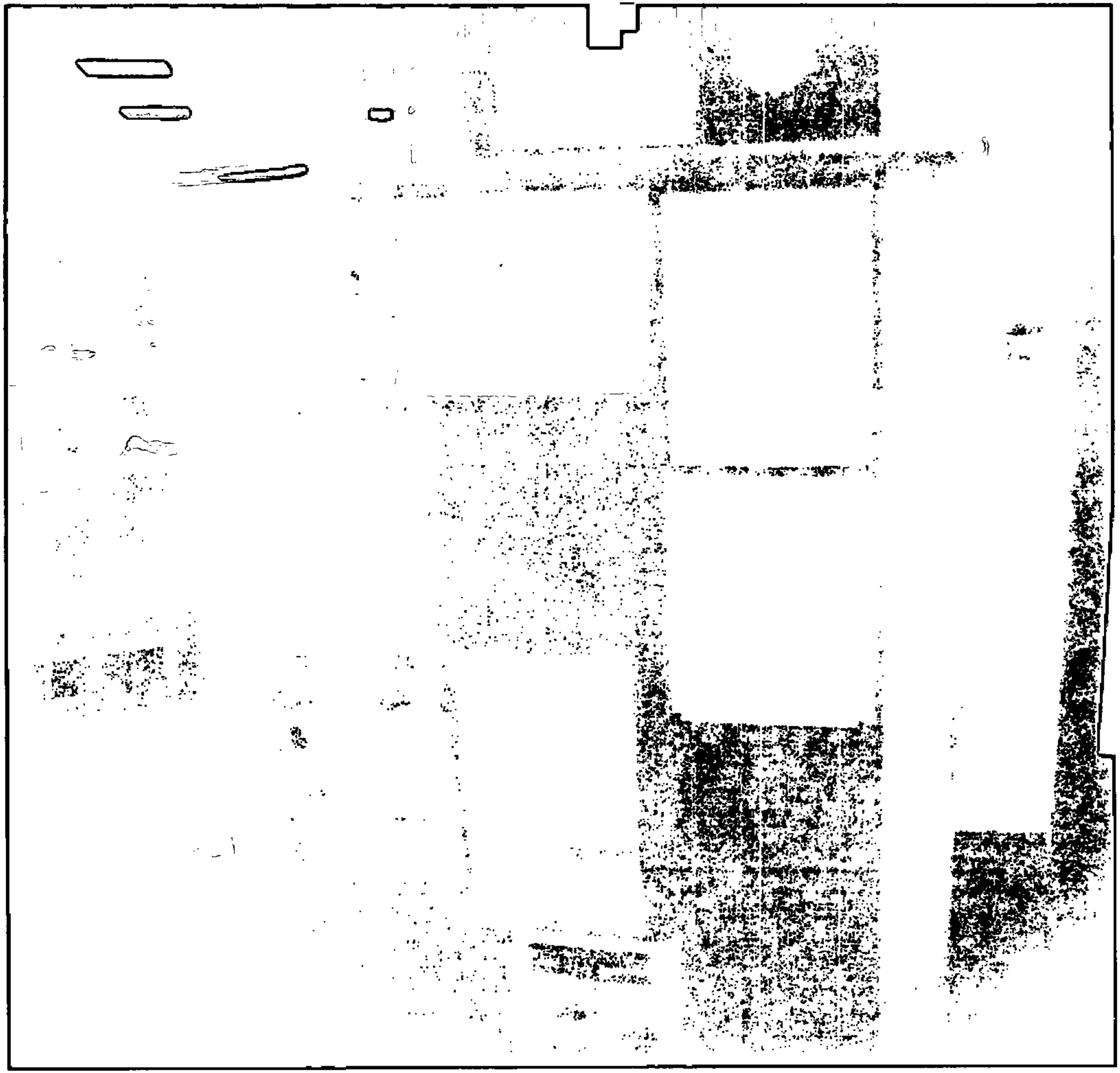
Discharge Permit Modification/Aplicación para Modificación del Permiso para Descargar:
For up to 2,752,831 gallons per day of salt contaminated storm water to a synthetically lined impoundment/
Hasta 2,752,831 galones por día de agua de lluvia contaminada con sal hacia un estanque sintéticamente forrado.
Applicant & Discharge Location/Solicitante & Sitio de Descarga:
Waste Isolation Pilot Plant, 33 miles East/Southeast of Carlsbad
For More Information/Para más Información (DP-831);
Ground Water Quality Bureau/Sección de Agua Subterránea
NM Environment Department/Departamento del Medio Ambiente.
(505)827-2900 www.nmenv.state.nm.us (public notices)
Information in this public notice was provided by the applicants and will be verified by NMED during the permit application review process.

Enclosure 5

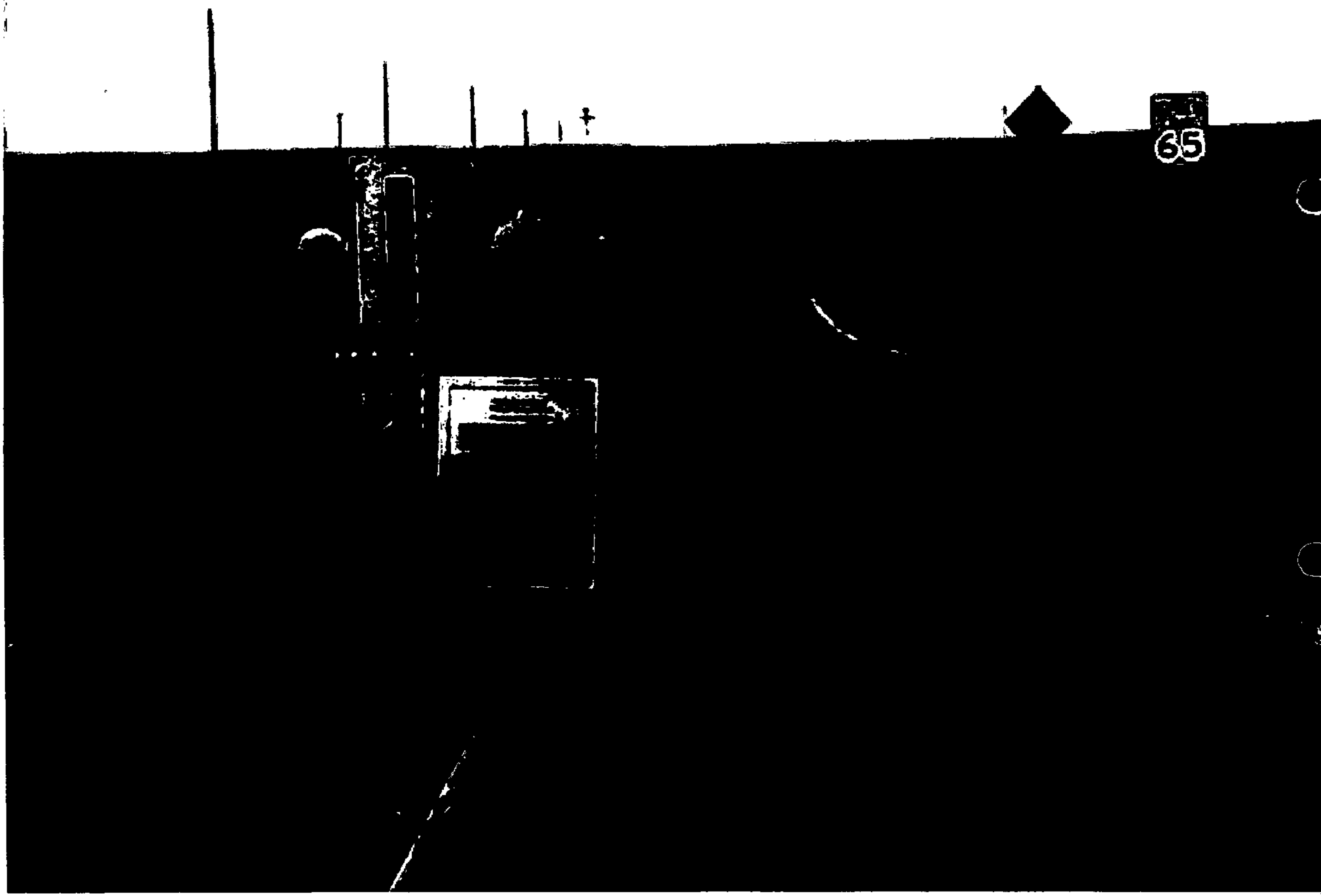
Public Notice Documentation

(4 pages)


WIPP Facility Entrance



WIPP North Access Road Entrance




Entrance

Marshall, Clint, NMENV

To: Ferguson, Daniel - DOE
Cc: Roush, Parrish; Jones, Stewart; Grow, Alan
Subject: RE: SSEB-II Construction Schedule Status

Dan,

The plan you just outlined below is perfectly acceptable. Just contact us when it is completed.

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
505-827-0027

From: Ferguson, Daniel - DOE [mailto:daniel.ferguson@wipp.ws].
Sent: Wednesday, March 10, 2010 3:17 PM
To: Marshall, Clint, NMENV
Cc: Roush, Parrish; Jones, Stewart; Grow, Alan
Subject: FW: SSEB-II Construction Schedule Status

Clint,

We wanted to keep you fully informed as to the construction of the new evaporation pond here at WIPP. All we lack is to install the culvert (pipe) between the new pond and the old pond and the project will be complete. As Parrish says in his email, the high winds here have been hindering the construction work. As soon as the wind dies down we should be able to finish everything up.

Because it doesn't look as though we will be finished by March 15, 2010, would it be allowable for us to keep working at this and notify you immediately as soon as the work is completed?

Sincerely,
Dan Ferguson, CBFO

From: Roush, Parrish
Sent: Wednesday, March 10, 2010 1:02 PM
To: Ferguson, Daniel - DOE
Cc: Jones, Stewart
Subject: FW: SSEB-II Construction Schedule Status

Dan,

In accordance with our e-mail commitment in the February 18, 2010 e-mail below we need to advise Clint Marshall that it is quite unlikely that we will be able to complete installing the culvert to connect the SSEB-II to the SSEB-I by March 15, 2010. We plugged the drain pipe from the Salt Storage Extension Area to prevent water from the Salt Storage Extension Area entering the SSEB-I. However, water continues to drain from the salt accumulated in the SSEB-I into the area where the excavation will take place to install the culvert. High winds last week and this week have also slowed progress, since we do not want to disturb the liner in the SSEB-I when there is a potential for wind to get under the liner and create additional damage during the excavation and installation of the culvert.

We have several pumps in place to transfer water from the SSEB-I to the SSEB-II in the event of additional precipitation. The new pond is in place and functional. If Clint is in agreement, we propose to notify Clint when the Culvert is installed completing this project rather than continuing to project optimistic completion dates during the windy season.

Thanks

Parrish

From: Marshall, Clint, NMENV [mailto:clint.marshall@state.nm.us]
Sent: Thursday, February 18, 2010 3:20 PM
To: Ferguson, Daniel - DOE
Cc: Jones, Stewart; Roush, Parrish
Subject: RE: SSEB-II Construction Schedule Status

Dan, Stewart & Parish,

Thanks for the update. The schedule you have outlined is acceptable.

Clint Marshall
Mining Environmental Compliance Section
Ground Water Quality Bureau
New Mexico Environment Department
505-827-0027

From: Ferguson, Daniel - DOE [mailto:daniel.ferguson@wipp.ws]
Sent: Thursday, February 18, 2010 2:56 PM
To: Marshall, Clint, NMENV
Cc: Jones, Stewart; Roush, Parrish
Subject: FW: SSEB-II Construction Schedule Status

Clint,

Parrish has put together this update on the construction of the new evaporation pond. We still need to tie the two ponds together with a drain pipe, but everything else has been completed. We will notify you as soon as everything is done.

Thanks,
Dan

From: Roush, Parrish
Sent: Thursday, February 18, 2010 2:51 PM
To: Ferguson, Daniel - DOE
Subject: SSEB-II Construction Schedule Status

Clint,

The U.S. DOE submitted a schedule for the construction of the new Salt Storage Extension Basin II (SSEB-II) in a letter dated August 28, 2009. The schedule estimated completion by February 28, 2010, assuming no issues with the weather or contractor resources. Snow and rain events totaling 1.54 inches in late January resulted in a considerable delay completing the installation of the second liner. Water had to be removed from the SSEB-II and leak detection sump to complete the installation of the last section of top liner. Currently water is being pumped from the Salt Storage Extension Basin I (SSEB-I) with less than a foot of water remaining. We are planning to excavate and complete the culvert installation the week of February 22, 2010 and hope to be complete by February 28, 2010. However, water

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

GROUND WATER

MAR 0 5 2010

BUREAU

February 24, 2010

~Notice~

Waste Isolation Pilot Plant Notification

The U.S. Department of Energy (DOE) Carlsbad Field Office and Washington TRU Solutions LLC hereby provide you with the following notice concerning the Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Permit Number: NM4890139088-TSDF.

December 15, 2009 (Class 1)

This modification allows for

- Revision to clarify which fire-water tank is used first during a fire and revised the unit of pressure for the fire-water tank's rating from kilograms per square inch to kiloPascal.
- Revision of several procedure numbers.
- Updates the pre-fire survey figures.
- Removal of trailer 965 and the addition of new trailer 953.
- Updates and consolidates the on-site assembly areas to improve personnel accountability and new areas were delineated to ensure personnel are away from substantially affected areas.
- Revision of the title of the WWIS User's manual in Section B-4a(6), B-5a(1), B-9, B3-12b(4) and B3-16.
- Change in specific area codes to reflect the change from (505) to (575) for certain areas in the State of New Mexico and update a phone number for the Hobbs Fire Department.
- Updated emergency coordinator list in Table F-2.

December 23, 2009 (Class 1)

- This modification allows the installation of a bulkhead in a filled room for additional ventilation control, if required.

February 19, 2010 (Notice)

Mine Operations plans to begin mining of Panel 7 on or about April 5, 2010. The reason for starting mining at this time is based on a need date for Panel 7 of February 2012.

Mining will take approximately 14 months followed by outfitting and certification (6.5 months) and drilling remote-handled transuranic waste emplacement holes in Room 7 (2 months). Based on this anticipated schedule, mining, outfitting and certification of Panel 7 will be completed before the anticipated first waste emplacement date in the panel. Initial preparatory operations, scheduled to begin on or about March 29, 2010, may include ramp building, setting ventilation and probe hole drilling.

New Mexico Env[illegible]nental Department
Ground Water Qua[illegible]y Bureau

Acknowledgement of Receipt

cm

Acknowledgement of Receipt of Check/Cash

I hereby acknowledge receipt of Check No. #022998 Dated. 2/22/10
or cash, received in the amount of $ 15.00 from Washington Tru Solutions
for Waste Isolation Pilot Plant (Facility Name) DP-831 (DP No.) 318 (AI ID)

GROUND WATER

Copy Made for Check Processing ________ Date ________ MAR 0 2 2010

For Central File Activity ________

BUREAU

Submitted to ASD by: ________ Date: ________

Received in ASD by: ________ Date: ________

Filing Fee [ ] New Facility [ ] Renewal [ ]

Modification [ ] Other [X] (Explain) Poster Fee

Organization Code ________ Application FY ________

To be Deposited in the Ground Water Section Discharge Plan Fees.

Full Payment [ ] or Annual Increment [ ]

WASHINGTON TRU SOLUTIONS LLC
P.O. Box 2078
Carlsbad, NM 88221

CARLSBAD NATIONAL BANK
PO Box 1359
Carlsbad, NM 88220

022998

VOID

Date Feb/22/2010 Pay Amount $15.00***

Pay ****FIFTEEN AND XX / 100 DOLLAR****

To The Order Of
NEW MEXICO ENVIRONMENT DEPT.
PO BOX 5469
SANTA FE, NM 87502-5469

Jerry K. Fenner
Authorized Signature

DP-831

⑈022998⑈ ⑆112201797⑆ 51225⑈

New Mexico Environment Department
Ground Water Quality Bureau

DP Processing Form

DP# 831 Reviewer Clint	Date 11-24-09	Initial CV

Discharge Plan Application		
❖ DP Application Received	11-24-09	CV
❖ Filing Fee Received (Amount: 100.00)	11-24-09	CV
❖ Plans and Specifications Received	11-24-09	CV

Public Notice		
❖ Public Notice 1 Published	1/21/10	ds

New Mexico ·onmental Department
Ground Water Quality Bureau

Acknowle‹ _ ment of Receipt

Acknowledgement of Receipt of Check/Cash

I hereby acknowledge receipt of Check No. 022260 Dated. 11/11/09
or cash, received in the amount of $ 100.00 from ______
for WasteIsolation 831 318
(Facility Name) (DP No.) (AI ID)

Copy Made for Check Processing ______ Date ______
For Central File Activity PRD20090001 (DP-Mod)

Submitted to ASD by: ______ Date: ______

Received in ASD by: ______ Date: ______

Filing Fee ☐ New Facility ☐ Renewal ☐

Modification ☒ Other ☐ (Explain) ______

Organization Code ______ Application FY ______

To be Deposited in the Ground Water Section Discharge Plan Fees.

Full Payment ☐ or Annual Increment ☐

WASHINGTON TRU SOLUTIONS LLC
P.O. Box 2078
Carlsbad, NM 88221

CARLSBAD NATIONAL BANK
PO Box 1359
Carlsbad, NM 88220

022260

VOID

Date Nov/11/2009 Pay Amount 100.00***

Pay ****ONE HUNDRED AND XX / 100 DOLLAR****

To The Order Of
NEW MEXICO ENVIRONMENT DEPARTMENT
2905 RODEO PARTK DRIVE EAST
BLDG 1
SANTA FE, NM 87505

Jerry K. Fenn

Authorized Signature

DP 831

MP

⑈022260⑈ ⑆112201797⑆ 51225⑈

Check Date: Nov/11/2009 Vendor Number: 0000000105 Check No. 022260

Invoice Number	Invoice Date	Voucher ID	PO Number	Gross Amount	Discount Taken	Late Charge	Paid Amount
Expense: ER00002117	Nov/11/2009	00047910		100.00	0.00	0.00	100.00

RECEIVED
NOV 24 2009
BY:

TROY ® CHECK PAPERS

For Inquiries: please call 1-888-234-3181

Check Number	Date	Total Gross Amount	Total Discounts	Total Late Charges	Total Paid Amount
022260	Nov/11/2009	100.00	0.00	0.00	100.00

NEW MEXICO ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 St. Francis Drive
P.O. Box 5469, Santa Fe, NM 87502
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us

BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary
JON GOLDSTEIN
Deputy Secretary

December 31, 2009

David Moody, Manager
Waste Isolation Pilot Plant
US Department of Energy Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

RE: Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant

Dear Mr. Moody:

The New Mexico Environment Department (NMED) received a Ground Water Discharge Permit Application for the above referenced facility on November 24, 2009. Pursuant to Section 20.6.2.3108 NMAC of the New Mexico Water Quality Control Commission Regulations (20.6.2 NMAC), NMED determined on December 9, 2009 that your application is administratively complete.

Within 30 days of the date your application was deemed administratively complete, you must provide public notice as required by Section 20.6.2.3108 NMAC. Instructions and materials needed to complete the public notice are enclosed.

A technical reviewer will contact you within the next few months if additional information is needed to process your application. If you have a deadline of concern in the interim or any questions, please call the Ground Water Quality Bureau at (505) 827-2900.

Sincerely,

for William C. Olson, Chief
Ground Water Quality Bureau

enc: Instructions for Completing Public Notice Requirements
Affidavit
Public Notice Flyer
Text for Newspaper Display Ad
Public Notice Sign
Invoice ($15 fee for sign) if not attached, the invoice will be mailed separately

INSTRUCTIONS FOR COMPLETING PUBLIC NOTICE REQUIREMENTS

Discharge Permit DP- 831 ☐ New ☒ Modification ☐ Renewal & Modification

Within 30 days of the date NMED deemed your Discharge Permit application administratively complete, you must provide public notice as follows:

1. **Post sign(s) at the facility.**
   Enclosed is a sign 2 x 3 feet in size (or multiple signs if required) which must be posted **at or near the facility** in a conspicuous location approved by NMED. An invoice for the sign(s) is enclosed. NMED approves the following sign posting location(s):
   Facility entrance

2. **Post a public notice flyer off-site.**
   The enclosed public notice flyer which must be posted **off-site** at a location conspicuous to the public and approved by NMED. NMED approves the following flyer posting location:
   Carlsbad Public Library

3. **Mail a public notice flyer to property owners within 1/3 mile.**
   A copy of the enclosed public notice flyer must be sent by 1st class mail to the owners of record of all properties within 1/3 mile from the boundary of the property where the discharge site is located. If there are no properties within 1/3 mile other than properties owned by the applicant, then the flyer must be mailed to the owners of record of the nearest adjacent properties.

   The names and addresses of property owners can be obtained from the county tax assessor's office. The list of property owners' names and addresses must be submitted to NMED.

4. **Mail a public notice flyer to the owner of the discharge site.**
   A copy of the enclosed flyer must be sent via certified mail, return receipt requested, to the owner(s) of the discharge site(s), if the applicant is not the owner. The list of owners' names and addresses and the certified mail receipts must be submitted to NMED.

5. **Place a display ad in the newspaper.**
   A display ad 3 x 4 inches in size must be published for one day in a newspaper of general circulation in the location of the proposed discharge. The ad may **not** be placed in the classified or legal section. The text for the ad is enclosed. NMED approves publishing the ad in the following newspaper:
   Carlsbad Current Argus

PROOF OF NOTICE. Within 15 days of completing the above requirements, the applicant must submit the following items as proof of notice to NMED:

Affidavit regarding the sign posting and mailing (form enclosed).
List of names and addresses to whom the public notice flyer was mailed.
List of names and addresses of owners of discharge sites.
Certified mail receipts for mailing to discharge site owner(s), if required.
Copy of newspaper ad.

Send to NMED Ground Water Quality Bureau, PO Box 5469, Santa Fe, NM 87502.

Reviewer's Initials and Date FV 12/10/07

PUBLIC NOTICE

Discharge Permit Application

Waste Isolation Pilot Plant, DP-831

DP-831, Waste Isolation Pilot Plant, David Moody, Manager, proposes to modify the Discharge Permit for the discharge of up to 2,752,831 gallons per day of salt contaminated storm water to a synthetically lined impoundment. Potential contaminants from this type of discharge include total dissolved solids, chloride and sulfate. The facility is located approximately 33 miles East/Southeast of Carlsbad, in Sections 20, 21, 28, and 29, T22S, R31E, Eddy County. Ground water beneath the site is at a depth of approximately 164 feet and has a total dissolved solids concentration of approximately 3,400 milligrams per liter.

The applicant is seeking a Discharge Permit for the proposed discharge. Provided the applicant has met applicable requirements, the New Mexico Environment Department (NMED) will propose a Discharge Permit containing limitations, monitoring requirements, and other conditions intended to protect ground water quality for present and potential future use. Information in this public notice was provided by the applicant and will be verified by the New Mexico Environment Department during the permit application review process. NMED will accept comments and statements of interest regarding the application and will create a facility specific mailing list for persons who wish to receive future notices.

You may send comments or statements of interest to:

Clint Marshall, DP-831
Ground Water Quality Bureau
PO Box 5469
Santa Fe, NM 87502.

For additional information, please call:
505-827-2900

Applicant
David Moody, Manager
Waste Isolation Pilot Plant
US Department of Energy Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

Public Notice Flyer

Public Notice Synopsis, DP-831
(for sign & newspaper display ad)

Newspaper display ad must be at least 3 inches by 4 inches in size and must be published for at least one day in a section other than the classifieds or legals.

PUBLIC NOTICE / NOTICIA PUBLICA

Discharge Permit Modification / Aplicación para Modificación del Permiso para Descargar:
For up to 2,752,831 gallons per day of salt contaminated storm water to a synthetically lined impoundment/
Hasta 2.752.831 galones por día de agua de lluvia contaminado con sal hacia un estanque sintéticamente forrado

Applicant & Discharge Location / Solicitante & Sitio de Descarga:
Waste Isolation Pilot Plant, 33 miles East/Southeast of Carlsbad

For More Information / Para Más Información (DP-831):
Ground Water Quality Bureau / Sección de Agua Subterránea
NM Environment Department / Departamento del Medio Ambiente

(505) 827-2900 www.nmenv.state.nm.us (public notices)

Information in this public notice was provided by the applicants and will be verified by NMED during the permit application review process.

*** FINAL DRAFT AGENDA

109th WIPP QUARTERLY REVIEW MEETING

January 21, 2010

New Mexico Environment Department, Host
NMED Hazardous Waste Bureau
Conference Room A
2905 Rodeo Park Dr E, Building 1
Santa Fe, NM

10:00 AM	Welcome, Introductions	5 min.	Steve Zappe, NMED/HWB
10:05 AM	NMED RCRA Permit Update (permit mods/renewal, audits, compliance, etc.)	20 min.	Steve Zappe, NMED/HWB
10:25 AM	NMED DOE Oversight Bureau WIPP Update	15 min.	Tom Kesterson, NMED/DOE-OB
10:40 AM	NM Radioactive Waste Task Force Update	20 min.	Anne Clark, NM EMNRD
11:00 AM	Break	10 min.	
11:10 AM	Independent Oversight Contract Update	10 min.	Jerry Fox, Director, PECOS Management Services
11:20 AM	DHSEM WIPP Personal Radiation Detection Program	25 min.	Don Shainin, NMDHSEM
11:45 AM	Lunch	75 min.	
1:00 PM	Chemistry and Generation of Carbon Tetrachloride Waste	15 min.	Steve Holmes, NMED/HWB
1:15 PM	CBFO Update	30 min.	George Basabilvazo, CBFO
1:45 PM	CBFO Update, continued • Additional Requested CBFO Agenda Topics	65 min.	George Basabilvazo, CBFO
2:50 PM	Action Item Commitments/Closeout	10 min.	Steve Zappe, NMED/HWB
3:00 PM	Adjourn		

: of New Mexico Environment Department

Ground Water Quality Bureau

1190 St. Francis Drive

Santa Fe, NM 87505

Telephone:(505) 827-2905 Fax: (505) 827-2965

cm

INVOICE

Primary Billing Party:
U.S. DOE
PO Box 3090
Carlsbad, NM 88221

Agency Interest:
318 - Waste Isolation Pilot Plant
32 Miles E of Carlsbad on the Jal Highway
33 miles E/SE of Carlsbad
Carlsbad, NM 88220

INVOICE ID: 72422

INVOICE DATE: 01/26/2010
INVOICE DUE DATE: 02/25/2010

ASSESSMENTS
Ground Water, PRD20090001, 341 - Discharge Fee $6,500.00

INVOICED AMOUNT $6,500.00

BALANCE DUE $6,500.00

Cut Here and Include Lower Portion with Payment

Primary Billing Party:
U.S. DOE
PO Box 3090
Carlsbad, NM 88221

Agency Interest:
318 - Waste Isolation Pilot Plant
32 Miles E of Carlsbad on the Jal Highway
33 miles E/SE of Carlsbad
Carlsbad, NM 88220

INVOICE ID: 72422

Invoice Amount: $6,500.00

INVOICE DUE DATE: 02/25/2010

Amount Enclosed____________________

Please make checks payable to: **New Mexico Environment Department**
Mail payments to: **Ground Water Quality Bureau**
PO Box 5469
Santa Fe, NM 87502-5469
NMED Federal Tax ID#: 85-6000565

Telephone: (505) 827-2905 **Fax:** (505) 827-2965

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 St. Francis Drive
P.O. Box 5469, Santa Fe, NM 87502
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us
William C. Olson, Bureau Chief

BILL RICHARDSON
Governor
DIANE DENISH
Lieutenant Governor

RON CURRY
Secretary
JON GOLDSTEIN

U.S. Postal Service
CERTIFIED MAIL
(Domestic Mail Only; No Ins
For delivery information visit ou
OFFICI
Postage $
Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
David C. Moody, M
US Dept. of Energy
Carlsbad Field Offic
PO Box 3090
Carlsbad, NM 88221
PS Form 3800, August 2006
7009 0080 0000 0482 4039

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

January 22, 2010

David C. Moody, Manager
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, New Mexico 88221

RE: Temporary Permission to Discharge Impacted Storm Water to the Salt Storage Extension Basin II, DP-831, U.S. Department of Energy Waste Isolation Pilot Plant

Dear Mr. Moody:

The New Mexico Environment Department has reviewed the request, dated January 14, 2010, from the U.S. Department of Energy (DOE) for temporary permission to discharge up to 2,752,831 gallons per day of impacted storm water to the newly constructed Salt Storage Extension Basin II (SSEB-II) at the Waste Isolation Pilot Plant (WIPP). NMED is currently processing an application for a discharge permit modification dated November 19, 2009, which will incorporate the new pond into DP-831. The newly constructed SSEB-II is located approximately 26 miles east of Carlsbad in Section 20, T22S, R31E, Eddy County.

The purpose of constructing the SSEB-II is to expand the storm water runoff storage capacity from the Salt Storage Extension (SSE), a synthetically lined repository for mined salt brought up from the subsurface. The SSEB-II will add additional storage capacity currently provided by the previously constructed SSEB-I. The SSEB-II is synthetically double-lined with 60 mil high density polyethylene (HDPE) and a 200 mil geonet leak detection layer. The SSEB-II is connected by two overflow pipes from the SSEB-I, approximately two feet above the SSEB-I basin floor. Temporary Permission is being requested in order to transfer water currently in SSEB-I to SSEB-II so that the piping between the two ponds can be completed.

Temporary permission to discharge is hereby granted for 120 days from the date discharge commences, pursuant to Section 20.6.2.3106.B NMAC of the New Mexico Water Quality Control Commission (WQCC) Regulations. This approval is contingent on your discharging and reporting as described in your request.

Please be advised that this temporary permission to discharge is for 120 days from the date discharge commences. You will not be authorized to discharge after this temporary permission expires without an approved permit.

This approval does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, such as zoning requirements and nuisance ordinances. Also, this approval does not relieve you of liability should your operation result in actual pollution of surface or ground waters.

If you have any questions, please contact Clint Marshall of the Mining Environmental Compliance Section at 505-827-0027.

Sincerely,

for:

William C. Olson, Chief
Ground Water Quality Bureau

WO:CLM

cc: Mary Ann Menetrey, Program Manager, MECS

GROUND WATER

JAN 19 2010

BUREAU

Waste Isolation Pilot Plant

Fact Sheet

January 12, 2010

DOE Proposes Modification To Hazardous Waste Facility Permit

Changes to WIPP Hazardous Waste Facility Permit

Background The U.S. Department of Energy Carlsbad Field Office (DOE) and Washington TRU Solutions LLC (WTS) submitted three proposed Class 2 permit modification requests to the New Mexico Environment Department (NMED) to change the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (Permit). NMED issued WIPP's Permit (Permit Number: NM4890139088-TSDF) in October 1999.

What is Proposed? The purpose of the proposed modifications, submitted to NMED on January 7, 2010, is to clarify language in the permit. Modification is requested for the following items:

1. Clarify language regarding the liquid prohibition in the Permit.
2. Clarify language regarding the use of the visual examination method to characterize waste
3. Clarify the requirements regarding nonconformance reports.

The first modification request clarifies Permit language related to the amount of liquids acceptable in containers for disposal at the WIPP facility. Specifically, the modification proposes four items:

1. Change the liquid prohibition and clarify the associated language.
   a. Retain an overall one percent liquid limit for each waste container.
   b. Define the acceptable amount of liquid for small internal containers.
   c. Prohibit overpacking and redistribution of untreated liquid as a means to comply with the liquid limit.

2. Define or clarify the following terms that are associated with the implementation of the liquid prohibition:
   a. Observable liquid
   b. Internal container
   c. Payload container
   d. Inner container

PUBLIC INFORMATION MEETINGS

On Three Proposed Modifications to the Hazardous Waste Facility Permit for the Waste Isolation Pilot Plant

WHO: U.S. Department of Energy (DOE) Carlsbad Field Office and Washington TRU Solutions LLC (WTS).

WHAT: DOE and WTS will conduct public meetings to provide information on the following requested permit modifications to the WIPP Hazardous Waste Facility Permit (Permit). There will be a 60-day public comment period beginning on January 13, 2010.

WHEN:	Tuesday, February 23, 2010 5 – 6 p.m.	Thursday, February 25, 2010 2 – 4 p.m. & 6 – 8 p.m.
WHERE:	Skeen-Whitlock Building 4021 National Parks Highway Carlsbad, New Mexico	Courtyard by Marriott 3347 Cerrillos Road Santa Fe, New Mexico

WHY: On January 7, 2010, DOE submitted three Class 2 permit modification requests to the New Mexico Environment Department (NMED).

1. The first proposed modification request is to clarify language regarding the liquid prohibition in the Permit.
2. The second proposed modification request is to clarify the use of the visual examination method to characterize waste.
3. The third proposed modification request is to clarify requirements regarding nonconformance reports.

HOW: To obtain additional information about this permit modification request, contact Mr. Bobby St. John, WTS, at 1-800-336-9477. The permit modification is also available on the WIPP web site at http://www.wipp.energy.gov and at the WIPP Information Center, Skeen-Whitlock Building, 4021 National Parks Highway, Carlsbad, N.M. A copy of the requested permit modification also may be obtained from NMED at the address listed below.

COMMENTS: Written comments for the record must be sent to the NMED contact person at the address below and received no later than 5 p.m. on March 15, 2010:

Mr. Steve Zappe
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, N.M. 87505
Phone: 505-476-6051
Fax: 505-476-6060
E-mail: steve.zappe@state.nm.us

The Permittees' compliance history during the life of the permit being modified is available from Mr. Steve Zappe at the New Mexico Environment Department.

QUESTIONS: Any questions or comments to the Permitees regarding this permit modification may be sent to Mr. Bobby St. John, P.O. Box 2078, Carlsbad, N.M. 88221, no later than March 1, 2010.

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

GROUND WATER

JAN 19 2010

BUREAU

JAN 14 2010

Mr. Clint Marshall
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

Subject: Request for Temporary Authorization to Discharge to the New Salt Storage Extension Evaporation Basin II

Dear Mr. Marshall:

The purpose of this letter is to request a temporary authorization to discharge to the new Salt Storage Extension Basin II (SSEB-II) for up to 120-days in accordance with 20.6.2.3106.B. NMAC. A discharge permit modification application was submitted to the Ground Water Quality Bureau on November 19, 2009 for the construction of the SSEB-II immediately west of the existing SSEB-I, to receive evaporate run-off from the Salt Storage Extension Area.

It is necessary to pump water from the existing SSEB-I to the SSEB-II in order to complete the piping installation that connects the two ponds. As discussed in the May 28, 2009 proposed engineering specifications for the new pond approved by the GWQB in a letter dated July 15, 2009, the two ponds will be hydraulically connected, and the discharge from the SSEB-I to the SSEB-II will be based on gravity flow.

The current construction schedule targets January 18, 2010 to begin transfer of water from the SSEB-I to SSEB-II, and to initiate the piping connection between the two ponds. Therefore, this is the requested date to begin the 120-day Temporary Authorization.

If you have any questions or wish to discuss this request for a Temporary Authorization, please contact me at 575-234-8128.

Sincerely,

Daniel J. Ferguson
Site Regulatory Specialist
Office of Regulatory Compliance

cc:
Mary Ann Menetrey, NMED
William Olsen, NMED

CBFO:ORC:DF:GS:10-0905:UFC 5486.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
NOV 1 9 2009

Mr. William Olson, Chief
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 26110
Santa Fe, NM 87502

RECEIVED
NOV 24 2009
BY:

Subject: Transmittal of Discharge Permit 831 Modification Application

Dear Mr. Olson:

Enclosed are three copies of the Discharge Permit 831 (DP-831) Modification for the construction of a new evaporation pond to receive run-off from the Salt Storage Extension Area at the Waste Isolation Pilot Plant located in Eddy County, New Mexico and the $100 filing fee. The design and specifications for the new evaporation pond were submitted to the Ground Water Quality Bureau (GWQB) in correspondence dated May 28, 2009, and approved by the GWQB in a letter dated July 15, 2009. Accordingly, this modification references that document for plans and specifications.

If the Discharge Permit Modification is not able to be issued by the time the construction of the new evaporation pond is complete, DOE will request a temporary authorization to discharge to the new pond for up to 120 days in accordance with 20.6.2.3106.B. NMAC. When completed, the new pond will be hydrologically connected to the existing Salt Storage Extension Basin permitted under DOE's existing Discharge Permit, DP-831. For this reason, DOE would appreciate the public notice process utilizing the option in 20.6.2.3108.J., combining the public notice procedures of Subsections E and H of 20.6.2.3108 NMAC.

If you have any questions or wish to discuss this application, please contact Mr. Dan Ferguson, Site Regulatory Specialist, at (575) 234-8128.

Sincerely,

David C. Moody

David C. Moody
Manager

cc:
C. Marshall, NMED *ED
M. Menetrey, NMED ED
*ED denotes electronic distribution

02484

CBFO:ORC:DF:GS:09-0342:UFC 5487.00

NEW MEXICO ENVIRONMENT DEPARTMENT
GROUND WATER QUALITY BUREAU

DISCHARGE PERMIT APPLICATION

RECEIVED
NOV 24 2009
BY:

Type of Application. Check appropriate box.

- ☐ Application for new Discharge Permit – new facility
- ☐ Application for new Discharge Permit – existing (unpermitted) facility
- ☐ Application for Discharge Permit Renewal
- X Application for Discharge Permit Modification
  "Modification" is defined as a change to the permit requirements that result from a change in the location of the discharge, a significant increase in the quantity of the discharge, or a significant change in the quality of the discharge.
- ☐ Application for Discharge Permit Renewal and Modification

For an existing Discharge Permit, please indicate: DP Number 831 Expiration date 9/9/13

Checklist of Application Components.

X Part A: Administrative Completeness.	*Instructions for completing the application are included on the form itself and on Supplemental Instructions for Parts A and B. You may fill out the application manually, or a Microsoft Word version may be downloaded from www.nmenv.state.nm.us (Ground Water Quality) and filled out electronically.*
X Part B: Operational, Monitoring, Contingency and Closure Plans, with required attachments. *Choose appropriate option*: ☐ Septic Tank System ☐ General – Various Facility Types	
X Part C: Site Information, with required attachments. (See December 20, 2007 Discharge Permit and Renewal Modification for Site Information.)	
X $100 Filing Fee, payable to the New Mexico Environment Department. *Required from all applicants.* An additional fee will be assessed prior to permit issuance. Permit fees are listed in Section 20.6.2.3114 NMAC.	

Certification. Signature must be that of the person named in Item A-3 of Part A of the application.

I certify under penalty of law that I am knowledgeable about the information contained in this application. The information is, to the best of my knowledge and belief, true, accurate and complete.

Signature: David C. Moody Date: 11/18/09

Printed Name: Dr. David Moody

Title: Manager

Send three complete copies of this application and the filing fee to:

Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
PO Box 5469
Santa Fe, NM 87502

GROUND WATER DISCHARGE PERMIT APPLICATION
PART A: ADMINISTRATIVE COMPLETENESS
All Facilities

A-1. Facility Information. See Supplemental Instructions to determine what constitutes the "facility." The physical location of the facility must be provided. If the facility does not have an address, the location can be described by road intersections, mile posts, or landmarks, as appropriate.

Facility Name: Waste Isolation Pilot Plant (WIPP)

Former Names (if any):

Physical address/location (*mandatory*): Driving distance is 33 miles east-southeast of Carlsbad, NM. Driving east from Carlsbad on U.S. Highway 62/180 turn onto the WIPP access road (Louis Whitlock Rd.) just east of mile marker 64, proceed 12.5 miles to the facility.

County: Eddy

Mailing address: P.O. Box 3090
Carlsbad, NM 88221-3090

Contact person: Mr. Dan Ferguson

Title: Site Regulatory Specialist

Telephone number(s): 575-234-8128

Fax number: 575-234-7061 E-mail address: dan.ferguson@wipp.ws

A-2. Type of Discharge and Type of Facility. See Supplemental Instructions.

Type of discharge: ☐ Domestic ☐ Agricultural X Industrial ☐ Mining

Type of facility: The facility's primary mission is the disposal of defense generated transuranic (TRU) waste in a geologic repository constructed using conventional mining techniques. Domestic wastewater is treated in the sewage treatment system. Wastewater from industrial related activities is treated by evaporation in synthetically lined ponds. Stormwater run-off from one active Salt Pile and one HDPE capped Salt Pile is collected in evaporation ponds for evaporation. An older inactive salt pile, the Site and Preliminary Design Validation (SPDV) material pile was closed by grading and lining the pile with a geosynthetic liner and covering it with 2 feet of soil blended with rock and establishing native vegetation.

The purpose of this modification is to add an additional evaporation pond to increase the treatment capacity for storm water run-off from the Salt Storage Extension Area for evaporation.

A-3. Applicant Information. The applicant is the person or entity (e.g., corporation, partnership, organization, municipality, etc.) legally responsible for the discharge and for complying with the terms of the Discharge Permit. If the applicant is an entity, then the name and title of a contact person must be provided. This application must be signed by the applicant or contact person named here.

Applicant Name: U.S. Department of Energy, Carlsbad Field Office

Mailing address: P.O. Box 3090

	Carlsbad, New Mexico 88221-3090
Contact person	Mr. David C. Moody
Title	Manager
Telephone number(s)	575-234-7300
Fax number	575-234-7027 E-mail address dave.moody@wipp.ws

A-4. Consultant Information (if applicable). If the consultant is a company or organization, then the name and title of a contact person must be provided.

Consultant/Firm Name	NA
Mailing address	
Contact person	
Title	
Telephone number(s)	
Fax number	E-mail address

A-5. Permit Contact Information (if applicable). If someone other the applicant listed in Item A-3 or a consultant listed in Item A-4 is a primary contact for this application and/or facility, list here.

Permit Contact Name	Mr. Dan Ferguson
Title	Site Regulatory Specialist
Mailing address	P. O. Box 3090
	Carlsbad, NM 88221-3090
Telephone number(s)	575-234-8128
Fax number	575-234-7061 E-mail address dan.ferguson@wipp.ws

A-6. Ownership.

The applicant owns (check as appropriate): X the facility ☐ some discharge sites X all discharge sites

If other parties own the facility or any of the discharge sites, attach their names and contact information.

Not Applicable

A-7. Discharge Quantity.

Your Discharge Permit will specify a maximum discharge volume, which is typically expressed as the maximum number of gallons per day that may be treated and/or disposed of. Please indicate below the maximum discharge volume for your facility. You must show how it was determined in Part B of your application. For further explanation, see Supplemental Instructions for Part B.

Infiltration Control Ponds and Run-Off Volumes			
	Drainage Area	Run-off Volumes for Design basis 25-year/24 hour storm event (3.90 inches)	Pond Capacity
Salt Storage Extension and Salt Storage Extension Basins (SSEB-I and SSEB-II)	26 acres	368,000 cubic feet	1,317,000 cubic feet[1]

[1] The existing pond (SSEB-I) and the new pond (SSEB-II) are hydraulically connected and this capacity is the combined capacity of both ponds.

A-8. Processing, Treatment, Storage and Disposal System. Briefly describe how wastewater, sludge, etc. is processed, treated, stored, and/or disposed of at your facility. See Supplemental Instructions for examples of system components.

The Salt Storage Extension Area and Salt Storage Extension Evaporation Basins

The Salt Storage Extension (SSE) is used to stockpile rock (primarily evaporites) excavated during the construction and maintenance of the underground geologic repository. The SSE was constructed with six inches of prepared subgrade, a 60-mil high density polyethylene (HDPE) liner, a 200-mil geonet drainage layer, an eight ounce geotextile fabric and covered with two feet of screened native soil. Each Cell slopes two percent toward the center which contains a collection trench and pipe for the conveyance of storm water run-off west to the SSEB-I. The SSEB-I is constructed with a prepared subgrade, a 60-mil HDPE liner, a 200-mil geonet cushion/drainage system, and a second 60-mil HDPE liner. The geonet leak detection layer drains to a sump with an inclined riser to allow for inspection and monitoring.

This modification is to add an additional pond to be constructed due west of the existing Salt Storage Extension Evaporation Basin (SSEB-I), and will be referred to as SSEB-II. When the level of water in the SSEB-I rises over approximately 2 feet deep, the water will flow into the SSEB-II for evaporation. The SSEB-II will be constructed with a prepared subgrade, a 60-mil HDPE liner, a 200-mil geonet cushion/drainage system, a second 60-mil HDPE liner, and a leak detection sump.

Sediment removed from the SSEB-I or SSEB-II is returned to the original SSE Area stockpile and will ultimately be dispositioned in accordance with the Closure Plan, Part B-18 of the December 20, 2007 Discharge Permit Renewal and Modification Application.

A-9. Discharge Locations. List the locations of your facility and of all components of your processing, treatment, storage and/or disposal system. Examples of components include septic tanks, lagoons, leachfields, irrigation sites, mine stockpiles, etc. Additional examples are listed in the Supplemental Instructions. Latitude and longitude are optional unless township, range and section are not available. .

Components	Township	Range	Section(s)	Latitude	Longitude
New Salt Storage Extension Basin (SSEB-II)	22S	31E	SE, NW, SE-20		

A-10. Discharge Quality.

Indicate the expected quality of the discharge -- wastewater, leachate, sludge, etc. -- generated, stored, treated, processed and/or discharged at your facility. List the contaminants of concern and the expected concentrations. *Not all facilities need to characterize influent quality.* See Supplemental Instructions for typical contaminants and additional guidance.

Expected or Known Contaminants	Expected or Known Contaminants Indicate units: mg/L, CFU/100 ml	
	Incoming (Influent)[1]	Final (Effluent)
Total Dissolved Solids (TDS)	250,000 mg/l	NA[2]
chlorides	223,00 mg/l	NA[2]
sulfate	11,000 mg/l	NA[2]

[1]Evaporation Ponds are a no discharge system
[2]High value from 2004 through 2006 Discharge Monitoring Reports

For new septic tank systems, you may either fill out the chart above or simply check one of the following options:

- ☐ typical domestic wastewater
- ☐ low-strength domestic wastewater (large gray water component; e.g., laundromat, spa, etc.)
- ☐ high-strength domestic wastewater (low water use; e.g., RV park, low-flow toilets at campground, etc.)

A-11. Ground Water Conditions.

All applicants must provide the depth to and pre-discharge TDS concentration of the ground water that could be affected by the discharge. Refer to Supplemental Instructions for details on how to obtain these values.

See the December 20, 2007 Discharge Permit Renewal and Modification Application

A-12. Public Notice. See Supplemental Instructions.

a) The public notice packet including instructions and materials should be sent to:

X Applicant ☐ Consultant ☐ Other: Dan Ferguson, P. O. Box 3090
Carlsbad, NM 88221-3090

b) Copies of the public notice packet (excluding sign) should be sent to:

X Applicant ☐ Consultant ☐ Other: Dan Ferguson, P. O. Box 3090
Carlsbad, NM 88221-3090

c) The applicant is required to provide public notice of this application by placing a display ad in a newspaper of general circulation near the location of the proposed discharge. Indicate newspaper you intend to place the ad in:

Newspaper: Carlsbad Current Argus

d) *For new or modification applications only:* The applicant must post a sign for 30 days in a conspicuous location at or near the facility, as approved by NMED. One sign must be posted for each 640 contiguous acres or less of the discharge site. An additional notice must be posted at an off-site location conspicuous to the public. Describe the locations below where you intend to post the notices. You may also attach sketches or photographs.

At or near facility: On the WIPP access road near the WIPP Site parking lot entrance
2 by 3 feet in size

Off-site location: Intersection of WIPP South Access Road and New Mexico Highway 128
flyer size Intersection of WIPP North Access Road and U.S. Highway 62/180

GROUND WATER DISCHARGE PERMIT APPLICATION
PART B: OPERATIONAL, MONITORING, CONTINGENCY AND CLOSURE PLANS
GENERAL FORM (VARIOUS FACILITY TYPES)

Operational Plan *[Section 20.6.2.3106.C, 3109.C NMAC]*

B-1. Source(s) of the Discharge. Describe what generates the wastewater, sludge or other discharges processed and/or disposed of at your facility. Identify all sources. Attach additional pages, if needed. See Supplemental Instructions.

See the December 20, 2007 Discharge Permit Renewal and Modification. The source of the discharge to the SSEB-II is precipitation that has been in contact with salt stored in the Salt Storage Extension.

B-2. Discharge Quantity. Describe the methods/calculations used to determine the maximum discharge volume listed in Item A-7 in Part A of your application. Attach additional pages, if needed. See Supplemental Instructions.

The discharge quantified in Part A, Section A-7 is a direct result of the quantity of precipitation received at the WIPP site. The SSEB-I was designed to contain and evaporate the average annual rainfall plus the 24 hour/25-25 year/24 hour storm event. Experience has indicated that one foot freeboard requirement can be exceeded in the SSEB-I by successive rainfall events over multiple days or weeks. The new pond provides approximately four acres of additional evaporative surface area at the design basis elevation of 3414 feet above sea level. The new pond in conjunction with the existing evaporation pond will provide the storage capacity for 1,317,000 cubic feet of water (approximately 3.5 times the 25-year/24 hour storm event). The new pond was sized based on a water balance evaluating three years of monthly average rainfall and estimating the evaporation rate of the saturated brines to be 70 percent of the evaporation rate of fresh water. One 25 year/24 hour rainfall event of 3.9 inches results in the accumulation of 368,000 cubic feet of water. Calculations are shown in the *Proposed Engineering Modifications and Schedule for Corrective Actions for Salt Contact Run-Off into the Salt Storage Extension* submitted May 28, 2009 and approved by the Ground Water Quality Bureau in a letter dated July 15, 2009.

B-3. Site Map. Attach a site map showing the components of your proposed system and relevant surrounding features, clearly labeled, such as:

- treatment units
- lagoons
- tanks
- sumps
- manure separators
- land application fields
- domestic wastewater reuse areas
- pits
- stockpiles
- leachfields
- sludge drying beds
- roads
- buildings
- supply wells
- monitoring wells
- extraction/injection wells
- arroyos
- nearby water bodies such as ponds or canals
- property boundaries
- other permitted discharges
- required setbacks
- north arrow

If map is not to scale, mark distances on the map.

X Site map is included in the *Proposed Engineering Modifications and Schedule for Corrective Actions for Salt Contact Run-Off into the Salt Storage Extension* submitted May 28, 2009. Attachment I is drawing 23-Z-014-W1, Salt Pile Infiltration Controls New SSE Evaporation Pond Site Plan. This drawing illustrates the Salt Storage Extension, SSEB-I and SSEB-II. See the December 20, 2007 Discharge Permit Renewal and Modification for other existing discharge facilities covered under the September 9, 2008 Discharge Permit DP-831 for the WIPP Site.

B-4. Flood Protection. Describe the methods used to prevent flooding and run-off at the facility (tank protection, berms, diversion channels, etc.)

The WIPP Site is within the Pecos River Basin. There are no perennial streams at the WIPP site. At its nearest point, the Pecos River is about 12 miles southwest of the WIPP site boundary. The maximum recorded flood on the Pecos River occurred on August 23, 1966 at an elevation of about 2,938 feet above mean sea level. The Surface elevation at WIPP is over 500 feet above the river bed and approximately 470 feet above the elevation of this maximum historical flood elevation. The potential for flash flooding is considered minimal because of the high percolation rate of the surrounding sand dunes and protection from flash floods by probable maximum precipitation events is provided by a system of peripheral interceptor berms and dikes.[1] The Salt Storage Area and Salt Storage Extension Area are within these peripheral berms.

1 Final No-Migration Variance Petition, June 14, 1996, DOE/CAO-96-2160

B-5. Plans and Specifications. For new facilities and for new components of existing systems, attach plans and specifications certified by a New Mexico registered professional engineer. *[Section 20.6.2.1202 NMAC]*

☐ Not applicable because no new facilities are proposed.

☐ Plans and specifications are attached.

X Plans and specifications were previously submitted. Submittal date(s): May 28, 2009

B-6. Description of Components. Provide descriptive details of all components of your processing, treatment, storage and/or disposal system. Include all components listed under Item A-8 in Part A.

Component	Construction Material	Volumetric Capacity/Area
Salt Storage Area Cell A and Cell B	60 mil HDPE 200-mil Geonet drainage layer 2-feet of native soil cover	Cell A: 6.2 acres Cell B: 5.2 acres Total:11.4 acres
Salt Storage Extension Basin (SSEB-I)	Double lined with 60-mil HDPE with a 200 mil geonet leak detection layer and sump	637,000 cubic feet
Salt Storage Extension Basin II (SSEB-II)	Double lined with 60-mil HDPE with a 200 mil geonet leak detection layer and sump	2,338,000 cubic feet

B-7. Operational Plan. Attach a detailed description of how you operate your processing, treatment, storage and/or disposal system.

Animal feeding operations: include stormwater management, nutrient management plans, method for mixing irrigation and wastewater.

Domestic wastewater treatment facilities: include pre-treatment, solids management, vegetation management for land application.

Facilities using reclaimed domestic wastewater above ground: include proposed water quality classification(s), effluent monitoring, setbacks, irrigation schedules, etc. that will result in protection of public health and the environment. Please refer to *NMED Ground Water Quality Bureau Guidance: Above-Ground Use of Reclaimed*

Domestic Wastewater for further information. A copy of the guidance document is available on the NMED website www.nmenv.state.nm.us under "Ground Water Quality".

X Operational plan is attached, see below.

☐ Operational plan was previously submitted. Submittal date(s): ____________________

The Salt Storage Extension consists of Cells A and B. Each cell was constructed with 6-inches of soil, a 60-mil HDPE liner, 200-mil geonet, and covered with two feet of screened native soil. Each Cell slopes two percent toward the center which contains a six inch perforated pipe for the collection of storm water which is diverted west by down gradient flow to the Salt Storage Extension Evaporation Basin. The Salt Storage Extension Evaporation Basin is constructed with a 60-mil HDPE liner, a 200-mil geonet, and a second HDPE liner. The geonet leak detection layer drains to a sump with an inclined riser for leak detection.

When water in the SSEB-I reaches an elevation of 3414 feet above sea level, it enters a pair of twelve inch diameter pipes which drains into the SSEB-II. The SSEB-II has a sloped bottom from 3409 feet above sea level on the east to 3404 feet above sea level on the west. See Attachment IV of the *Proposed Engineering Modifications and Schedule for Corrective Actions for Salt Contact Run-Off into the Salt Storage Extension* submitted on May 28, 2009 for design calculations, a description of drainage areas, evaporation surface areas, SSEB-II storage capacities at various elevations, and a water mass balance demonstrating that the pond is sized to store and evaporate the annual average precipitation of 12.8 inches plus a 25-year 24-hour rain event of 3.9 inches.

Inspections are conducted at least monthly for damage or erosion and appropriate repairs are made. It may be necessary to install a pipe connecting the SSE to the SSEB-II, bypassing the SSEB-I if sediment should build up in the pond excessively.

B-8. System Maintenance. Attach a description of the operations and maintenance procedures which ensure that your processing, treatment and disposal system functions properly; e.g., inspections, pumping schedules, equipment maintenance, etc.

X O & M procedures are attached, See Below.

☐ O & M procedures were previously submitted. Submittal date(s): ____________________

The Salt Storage Area and associated evaporation ponds are designed as gravity flow systems. Inspection and maintenance of the liners are the primary operational controls. The Salt Storage Area, SSEB-I and SSEB-II are inspected monthly and following rainstorms (two inches or greater during a 24 hour period) for signs of erosion, damage to the liners, signs of burrowing animals, deep rooted plants that could damage the anchor trenches or other items that may need remediation. In the event of an unsatisfactory condition, appropriate corrective actions are initiated.

The system is designed such that, when necessary, the pipe that conveys water to the SSEB-I can be connected directly to the pipe that drains the SSEB-I into the SSEB-II. This would facilitate evaporating liquids from the SSEB-I and the removal of accumulated sediment from the SSEB-I. Similarly, the pipes that drain the SSEB-I into the SSEB-II could be capped to facilitate drying and cleaning out the SSEB-II if necessary.

B-9. Backflow Prevention. If wastewater is used for land application or irrigation, describe methods used to protect wells from contamination by wastewater backflow. For new facilities or new systems at an existing facility, only air gap or reduced pressure valve assemblies are acceptable methods.

a) Clearly describe and/or sketch the location of air gaps or devices and attach specifications.

NA

b) Describe how devices are maintained.

NA

B-10. Water Rights. Animal feeding operations which land apply wastewater must attach documentation of irrigation water rights for the proposed land application fields, sufficient to sustain the intended crop rotation.

☐ Water right documentation is attached.

X Not applicable.

B-11. Past Ground Water Monitoring Results. *This item applies only to existing facilities seeking renewal and/or modification of a Discharge Permit that required ground water monitoring.*

a) Attach a graph or a table showing all analytical results from ground water sampling at your facility. If preparing graphs, a separate graph should be developed for each constituent, except that nitrate and TKN may be shown on the same graph. Multiple wells may be shown on the same graph. See Supplemental Instructions for sample table and graph.

b) If the monitoring results indicate that ground water standards have been violated or that there is an upward trend approaching standards, attach a description of what actions you have taken or will take to address the elevated concentrations. Ground water standards are listed in Section 20.6.2.3103 NMAC. See the Supplemental Instructions for frequently referenced standards.

See Section B-11 of the December 20, 2007 Discharge Permit Renewal and Modification for ground water monitoring results and a description of actions taken to address elevated concentrations of constituents outlined in 20.6.2.3103 NMAC.

Monitoring Plan *[Section 20.6.2.3107.A NMAC]*

B-12. Discharge Volumes. Describe how and where the monthly discharge volume at your facility will be. For all measuring devices, provide type, location, and units of measure including multipliers (e.g., gallons, gallons x 100, acre-ft, etc.) See Supplemental Instructions. Attach additional pages, if necessary.

Discharge volumes are a direct function of the precipitation events, the surface area of the Salt Storage Extension drainage area and surface area of SSEB-I and SSEB-II. See Attachment IV of the *Proposed Engineering Modifications and Schedule for Corrective Actions for Salt Contact Run-Off into the Salt Storage Extension* for the Evaporation Pond Design Calculations and Water Mass Balance for sizing the ponds.

B-13. Discharge Quality Monitoring. Discharge Permits typically require that the discharge (treated wastewater, sludge, septage, etc.) be sampled on a regular basis. The frequency of sampling varies by type of facility, as do the contaminants of concern. Domestic and agricultural Discharge Permits typically require sampling for total Kjeldahl nitrogen (TKN), nitrate-nitrogen (NO_3-N), total dissolved solids (TDS) and chloride on a quarterly or semi-annual basis. *(continued on next page)*

If reclaimed domestic wastewater will be discharged for above ground uses, testing of the discharge for additional parameters is appropriate. Please refer to the *NMED Ground Water Quality Bureau Guidance: Above-Ground Use of Reclaimed Domestic Wastewater* for further information.

In the space below, provide a description or sketch of the sampling point(s) to be used for sampling the discharge at your facility.

A grab sample of the homogenous saturated salt solution is collected from the SSEB-I or the SSEB-II depending on water levels and the safest most accessible location on one of the ponds using a sampling boom.

Optional: In the space below (or as an attachment), you may propose revisions or additions to the standard discharge quality monitoring requirements. If you do, provide the rationale for your proposal.

No additional discharge quality monitoring is proposed. The SSEB-I is sampled annually for TDS, chlorides and sulfates. The SSEB-II receives the same water that is discharged to the SSEB-I. One sample will be collected annually from either the SSEB-I or the SSEB-II and analyzed for TDS, chlorides and sulfates. The results will be presented in the semi-annual discharge monitoring report.

B-14. Ground Water Quality Monitoring. Discharge Permits typically require that ground water samples be collected quarterly from properly constructed monitoring wells located downgradient from discharge locations. The samples must be analyzed for contaminants of concern. For most domestic and agricultural Discharge Permits, the typical contaminants of concern are total Kjeldahl nitrogen (TKN), nitrate-nitrogen (NO_3-N), total dissolved solids (TDS) and chloride.

Optional: In the space below (or as an attachment), you may propose revisions or additions to the standard ground water monitoring requirements. If you do, provide the rationale for your proposal.

See the December 20, 2007 Discharge Permit Renewal and Modification.

For existing facilities:

Indicate number of existing monitoring wells: ________

Attach copies of monitoring well logs.

☐ Well logs attached. ☐ Well logs cannot be located.

☐ Well logs previously submitted. Submittal date(s): ________________

Attach copy of monitoring well survey (typically not applicable if fewer than 3 monitoring wells).

☐ Survey attached. ☐ No survey has been conducted.

☐ Survey previously submitted. Submittal date(s): ________________

B-15. Other Monitoring. In addition to discharge volumes, discharge quality monitoring and ground water sampling, Discharge Permits typically require the following monitoring, depending on the type of facility:

- inspection and pumping of septic tanks, grease tanks, lift stations
- inspection of leachfields
- inspection of lagoons
- process testing for treatment plants
- land application data sheets (LADS)
- tracking of chemical fertilizer applications to land application areas
- soil sampling (agricultural and selected other facilities land applying wastewater)
- harvested plant material testing (agricultural facilities)

Optional: In the space below (or as an attachment), you may propose revisions or additions to the other standard monitoring requirements for your type of facility. If you do, provide the rationale for your proposal.

See the December 20, 2007 Discharge Permit Renewal and Modification.

Contingency Plan *[Section 20.6.2.3107.A.10 NMAC]*

B-16. System Failure. Describe your contingency plan in the event there is a failure of your wastewater or discharge system (e.g., wastewater back-up, pump failure, pipe breaks, tank overflow, leachfield failure, saturated fields etc.)

See the December 20, 2007 Discharge Permit Renewal and Modification.

B-17. Contingency Leachfield Location. *This item applies only if your disposal system includes a leachfield.* Identify a location on your site map (Item B-3) for a contingency leachfield in the event that your leachfield must be replaced. If no land is available for a contingency leachfield at an existing facility, describe how you will address a failed leachfield. New facilities must provide for a contingency leachfield location.

NA

B-18. Other Contingencies. Discharge Permits typically contain standard contingencies to address:

- exceeding wastewater quality limits
- violation of ground water or surface water standards
- spills or illegal releases of wastewater
- migration of soil nitrogen
- loading nitrogen above limit

Propose additional contingency plans, if appropriate:

See the December 20, 2007 Discharge Permit Renewal and Modification.

__Closure Plan__ [Section 20.6.2.3107(A)11 NMAC]

B-18. Facility Closure and Post-Closure Monitoring. Discharge Permits contain standard requirements to address the closure of part or all of your discharge system, as follows:

- cap or plug lines to prevent the flow of wastewater to treatment or disposal system
- empty and remove or backfill tanks
- empty lagoons, perforate or remove liners, re-grade to surface topography
- appropriately dispose of solids
- regrade and cover stockpiles at mine facilities
- continue ground water monitoring for at least two years, longer as appropriate
- enact contingency plans if ground water standards are violated
- financial assurance may be required.

Propose additional closure plans in the space below or as an attachment, if appropriate:

See the December 20, 2007 Discharge Permit Renewal and Modification. Closure of the SSEB-II will be consistent with the other evaporation ponds covered by DP-831. The plan includes the pumping or evaporation of the wastewater in the ponds, removal of solids, and recontouring and revegetation of the site. In addition, basin liners will be removed or perforated upon closure of the site. This will be performed to comply with Section 20.6.2.3107.A.11 NMAC.

New Mexico Environment Department
Ground Water Quality Bureau

Memorandum of Meeting or Phone Conversation

☑ Telephone ☐ Meeting	**Time:** 4:45 PM	**Date:** 9/16/14

Individuals Involved

Stewart Jones, WIPP	Called	John Hall, GWQB--PPS
	☐ returned call to	
	☐ teleconference	
	☐ other:	

Subject: Exceedance of Freeboard in Impoundment Due to Rainfall Event

Discussion:

Stewart Jones left a message saying that one impoundment exceeded its one foot freeboard limit and that they will be transferring wastewater to an adjacent impoundment that has enough excess volume to receive it.

John Hall called and left Stewart Jones a message saying that if they have problems restoring the freeboard within 72 hours, they will need to submit a short term corrective action plan and that he should call me if necessary.

Conclusions:

No further actions.

Distribution:

File

Initialed

New Mexico Environment Department
Ground Water Quality Bureau

Acknowledgement of Receipt

reviewer's initials ua

I, Diana Sandoval hereby acknowledge receipt of
Check No. #043198, dated 8/21/14
received in the amount of $ 12,650.00/; or
cash received in the amount of $ ______
from Nuclear Waste Partnership, LLC
Facility Name: Waste Isolation Pilot Plant
DP #: 831 AI ID: 318
Activity ID Number: PRD ______

GWQB – Date of Receipt

GROUND WATER
AUG 26 2014
BUREAU

Administrative Fees

☐ $100.00 application filing fee

Permit Fees

☐ new facility
☐ renewal or renewal/modification
☐ modification fee = $______

Other Fees

☐ $15.00 per poster:
poster(s)______ x $15.00 = $______
☐ $150.00 temporary permission
☐ Other: $______
Explain: ______

Copy of Check (below):

Check Date: Aug/21/2014 Vendor Number: 0000002475 Check No. 043198

NUCLEAR WASTE PARTNERSHIP, LLC
P.O. Box 2078
Carlsbad, NM 88221

CARLSBAD NATIONAL BANK
PO Box 1359
Carlsbad, NM 88220

043198

Date Aug/21/2014 Pay Amount 12,650.00***

Pay ***TWELVE THOUSAND SIX HUNDRED FIFTY AND XX / 100 DOLLAR****

To The Order Of
NEW MEXICO ENVIRONMENT DEPT.
PO BOX 5469
SANTA FE, NM 87502-5469

Authorized Signature

DP-831

⑈043198⑈ ⑆112201797⑆ 65676⑈

GROUND WATER

AUG 26 2014

BUREAU

NWP
Nuclear Waste Partnership LLC

A URS-led partnership with B&W and AREVA

RES:14:531
UFC:5486.00

August 25, 2014

Ms. Jennifer Pruitt
New Mexico Environment Department
Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: TRANSMITTAL OF THE WASTE ISOLATION PILOT PLANT GROUND WATER DISCHARGE PERMIT 831 FEE

Dear Ms. Pruitt:

The purpose of this letter is to transmit check number 43198 for the amount of $12,650.00. This is for invoice identification number 123475 dated July 31, 2014, for the Ground Water Quality Bureau (GWQB) Discharge Permit 831.

This check is being submitted on behalf of the U.S. Department of Energy, Waste Isolation Pilot Plant, and is due to the GWQB by August 30, 2014. In addition to the check, a copy of the invoice is enclosed.

If you have any questions regarding this transmittal, please contact Mr. Bill Jaco at (575) 234-8177.

Sincerely,

R. R. Chavez, Manager
Regulatory Environmental Services

WHJ:vrm

Enclosures (2)

cc: (with enclosure)
G. T. Basabilvazo, CBFO
S. McCauslin, CBFO
A. Stone, CBFO
M&RC, CBFO

COPY

State of New Mexico Environment Department
Ground Water Quality Bureau
1190 St. Francis Drive
Santa Fe, NM 87505

Telephone:(505) 827-2905 Fax: (505) 827-2965

INVOICE

Primary Billing Party:	Agency Interest:
Jose Franco	318 - Waste Isolation Pilot Plant
US DOE, Carlsbad Field Office, PO Box 3090	32 Miles E of Carlsbad on the Jal Highway
Carlsbad, NM 88220	33 miles E/SE of Carlsbad
DP-831	Carlsbad, NM 88220

INVOICE ID: 123475

INVOICE DATE: 07/31/2014
INVOICE DUE DATE: 08/30/2014

ASSESSMENTS
Ground Water, PRD20130001, 341 - Discharge Fee $12,650.00

INVOICED AMOUNT $12,650.00

BALANCE DUE $12,650.00

Cut Here and Include Lower Portion with Payment

Primary Billing Party:	Agency Interest:
Jose Franco	318 - Waste Isolation Pilot Plant
US DOE, Carlsbad Field Office, PO Box 3090	32 Miles E of Carlsbad on the Jal Highway
Carlsbad, NM 88220	33 miles E/SE of Carlsbad
DP-831	Carlsbad, NM 88220

INVOICE ID: 123475
Invoice Amount: $12,650.00

INVOICE DUE DATE: 08/30/2014
Amount Enclosed $12,650.00

Please make checks payable to:
Mail payments to:
NMED Federal Tax ID#: 85-6000565

New Mexico Environment Department
Ground Water Quality Bureau
PO Box 5469
Santa Fe, NM 87502-5469
Telephone: (505) 827-2905 Fax: (505) 827-2965

State of New Mexico Environment Department

Ground Water Quality Bureau

1190 St. Francis Drive

Santa Fe, NM 87505

Telephone: (505) 827-2905 Fax: (505) 827-2965

INVOICE

Primary Billing Party:
Jose Franco
US DOE, Carlsbad Field Office, PO Box 3090
Carlsbad, NM 88220
DP-831

Agency Interest:
318 - Waste Isolation Pilot Plant
32 Miles E of Carlsbad on the Jal Highway
33 miles E/SE of Carlsbad
Carlsbad, NM 88220

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US DOE, Carlsbad Field Office, PO Box 3090
Carlsbad, NM 88220
DP-831

Agency Interest:
318 - Waste Isolation Pilot Plant
32 Miles E of Carlsbad on the Jal Highway
33 miles E/SE of Carlsbad
Carlsbad, NM 88220

INVOICE ID: 123475

Invoice Amount: $12,650.00

INVOICE DUE DATE: 08/30/2014

Amount Enclosed____________________

Please make checks payable to: **New Mexico Environment Department**
Mail payments to: **Ground Water Quality Bureau**
PO Box 5469
Santa Fe, NM 87502-5469
NMED Federal Tax ID#: 85-6000565

Telephone: **(505) 827-2905** **Fax:** **(505) 827-2965**

NEW MEXICO
ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 St. Francis Drive
P.O. Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

RYAN FLYNN
Secretary

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7008 1830 0003 4178 6206

Jose Franco, Mana
US Department of
PO Box 3090
Carlsbad, NM 882

PS Form 3800, August 2006

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

July 29, 2014

Jose Franco, Manager
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221

RE: Discharge Permit Renewal, DP-831, Waste Isolation Pilot Plant (WIPP)

Dear Mr. Franco:

The New Mexico Environment Department (NMED) issues the enclosed Discharge Permit Renewal, DP-831, to the Department of Energy (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

The Discharge Permit contains terms and conditions that shall be complied with by the permittee and are enforceable by NMED pursuant to Section 20.6.2.3104 NMAC, WQA, NMSA 1978 §74-6-5 and §74-6-10. Please be aware that this Discharge Permit may contain conditions that require the permittee to implement operational, monitoring or closure actions by a specified deadline. Such conditions are listed at the beginning of the operational, monitoring and closure plans of this Discharge Permit.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

Pursuant to Paragraph (4) of Subsection H of 20.6.2.3109 NMAC, the term of the Discharge Permit shall be five years from the effective date. The term of this Discharge Permit will end on July 29, 2019.

NMED requests that the permittee submit an application for renewal (or renewal and modification) at least 180 days prior to the date the Discharge Permit term ends.

An invoice for the Discharge Permit Fee of $12,650.00 is being sent under separate cover. Payment of the Discharge Permit Fee must be received by NMED within 30 days of the date the Discharge Permit is issued.

If you have any questions, please contact John Hall at (505) 827-1049. Thank you for your cooperation during this Discharge Permit review.

Sincerely,

Jerry Schoeppner, Chief
Ground Water Quality Bureau

JS:JH

Encs: Discharge Permit Renewal, DP-831
Ground Water Discharge Permit Conditions for Synthetically Lined Lagoons – Liner Material and Site Preparation, Revision 0.0, May 2007
Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions, Revision 1.1, March 2011

cc: Michael Kesler, District Manager, NMED District III (electronic copy)
NMED Carlsbad Field Office (electronic copy).
John Romero, Office of the State Engineer (electronic copy)
George Basabilvazo, Director of HSE, U.S. Department of Energy, P.O. Box 3090, Carlsbad, NM 88221 (permit/enclosures)

GROUND WATER DISCHARGE PERMIT RENEWAL
Waste Isolation Pilot Plant (WIPP), DP-831

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Discharge Permit Renewal (Discharge Permit), DP-831, to the U.S. Department of Energy (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the Waste Isolation Pilot Plant (WIPP) (facility) into ground and surface water, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses and protect public health. In issuing this Discharge Permit, NMED has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been or will be met. Pursuant to Section 20.6.2.3104 NMAC, it is the responsibility of the permittee to comply with the terms and conditions of this Discharge Permit; failure may result in an enforcement action(s) by NMED (20.6.2.1220 NMAC).

The activities which produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics of the discharge are briefly described as follows:

Up to 23,000 gallons per day (gpd) of domestic wastewater is discharged to a synthetically lined impoundment system for disposal by evaporation. The system consists of seven synthetically-lined facultative sewage lagoons (Facultative Lagoon System) that include Settling Lagoons 1 and 2, Polishing Lagoons 1 and 2, and Effluent Lagoons A, B, and C. Industrial wastewater from two compressed air systems at the facility is also discharged to the Facultative Lagoon System. Brine, purge waters, and miscellaneous industrial non-hazardous wastewater are discharged to the Effluent Lagoons B and C of the Facultative Lagoon System. In addition, brine, purge waters, and miscellaneous industrial non-hazardous wastewater are discharged to a separate synthetically-lined impoundment for disposal by evaporation (Evaporation Pond H-19).

Salt and other subsurface materials mined during construction of the facility, as well as currently mined salt, are stored on the surface in three stockpiles. The stockpiles that are being used to store salt currently, or in the future, as it is mined out from the underground panels at the facility are Salt Cells 2 and 3. Up to 2,547,202 gpd of storm water runoff in contact with these salt stockpiles (based on a 24-hour, 25-year storm event - 3.9 inches) is collected in two double synthetically-lined storm water impoundments, each with a leak detection system (Salt Storage Ponds 2 and 3). The third salt stockpile (Salt Cell 1) is capped with a synthetic liner and earthen cover. Up to 1,677,633 gpd of storm water runoff in contact with this stockpile is collected in synthetically-lined diversion ditches and is diverted to a synthetically-lined impoundment (Salt Storage Pond 1).

Additional storm water runoff from the facility's paved areas and roofs is collected in three synthetically-lined impoundments (Storm Water Ponds 1, 2, and 3). This runoff is not in contact with the salt stockpiles at the facility.

The Site and Preliminary and Design Validation (SPDV) material pile was constructed as the shafts were excavated when construction first began at the WIPP site. The SPDV material pile was closed in the year 2000 with a cover consisting of a geosynthetic liner installed on 6 inches of bedding material and covered with a minimum of three feet of earthen material.

The discharge contains water contaminants which may be elevated above the standards of Section 20.6.2.3103 NMAC and/or the presence of toxic pollutants as defined in Subsection WW of 20.6.2.7 NMAC. The facility is located off of the Jal Highway, approximately 26 miles southeast of Carlsbad, in Sections 20, 28, and 29, Township 22 South, Range 31 East, Eddy County. Ground water most likely to be affected is at a depth of approximately 164 feet and has a total dissolved solids concentration of approximately 3,400 milligrams per liter.

The Discharge Permit sets forth separate requirements for the Facultative Lagoon System, the storage of storm water runoff in contact with salt stockpiles, and storm water runoff from the facility's paved and impermeable areas.

- Part A. Applicable to All Parts
- Part B. Applicable to the Facultative Lagoon System
- Part C. Applicable to the Evaporation Pond H-19 and Storm Water Impoundments Not in Contact with Salt Stockpiles (Storm Water Ponds 1, 2, and 3)
- Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2, and 3)

The original Discharge Permit was issued on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998, amended on January 24, 2000, renewed on April 29, 2003, modified on December 22, 2003, modified again on December 29, 2006, and renewed and modified on July 23, 2008. The application (i.e., discharge plan) consists of the materials submitted by the permittee dated May 10, 2013 and materials contained in the administrative record prior to issuance of this Discharge Permit. The discharge shall be managed in accordance with all conditions and requirements of this Discharge Permit.

Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to require a Discharge Permit Modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under this Discharge Permit are not protective of ground water quality, and that more stringent requirements to protect ground water quality may be required by NMED. The permittee may be required to implement abatement of water pollution and remediate ground water quality.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

The following acronyms and abbreviations may be used in this Discharge Permit:

Abbreviation	Explanation
CFR	Code of Federal Regulations
Cl	Chloride
EPA	United States Environmental Protection Agency
gpd	gallons per day
mg/L	milligrams per liter
mL	Milliliters
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NMSA	New Mexico Statutes Annotated
NO_3-N	nitrate-nitrogen
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
total nitrogen	= TKN + NO_3-N
SO_4	Sulfate
UPC	Uniform Plumbing Code
WQA	New Mexico Water Quality Act
WQCC	Water Quality Control Commission
WWTF	Wastewater Treatment Facility

II. FINDINGS

In issuing this Discharge Permit, NMED finds:

1. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move directly or indirectly into ground water within the meaning of Section 20.6.2.3104 NMAC.

2. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move into ground water of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of TDS within the meaning of Subsection A of 20.6.2.3101 NMAC.

3. The discharge from the facility is not subject to any of the exemptions of Section 20.6.2.3105 NMAC.

III. AUTHORIZATION TO DISCHARGE

Pursuant to 20.6.2.3104 NMAC, it is the responsibility of the permittee to ensure that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein.

The permittee is authorized to discharge up to 23,000 gpd of domestic wastewater to a synthetically-lined facultative impoundment system for disposal by evaporation. The permittee is also authorized to discharge up to 4,224,835 gpd of runoff in contact with salt stockpiles to three synthetically-lined impoundments for disposal by evaporation. The Facultative Lagoon System is permitted to accept non-hazardous industrial wastewater from two compressed air systems at the facility. Up to 50,000 gpd of brine, purge waters, and miscellaneous non-hazardous process waters are permitted to be discharged into Evaporation Ponds B and C of the Facultative Lagoon System, up to the capacity of the ponds with one foot of freeboard. Up to 50,000 gpd of brine, purge waters, and miscellaneous non-hazardous process waters are permitted to be discharged into to the Evaporation Pond H-19, up to the capacity of the pond with one foot of freeboard. The permittee is also authorized to collect storm water runoff from the facility's paved areas and

roofs in Storm Water Ponds 1, 2, and 3. This runoff is not in contact with the salt stockpiles at the facility.

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

IV. CONDITIONS

NMED issues this Discharge Permit for the discharge of water contaminants subject to the following conditions:

OPERATIONAL PLAN

Part A. Applicable to All Parts

#	Terms and Conditions
1.	The permittee shall implement the following operational plan to ensure compliance with Title 20, Chapter 6, Parts 1 and 2 NMAC. [Subsection C of 20.6.2.3109 NMAC]
2.	The permittee shall operate in a manner such that standards and requirements of Sections 20.6.2.3101 and 20.6.2.3103 NMAC are not violated. [20.6.2.3101 NMAC, 20.6.2.3103 NMAC, Subsection C of 20.6.2.3109 NMAC]
3.	The permittee shall maintain the impoundment liner(s) in such a manner as to avoid conditions which could affect the structural integrity of the impoundment(s) and/or impoundment liner(s). Such conditions include or may be characterized by the following: • erosion damage; • animal burrows or other damage; • the presence of vegetation including aquatic plants, weeds, woody shrubs or trees growing within five feet of the top inside edge of a sub-grade impoundment, within five feet of the toe of the outside berm of an above-grade impoundment, or within the impoundment itself; • the presence of large debris or large quantities of debris in the impoundment; • evidence of seepage; and • evidence of berm subsidence. Vegetation growing around the impoundment shall be routinely controlled by mechanical removal in a manner that is protective of the impoundment liner. The permittee shall visually inspect the impoundment(s) and surrounding berms on a monthly basis to ensure proper maintenance. In the event that inspection reveals any evidence of damage that threatens the structural integrity of an impoundment berm or liner, or that may result in an unauthorized discharge, the permittee shall enact the

#	Terms and Conditions
	contingency plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
4.	The permittee shall preserve a minimum of one foot of freeboard between the liquid level in the all impoundments and the elevation of the top of the impoundment liners. In the event that the permittee determines that one foot of freeboard cannot be preserved in any impoundment, the permittee shall enact the contingency plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

Part B. Applicable to the Facultative Lagoon System

#	Terms and Conditions
5.	The permittee shall maintain fences around the Facultative Lagoon System to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. Fences shall be maintained throughout the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
6.	The permittee shall maintain signs indicating that the wastewater at the facility is not potable. Signs shall be posted at the Facultative Lagoon System's entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish remain visible and legible for the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
7.	The permittee shall utilize operators, certified by the State of New Mexico at the appropriate level, to operate the wastewater collection, treatment and disposal systems. The operations and maintenance of all or any part of the wastewater system shall be performed by, or under the direct supervision of, a certified operator. [Subsection C of 20.6.2.3109 NMAC, 20.7.4 NMAC]
8.	The permittee shall measure the thickness of the sludge blanket in each pond of the Facultative Lagoon System ***once within the effective term*** of this Discharge Permit, but before the end of 2018. When sludge accumulation exceeds 1/3 of the total depth of any pond, the permittee shall remove the sludge in a manner, which is protective of the pond liner. Removed solids shall be contained, transported, and disposed of in accordance with all local, state, and federal regulations. The permittee shall maintain solids blanket measurements and solids disposal manifests for solids transported from the facility for

#	**Terms and Conditions**
	off-site disposal. The permittee shall submit all measurements and manifests to NMED in the semi-annual monitoring report immediately following the solids thickness measurement. [20.6.2.3109 NMAC, 20.6.2.3107 NMAC]

Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2 and 3)

#	**Terms and Conditions**
9.	The permittee shall measure the thickness of the solids blanket in each impoundment ***once within the effective term*** of this Discharge Permit, but before the end of 2018. Removed solids shall be contained, transported, and disposed of in accordance with all local, state, and federal regulations. The permittee shall maintain solids blanket measurements and solids disposal manifests for solids transported from the facility for off-site disposal. The permittee shall submit all measurements and manifests to NMED in the semi-annual monitoring report immediately following the solids thickness measurement. [20.6.2.3109 NMAC, 20.6.2.3107 NMAC]
10.	The permittee shall inspect the leak detection systems for Salt Storage Ponds 2 and 3 on a monthly basis for the presence of liquid. The permittee shall keep a log of the inspection findings and repairs made. The inspection log, including a statement whether or not liquids were observed in the leak detection systems, shall be submitted to NMED in the semi-annual monitoring reports. [20.6.2.3107 NMAC]
11.	The permittee shall conduct regular maintenance of the earthen cover on the Salt Cell 1 and the SPDV material pile. Inspections shall be conducted monthly and after storm events of 2 inches or greater in a 24-hour period to evaluate potential erosion and vegetation success of the cover. In the event of significant erosion or failure of vegetative success, the permittee shall provide a plan and schedule for repair within 90 days of discovery. General observations and cover repairs shall be reported to NMED. [20.6.2.3109 NMAC]

MONITORING AND REPORTING

Part A. Applicable to All Parts

#	**Terms and Conditions**
12.	The permittee shall conduct the following monitoring, reporting, and other requirements listed below in accordance with the monitoring requirements of this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
13.	METHODOLOGY – Unless otherwise approved in writing by NMED, the permittee shall conduct sampling and analysis in accordance with the most recent edition of the following documents: a) American Public Health Association, Standard Methods for the Examination of Water and Wastewater (18th, 19th or current) b) U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Waste c) U.S. Geological Survey, Techniques for Water Resources Investigations of the U.S. Geological Survey d) American Society for Testing and Materials, Annual Book of ASTM Standards, Part 31. Water e) U.S. Geological Survey, et al., National Handbook of Recommended Methods for Water Data Acquisition f) Federal Register, latest methods published for monitoring pursuant to Resource Conservation and Recovery Act regulations g) Methods of Soil Analysis: Part 1. Physical and Mineralogical Methods; Part 2. Microbiological and Biochemical Properties; Part 3. Chemical Methods, American Society of Agronomy h) New Mexico Environment Department, Hazardous Waste Bureau Position Paper, *Use of Low-Flow and Other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring.* [Subsection B of 20.6.2.3107 NMAC]
14.	The permittee shall submit semi-annual monitoring reports to NMED for the most recently completed semi-annual period by the 1st of February and August each year. Semi-annual monitoring shall be performed during the following periods and submitted as follows: • January 1st through June 30th (first half) – **due by August 1st** • July 1st through December 31st (second half) – **due by February 1st** [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Sewage Lagoon System

#	Terms and Conditions
15.	The volume of domestic influent discharged to the Facultative Lagoon System shall be measured ***monthly*** using a totalizing flow meter on the influent line to the system or the totalizing meter that measures total domestic water usage. Volumes of other authorized discharges to the Facultative Lagoon System shall be calculated by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. Monthly meter readings, the units of measurement, monthly discharge volumes and other volumetric calculations for the previous 6-month period shall be submitted to NMED semi-annually in the monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
16.	The permittee shall collect a wastewater sample on a ***semi-annual*** basis (once every six months) from the influent to the Facultative Lagoon System. The grab sample shall be analyzed for TKN, NO_3-N, SO_4, TDS and Cl. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]

Part C. Applicable to the Evaporation Pond H-19 and Storm Water Impoundments Not in Contact with Salt Stockpiles (Storm Water Ponds 1, 2, and 3)

#	Terms and Conditions
17.	The volume and origin of all wastewater discharged to the Evaporation Pond H-19 that is derived from miscellaneous non-hazardous sources shall be measured ***monthly*** and reported to NMED. Discharge volumes to the Evaporation Pond H-19 shall be calculated by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. Monthly discharge volumes and other volumetric calculations for the previous 6-month period shall be submitted to NMED semi-annually in the monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
18.	A sample shall be collected ***semi-annually*** from the Evaporation Pond H-19 and analyzed for SO_4, Cl, and TDS. Samples shall be collected ***annually*** after a significant storm event from each of the storm water ponds, Storm Water Ponds 1, 2, and 3 and analyzed for SO_4, Cl, and TDS. Samples shall be properly prepared, preserved, transported and

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	analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
19.	The water depth shall be measured ***monthly*** to the nearest tenth of a foot (0.1 ft) in the Storm Water Ponds 1, 2, and 3. The approximate volume of storm water shall be calculated and submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]

Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2 and 3)

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20.	A sample shall be collected ***annually*** after a significant storm event from each of the Salt Storage Cells 1, 2, and 3 and analyzed for SO_4, Cl, and TDS. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
21.	The water depth shall be measured monthly to the nearest tenth of a foot (0.1 ft) in the Salt Storage Ponds 1, 2, and 3. The approximate volume of storm water shall be calculated and submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]

GROUND WATER MONTIROING AND REPORTS

#	Terms and Conditions
22.	Depth to the water table shall be measured to the nearest hundredth of a foot (0.01 ft) ***quarterly*** in piezometers/monitoring wells: • PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-6, PZ-7, PZ-8, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13,

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	PZ-14, and PZ-15 • C-2505, C-2506, C-2507, C-2811, and WQSP-6A [Subsection A of 20.6.2.3107 NMAC]
23.	The permittee shall perform ***semi-annual*** ground water sampling in the following piezometers/monitoring wells and analyze the samples for temperature, pH, specific conductance, SO_4, TDS, and Cl: • Piezometers: PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, and PZ-13 • Monitoring Wells: C-2507, C-2811, and WQSP-6A Ground water sample collection, preservation, transport and analysis shall be performed according to the following procedure: a) Measure the depth-to-most-shallow ground water from the top of the well casing to the nearest hundredth of a foot. b) Purge three well volumes of water from the well prior to sample collection. c) Obtain samples from the well for analysis. d) Properly prepare, preserve and transport samples. e) Analyze samples in accordance with the methods authorized in this Discharge Permit. Depth-to-most-shallow ground water measurements, analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
24.	The permittee shall perform ***semi-annual*** ground water sampling from monitoring well WQSP-6A and analyzed for TKN and NO_3. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
25.	Hydrographs shall be submitted ***annually*** for all monitoring wells and piezometers covered under Condition 22 of this Discharge Permit. At a minimum, graphs shall include the previous five years of water level data, or for recently installed wells, all data since the well was installed. Data for several wells may be included on one graph.

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	[Subsection A of 20.6.2.3107 NMAC]
26.	A potentiometric map for facility area shall be submitted ***annually***. The map shall incorporate the most recent water level data for all monitoring wells and piezometers installed in the shallow subsurface water (SSW). [Subsection A of 20.6.2.3107 NMAC]
27.	A single table in a paper and electronic format (EXCEL spreadsheet) of water level measurements and water quality data with only those constituents analyzed and water levels measured during a single event shown in columns. Tabulated field measurements to include temperature, pH, and electrical conductivity corrected to 25 degrees Celsius. Monitoring sites shall be shown in rows. The second column shall contain the date of the sampling event. Values exceeding standards shall be bolded. Any constituent not analyzed for a particular site shall be shown as "NA", any site not sampled shall be shown as "NS" with an associated reason, and any site not measured for water levels shall be shown as "NM" with an associated reason. [Subsection A of 20.6.2.3107 NMAC]
28.	A single table that includes all available ground water data to date shall be submitted annually. For each monitoring well, the name of the well shall be entered in the far left column in a row by itself. Sampling events, beginning with the earliest event first, shall be entered in subsequent rows with the sampling date in the second column and the corresponding analytical data in columns further to the right. Each new sampling event shall be added as an additional row to the existing spreadsheet with the corresponding date of the sampling event noted in the second column next to the monitoring well name. [Subsection A of 20.6.2.3107 NMAC]

CONTINGENCY PLAN

#	Terms and Conditions
29.	In the event that ground water monitoring indicates that a ground water quality standard identified in Section 20.6.2.3103 NMAC is exceeded; the total nitrogen concentration in ground water is greater than 10 mg/L; or a toxic pollutant (defined in Subsection WW of 20.6.2.7 NMAC) is present in a ground water sample and in any subsequent ground water sample collected from a monitoring well required by this Discharge Permit, the permittee shall enact the following contingency plan: Within 60 days of the subsequent sample analysis date, the permittee shall propose measures to ensure that the exceedance of the standard or the presence of a toxic pollutant will be mitigated by submitting a corrective action plan to NMED for approval.

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	The corrective action plan shall include a description of the proposed actions to control the source and an associated completion schedule. The plan shall be enacted as approved by NMED. Once invoked (whether during the term of this Discharge Permit; or after the term of this Discharge Permit and prior to the completion of the Discharge Permit closure plan requirements), this condition shall apply until the permittee has fulfilled the requirements of this condition and ground water monitoring confirms for a minimum of two years of consecutive ground water sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded and toxic pollutants are not present in ground water. The permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC, should the corrective action plan not result in compliance with the standards and requirements set forth in Section 20.6.2.4103 NMAC within 180 days of confirmed ground water contamination. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]
30.	In the event that inspection findings reveal significant damage likely to affect the structural integrity of the lined impoundment(s) or its ability to contain contaminants, the permittee shall propose the repair or replacement of the impoundment liner(s) by submitting a corrective action plan to NMED for approval. The plan shall be submitted to NMED within 30 days after discovery by the permittee or following notification from NMED that significant liner damage is evident. The corrective action plan shall include a schedule for completion of corrective actions and the permittee shall initiate implementation of the plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
31.	In the event that a minimum of one foot of freeboard cannot be preserved in the impoundment(s), the permittee shall take actions authorized by this Discharge Permit and all applicable local, state, and federal regulations to restore the required freeboard. In the event that one foot of freeboard cannot be restored within a period of 72 hours following discovery, the permittee shall propose actions to be immediately implemented to restore one foot of freeboard by submitting a short-term corrective action plan to NMED for approval. Examples of short-term corrective actions include: removing excess wastewater from the impoundment through pumping and hauling; or reducing the volume of liquid/wastewater discharged to the impoundment. The plan shall include a schedule for completion of corrective actions and shall be submitted within 15 days following the date when the one foot of freeboard limit was initially discovered. The permittee shall initiate implementation of the plan following approval by NMED. In the event that the short-term corrective actions failed to restore one foot of freeboard,

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	the permittee shall propose permanent corrective actions in a long-term corrective action plan submitted to NMED within 90 days following failure of the short-term corrective action plan. Examples include: the installation of an additional storage impoundment, or a significant/permanent reduction in the volume of liquid/wastewater discharged to the impoundment. The plan shall include a schedule for completion of corrective actions and implementation of the plan shall be initiated following approval by NMED. [Subsection A of 20.6.2.3107 NMAC]
32.	In the event that a release (commonly known as a "spill") occurs that is not authorized under this Discharge Permit, the permittee shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in Section 20.6.2.1203 NMAC and summarized below. Within <u>24 hours</u> following discovery of the unauthorized discharge, the permittee shall verbally notify NMED and provide the following information: a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility. b) The name and address of the facility. c) The date, time, location, and duration of the unauthorized discharge. d) The source and cause of unauthorized discharge. e) A description of the unauthorized discharge, including its estimated chemical composition. f) The estimated volume of the unauthorized discharge. g) Any actions taken to mitigate immediate damage from the unauthorized discharge. Within <u>one week</u> following discovery of the unauthorized discharge, the permittee shall submit written notification to NMED with the information listed above and any pertinent updates. Within <u>15 days</u> following discovery of the unauthorized discharge, the permittee shall submit a corrective action report/plan to NMED describing any corrective actions taken and/or to be taken relative to the unauthorized discharge that includes the following: a) A description of proposed actions to mitigate damage from the unauthorized discharge. b) A description of proposed actions to prevent future unauthorized discharges of this nature. c) A schedule for completion of proposed actions. In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of Section 20.6.2.4103 NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to Paragraph (1) of Subsection A of 20.6.2.1203 NMAC, the permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000

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	through 20.6.2.4115 NMAC. Nothing in this condition shall be construed as relieving the permittee of the obligation to comply with all requirements of Section 20.6.2.1203 NMAC. [20.6.2.1203 NMAC]
33.	In the event that NMED or the permittee identifies any failures of the discharge plan or this Discharge Permit not specifically noted herein, NMED may require the permittee to submit a corrective action plan and a schedule for completion of corrective actions to address the failure(s). Additionally, NMED may require a Discharge Permit modification to achieve compliance with 20.6.2 NMAC. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]
34.	In the event of a pipeline break, pump failure, pond overflow or other system failure at the facility, discharged water shall be contained, pumped and transferred to area of the facility that impose minimal impacts to ground water quality. Failed components shall be repaired or replaced as soon as possible and no later than 72 hours from the time of failure. For good cause demonstrated, the permittee may request NMED approval of an extension of the schedule for the repair or replacement of a failed component. [20.6.2.3107A NMAC]

CLOSURE PLAN

Part A. Applicable to All Parts

#	Terms and Conditions
35.	The permittee shall close the facilities covered under this Discharge Permit in accordance with the closure plan in the March 4, 2005 discharge permit application, the closure plan in the WIPP Hazardous Waste Facility Permit (HWFP) dated November 1, 2012, and the WIPP Land Management Plan. [Subsection A of 20.6.2.3107 NMAC]
36.	The permittee shall continue ground water monitoring until the requirements of this condition have been met and ground water monitoring confirms for a minimum of two years of consecutive ground water sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded and toxic pollutants are not present in ground water. If monitoring results show that a ground water quality standard in Section 20.6.2.3103 NMAC is exceeded; the total nitrogen concentration in ground water is greater than 10

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	mg/L; or a toxic pollutant (defined in Subsection WW of 20.6.2.7 NMAC) is present in ground water, the permittee shall implement the contingency plan required by this Discharge Permit. Following notification from NMED that post-closure monitoring may cease, the permittee shall plug and abandon the monitoring well(s) in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Sewage Lagoon System

#	Terms and Conditions
37.	In the event the Facultative Lagoon System is proposed to be permanently closed, upon ceasing discharging, the permittee shall perform the following closure measures: Within <u>60 days</u> of ceasing discharging to the Facultative Lagoon System impoundments(s), the line leading to the impoundment shall be plugged so that a discharge can no longer occur. Within <u>60 days</u> of ceasing discharging to the Facultative Lagoon System (impoundments), wastewater shall be drained or evaporated from the impoundment and any other wastewater system components and it shall be disposed of in accordance with all local, state, and federal regulations. Within <u>90 days</u> of ceasing discharging to the Facultative Lagoon System impoundment(s), the permittee shall submit a sludge removal and disposal plan to NMED for approval. The permittee shall initiate implementation of the plan within 30 days following approval by NMED. The sludge removal and disposal plan shall include the following: a) The estimated volume and dry weight of sludge to be removed and disposed, including measurements and calculations. b) Analytical results for samples of the sludge taken from the impoundment for TKN, NO_3-N, percent total solids, hazardous constituents, and any other parameters tested (reported in mg/kg, dry weight basis). c) The method(s) of sludge *removal* from the impoundment(s). d) The method(s) of *disposal* for all of the sludge (and its contents) removed from the impoundment(s). The method(s) shall comply with all local, state and federal regulations, including 40 CFR Part 503. *Note: A proposal that includes the surface disposal of sludge may be subject to Ground Water Discharge Permitting requirements pursuant to 20.6.2.3104 NMAC that are separate from the*

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	requirements of this Discharge Permit. e) A schedule for completion of sludge removal and disposal not to exceed two years from the date discharge to the impoundment(s) ceased. Within one year following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove all lines leading to and from the Facultative Lagoon System impoundment(s), or permanently plug and abandon them in place. b) Remove or demolish any other wastewater system components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liner(s). d) Fill the impoundment(s) with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [Subsection A of 20.6.2.3107 NMAC, 40 CFR Part 503]

Part C. Applicable to the Evaporation Pond H-19 and Storm Water Impoundments Not in Contact with Salt Stockpiles (Storm Water Ponds 1, 2, and 3)

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38.	Upon cessation of operation, the permittee shall close the Evaporation Pond H-19 and Storm Water Ponds 1, 2, and 3. Remaining liquids in each impoundment shall be removed and/or evaporated. All sludge shall be sampled to determine if hazardous constituents exist and managed and/or disposed of in accordance with applicable regulations. Within one year following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove or plug all piping and other ancillary components b) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liner(s). d) Fill the impoundment(s) with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [20.6.2.3107A(11) NMAC]

Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2 and 3)

#	Terms and Conditions
39.	Upon cessation of operation, all mined salt at the facility shall be removed from the site. The permittee is permitted to use the mined salt as backfill in shafts and as interior fill material in berms and permanent markers after closure. All mined salt remaining after backfilling and after construction of surface structures shall be removed from the site. The permittee shall submit a plan and schedule for salt tailings removal to NMED for approval within 120 days prior to the facility closure. The WIPP Land Management Plan reflects the Land Withdrawal Act's requirements for disposition of the salt. The WIPP's Hazardous Waste Facility Permit also addresses closure activities that include closure of the salt storage areas in accordance with the provisions of the WIPP Land Management Plan. The salt storage area will be reclaimed in the manner described in these documents. [20.6.2.3107A(11) NMAC]
40.	Upon cessation of operation, the permittee shall close Salt Storage Ponds 1, 2, and 3. Remaining liquids in each impoundment shall be removed and/or evaporated. All sludge shall be sampled to determine if hazardous constituents exist and managed and/or disposed of in accordance with applicable regulations. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: f) Remove or plug all piping and other ancillary components g) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. h) Perforate or remove the impoundment liner(s). i) Fill the impoundment(s) with suitable fill. j) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [20.6.2.3107A(11) NMAC]

E. GENERAL TERMS AND CONDITIONS

#	Terms and Conditions
41.	RECORD KEEPING - The permittee shall maintain a written record of the following information: a) Information and data used to complete the application for this Discharge Permit. b) Records of any releases (commonly known as "spills") not authorized under this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC.

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	c) Records of the operation, maintenance, and repair of all facilities/equipment used to treat, store or dispose of wastewater. d) Facility record drawings (plans and specifications) showing the actual construction of the facility and bear the seal and signature of a licensed New Mexico professional engineer. e) Copies of monitoring reports completed and/or submitted to NMED pursuant to this Discharge Permit. f) The volume of wastewater or other wastes discharged pursuant to this Discharge Permit. g) Ground water quality and wastewater quality data collected pursuant to this Discharge Permit. h) Copies of construction records (well log) for all ground water monitoring wells required to be sampled pursuant to this Discharge Permit. i) Records of the maintenance, repair, replacement or calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit. j) Data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit. The following information shall be recorded and shall be made available to NMED upon request: i) The dates, location and times of sampling or field measurements; ii) The name and job title of the individuals who performed each sample collection or field measurement; iii) The sample analysis date of each sample; iv) The name and address of the laboratory, and the name of the signatory authority for the laboratory analysis; v) The analytical technique or method used to analyze each sample or collect each field measurement; vi) The results of each analysis or field measurement, including raw data; vii) The results of any split, spiked, duplicate or repeat sample; and viii) A copy of the laboratory analysis chain-of-custody as well as a description of the quality assurance and quality control procedures used. The written record shall be maintained by the permittee at a location accessible during a facility inspection by NMED for a period of at least five years from the date of application, report, collection or measurement and shall be made available to the department upon request. [Subsections A and D of 20.6.2.3107 NMAC]
42.	INSPECTION and ENTRY – The permittee shall allow inspection by NMED of the facility and its operations which are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC.

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	The permittee shall allow NMED to have access to and reproduce for their use any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge Permit and the WQCC regulations. Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED under the WQA, the WQCC Regulations, or any other local, state or federal regulations. [Subsection D of 20.6.2.3107 NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]
43.	DUTY to PROVIDE INFORMATION - The permittee shall, upon NMED's request, allow for NMED's inspection/duplication of records required by this Discharge Permit and/or furnish to NMED copies of such records. [Subsection D of 20.6.2.3107 NMAC]
44.	MODIFICATIONS and/or AMENDMENTS – In the event the permittee proposes a change to the facility or the facility's discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the facility, the permittee shall notify NMED prior to implementing such changes. The permittee shall obtain approval (which may require modification of this Discharge Permit) by NMED prior to implementing such changes. [Subsection C of 20.6.2.3107 NMAC, Subsections E and G of 20.6.2.3109 NMAC]
45.	PLANS and SPECIFICATIONS – In the event the permittee is proposing to construct a wastewater system or change a process unit of an existing system such that the quantity or quality of the discharge will change substantially from that authorized by this Discharge Permit, the permittee shall submit construction plans and specifications to NMED for the proposed system or process unit prior to the commencement of construction. In the event the permittee implements changes to the wastewater system authorized by this Discharge Permit which result in only a minor effect on the character of the discharge, the permittee shall report such changes (including the submission of record drawings, where applicable) as of January 1 and June 30 of each year to NMED. [Subsections A and C of 20.6.2.1202 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
46.	CIVIL PENALTIES - Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or facilities, or any refusal or failure to provide NMED with records or information, may

#	Terms and Conditions
	subject the permittee to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10(C) and 74-6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to $10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the permittee waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10 and 74-6-10.1]
47.	CRIMINAL PENALTIES – No person shall: 1) make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained under the WQA; 2) falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained under the WQA; or 3) fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation. Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental impact is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily injury to any other person is guilty of a second degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]
48.	COMPLIANCE with OTHER LAWS - Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of the obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders.

#	Terms and Conditions
	[NMSA 1978, § 74-6-5.L]
49.	RIGHT to APPEAL - The permittee may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC within thirty days of the receipt of postal notice of this Discharge Permit and shall include a statement of the issues to be raised and the relief sought. Unless a timely petition for review is made, the decision of NMED shall be final and not subject to judicial review. [20.6.2.3112 NMAC, NMSA 1978, § 74-6-5.O]
50.	TRANSFER of DISCHARGE PERMIT - Prior to the transfer of any ownership, control, or possession of this facility or any portion thereof, the permittee shall: 1) notify the proposed transferee in writing of the existence of this Discharge Permit; 2) include a copy of this Discharge Permit with the notice; and 3) deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee. Until both ownership and possession of the facility have been transferred to the transferee, the permittee shall continue to be responsible for any discharge from the facility. [20.6.2.3111 NMAC]
51.	PERMIT FEES - Payment of permit fees is due at the time of Discharge Permit approval. Permit fees shall be paid in a single payment or shall be paid in equal installments on a yearly basis over the term of the Discharge Permit. Single payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date. Initial installment payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date; subsequent installment payments shall be remitted to NMED no later than the anniversary of the Discharge Permit effective date. Permit fees are associated with <u>issuance</u> of this Discharge Permit. Nothing in this Discharge Permit shall be construed as relieving the permittee of the obligation to pay all permit fees assessed by NMED. A permittee that ceases discharging or does not commence discharging from the facility during the term of the Discharge Permit shall pay all permit fees assessed by NMED. An approved Discharge Permit shall be suspended or terminated if the facility fails to remit an installment payment by its due date. [Subsection F of 20.6.2.3114 NMAC, NMSA 1978, § 74-6-5.K]

V. PERMIT TERM & SIGNATURE

EFFECTIVE DATE: July 29, 2014
TERM ENDS: July 29, 2019

[Subsection H of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.I]

JERRY SCHOEPPNER
Chief, Ground Water Quality Bureau
New Mexico Environment Department

New Mexico Environment Department Ground Water Quality Bureau
Discharge Permit Summary

Facility Information

Facility Name	Waste Isolation Pilot Plant (WIPP)
Discharge Permit Number	DP-831
Legally Responsible Party	Jose Franco, Manager U.S. Department of Energy P.O. Box 3090 Carlsbad, NM 88221 (575) 234-7300

Treatment, Disposal and Site Information

Primary Waste Type	Domestic and Industrial
Facility Type	Federal Agency - U.S. Department of Energy

Evaporative Impoundment Locations

Domestic Wastewater

Type	Designation	Description & Comments
Settling Impoundment	Settling Lagoon 1	Formerly known as "Settling Pond 1A"; Primary treatment; Permitted 1 foot of freeboard.
Settling Impoundment	Settling Lagoon 2	Formerly known as "Settling Pond 2A"; Primary treatment; Permitted 1 foot of freeboard.
Polishing Impoundment	Polishing Lagoon 1	Formerly known as "Polishing Pond 1B"; Passive secondary treatment; Permitted 1 foot of freeboard.
Polishing Impoundment	Polishing Lagoon 2	Formerly known as "Polishing Pond 2B"; Passive secondary treatment; Permitted 1 foot of freeboard.
Evaporation Impoundment	Effluent Lagoon A	Formerly known as "Evaporation Pond A"; Effluent storage; Disposal by evaporation; Permitted 1 foot of freeboard.
Evaporation Impoundment	Effluent Lagoon B	Formerly known as "Evaporation Pond B"; Effluent storage; Disposal by evaporation; Permitted discharges are domestic waste, brine, purge waters, and miscellaneous industrial non-hazardous wastewater; Permitted 1 foot of freeboard.
Evaporation Impoundment	Effluent Lagoon C	Formerly known as "Evaporation Pond C"; Effluent Storage; Disposal by evaporation; Permitted discharges are domestic waste, brine, purge waters, and miscellaneous industrial non-hazardous wastewater; Permitted 1 foot of freeboard.

Storm Water Control

Type	Designation	Description & Comments
Storm Water Impoundment	Storm Water Pond 1	Formerly known as "Storm Water Intrusion Pond 1"; Receives clean non-contact storm water from paved areas, roofs, air conditioner condensate, and water from domestic water lines; Disposal by evaporation.

Storm Water Impoundment	Storm Water Pond 2	Formerly known as "Storm Water Intrusion Pond 2"; Receives clean non-contact storm after from the facilities paved areas, roofs, air conditioner condensate, and draining domestic water lines; Disposal by evaporation.
Storm Water Impoundment	Storm Water Pond 3	Formerly known as "Storm Water Intrusion Pond A"; Receives clean non-contact storm after from the facilities paved areas, roofs, air conditioner condensate, and draining domestic water lines; Disposal by evaporation.

Industrial Wastewater

Type	Designation	Description & Comments
Evaporation Impoundment	Evaporation Pond H-19	Permitted discharges are brine, purge waters, and miscellaneous industrial non-hazardous wastewater; 346, 085 gallons (with one foot of freeboard); Disposal by evaporation.
Evaporation Impoundment	Salt Storage Pond 1	Formerly known as "Salt Pile Evaporation Pond"; 1,677,633 gallons (with one foot freeboard); Disposal by evaporation
Evaporation Impoundment	Salt Storage Pond 2	Formerly known as "Salt Storage Extension Basin I"; Constructed using 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system;1,273,601 gallons (with one foot of freeboard); Disposal by evaporation.
Evaporation Impoundment	Salt Storage Pond 3	Formerly known as "Salt Storage Extension Basin II"; Constructed using 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system; 1,273,601 gallons (with one foot of freeboard); Disposal by evaporation.

Salt Storage Locations

Type	Designation	Description & Comments
Salt Pile	Salt Cell 1	Formerly known as "Salt Pile"; Inactive; Approximately 18.8 acres; graded to 2% slope covered with sand and 60 mil HDPE liner and with 2 ft. of native soil; Seeded; Run-off collects in to Salt Storage Pond 1.
Salt Pile	Salt Cell 2	Formerly known as "Salt Extension Cell A"; Active; 6.2 acres; Run-off area of 326,350 sq. ft.; Constructed using of six inch prepared subgrade, 60-mil HDPE liner, 200-mil drainage layer, eight oz. geotextile fabric covered with 2 ft. of native soil; Runoff collects in Storage Pond(s) 2 and/or 3.

Salt Pile	Salt Cell 3	Formerly known as "Salt Extension Cell B"; Active; 5.2 acres; run-off area of 272,850 sq. ft.; Constructed using of six inch prepared subgrade, 60-mil HDPE liner, 200-mil drainage layer, eight oz. geotextile fabric covered with 2 ft. of native soil; Runoff collects in Storage Pond(s) 2 and/or 3.
Salt Pile	Site Preliminary Design Validation Pile	Closed in 2000; Covered with a geosynthetic liner, 6 inches of bedding material, and three feet of soil; Seeded.

Flow Metering Locations

Type	Designation	Description & Comments
Totalizing Flow Meter	Ultrasonic Flow Meter	Located at the facility Pump House – water supply; Estimates domestic wastewater discharged to the facultative sewage impoundment system.
Primary Measurement Device	Time Recorder	Estimates miscellaneous wastewater discharged to Evaporation Pond H-19 and Facultative Lagoon System.

Ground Water Monitoring Locations

Type	Designation	Description & Comments
Monitoring Well	C-2505	Quarterly depth to water measurement.
Monitoring Well	C-2506	Quarterly depth to water measurement.
Monitoring Well	C-2507	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Monitoring Well	C-2811	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Monitoring Well	WQSP-6A	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO_4, Cl, TDS, TKN and NO_3.
Piezometer	PZ-4	Quarterly depth to water measurement.
Piezometer	PZ-5	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.

Piezometer	PZ-6	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-7	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-8	Quarterly depth to water measurement.
Piezometer	PZ-9	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-10	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-11	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-12	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-13	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-14	Quarterly depth to water measurement.
Piezometer	PZ-15	Quarterly depth to water measurement.

Depth-to-Ground Water 164 feet
Total Dissolved Solids (TDS) 3,400 mg/L

Permit Information

Application Received May 10, 2013
Public Notice Published May 31, 2014
Discharge Permit Issued July 29, 2014
Discharge Permit Term Ends July 29, 2019
Permitted Discharge Volume Domestic – 23,000 gallons per day
Industrial – 4,224,835 gallons per day

NMED Contact Information

Mailing Address	Ground Water Quality Bureau P.O. Box 5469 Santa Fe, New Mexico 87502-5469
GWQB Telephone Number	(505) 827-2900
NMED Lead Staff	John Hall
Lead Staff Telephone Number	(505) 827-1049
Lead Staff Email	john.hall@state.nm.us

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUN 3 0 2014

GROUND WATER
JUL 0 3 2014
BUREAU

Ms. Diana D. Sandoval
New Mexico Environment Department
Ground Water Pollution Prevention Section
PO Box 5469
Santa Fe, New Mexico 87502-5469

Subject: Comments on the Waste Isolation Pilot Plant Discharge Permit 831

Reference: Letter from Diana D Sandoval, Ground Water Pollution Prevention Section to Mr. Jose Franco, Manager, US Department of Energy, dated May 31, 2014

Dear Ms. Sandoval:

The purpose of this letter is to transmit comments on the Waste Isolation Pilot Plant Discharge Permit 831, as noted in the referenced letter to Mr. Franco. Our comments are as follows:

1. Page 6, Section IV, Conditions/Operational Plan/Part D: #11, delete "and after storm events of 2" or greater in a 24 hour period" since inspections are performed monthly.
2. Page 6, Section IV, Conditions/Operational Plan/Part D: #11, "The first sentence should read "...Salt Cell 1 and..." instead of "...Salt Cell 1and".
3. Page 7, Section IV, Condition/Monitoring and Reporting/Part A: #13 – Add the words "as applicable to analysis conducted for WIPP" at the end of the first sentence. This allows the laboratory to use older versions of the documents when the actual methods are not changed in the updates.
4. Page 9, Section IV, Conditions/Monitoring and Reporting/Part D: #20 – The first sentence should read "... Salt Storage Ponds 1, 2, and 3..." not "... Salt Storage Cells 1, 2, 3, and 3..."

If you have any questions, please contact Mr. George T. Basabilvazo at (505) 234-7488.

Sincerely,

George T. Basabilvazo

George T. Basabilvazo, Director
Carlsbad Field Office

Enclosure

cc: w/o enclosure

T. Skibitski, NMED	*ED
J. Kieling, NMED	ED
T. Kliphuis, NMED	ED
CBFO M&RC	

*ED denotes electronic distribution

CBFO:OESH:GTB:MN:14-1540:UFC 5487.00

GROUND WATER DISCHARGE PERMIT RENEWAL
Waste Isolation Pilot Plant (WIPP), DP-831

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Discharge Permit Renewal (Discharge Permit), DP-831, to the U.S. Department of Energy (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the Waste Isolation Pilot Plant (WIPP) (facility) into ground and surface water, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses and protect public health. In issuing this Discharge Permit, NMED has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been or will be met. Pursuant to Section 20.6.2.3104 NMAC, it is the responsibility of the permittee to comply with the terms and conditions of this Discharge Permit; failure may result in an enforcement action(s) by NMED (20.6.2.1220 NMAC).

The activities which produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics of the discharge are briefly described as follows:

Up to 23,000 gallons per day (gpd) of domestic wastewater is discharged to a synthetically lined impoundment system for disposal by evaporation. The system consists of seven synthetically-lined facultative sewage lagoons (Facultative Lagoon System) that include Settling Lagoons 1 and 2, Polishing Lagoons 1 and 2, and Effluent Lagoons A, B, and C. Industrial wastewater from two compressed air systems at the facility is also discharged to the Facultative Lagoon System. Brine, purge waters, and miscellaneous industrial non-hazardous wastewater are discharged to the Effluent Lagoons B and C of the Facultative Lagoon System. In addition, brine, purge waters, and miscellaneous industrial non-hazardous wastewater are discharged to a separate synthetically-lined impoundment for disposal by evaporation (Evaporation Pond H-19).

Salt and other subsurface materials mined during construction of the facility, as well as currently mined salt, are stored on the surface in three stockpiles. The stockpiles that are being used to store salt currently, or in the future, as it is mined out from the underground panels at the facility are Salt Cells 2 and 3. Up to 2,547,202 gpd of storm water runoff in contact with these salt stockpiles (based on a 24-hour, 25-year storm event - 3.9 inches) is collected in two double synthetically-lined storm water impoundments, each with a leak detection system (Salt Storage Ponds 2 and 3). The third salt stockpile (Salt Cell 1) is capped with a synthetic liner and earthen cover. Up to 1,677,633 gpd of storm water runoff in contact with this stockpile is collected in synthetically-lined diversion ditches and is diverted to a synthetically-lined impoundment (Salt Storage Pond 1).

Additional storm water runoff from the facility's paved areas and roofs is collected in three synthetically-lined impoundments (Storm Water Ponds 1, 2, and 3). This runoff is not in contact with the salt stockpiles at the facility.

The Site and Preliminary and Design Validation (SPDV) material pile was constructed as the shafts were excavated when construction first began at the WIPP site. The SPDV material pile was closed in the year 2000 with a cover consisting of a geosynthetic liner installed on 6 inches of bedding material and covered with a minimum of three feet of earthen material.

The discharge contains water contaminants which may be elevated above the standards of Section 20.6.2.3103 NMAC and/or the presence of toxic pollutants as defined in Subsection WW of 20.6.2.7 NMAC. The facility is located off of the Jal Highway, approximately 26 miles southeast of Carlsbad, in Sections 20, 28, and 29, Township 22 South, Range 31 East, Eddy County. Ground water most likely to be affected is at a depth of approximately 164 feet and has a total dissolved solids concentration of approximately 3,400 milligrams per liter.

The Discharge Permit sets forth separate requirements for the Facultative Lagoon System, the storage of storm water runoff in contact with salt stockpiles, and storm water runoff from the facility's paved and impermeable areas.

- Part A. Applicable to All Parts
- Part B. Applicable to the Facultative Lagoon System
- Part C. Applicable to the Evaporation Pond H-19 and Storm Water Impoundments Not in Contact with Salt Stockpiles (Storm Water Ponds 1, 2, and 3)
- Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2, and 3)

The original Discharge Permit was issued on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998, amended on January 24, 2000, renewed on April 29, 2003, modified on December 22, 2003, modified again on December 29, 2006, and renewed and modified on July 23, 2008. The application (i.e., discharge plan) consists of the materials submitted by the permittee dated May 10, 2013 and materials contained in the administrative record prior to issuance of this Discharge Permit. The discharge shall be managed in accordance with all conditions and requirements of this Discharge Permit.

Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to require a Discharge Permit Modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under this Discharge Permit are not protective of ground water quality, and that more stringent requirements to protect ground water quality may be required by NMED. The permittee may be required to implement abatement of water pollution and remediate ground water quality.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

The following acronyms and abbreviations may be used in this Discharge Permit:

Abbreviation	Explanation	Abbreviation	Explanation
CFR	Code of Federal Regulations	NO_3-N	nitrate-nitrogen
Cl	Chloride	TDS	total dissolved solids
EPA	United States Environmental Protection Agency	TKN	total Kjeldahl nitrogen
gpd	gallons per day	total nitrogen	= TKN + NO_3-N
mg/L	milligrams per liter	SO_4	Sulfate
mL	Milliliters	UPC	Uniform Plumbing Code
NMAC	New Mexico Administrative Code	WQA	New Mexico Water Quality Act
NMED	New Mexico Environment Department	WQCC	Water Quality Control Commission
NMSA	New Mexico Statutes Annotated	WWTF	Wastewater Treatment Facility

II. FINDINGS

In issuing this Discharge Permit, NMED finds:

1. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move directly or indirectly into ground water within the meaning of Section 20.6.2.3104 NMAC.

2. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move into ground water of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of TDS within the meaning of Subsection A of 20.6.2.3101 NMAC.

3. The discharge from the facility is not subject to any of the exemptions of Section 20.6.2.3105 NMAC.

III. AUTHORIZATION TO DISCHARGE

Pursuant to 20.6.2.3104 NMAC, it is the responsibility of the permittee to ensure that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein.

The permittee is authorized to discharge up to 23,000 gpd of domestic wastewater to a synthetically-lined facultative impoundment system for disposal by evaporation. The permittee is also authorized to discharge up to 4,224,835 gpd of runoff in contact with salt stockpiles to three synthetically-lined impoundments for disposal by evaporation. The Facultative Lagoon System is permitted to accept non-hazardous industrial wastewater from two compressed air systems at the facility. Up to 50,000 gpd of brine, purge waters, and miscellaneous non-hazardous process waters are permitted to be discharged into Evaporation Ponds B and C of the Facultative Lagoon System, up to the capacity of the ponds with one foot of freeboard. Up to 50,000 gpd of brine, purge waters, and miscellaneous non-hazardous process waters are permitted to be discharged into to the Evaporation Pond H-19, up to the capacity of the pond with one foot of freeboard. The permittee is also authorized to collect storm water runoff from the facility's paved areas and

roofs in Storm Water Ponds 1, 2, and 3. This runoff is not in contact with the salt stockpiles at the facility.

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

IV. CONDITIONS

NMED issues this Discharge Permit for the discharge of water contaminants subject to the following conditions:

OPERATIONAL PLAN

Part A. Applicable to All Parts

#	Terms and Conditions
1.	The permittee shall implement the following operational plan to ensure compliance with Title 20, Chapter 6, Parts 1 and 2 NMAC. [Subsection C of 20.6.2.3109 NMAC]
2.	The permittee shall operate in a manner such that standards and requirements of Sections 20.6.2.3101 and 20.6.2.3103 NMAC are not violated. [20.6.2.3101 NMAC, 20.6.2.3103 NMAC, Subsection C of 20.6.2.3109 NMAC]
3.	The permittee shall maintain the impoundment liner(s) in such a manner as to avoid conditions which could affect the structural integrity of the impoundment(s) and/or impoundment liner(s). Such conditions include or may be characterized by the following: • erosion damage; • animal burrows or other damage; • the presence of vegetation including aquatic plants, weeds, woody shrubs or trees growing within five feet of the top inside edge of a sub-grade impoundment, within five feet of the toe of the outside berm of an above-grade impoundment, or within the impoundment itself; • the presence of large debris or large quantities of debris in the impoundment; • evidence of seepage; and • evidence of berm subsidence. Vegetation growing around the impoundment shall be routinely controlled by mechanical removal in a manner that is protective of the impoundment liner. The permittee shall visually inspect the impoundment(s) and surrounding berms on a monthly basis to ensure proper maintenance. In the event that inspection reveals any evidence of damage that threatens the structural integrity of an impoundment berm or liner, or that may result in an unauthorized discharge, the permittee shall enact the

#	Terms and Conditions
	contingency plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
4.	The permittee shall preserve a minimum of one foot of freeboard between the liquid level in the all impoundments and the elevation of the top of the impoundment liners. In the event that the permittee determines that one foot of freeboard cannot be preserved in any impoundment, the permittee shall enact the contingency plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

Part B. Applicable to the Facultative Lagoon System

#	Terms and Conditions
5.	The permittee shall maintain fences around the Facultative Lagoon System to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. Fences shall be maintained throughout the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
6.	The permittee shall maintain signs indicating that the wastewater at the facility is not potable. Signs shall be posted at the Facultative Lagoon System's entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish remain visible and legible for the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
7.	The permittee shall utilize operators, certified by the State of New Mexico at the appropriate level, to operate the wastewater collection, treatment and disposal systems. The operations and maintenance of all or any part of the wastewater system shall be performed by, or under the direct supervision of, a certified operator. [Subsection C of 20.6.2.3109 NMAC, 20.7.4 NMAC]
8.	The permittee shall measure the thickness of the sludge blanket in each pond of the Facultative Lagoon System ***once within the effective term*** of this Discharge Permit, but before the end of 2018. When sludge accumulation exceeds 1/3 of the total depth of any pond, the permittee shall remove the sludge in a manner, which is protective of the pond liner. Removed solids shall be contained, transported, and disposed of in accordance with all local, state, and federal regulations. The permittee shall maintain solids blanket measurements and solids disposal manifests for solids transported from the facility for

#	Terms and Conditions
	off-site disposal. The permittee shall submit all measurements and manifests to NMED in the semi-annual monitoring report immediately following the solids thickness measurement. [20.6.2.3109 NMAC, 20.6.2.3107 NMAC]

Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2 and 3)

#	Terms and Conditions
9.	The permittee shall measure the thickness of the solids blanket in each impoundment ***once within the effective term*** of this Discharge Permit, but before the end of 2018. Removed solids shall be contained, transported, and disposed of in accordance with all local, state, and federal regulations. The permittee shall maintain solids blanket measurements and solids disposal manifests for solids transported from the facility for off-site disposal. The permittee shall submit all measurements and manifests to NMED in the semi-annual monitoring report immediately following the solids thickness measurement. [20.6.2.3109 NMAC, 20.6.2.3107 NMAC]
10.	The permittee shall inspect the leak detection systems for Salt Storage Ponds 2 and 3 on a monthly basis for the presence of liquid. The permittee shall keep a log of the inspection findings and repairs made. The inspection log, including a statement whether or not liquids were observed in the leak detection systems, shall be submitted to NMED in the semi-annual monitoring reports. [20.6.2.3107 NMAC]
11.	The permittee shall conduct regular maintenance of the earthen cover on the Salt Cell 1 and the SPDV material pile. Inspections shall be conducted monthly to evaluate potential erosion and vegetation success of the cover. In the event of significant erosion or failure of vegetative success, the permittee shall provide a plan and schedule for repair within 90 days of discovery. General observations and cover repairs shall be reported to NMED. [20.6.2.3109 NMAC]

MONITORING AND REPORTING

Part A. Applicable to All Parts

#	Terms and Conditions
12.	The permittee shall conduct the following monitoring, reporting, and other requirements listed below in accordance with the monitoring requirements of this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
13.	METHODOLOGY – Unless otherwise approved in writing by NMED, the permittee shall conduct sampling and analysis in accordance with the most recent edition of the following documents as applicable to analysis conducted for WIPP: a) American Public Health Association, Standard Methods for the Examination of Water and Wastewater (18th, 19th or current) b) U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Waste c) U.S. Geological Survey, Techniques for Water Resources Investigations of the U.S. Geological Survey d) American Society for Testing and Materials, Annual Book of ASTM Standards, Part 31. Water e) U.S. Geological Survey, et al., National Handbook of Recommended Methods for Water Data Acquisition f) Federal Register, latest methods published for monitoring pursuant to Resource Conservation and Recovery Act regulations g) Methods of Soil Analysis: Part 1. Physical and Mineralogical Methods; Part 2. Microbiological and Biochemical Properties; Part 3. Chemical Methods, American Society of Agronomy h) New Mexico Environment Department, Hazardous Waste Bureau Position Paper, *Use of Low-Flow and Other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring.* [Subsection B of 20.6.2.3107 NMAC]
14.	The permittee shall submit semi-annual monitoring reports to NMED for the most recently completed semi-annual period by the 1st of February and August each year. Semi-annual monitoring shall be performed during the following periods and submitted as follows: • January 1st through June 30th (first half) – **due by August 1st** • July 1st through December 31st (second half) – **due by February 1st** [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Sewage Lagoon System

#	Terms and Conditions
15.	The volume of domestic influent discharged to the Facultative Lagoon System shall be measured ***monthly*** using a totalizing flow meter on the influent line to the system or the totalizing meter that measures total domestic water usage. Volumes of other authorized discharges to the Facultative Lagoon System shall be calculated by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. Monthly meter readings, the units of measurement, monthly discharge volumes and other volumetric calculations for the previous 6-month period shall be submitted to NMED semi-annually in the monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
16.	The permittee shall collect a wastewater sample on a ***semi-annual*** basis (once every six months) from the influent to the Facultative Lagoon System. The grab sample shall be analyzed for TKN, NO_3-N, SO_4, TDS and Cl. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]

Part C. Applicable to the Evaporation Pond H-19 and Storm Water Impoundments Not in Contact with Salt Stockpiles (Storm Water Ponds 1, 2, and 3)

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17.	The volume and origin of all wastewater discharged to the Evaporation Pond H-19 that is derived from miscellaneous non-hazardous sources shall be measured ***monthly*** and reported to NMED. Discharge volumes to the Evaporation Pond H-19 shall be calculated by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. Monthly discharge volumes and other volumetric calculations for the previous 6-month period shall be submitted to NMED semi-annually in the monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
18.	A sample shall be collected ***semi-annually*** from the Evaporation Pond H-19 and analyzed for SO_4, Cl, and TDS. Samples shall be collected ***annually*** after a significant storm event from each of the storm water ponds, Storm Water Ponds 1, 2, and 3 and analyzed for SO_4, Cl, and TDS. Samples shall be properly prepared, preserved, transported and

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	analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
19.	The water depth shall be measured ***monthly*** to the nearest tenth of a foot (0.1 ft) in the Storm Water Ponds 1, 2, and 3. The approximate volume of storm water shall be calculated and submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]

Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2 and 3)

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20.	A sample shall be collected ***annually*** after a significant storm event from each of the Salt Storage Ponds 1, 2 and 3, and analyzed for SO_4, Cl, and TDS. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
21.	The water depth shall be measured monthly to the nearest tenth of a foot (0.1 ft) in the Salt Storage Ponds 1, 2, and 3. The approximate volume of storm water shall be calculated and submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]

GROUND WATER MONTIROING AND REPORTS

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22.	Depth to the water table shall be measured to the nearest hundredth of a foot (0.01 ft) ***quarterly*** in piezometers/monitoring wells: • PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-6, PZ-7, PZ-8, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13,

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	PZ-14, and PZ-15 • C-2505, C-2506, C-2507, C-2811, and WQSP-6A [Subsection A of 20.6.2.3107 NMAC]
23.	The permittee shall perform ***semi-annual*** ground water sampling in the following piezometers/monitoring wells and analyze the samples for temperature, pH, specific conductance, SO_4, TDS, and Cl: • Piezometers: PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, and PZ-13 • Monitoring Wells: C-2507, C-2811, and WQSP-6A Ground water sample collection, preservation, transport and analysis shall be performed according to the following procedure: a) Measure the depth-to-most-shallow ground water from the top of the well casing to the nearest hundredth of a foot. b) Purge three well volumes of water from the well prior to sample collection. c) Obtain samples from the well for analysis. d) Properly prepare, preserve and transport samples. e) Analyze samples in accordance with the methods authorized in this Discharge Permit. Depth-to-most-shallow ground water measurements, analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
24.	The permittee shall perform ***semi-annual*** ground water sampling from monitoring well WQSP-6A and analyzed for TKN and NO_3. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
25.	Hydrographs shall be submitted ***annually*** for all monitoring wells and piezometers covered under Condition 22 of this Discharge Permit. At a minimum, graphs shall include the previous five years of water level data, or for recently installed wells, all data since the well was installed. Data for several wells may be included on one graph.

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	[Subsection A of 20.6.2.3107 NMAC]
26.	A potentiometric map for facility area shall be submitted ***annually***. The map shall incorporate the most recent water level data for all monitoring wells and piezometers installed in the shallow subsurface water (SSW). [Subsection A of 20.6.2.3107 NMAC]
27.	A single table in a paper and electronic format (EXCEL spreadsheet) of water level measurements and water quality data with only those constituents analyzed and water levels measured during a single event shown in columns. Tabulated field measurements to include temperature, pH, and electrical conductivity corrected to 25 degrees Celsius. Monitoring sites shall be shown in rows. The second column shall contain the date of the sampling event. Values exceeding standards shall be bolded. Any constituent not analyzed for a particular site shall be shown as "NA", any site not sampled shall be shown as "NS" with an associated reason, and any site not measured for water levels shall be shown as "NM" with an associated reason. [Subsection A of 20.6.2.3107 NMAC]
28.	A single table that includes all available ground water data to date shall be submitted annually. For each monitoring well, the name of the well shall be entered in the far left column in a row by itself. Sampling events, beginning with the earliest event first, shall be entered in subsequent rows with the sampling date in the second column and the corresponding analytical data in columns further to the right. Each new sampling event shall be added as an additional row to the existing spreadsheet with the corresponding date of the sampling event noted in the second column next to the monitoring well name. [Subsection A of 20.6.2.3107 NMAC]

CONTINGENCY PLAN

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29.	In the event that ground water monitoring indicates that a ground water quality standard identified in Section 20.6.2.3103 NMAC is exceeded; the total nitrogen concentration in ground water is greater than 10 mg/L; or a toxic pollutant (defined in Subsection WW of 20.6.2.7 NMAC) is present in a ground water sample and in any subsequent ground water sample collected from a monitoring well required by this Discharge Permit, the permittee shall enact the following contingency plan: Within 60 days of the subsequent sample analysis date, the permittee shall propose measures to ensure that the exceedance of the standard or the presence of a toxic pollutant will be mitigated by submitting a corrective action plan to NMED for approval.

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	The corrective action plan shall include a description of the proposed actions to control the source and an associated completion schedule. The plan shall be enacted as approved by NMED. Once invoked (whether during the term of this Discharge Permit; or after the term of this Discharge Permit and prior to the completion of the Discharge Permit closure plan requirements), this condition shall apply until the permittee has fulfilled the requirements of this condition and ground water monitoring confirms for a minimum of two years of consecutive ground water sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded and toxic pollutants are not present in ground water. The permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC, should the corrective action plan not result in compliance with the standards and requirements set forth in Section 20.6.2.4103 NMAC within 180 days of confirmed ground water contamination. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]
30.	In the event that inspection findings reveal significant damage likely to affect the structural integrity of the lined impoundment(s) or its ability to contain contaminants, the permittee shall propose the repair or replacement of the impoundment liner(s) by submitting a corrective action plan to NMED for approval. The plan shall be submitted to NMED within 30 days after discovery by the permittee or following notification from NMED that significant liner damage is evident. The corrective action plan shall include a schedule for completion of corrective actions and the permittee shall initiate implementation of the plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
31.	In the event that a minimum of one foot of freeboard cannot be preserved in the impoundment(s), the permittee shall take actions authorized by this Discharge Permit and all applicable local, state, and federal regulations to restore the required freeboard. In the event that one foot of freeboard cannot be restored within a period of 72 hours following discovery, the permittee shall propose actions to be immediately implemented to restore one foot of freeboard by submitting a short-term corrective action plan to NMED for approval. Examples of short-term corrective actions include: removing excess wastewater from the impoundment through pumping and hauling; or reducing the volume of liquid/wastewater discharged to the impoundment. The plan shall include a schedule for completion of corrective actions and shall be submitted within 15 days following the date when the one foot of freeboard limit was initially discovered. The permittee shall initiate implementation of the plan following approval by NMED. In the event that the short-term corrective actions failed to restore one foot of freeboard,

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	the permittee shall propose permanent corrective actions in a long-term corrective action plan submitted to NMED within 90 days following failure of the short-term corrective action plan. Examples include: the installation of an additional storage impoundment, or a significant/permanent reduction in the volume of liquid/wastewater discharged to the impoundment. The plan shall include a schedule for completion of corrective actions and implementation of the plan shall be initiated following approval by NMED. [Subsection A of 20.6.2.3107 NMAC]
32.	In the event that a release (commonly known as a "spill") occurs that is not authorized under this Discharge Permit, the permittee shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in Section 20.6.2.1203 NMAC and summarized below. Within <u>24 hours</u> following discovery of the unauthorized discharge, the permittee shall verbally notify NMED and provide the following information: a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility. b) The name and address of the facility. c) The date, time, location, and duration of the unauthorized discharge. d) The source and cause of unauthorized discharge. e) A description of the unauthorized discharge, including its estimated chemical composition. f) The estimated volume of the unauthorized discharge. g) Any actions taken to mitigate immediate damage from the unauthorized discharge. Within <u>one week</u> following discovery of the unauthorized discharge, the permittee shall submit written notification to NMED with the information listed above and any pertinent updates. Within <u>15 days</u> following discovery of the unauthorized discharge, the permittee shall submit a corrective action report/plan to NMED describing any corrective actions taken and/or to be taken relative to the unauthorized discharge that includes the following: a) A description of proposed actions to mitigate damage from the unauthorized discharge. b) A description of proposed actions to prevent future unauthorized discharges of this nature. c) A schedule for completion of proposed actions. In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of Section 20.6.2.4103 NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to Paragraph (1) of Subsection A of 20.6.2.1203 NMAC, the permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000

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	through 20.6.2.4115 NMAC. Nothing in this condition shall be construed as relieving the permittee of the obligation to comply with all requirements of Section 20.6.2.1203 NMAC. [20.6.2.1203 NMAC]
33.	In the event that NMED or the permittee identifies any failures of the discharge plan or this Discharge Permit not specifically noted herein, NMED may require the permittee to submit a corrective action plan and a schedule for completion of corrective actions to address the failure(s). Additionally, NMED may require a Discharge Permit modification to achieve compliance with 20.6.2 NMAC. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]
34.	In the event of a pipeline break, pump failure, pond overflow or other system failure at the facility, discharged water shall be contained, pumped and transferred to area of the facility that impose minimal impacts to ground water quality. Failed components shall be repaired or replaced as soon as possible and no later than 72 hours from the time of failure. For good cause demonstrated, the permittee may request NMED approval of an extension of the schedule for the repair or replacement of a failed component. [20.6.2.3107A NMAC]

CLOSURE PLAN

Part A. Applicable to All Parts

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35.	The permittee shall close the facilities covered under this Discharge Permit in accordance with the closure plan in the March 4, 2005 discharge permit application, the closure plan in the WIPP Hazardous Waste Facility Permit (HWFP) dated November 1, 2012, and the WIPP Land Management Plan. [Subsection A of 20.6.2.3107 NMAC]
36.	The permittee shall continue ground water monitoring until the requirements of this condition have been met and ground water monitoring confirms for a minimum of two years of consecutive ground water sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded and toxic pollutants are not present in ground water. If monitoring results show that a ground water quality standard in Section 20.6.2.3103 NMAC is exceeded; the total nitrogen concentration in ground water is greater than 10

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	mg/L; or a toxic pollutant (defined in Subsection WW of 20.6.2.7 NMAC) is present in ground water, the permittee shall implement the contingency plan required by this Discharge Permit. Following notification from NMED that post-closure monitoring may cease, the permittee shall plug and abandon the monitoring well(s) in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Sewage Lagoon System

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37.	In the event the Facultative Lagoon System is proposed to be permanently closed, upon ceasing discharging, the permittee shall perform the following closure measures: Within 60 days of ceasing discharging to the Facultative Lagoon System impoundments(s), the line leading to the impoundment shall be plugged so that a discharge can no longer occur. Within 60 days of ceasing discharging to the Facultative Lagoon System (impoundments), wastewater shall be drained or evaporated from the impoundment and any other wastewater system components and it shall be disposed of in accordance with all local, state, and federal regulations. Within 90 days of ceasing discharging to the Facultative Lagoon System impoundment(s), the permittee shall submit a sludge removal and disposal plan to NMED for approval. The permittee shall initiate implementation of the plan within 30 days following approval by NMED. The sludge removal and disposal plan shall include the following: a) The estimated volume and dry weight of sludge to be removed and disposed, including measurements and calculations. b) Analytical results for samples of the sludge taken from the impoundment for TKN, NO_3-N, percent total solids, hazardous constituents, and any other parameters tested (reported in mg/kg, dry weight basis). c) The method(s) of sludge *removal* from the impoundment(s). d) The method(s) of *disposal* for all of the sludge (and its contents) removed from the impoundment(s). The method(s) shall comply with all local, state and federal regulations, including 40 CFR Part 503. *Note: A proposal that includes the surface disposal of sludge may be subject to Ground Water Discharge Permitting requirements pursuant to 20.6.2.3104 NMAC that are separate from the*

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	requirements of this Discharge Permit. e) A schedule for completion of sludge removal and disposal not to exceed two years from the date discharge to the impoundment(s) ceased. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove all lines leading to and from the Facultative Lagoon System impoundment(s), or permanently plug and abandon them in place. b) Remove or demolish any other wastewater system components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liner(s). d) Fill the impoundment(s) with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [Subsection A of 20.6.2.3107 NMAC, 40 CFR Part 503]

Part C. Applicable to the Evaporation Pond H-19 and Storm Water Impoundments Not in Contact with Salt Stockpiles (Storm Water Ponds 1, 2, and 3)

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38.	Upon cessation of operation, the permittee shall close the Evaporation Pond H-19 and Storm Water Ponds 1, 2, and 3. Remaining liquids in each impoundment shall be removed and/or evaporated. All sludge shall be sampled to determine if hazardous constituents exist and managed and/or disposed of in accordance with applicable regulations. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove or plug all piping and other ancillary components b) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liner(s). d) Fill the impoundment(s) with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [20.6.2.3107A(11) NMAC]

Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2 and 3)

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39.	Upon cessation of operation, all mined salt at the facility shall be removed from the site. The permittee is permitted to use the mined salt as backfill in shafts and as interior fill material in berms and permanent markers after closure. All mined salt remaining after backfilling and after construction of surface structures shall be removed from the site. The permittee shall submit a plan and schedule for salt tailings removal to NMED for approval within 120 days prior to the facility closure. The WIPP Land Management Plan reflects the Land Withdrawal Act's requirements for disposition of the salt. The WIPP's Hazardous Waste Facility Permit also addresses closure activities that include closure of the salt storage areas in accordance with the provisions of the WIPP Land Management Plan. The salt storage area will be reclaimed in the manner described in these documents. [20.6.2.3107A(11) NMAC]
40.	Upon cessation of operation, the permittee shall close Salt Storage Ponds 1, 2, and 3. Remaining liquids in each impoundment shall be removed and/or evaporated. All sludge shall be sampled to determine if hazardous constituents exist and managed and/or disposed of in accordance with applicable regulations. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: f) Remove or plug all piping and other ancillary components g) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. h) Perforate or remove the impoundment liner(s). i) Fill the impoundment(s) with suitable fill. j) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [20.6.2.3107A(11) NMAC]

E. GENERAL TERMS AND CONDITIONS

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41.	RECORD KEEPING - The permittee shall maintain a written record of the following information: a) Information and data used to complete the application for this Discharge Permit. b) Records of any releases (commonly known as "spills") not authorized under this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC.

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	c) Records of the operation, maintenance, and repair of all facilities/equipment used to treat, store or dispose of wastewater. d) Facility record drawings (plans and specifications) showing the actual construction of the facility and bear the seal and signature of a licensed New Mexico professional engineer. e) Copies of monitoring reports completed and/or submitted to NMED pursuant to this Discharge Permit. f) The volume of wastewater or other wastes discharged pursuant to this Discharge Permit. g) Ground water quality and wastewater quality data collected pursuant to this Discharge Permit. h) Copies of construction records (well log) for all ground water monitoring wells required to be sampled pursuant to this Discharge Permit. i) Records of the maintenance, repair, replacement or calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit. j) Data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit. The following information shall be recorded and shall be made available to NMED upon request: i) The dates, location and times of sampling or field measurements; ii) The name and job title of the individuals who performed each sample collection or field measurement; iii) The sample analysis date of each sample; iv) The name and address of the laboratory, and the name of the signatory authority for the laboratory analysis; v) The analytical technique or method used to analyze each sample or collect each field measurement; vi) The results of each analysis or field measurement, including raw data; vii) The results of any split, spiked, duplicate or repeat sample; and viii) A copy of the laboratory analysis chain-of-custody as well as a description of the quality assurance and quality control procedures used. The written record shall be maintained by the permittee at a location accessible during a facility inspection by NMED for a period of at least five years from the date of application, report, collection or measurement and shall be made available to the department upon request. [Subsections A and D of 20.6.2.3107 NMAC]
42.	INSPECTION and ENTRY – The permittee shall allow inspection by NMED of the facility and its operations which are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC.

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	The permittee shall allow NMED to have access to and reproduce for their use any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge Permit and the WQCC regulations. Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED under the WQA, the WQCC Regulations, or any other local, state or federal regulations. [Subsection D of 20.6.2.3107 NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]
43.	DUTY to PROVIDE INFORMATION - The permittee shall, upon NMED's request, allow for NMED's inspection/duplication of records required by this Discharge Permit and/or furnish to NMED copies of such records. [Subsection D of 20.6.2.3107 NMAC]
44.	MODIFICATIONS and/or AMENDMENTS – In the event the permittee proposes a change to the facility or the facility's discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the facility, the permittee shall notify NMED prior to implementing such changes. The permittee shall obtain approval (which may require modification of this Discharge Permit) by NMED prior to implementing such changes. [Subsection C of 20.6.2.3107 NMAC, Subsections E and G of 20.6.2.3109 NMAC]
45.	PLANS and SPECIFICATIONS – In the event the permittee is proposing to construct a wastewater system or change a process unit of an existing system such that the quantity or quality of the discharge will change substantially from that authorized by this Discharge Permit, the permittee shall submit construction plans and specifications to NMED for the proposed system or process unit prior to the commencement of construction. In the event the permittee implements changes to the wastewater system authorized by this Discharge Permit which result in only a minor effect on the character of the discharge, the permittee shall report such changes (including the submission of record drawings, where applicable) as of January 1 and June 30 of each year to NMED. [Subsections A and C of 20.6.2.1202 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
46.	CIVIL PENALTIES - Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or facilities, or any refusal or failure to provide NMED with records or information, may

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	subject the permittee to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10(C) and 74-6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to $10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the permittee waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10 and 74-6-10.1]
47.	CRIMINAL PENALTIES – No person shall: 1) make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained under the WQA; 2) falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained under the WQA; or 3) fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation. Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental impact is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily injury to any other person is guilty of a second degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]
48.	COMPLIANCE with OTHER LAWS - Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of the obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders.

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	[NMSA 1978, § 74-6-5.L]
49.	RIGHT to APPEAL - The permittee may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC within thirty days of the receipt of postal notice of this Discharge Permit and shall include a statement of the issues to be raised and the relief sought. Unless a timely petition for review is made, the decision of NMED shall be final and not subject to judicial review. [20.6.2.3112 NMAC, NMSA 1978, § 74-6-5.O]
50.	TRANSFER of DISCHARGE PERMIT - Prior to the transfer of any ownership, control, or possession of this facility or any portion thereof, the permittee shall: 1) notify the proposed transferee in writing of the existence of this Discharge Permit; 2) include a copy of this Discharge Permit with the notice; and 3) deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee. Until both ownership and possession of the facility have been transferred to the transferee, the permittee shall continue to be responsible for any discharge from the facility. [20.6.2.3111 NMAC]
51.	PERMIT FEES - Payment of permit fees is due at the time of Discharge Permit approval. Permit fees shall be paid in a single payment or shall be paid in equal installments on a yearly basis over the term of the Discharge Permit. Single payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date. Initial installment payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date; subsequent installment payments shall be remitted to NMED no later than the anniversary of the Discharge Permit effective date. Permit fees are associated with <u>issuance</u> of this Discharge Permit. Nothing in this Discharge Permit shall be construed as relieving the permittee of the obligation to pay all permit fees assessed by NMED. A permittee that ceases discharging or does not commence discharging from the facility during the term of the Discharge Permit shall pay all permit fees assessed by NMED. An approved Discharge Permit shall be suspended or terminated if the facility fails to remit an installment payment by its due date. [Subsection F of 20.6.2.3114 NMAC, NMSA 1978, § 74-6-5.K]

V. PERMIT TERM & SIGNATURE

EFFECTIVE DATE: [effective date]
TERM ENDS: [expiration date]

[Subsection H of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.I]

____
JERRY SCHOEPPNER
Chief, Ground Water Quality Bureau
New Mexico Environment Department

draft

Melissa
DP 831

AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO
County of Bernalillo SS

Linda MacEachen, being duly sworn, declares and says that she is Classified Advertising Manager of The Albuquerque Journal, and that this newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Session Laws of 1937, and that payment therefore has been made of assessed as court cost; that the notice, copy of which is hereto attached, was published in said paper in the regular daily edition, for 1 times, the first publication being on the 31st day of May, 2014, and the subsequent consecutive publications on ______________, 20____.

Linda MacEachen

Sworn and subscribed before me, a Notary Public, in and for the County of Bernalillo and State of New Mexico this 31st day of May of 2014.

OFFICIAL SEAL
Sandra B. Gutierrez
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 2-18-17

Sandra B. Gutierrez

PRICE $157.07

Statement to come at end of month.

CLA-22-A (R-1/93)

ACCOUNT NUMBER 1007595

New Mexico Environment Department
Ground Water Quality Bureau

Notice is hereby given pursuant to 20.6.2.3108.G NMAC, the following Ground Water Discharge Permit applications have been proposed for approval. To request additional information or to obtain a copy of a draft permit, contact the Ground Water Quality Bureau in Santa Fe at (505) 827-2900. Draft permits may also be viewed on-line at http://www.nmenv.state.nm.us/gwb/NMED-GWQB-PublicNotice.htm

DP-1810, Young Guns, Inc., Christopher Franzoy, Owner, P.O. Box 959, Hatch, NM 87937, proposes to discharge up to 68,000 gallons per day (gpd) to two surface disposal fields that are under cultivation via flood irrigation. Solids generated by chile processing are stored at the facility prior to disposal offsite in accordance with all local, state, and federal regulations. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at 1230 BB Romig Road approximately 2.5 miles northwest of Hatch, in Section 1, Township 19 South, Range 04 West, Doña Ana County. Ground water beneath the site is at a depth of approximately 17 feet and has a total dissolved solids concentration of approximately 1,650 milligrams per liter. NMED permit contact: Nancy McDuffie at (505) 222-9523 or nancy.mcduffie@state.nm.us

DP-831, Waste Isolation Pilot Plant, Jose Franco, Manager, U.S. Dept. of Energy, P.O. Box 3090, Carlsbad, NM 88221, proposes to renew the Discharge Permit for the discharge of up to 23,000 gallons per day (gpd) of domestic wastewater to a synthetically lined impoundment system consisting of seven synthetically-lined impoundments for disposal by evaporation. Industrial wastewater from two compressed air systems, brine, purge waters, and miscellaneous industrial non-hazardous wastewater is also discharged to the domestic wastewater impoundment system. In addition, brine, purge waters, and miscellaneous industrial non-hazardous wastewater are discharged to a separate synthetically-lined impoundment for disposal by evaporation. Up to 2,547,202 gpd of storm water runoff in contact with salt and other subsurface material stockpiles (based on a 24-hour, 25-year storm event - 3.9 inches) is collected in two double synthetically-lined storm water impoundments, each with a leak detection system. A third salt stockpile is capped with a synthetic liner and earthen cover that discharges up to 1,677,633 gpd of storm water runoff to a synthetically-lined impoundment. Potential contaminants associated with this type of discharge include nitrogen compounds, chloride, sulfate, and total dissolved solids. The facility is located off of the Jal Highway approximately 26 miles southeast of Carlsbad, in Sections 20, 28, and 29, Township 22 South, Range 31 East, Eddy County. Ground water most likely to be affected is at a depth of approximately 164 feet and has a total dissolved solids concentration of approximately 3,400 milligrams per liter. NMED permit contact: John Hall at (505) 827-1049 or

DP-1042, National Solar Observatory, Rex Hunter, Administrative Manager, P.O. Box 62, Sunspot, NM 88349, proposes to renew the Discharge Permit for the discharge of up to 10,000 gallons per day of domestic wastewater from the National Solar Observatory and employee housing to a wastewater treatment and disposal system. Wastewater collects in a lift station, which pumps wastewater to a mechanical treatment plant. Treated wastewater is then pumped to approximately four acres of land application area for disposal. The Discharge Plan includes a reduction in the permitted discharge volume from 17,000 to 10,000 gallons per day. Potential contaminants associated with this type of discharge include nitrogen compounds. The facility is located at New Mexico Scenic Byway 6553, Sunspot, in Sections 33 and 34, T17S, R11E, Otero County. Ground water most likely to be affected is at a depth of approximately 400 feet and has a total dissolved solids concentration of approximately 424 milligrams per liter. NMED permit contact: Melanie Sanchez at (505) 222-9574 or melanie.sanchez@state.nm.us

Prior to ruling on any proposed Discharge Permit or its modification, the New Mexico Environment Department (NMED) will allow thirty days after the date of publication of this notice to receive written comments and during which a public hearing may be requested by any interested person, including the applicant. Requests for public hearing shall be in writing and shall set forth the reasons why the hearing should be held. A hearing will be held if NMED determines that there is substantial public interest. Comments for requests for hearing should be submitted to the Ground Water Quality Bureau at PO Box 5469, Santa Fe, NM 87502-5469.

DP-1132, Los Alamos National Laboratory's Radioactive Liquid Waste Treatment Facility, Robert Beers, Point of Contact, Los Alamos National Laboratory, Environmental Protection Division, Water Quality & RCRA Group, P.O. Box 1663, Mail Stop K490, Los Alamos, NM 87545. As a result of comments received during the public comment period for DP-1132, the New Mexico Environment Department is hereby withdrawing the draft permit noticed (PN-2) on or around September 13, 2013 in order to further evaluate the comments received and amend the draft permit, as necessary. The New Mexico Environment Department will re-issue for public notice (PN-2) any subsequent draft permit in compliance with 20.6.2.3108.H NMAC. Los Alamos National Security, LLC (LANS) and the United States Department of Energy (DOE) have proposed to treat up to 40,000 gallons per day of low-level radioactive wastewater at Los Alamos National Laboratory's Radioactive Liquid Waste Treatment Facility, and to discharge treated effluent to a mechanical evaporation system, solar evaporation system or to an outfall (Outfall 051 also regulated under a National Pollutant Discharge Elimination System (NPDES) permit issued by the United States Environmental Protection Agency (EPA) pursuant to the federal Clean Water Act section 402, 33 U.S.C. § 1342). Potential contaminants associated with this type of waste stream include nitrogen compounds, metals, organic compounds, and low-level radioactive materials. The Facility is located within Los Alamos National Laboratory, approximately 1.5 miles south of Los Alamos, New Mexico, in Sections 16, 17, 20, 21 and 22, Township 19N, Range 06E, Los Alamos County. Ground water most likely to be affected ranges from depths of approximately one foot to 1,306 feet and has a total dissolved solids concentration ranging from approximately 162 to 255 milligrams per liter. NMED permit contact:

02554

Affidavit of Publication

GROUND WATER

JUN 0 9 2014

BUREAU

State of New Mexico,
County of Eddy, ss.

Kathy McCarroll, being first duly sworn, on oath says:

That she is the Classified Supervisor of the Carlsbad Current-Argus, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

May 31 2014

That the cost of publication is **$130.50** and that payment thereof has been made and will be assessed as court costs.

Kathy McCarroll

Subscribed and sworn to before me this

31 day of May, 2014

Cynthia Arredondo

My commission Expires
2/13/17

Notary Public

OFFICIAL SEAL
Cynthia Arredondo
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires 2/13/17

May 31, 2014

New Mexico Environment Department Ground Water Quality Bureau

Notice is hereby given pursuant to 20.6.2.3108.G NMAC, the following Ground Water Discharge Permit applications have been proposed for approval. To request additional information or to obtain a copy of a draft permit, contact the Ground Water Quality Bureau in Santa Fe at (505) 827-2900. Draft permits may be viewed online at http://www.nmenv.state.nm.us/gwb/NMED-GWQB-PublicNotice.htm

DP-831, Waste Isolation Pilot Plant, Jose Franco, Manager, U.S. Dept. of Energy, P.O. Box 3090, Carlsbad, NM 88221, proposes to renew the Discharge Permit for the discharge of up to 23,000 gallons per day (gpd) of domestic wastewater to a synthetically lined impoundment system consisting of seven synthetically-lined impoundments for disposal by evaporation. Industrial wastewater from two compressed air systems, brine, purge waters, and miscellaneous industrial non-hazardous wastewater is also discharged to the domestic wastewater impoundment system. In addition, brine, purge waters, and miscellaneous industrial non-hazardous wastewater are discharged to a separate synthetically-lined impoundment for disposal by evaporation. Up to 2,547,202 gpd of storm water runoff in contact with salt and other subsurface material stockpiles (based on a 24-hour, 25-year storm event - 3.9 inches) is collected in two double synthetically-lined storm water impoundments, each with a leak detection system. A third salt stockpile is capped with a synthetic liner and earthen cover that discharges up to 1,677,633 gpd of storm water runoff to a synthetically-lined impoundment. Potential contaminants associated with this type of discharge include nitrogen compounds, chloride, sulfate, and total dissolved solids. The facility is located off of the Jal Highway, approximately 26 miles southeast of Carlsbad, in Sections 20, 28, and 29, Township 22 South, Range 31 East, Eddy County. Ground water most likely to be affected is at a depth of approximately 164 feet and has a total dissolved solids concentration of approximately 3,400 milligrams per liter. NMED permit contact: John Hall at (505) 827-1049 or john.hall@state.nm.us

Prior to ruling on any proposed Discharge Permit or its modification, the New Mexico Environment Department, (NMED) will allow thirty days after the date of publication of this notice to receive written comments and during which a public hearing may be requested by any interested person, including the applicant. Requests for public hearing shall be in writing and shall set forth the reasons why the hearing should be held. A hearing will be held if NMED determines that there is substantial public interest. Comments for requests for hearing should be submitted to the Ground Water Quality Bureau at PO Box 5469, Santa Fe, NM 87502-5469.

NEW MEXICO
ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 St. Francis Drive
P.O. Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us

SUSANA MARTINEZ
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Jose Franco, Man
U.S. Dept. of Ene
P.O. Box 3090
Carlsbad, NM 882
PS Form 3800, June 2002

7005 1820 0001 5772 5730

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

May 20, 2014

Jose Franco, Manager
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221

RE: Draft Discharge Permit Renewal, DP-831, Waste Isolation Pilot Plant (WIPP)

Dear Mr. Franco:

Notice is hereby given pursuant to Subsection H of 20.6.2.3108 NMAC that Ground Water Discharge Permit, DP-831, Waste Isolation Pilot Plant, has been proposed for approval (copy enclosed). The New Mexico Environment Department (NMED) will publish notice of the availability of the draft Discharge Permit in the near future and will forward a copy of the notice to you.

Prior to making a final ruling on the proposed Discharge Permit, NMED will allow 30 days from the date the public notice is published during which time written comments can be submitted and/or a public hearing requested. Comments and/or hearing requests may be submitted by any interested person, including the Discharge Permit applicant. Written comments and/or hearing requests must be submitted to the Ground Water Quality Bureau at the address above and shall set forth the reasons why a hearing is requested. A hearing will be held only if hearing requests are received from the public and/or the Discharge Permit applicant during the 30-day comment period and NMED determines there is substantial public interest in the proposed Discharge Permit. Hearings are presided over by the NMED Secretary or a hearing officer appointed by the Secretary.

Please review the enclosed draft Discharge Permit carefully for accuracy and completeness, and to make sure you understand what it requires. Please be aware that this Discharge Permit may contain conditions that require the permittee to implement operational, monitoring or closure actions by a specified deadline

A copy of the Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC, is available at http://www.nmcpr.state.nm.us/nmac/_title20/T20C006.htm.

If you have any comments, questions, or concerns, please contact me at (505) 827-1046. If written comments and/or a written request for hearing are not received during the public comment period, the draft Discharge Permit will become final. Thank you for your cooperation during the review process.

Sincerely,

JERRY SCHOEPPNER
Chief, Ground Water Quality Bureau
New Mexico Environment Department

enc: Draft Discharge Permit Renewal, DP-831
Ground Water Discharge Permit Conditions for Synthetically Lined Lagoons – Liner Material and Site Preparation, Revision 0.0, May 2007
Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions, Revision 1.1, March 2011

cc: George Basabilvazo, Director of HSE, U.S. Department of Energy, P.O. Box 3090, Carlsbad, NM 88221 (permit/enclosures)

GROUND WATER DISCHARGE PERMIT RENEWAL
Waste Isolation Pilot Plant (WIPP), DP-831

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Discharge Permit Renewal (Discharge Permit), DP-831, to the U.S. Department of Energy (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the Waste Isolation Pilot Plant (WIPP) (facility) into ground and surface water, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses and protect public health. In issuing this Discharge Permit, NMED has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been or will be met. Pursuant to Section 20.6.2.3104 NMAC, it is the responsibility of the permittee to comply with the terms and conditions of this Discharge Permit; failure may result in an enforcement action(s) by NMED (20.6.2.1220 NMAC).

The activities which produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics of the discharge are briefly described as follows:

Up to 23,000 gallons per day (gpd) of domestic wastewater is discharged to a synthetically lined impoundment system for disposal by evaporation. The system consists of seven synthetically-lined facultative sewage lagoons (Facultative Lagoon System) that include Settling Lagoons 1 and 2, Polishing Lagoons 1 and 2, and Effluent Lagoons A, B, and C. Industrial wastewater from two compressed air systems at the facility is also discharged to the Facultative Lagoon System. Brine, purge waters, and miscellaneous industrial non-hazardous wastewater are discharged to the Effluent Lagoons B and C of the Facultative Lagoon System. In addition, brine, purge waters, and miscellaneous industrial non-hazardous wastewater are discharged to a separate synthetically-lined impoundment for disposal by evaporation (Evaporation Pond H-19).

Salt and other subsurface materials mined during construction of the facility, as well as currently mined salt, are stored on the surface in three stockpiles. The stockpiles that are being used to store salt currently, or in the future, as it is mined out from the underground panels at the facility are Salt Cells 2 and 3. Up to 2,547,202 gpd of storm water runoff in contact with these salt stockpiles (based on a 24-hour, 25-year storm event - 3.9 inches) is collected in two double synthetically-lined storm water impoundments, each with a leak detection system (Salt Storage Ponds 2 and 3). The third salt stockpile (Salt Cell 1) is capped with a synthetic liner and earthen cover. Up to 1,677,633 gpd of storm water runoff in contact with this stockpile is collected in synthetically-lined diversion ditches and is diverted to a synthetically-lined impoundment (Salt Storage Pond 1).

Additional storm water runoff from the facility's paved areas and roofs is collected in three synthetically-lined impoundments (Storm Water Ponds 1, 2, and 3). This runoff is not in contact with the salt stockpiles at the facility.

The Site and Preliminary and Design Validation (SPDV) material pile was constructed as the shafts were excavated when construction first began at the WIPP site. The SPDV material pile was closed in the year 2000 with a cover consisting of a geosynthetic liner installed on 6 inches of bedding material and covered with a minimum of three feet of earthen material.

The discharge contains water contaminants which may be elevated above the standards of Section 20.6.2.3103 NMAC and/or the presence of toxic pollutants as defined in Subsection WW of 20.6.2.7 NMAC. The facility is located off of the Jal Highway, approximately 26 miles southeast of Carlsbad, in Sections 20, 28, and 29, Township 22 South, Range 31 East, Eddy County. Ground water most likely to be affected is at a depth of approximately 164 feet and has a total dissolved solids concentration of approximately 3,400 milligrams per liter.

The Discharge Permit sets forth separate requirements for the Facultative Lagoon System, the storage of storm water runoff in contact with salt stockpiles, and storm water runoff from the facility's paved and impermeable areas.

- Part A. Applicable to All Parts
- Part B. Applicable to the Facultative Lagoon System
- Part C. Applicable to the Evaporation Pond H-19 and Storm Water Impoundments Not in Contact with Salt Stockpiles (Storm Water Ponds 1, 2, and 3)
- Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2, and 3)

The original Discharge Permit was issued on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998, amended on January 24, 2000, renewed on April 29, 2003, modified on December 22, 2003, modified again on December 29, 2006, and renewed and modified on July 23, 2008. The application (i.e., discharge plan) consists of the materials submitted by the permittee dated May 10, 2013 and materials contained in the administrative record prior to issuance of this Discharge Permit. The discharge shall be managed in accordance with all conditions and requirements of this Discharge Permit.

Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to require a Discharge Permit Modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under this Discharge Permit are not protective of ground water quality, and that more stringent requirements to protect ground water quality may be required by NMED. The permittee may be required to implement abatement of water pollution and remediate ground water quality.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

The following acronyms and abbreviations may be used in this Discharge Permit:

Abbreviation	Explanation	Abbreviation	Explanation
CFR	Code of Federal Regulations	NO_3-N	nitrate-nitrogen
Cl	Chloride	TDS	total dissolved solids
EPA	United States Environmental Protection Agency	TKN	total Kjeldahl nitrogen
gpd	gallons per day	total nitrogen	= TKN + NO_3-N
mg/L	milligrams per liter	SO_4	Sulfate
mL	Milliliters	UPC	Uniform Plumbing Code
NMAC	New Mexico Administrative Code	WQA	New Mexico Water Quality Act
NMED	New Mexico Environment Department	WQCC	Water Quality Control Commission
NMSA	New Mexico Statutes Annotated	WWTF	Wastewater Treatment Facility

II. FINDINGS

In issuing this Discharge Permit, NMED finds:

1. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move directly or indirectly into ground water within the meaning of Section 20.6.2.3104 NMAC.

2. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move into ground water of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of TDS within the meaning of Subsection A of 20.6.2.3101 NMAC.

3. The discharge from the facility is not subject to any of the exemptions of Section 20.6.2.3105 NMAC.

III. AUTHORIZATION TO DISCHARGE

Pursuant to 20.6.2.3104 NMAC, it is the responsibility of the permittee to ensure that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein.

The permittee is authorized to discharge up to 23,000 gpd of domestic wastewater to a synthetically-lined facultative impoundment system for disposal by evaporation. The permittee is also authorized to discharge up to 4,224,835 gpd of runoff in contact with salt stockpiles to three synthetically-lined impoundments for disposal by evaporation. The Facultative Lagoon System is permitted to accept non-hazardous industrial wastewater from two compressed air systems at the facility. Up to 50,000 gpd of brine, purge waters, and miscellaneous non-hazardous process waters are permitted to be discharged into Evaporation Ponds B and C of the Facultative Lagoon System, up to the capacity of the ponds with one foot of freeboard. Up to 50,000 gpd of brine, purge waters, and miscellaneous non-hazardous process waters are permitted to be discharged into to the Evaporation Pond H-19, up to the capacity of the pond with one foot of freeboard. The permittee is also authorized to collect storm water runoff from the facility's paved areas and

draft

roofs in Storm Water Ponds 1, 2, and 3. This runoff is not in contact with the salt stockpiles at the facility.

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

IV. CONDITIONS

NMED issues this Discharge Permit for the discharge of water contaminants subject to the following conditions:

OPERATIONAL PLAN

Part A. Applicable to All Parts

#	Terms and Conditions
1.	The permittee shall implement the following operational plan to ensure compliance with Title 20, Chapter 6, Parts 1 and 2 NMAC. [Subsection C of 20.6.2.3109 NMAC]
2.	The permittee shall operate in a manner such that standards and requirements of Sections 20.6.2.3101 and 20.6.2.3103 NMAC are not violated. [20.6.2.3101 NMAC, 20.6.2.3103 NMAC, Subsection C of 20.6.2.3109 NMAC]
3.	The permittee shall maintain the impoundment liner(s) in such a manner as to avoid conditions which could affect the structural integrity of the impoundment(s) and/or impoundment liner(s). Such conditions include or may be characterized by the following: • erosion damage; • animal burrows or other damage; • the presence of vegetation including aquatic plants, weeds, woody shrubs or trees growing within five feet of the top inside edge of a sub-grade impoundment, within five feet of the toe of the outside berm of an above-grade impoundment, or within the impoundment itself; • the presence of large debris or large quantities of debris in the impoundment; • evidence of seepage; and • evidence of berm subsidence. Vegetation growing around the impoundment shall be routinely controlled by mechanical removal in a manner that is protective of the impoundment liner. The permittee shall visually inspect the impoundment(s) and surrounding berms on a monthly basis to ensure proper maintenance. In the event that inspection reveals any evidence of damage that threatens the structural integrity of an impoundment berm or liner, or that may result in an unauthorized discharge, the permittee shall enact the

#	Terms and Conditions
	contingency plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
4.	The permittee shall preserve a minimum of one foot of freeboard between the liquid level in the all impoundments and the elevation of the top of the impoundment liners. In the event that the permittee determines that one foot of freeboard cannot be preserved in any impoundment, the permittee shall enact the contingency plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

Part B. Applicable to the Facultative Lagoon System

#	Terms and Conditions
5.	The permittee shall maintain fences around the Facultative Lagoon System to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. Fences shall be maintained throughout the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
6.	The permittee shall maintain signs indicating that the wastewater at the facility is not potable. Signs shall be posted at the Facultative Lagoon System's entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish remain visible and legible for the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
7.	The permittee shall utilize operators, certified by the State of New Mexico at the appropriate level, to operate the wastewater collection, treatment and disposal systems. The operations and maintenance of all or any part of the wastewater system shall be performed by, or under the direct supervision of, a certified operator. [Subsection C of 20.6.2.3109 NMAC, 20.7.4 NMAC]
8.	The permittee shall measure the thickness of the sludge blanket in each pond of the Facultative Lagoon System ***once within the effective term*** of this Discharge Permit, but before the end of 2018. When sludge accumulation exceeds 1/3 of the total depth of any pond, the permittee shall remove the sludge in a manner, which is protective of the pond liner. Removed solids shall be contained, transported, and disposed of in accordance with all local, state, and federal regulations. The permittee shall maintain solids blanket measurements and solids disposal manifests for solids transported from the facility for

#	Terms and Conditions
	off-site disposal. The permittee shall submit all measurements and manifests to NMED in the semi-annual monitoring report immediately following the solids thickness measurement. [20.6.2.3109 NMAC, 20.6.2.3107 NMAC]

Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2 and 3)

#	Terms and Conditions
9.	The permittee shall measure the thickness of the solids blanket in each impoundment ***once within the effective term*** of this Discharge Permit, but before the end of 2018. Removed solids shall be contained, transported, and disposed of in accordance with all local, state, and federal regulations. The permittee shall maintain solids blanket measurements and solids disposal manifests for solids transported from the facility for off-site disposal. The permittee shall submit all measurements and manifests to NMED in the semi-annual monitoring report immediately following the solids thickness measurement. [20.6.2.3109 NMAC, 20.6.2.3107 NMAC]
10.	The permittee shall inspect the leak detection systems for Salt Storage Ponds 2 and 3 on a monthly basis for the presence of liquid. The permittee shall keep a log of the inspection findings and repairs made. The inspection log, including a statement whether or not liquids were observed in the leak detection systems, shall be submitted to NMED in the semi-annual monitoring reports. [20.6.2.3107 NMAC]
11.	The permittee shall conduct regular maintenance of the earthen cover on the Salt Cell 1and the SPDV material pile. Inspections shall be conducted monthly and after storm events of 2 inches or greater in a 24-hour period to evaluate potential erosion and vegetation success of the cover. In the event of significant erosion or failure of vegetative success, the permittee shall provide a plan and schedule for repair within 90 days of discovery. General observations and cover repairs shall be reported to NMED. [20.6.2.3109 NMAC]

MONITORING AND REPORTING

Part A. Applicable to All Parts

#	Terms and Conditions
12.	The permittee shall conduct the following monitoring, reporting, and other requirements listed below in accordance with the monitoring requirements of this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
13.	METHODOLOGY – Unless otherwise approved in writing by NMED, the permittee shall conduct sampling and analysis in accordance with the most recent edition of the following documents: a) American Public Health Association, Standard Methods for the Examination of Water and Wastewater (18th, 19th or current) b) U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Waste c) U.S. Geological Survey, Techniques for Water Resources Investigations of the U.S. Geological Survey d) American Society for Testing and Materials, Annual Book of ASTM Standards, Part 31. Water e) U.S. Geological Survey, et al., National Handbook of Recommended Methods for Water Data Acquisition f) Federal Register, latest methods published for monitoring pursuant to Resource Conservation and Recovery Act regulations g) Methods of Soil Analysis: Part 1. Physical and Mineralogical Methods; Part 2. Microbiological and Biochemical Properties; Part 3. Chemical Methods, American Society of Agronomy h) New Mexico Environment Department, Hazardous Waste Bureau Position Paper, *Use of Low-Flow and Other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring.* [Subsection B of 20.6.2.3107 NMAC]
14.	The permittee shall submit semi-annual monitoring reports to NMED for the most recently completed semi-annual period by the 1st of February and August each year. Semi-annual monitoring shall be performed during the following periods and submitted as follows: • January 1st through June 30th (first half) – **due by August 1st** • July 1st through December 31st (second half) – **due by February 1st** [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Sewage Lagoon System

#	Terms and Conditions
15.	The volume of domestic influent discharged to the Facultative Lagoon System shall be measured ***monthly*** using a totalizing flow meter on the influent line to the system or the totalizing meter that measures total domestic water usage. Volumes of other authorized discharges to the Facultative Lagoon System shall be calculated by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. Monthly meter readings, the units of measurement, monthly discharge volumes and other volumetric calculations for the previous 6-month period shall be submitted to NMED semi-annually in the monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
16.	The permittee shall collect a wastewater sample on a ***semi-annual*** basis (once every six months) from the influent to the Facultative Lagoon System. The grab sample shall be analyzed for TKN, NO_3-N, SO_4, TDS and Cl. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]

Part C. Applicable to the Evaporation Pond H-19 and Storm Water Impoundments Not in Contact with Salt Stockpiles (Storm Water Ponds 1, 2, and 3)

#	Terms and Conditions
17.	The volume and origin of all wastewater discharged to the Evaporation Pond H-19 that is derived from miscellaneous non-hazardous sources shall be measured ***monthly*** and reported to NMED. Discharge volumes to the Evaporation Pond H-19 shall be calculated by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. Monthly discharge volumes and other volumetric calculations for the previous 6-month period shall be submitted to NMED semi-annually in the monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
18.	A sample shall be collected ***semi-annually*** from the Evaporation Pond H-19 and analyzed for SO_4, Cl, and TDS. Samples shall be collected ***annually*** after a significant storm event from each of the storm water ponds, Storm Water Ponds 1, 2, and 3 and analyzed for SO_4, Cl, and TDS. Samples shall be properly prepared, preserved, transported and

#	Terms and Conditions
	analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
19.	The water depth shall be measured ***monthly*** to the nearest tenth of a foot (0.1 ft) in the Storm Water Ponds 1, 2, and 3. The approximate volume of storm water shall be calculated and submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]

Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2 and 3)

#	Terms and Conditions
20.	A sample shall be collected ***annually*** after a significant storm event from each of the Salt Storage Cells 1, 2 and 3and 3 and analyzed for SO_4, Cl, and TDS. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
21.	The water depth shall be measured monthly to the nearest tenth of a foot (0.1 ft) in the Salt Storage Ponds 1, 2, and 3. The approximate volume of storm water shall be calculated and submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]

GROUND WATER MONTIROING AND REPORTS

#	Terms and Conditions
22.	Depth to the water table shall be measured to the nearest hundredth of a foot (0.01 ft) ***quarterly*** in piezometers/monitoring wells: • PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-6, PZ-7, PZ-8, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13,

#	Terms and Conditions
	PZ-14, and PZ-15 • C-2505, C-2506, C-2507, C-2811, and WQSP-6A [Subsection A of 20.6.2.3107 NMAC]
23.	The permittee shall perform ***semi-annual*** ground water sampling in the following piezometers/monitoring wells and analyze the samples for temperature, pH, specific conductance, SO_4, TDS, and Cl: • Piezometers: PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, and PZ-13 • Monitoring Wells: C-2507, C-2811, and WQSP-6A Ground water sample collection, preservation, transport and analysis shall be performed according to the following procedure: a) Measure the depth-to-most-shallow ground water from the top of the well casing to the nearest hundredth of a foot. b) Purge three well volumes of water from the well prior to sample collection. c) Obtain samples from the well for analysis. d) Properly prepare, preserve and transport samples. e) Analyze samples in accordance with the methods authorized in this Discharge Permit. Depth-to-most-shallow ground water measurements, analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
24.	The permittee shall perform ***semi-annual*** ground water sampling from monitoring well WQSP-6A and analyzed for TKN and NO_3. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
25.	Hydrographs shall be submitted ***annually*** for all monitoring wells and piezometers covered under Condition 22 of this Discharge Permit. At a minimum, graphs shall include the previous five years of water level data, or for recently installed wells, all data since the well was installed. Data for several wells may be included on one graph.

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#	Terms and Conditions
	[Subsection A of 20.6.2.3107 NMAC]
26.	A potentiometric map for facility area shall be submitted ***annually***. The map shall incorporate the most recent water level data for all monitoring wells and piezometers installed in the shallow subsurface water (SSW). [Subsection A of 20.6.2.3107 NMAC]
27.	A single table in a paper and electronic format (EXCEL spreadsheet) of water level measurements and water quality data with only those constituents analyzed and water levels measured during a single event shown in columns. Tabulated field measurements to include temperature, pH, and electrical conductivity corrected to 25 degrees Celsius. Monitoring sites shall be shown in rows. The second column shall contain the date of the sampling event. Values exceeding standards shall be bolded. Any constituent not analyzed for a particular site shall be shown as "NA", any site not sampled shall be shown as "NS" with an associated reason, and any site not measured for water levels shall be shown as "NM" with an associated reason. [Subsection A of 20.6.2.3107 NMAC]
28.	A single table that includes all available ground water data to date shall be submitted annually. For each monitoring well, the name of the well shall be entered in the far left column in a row by itself. Sampling events, beginning with the earliest event first, shall be entered in subsequent rows with the sampling date in the second column and the corresponding analytical data in columns further to the right. Each new sampling event shall be added as an additional row to the existing spreadsheet with the corresponding date of the sampling event noted in the second column next to the monitoring well name. [Subsection A of 20.6.2.3107 NMAC]

CONTINGENCY PLAN

#	Terms and Conditions
29.	In the event that ground water monitoring indicates that a ground water quality standard identified in Section 20.6.2.3103 NMAC is exceeded; the total nitrogen concentration in ground water is greater than 10 mg/L; or a toxic pollutant (defined in Subsection WW of 20.6.2.7 NMAC) is present in a ground water sample and in any subsequent ground water sample collected from a monitoring well required by this Discharge Permit, the permittee shall enact the following contingency plan: Within 60 days of the subsequent sample analysis date, the permittee shall propose measures to ensure that the exceedance of the standard or the presence of a toxic pollutant will be mitigated by submitting a corrective action plan to NMED for approval.

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	The corrective action plan shall include a description of the proposed actions to control the source and an associated completion schedule. The plan shall be enacted as approved by NMED. Once invoked (whether during the term of this Discharge Permit; or after the term of this Discharge Permit and prior to the completion of the Discharge Permit closure plan requirements), this condition shall apply until the permittee has fulfilled the requirements of this condition and ground water monitoring confirms for a minimum of two years of consecutive ground water sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded and toxic pollutants are not present in ground water. The permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC, should the corrective action plan not result in compliance with the standards and requirements set forth in Section 20.6.2.4103 NMAC within 180 days of confirmed ground water contamination. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]
30.	In the event that inspection findings reveal significant damage likely to affect the structural integrity of the lined impoundment(s) or its ability to contain contaminants, the permittee shall propose the repair or replacement of the impoundment liner(s) by submitting a corrective action plan to NMED for approval. The plan shall be submitted to NMED within 30 days after discovery by the permittee or following notification from NMED that significant liner damage is evident. The corrective action plan shall include a schedule for completion of corrective actions and the permittee shall initiate implementation of the plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
31.	In the event that a minimum of one foot of freeboard cannot be preserved in the impoundment(s), the permittee shall take actions authorized by this Discharge Permit and all applicable local, state, and federal regulations to restore the required freeboard. In the event that one foot of freeboard cannot be restored within a period of 72 hours following discovery, the permittee shall propose actions to be immediately implemented to restore one foot of freeboard by submitting a short-term corrective action plan to NMED for approval. Examples of short-term corrective actions include: removing excess wastewater from the impoundment through pumping and hauling; or reducing the volume of liquid/wastewater discharged to the impoundment. The plan shall include a schedule for completion of corrective actions and shall be submitted within 15 days following the date when the one foot of freeboard limit was initially discovered. The permittee shall initiate implementation of the plan following approval by NMED. In the event that the short-term corrective actions failed to restore one foot of freeboard,

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	the permittee shall propose permanent corrective actions in a long-term corrective action plan submitted to NMED within 90 days following failure of the short-term corrective action plan. Examples include: the installation of an additional storage impoundment, or a significant/permanent reduction in the volume of liquid/wastewater discharged to the impoundment. The plan shall include a schedule for completion of corrective actions and implementation of the plan shall be initiated following approval by NMED. [Subsection A of 20.6.2.3107 NMAC]
32.	In the event that a release (commonly known as a "spill") occurs that is not authorized under this Discharge Permit, the permittee shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in Section 20.6.2.1203 NMAC and summarized below. Within 24 hours following discovery of the unauthorized discharge, the permittee shall verbally notify NMED and provide the following information: a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility. b) The name and address of the facility. c) The date, time, location, and duration of the unauthorized discharge. d) The source and cause of unauthorized discharge. e) A description of the unauthorized discharge, including its estimated chemical composition. f) The estimated volume of the unauthorized discharge. g) Any actions taken to mitigate immediate damage from the unauthorized discharge. Within one week following discovery of the unauthorized discharge, the permittee shall submit written notification to NMED with the information listed above and any pertinent updates. Within 15 days following discovery of the unauthorized discharge, the permittee shall submit a corrective action report/plan to NMED describing any corrective actions taken and/or to be taken relative to the unauthorized discharge that includes the following: a) A description of proposed actions to mitigate damage from the unauthorized discharge. b) A description of proposed actions to prevent future unauthorized discharges of this nature. c) A schedule for completion of proposed actions. In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of Section 20.6.2.4103 NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to Paragraph (1) of Subsection A of 20.6.2.1203 NMAC, the permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000

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	through 20.6.2.4115 NMAC. Nothing in this condition shall be construed as relieving the permittee of the obligation to comply with all requirements of Section 20.6.2.1203 NMAC. [20.6.2.1203 NMAC]
33.	In the event that NMED or the permittee identifies any failures of the discharge plan or this Discharge Permit not specifically noted herein, NMED may require the permittee to submit a corrective action plan and a schedule for completion of corrective actions to address the failure(s). Additionally, NMED may require a Discharge Permit modification to achieve compliance with 20.6.2 NMAC. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]
34.	In the event of a pipeline break, pump failure, pond overflow or other system failure at the facility, discharged water shall be contained, pumped and transferred to area of the facility that impose minimal impacts to ground water quality. Failed components shall be repaired or replaced as soon as possible and no later than 72 hours from the time of failure. For good cause demonstrated, the permittee may request NMED approval of an extension of the schedule for the repair or replacement of a failed component. [20.6.2.3107A NMAC]

CLOSURE PLAN

Part A. Applicable to All Parts

#	Terms and Conditions
35.	The permittee shall close the facilities covered under this Discharge Permit in accordance with the closure plan in the March 4, 2005 discharge permit application, the closure plan in the WIPP Hazardous Waste Facility Permit (HWFP) dated November 1, 2012, and the WIPP Land Management Plan. [Subsection A of 20.6.2.3107 NMAC]
36.	The permittee shall continue ground water monitoring until the requirements of this condition have been met and ground water monitoring confirms for a minimum of two years of consecutive ground water sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded and toxic pollutants are not present in ground water. If monitoring results show that a ground water quality standard in Section 20.6.2.3103 NMAC is exceeded; the total nitrogen concentration in ground water is greater than 10

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	mg/L; or a toxic pollutant (defined in Subsection WW of 20.6.2.7 NMAC) is present in ground water, the permittee shall implement the contingency plan required by this Discharge Permit. Following notification from NMED that post-closure monitoring may cease, the permittee shall plug and abandon the monitoring well(s) in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Sewage Lagoon System

#	Terms and Conditions
37.	In the event the Facultative Lagoon System is proposed to be permanently closed, upon ceasing discharging, the permittee shall perform the following closure measures: Within <u>60 days</u> of ceasing discharging to the Facultative Lagoon System impoundments(s), the line leading to the impoundment shall be plugged so that a discharge can no longer occur. Within <u>60 days</u> of ceasing discharging to the Facultative Lagoon System (impoundments), wastewater shall be drained or evaporated from the impoundment and any other wastewater system components and it shall be disposed of in accordance with all local, state, and federal regulations. Within <u>90 days</u> of ceasing discharging to the Facultative Lagoon System impoundment(s), the permittee shall submit a sludge removal and disposal plan to NMED for approval. The permittee shall initiate implementation of the plan within 30 days following approval by NMED. The sludge removal and disposal plan shall include the following: a) The estimated volume and dry weight of sludge to be removed and disposed, including measurements and calculations. b) Analytical results for samples of the sludge taken from the impoundment for TKN, NO_3-N, percent total solids, hazardous constituents, and any other parameters tested (reported in mg/kg, dry weight basis). c) The method(s) of sludge *removal* from the impoundment(s). d) The method(s) of *disposal* for all of the sludge (and its contents) removed from the impoundment(s). The method(s) shall comply with all local, state and federal regulations, including 40 CFR Part 503. *Note: A proposal that includes the surface disposal of sludge may be subject to Ground Water Discharge Permitting requirements pursuant to 20.6.2.3104 NMAC that are separate from the*

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	requirements of this Discharge Permit. e) A schedule for completion of sludge removal and disposal not to exceed two years from the date discharge to the impoundment(s) ceased. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove all lines leading to and from the Facultative Lagoon System impoundment(s), or permanently plug and abandon them in place. b) Remove or demolish any other wastewater system components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liner(s). d) Fill the impoundment(s) with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [Subsection A of 20.6.2.3107 NMAC, 40 CFR Part 503]

Part C. Applicable to the Evaporation Pond H-19 and Storm Water Impoundments Not in Contact with Salt Stockpiles (Storm Water Ponds 1, 2, and 3)

#	Terms and Conditions
38.	Upon cessation of operation, the permittee shall close the Evaporation Pond H-19 and Storm Water Ponds 1, 2 and 3. Remaining liquids in each impoundment shall be removed and/or evaporated. All sludge shall be sampled to determine if hazardous constituents exist and managed and/or disposed of in accordance with applicable regulations. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove or plug all piping and other ancillary components b) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liner(s). d) Fill the impoundment(s) with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [20.6.2.3107A(11) NMAC]

Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2 and 3)

#	Terms and Conditions
39.	Upon cessation of operation, all mined salt at the facility shall be removed from the site. The permittee is permitted to use the mined salt as backfill in shafts and as interior fill material in berms and permanent markers after closure. All mined salt remaining after backfilling and after construction of surface structures shall be removed from the site. The permittee shall submit a plan and schedule for salt tailings removal to NMED for approval within 120 days prior to the facility closure. The WIPP Land Management Plan reflects the Land Withdrawal Act's requirements for disposition of the salt. The WIPP's Hazardous Waste Facility Permit also addresses closure activities that include closure of the salt storage areas in accordance with the provisions of the WIPP Land Management Plan. The salt storage area will be reclaimed in the manner described in these documents. [20.6.2.3107A(11) NMAC]
40.	Upon cessation of operation, the permittee shall close Salt Storage Ponds 1, 2, and 3. Remaining liquids in each impoundment shall be removed and/or evaporated. All sludge shall be sampled to determine if hazardous constituents exist and managed and/or disposed of in accordance with applicable regulations. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: f) Remove or plug all piping and other ancillary components g) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. h) Perforate or remove the impoundment liner(s). i) Fill the impoundment(s) with suitable fill. j) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [20.6.2.3107A(11) NMAC]

E. GENERAL TERMS AND CONDITIONS

#	Terms and Conditions
41.	RECORD KEEPING - The permittee shall maintain a written record of the following information: a) Information and data used to complete the application for this Discharge Permit. b) Records of any releases (commonly known as "spills") not authorized under this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC.

#	Terms and Conditions
	c) Records of the operation, maintenance, and repair of all facilities/equipment used to treat, store or dispose of wastewater. d) Facility record drawings (plans and specifications) showing the actual construction of the facility and bear the seal and signature of a licensed New Mexico professional engineer. e) Copies of monitoring reports completed and/or submitted to NMED pursuant to this Discharge Permit. f) The volume of wastewater or other wastes discharged pursuant to this Discharge Permit. g) Ground water quality and wastewater quality data collected pursuant to this Discharge Permit. h) Copies of construction records (well log) for all ground water monitoring wells required to be sampled pursuant to this Discharge Permit. i) Records of the maintenance, repair, replacement or calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit. j) Data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit. The following information shall be recorded and shall be made available to NMED upon request: i) The dates, location and times of sampling or field measurements; ii) The name and job title of the individuals who performed each sample collection or field measurement; iii) The sample analysis date of each sample; iv) The name and address of the laboratory, and the name of the signatory authority for the laboratory analysis; v) The analytical technique or method used to analyze each sample or collect each field measurement; vi) The results of each analysis or field measurement, including raw data; vii) The results of any split, spiked, duplicate or repeat sample; and viii) A copy of the laboratory analysis chain-of-custody as well as a description of the quality assurance and quality control procedures used. The written record shall be maintained by the permittee at a location accessible during a facility inspection by NMED for a period of at least five years from the date of application, report, collection or measurement and shall be made available to the department upon request. [Subsections A and D of 20.6.2.3107 NMAC]
42.	INSPECTION and ENTRY – The permittee shall allow inspection by NMED of the facility and its operations which are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC.

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	The permittee shall allow NMED to have access to and reproduce for their use any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge Permit and the WQCC regulations. Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED under the WQA, the WQCC Regulations, or any other local, state or federal regulations. [Subsection D of 20.6.2.3107 NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]
43.	DUTY to PROVIDE INFORMATION - The permittee shall, upon NMED's request, allow for NMED's inspection/duplication of records required by this Discharge Permit and/or furnish to NMED copies of such records. [Subsection D of 20.6.2.3107 NMAC]
44.	MODIFICATIONS and/or AMENDMENTS – In the event the permittee proposes a change to the facility or the facility's discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the facility, the permittee shall notify NMED prior to implementing such changes. The permittee shall obtain approval (which may require modification of this Discharge Permit) by NMED prior to implementing such changes. [Subsection C of 20.6.2.3107 NMAC, Subsections E and G of 20.6.2.3109 NMAC]
45.	PLANS and SPECIFICATIONS – In the event the permittee is proposing to construct a wastewater system or change a process unit of an existing system such that the quantity or quality of the discharge will change substantially from that authorized by this Discharge Permit, the permittee shall submit construction plans and specifications to NMED for the proposed system or process unit prior to the commencement of construction. In the event the permittee implements changes to the wastewater system authorized by this Discharge Permit which result in only a minor effect on the character of the discharge, the permittee shall report such changes (including the submission of record drawings, where applicable) as of January 1 and June 30 of each year to NMED. [Subsections A and C of 20.6.2.1202 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
46.	CIVIL PENALTIES - Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or facilities, or any refusal or failure to provide NMED with records or information, may

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	subject the permittee to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10(C) and 74-6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to $10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the permittee waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10 and 74-6-10.1]
47.	CRIMINAL PENALTIES – No person shall: 1) make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained under the WQA; 2) falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained under the WQA; or 3) fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation. Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental impact is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily injury to any other person is guilty of a second degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]
48.	COMPLIANCE with OTHER LAWS - Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of the obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders.

#	**Terms and Conditions**
	[NMSA 1978, § 74-6-5.L]
49.	RIGHT to APPEAL - The permittee may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC within thirty days of the receipt of postal notice of this Discharge Permit and shall include a statement of the issues to be raised and the relief sought. Unless a timely petition for review is made, the decision of NMED shall be final and not subject to judicial review. [20.6.2.3112 NMAC, NMSA 1978, § 74-6-5.O]
50.	TRANSFER of DISCHARGE PERMIT - Prior to the transfer of any ownership, control, or possession of this facility or any portion thereof, the permittee shall: 1) notify the proposed transferee in writing of the existence of this Discharge Permit; 2) include a copy of this Discharge Permit with the notice; and 3) deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee. Until both ownership and possession of the facility have been transferred to the transferee, the permittee shall continue to be responsible for any discharge from the facility. [20.6.2.3111 NMAC]
51.	PERMIT FEES - Payment of permit fees is due at the time of Discharge Permit approval. Permit fees shall be paid in a single payment or shall be paid in equal installments on a yearly basis over the term of the Discharge Permit. Single payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date. Initial installment payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date; subsequent installment payments shall be remitted to NMED no later than the anniversary of the Discharge Permit effective date. Permit fees are associated with <u>issuance</u> of this Discharge Permit. Nothing in this Discharge Permit shall be construed as relieving the permittee of the obligation to pay all permit fees assessed by NMED. A permittee that ceases discharging or does not commence discharging from the facility during the term of the Discharge Permit shall pay all permit fees assessed by NMED. An approved Discharge Permit shall be suspended or terminated if the facility fails to remit an installment payment by its due date. [Subsection F of 20.6.2.3114 NMAC, NMSA 1978, § 74-6-5.K]

V. PERMIT TERM & SIGNATURE

EFFECTIVE DATE: [effective date]
TERM ENDS: [expiration date]

[Subsection H of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.I]

____

JERRY SCHOEPPNER
Chief, Ground Water Quality Bureau
New Mexico Environment Department

draft

New Mexico Environment Department Ground Water Quality Bureau
Discharge Permit Summary

Facility Information

Facility Name — Waste Isolation Pilot Plant (WIPP)
Discharge Permit Number — DP-831

Legally Responsible Party
Jose Franco, Manager
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221
(575) 234-7300

Treatment, Disposal and Site Information

Primary Waste Type — Domestic and Industrial
Facility Type — Federal Agency - U.S. Department of Energy

Evaporative Impoundment Locations

Domestic Wastewater

Type	Designation	Description & Comments
Settling Impoundment	Settling Lagoon 1	Formerly known as "Settling Pond 1A"; Primary treatment; Permitted 1 foot of freeboard.
Settling Impoundment	Settling Lagoon 2	Formerly known as "Settling Pond 2A"; Primary treatment; Permitted 1 foot of freeboard.
Polishing Impoundment	Polishing Lagoon 1	Formerly known as "Polishing Pond 1B"; Passive secondary treatment; Permitted 1 foot of freeboard.
Polishing Impoundment	Polishing Lagoon 2	Formerly known as "Polishing Pond 2B"; Passive secondary treatment; Permitted 1 foot of freeboard.
Evaporation Impoundment	Effluent Lagoon A	Formerly known as "Evaporation Pond A"; Effluent storage; Disposal by evaporation; Permitted 1 foot of freeboard.
Evaporation Impoundment	Effluent Lagoon B	Formerly known as "Evaporation Pond B"; Effluent storage; Disposal by evaporation; Permitted discharges are domestic waste, brine, purge waters, and miscellaneous industrial non-hazardous wastewater; Permitted 1 foot of freeboard.
Evaporation Impoundment	Effluent Lagoon C	Formerly known as "Evaporation Pond C"; Effluent Storage; Disposal by evaporation; Permitted discharges are domestic waste, brine, purge waters, and miscellaneous industrial non-hazardous wastewater; Permitted 1 foot of freeboard.

Storm Water Control

Type	Designation	Description & Comments
Storm Water Impoundment	Storm Water Pond 1	Formerly known as "Storm Water Intrusion Pond 1"; Receives clean non-contact storm water from paved areas, roofs, air conditioner condensate, and water from domestic water lines; Disposal by evaporation.

Storm Water Impoundment	Storm Water Pond 2	Formerly known as "Storm Water Intrusion Pond 2"; Receives clean non-contact storm after from the facilities paved areas, roofs, air conditioner condensate, and draining domestic water lines; Disposal by evaporation.
Storm Water Impoundment	Storm Water Pond 3	Formerly known as "Storm Water Intrusion Pond A"; Receives clean non-contact storm after from the facilities paved areas, roofs, air conditioner condensate, and draining domestic water lines; Disposal by evaporation.

Industrial Wastewater

Type	Designation	Description & Comments
Evaporation Impoundment	Evaporation Pond H-19	Permitted discharges are brine, purge waters, and miscellaneous industrial non-hazardous wastewater; 346, 085 gallons (with one foot of freeboard); Disposal by evaporation.
Evaporation Impoundment	Salt Storage Pond 1	Formerly known as "Salt Pile Evaporation Pond"; 1,677,633 gallons (with one foot freeboard); Disposal by evaporation
Evaporation Impoundment	Salt Storage Pond 2	Formerly known as "Salt Storage Extension Basin I"; Constructed using 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system;1,273,601 gallons (with one foot of freeboard); Disposal by evaporation.
Evaporation Impoundment	Salt Storage Pond 3	Formerly known as "Salt Storage Extension Basin II"; Constructed using 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system; 1,273,601 gallons (with one foot of freeboard); Disposal by evaporation.

Salt Storage Locations

Type	Designation	Description & Comments
Salt Pile	Salt Cell 1	Formerly known as "Salt Pile"; Inactive; Approximately 18.8 acres; graded to 2% slope covered with sand and 60 mil HDPE liner and with 2 ft. of native soil; Seeded; Run-off collects in to Salt Storage Pond 1.
Salt Pile	Salt Cell 2	Formerly known as "Salt Extension Cell A"; Active; 6.2 acres; Run-off area of 326,350 sq. ft.; Constructed using of six inch prepared subgrade, 60-mil HDPE liner, 200-mil drainage layer, eight oz. geotextile fabric covered with 2 ft. of native soil; Runoff collects in Storage Pond(s) 2 and/or 3.

Salt Pile	Salt Cell 3	Formerly known as "Salt Extension Cell B"; Active; 5.2 acres; run-off area of 272,850 sq. ft.; Constructed using of six inch prepared subgrade, 60-mil HDPE liner, 200-mil drainage layer, eight oz. geotextile fabric covered with 2 ft. of native soil; Runoff collects in Storage Pond(s) 2 and/or 3.
Salt Pile	Site Preliminary Design Validation Pile	Closed in 2000; Covered with a geosynthetic liner, 6 inches of bedding material, and three feet of soil; Seeded.

Flow Metering Locations

Type	Designation	Description & Comments
Totalizing Flow Meter	Ultrasonic Flow Meter	Located at the facility Pump House – water supply; Estimates domestic wastewater discharged to the facultative sewage impoundment system.
Primary Measurement Device	Time Recorder	Estimates miscellaneous wastewater discharged to Evaporation Pond H-19 and Facultative Lagoon System.

Ground Water Monitoring Locations

Type	Designation	Description & Comments
Monitoring Well	C-2505	Quarterly depth to water measurement.
Monitoring Well	C-2506	Quarterly depth to water measurement.
Monitoring Well	C-2507	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Monitoring Well	C-2811	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Monitoring Well	WQSP-6A	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO_4, Cl, TDS, TKN and NO_3.
Piezometer	PZ-4	Quarterly depth to water measurement.
Piezometer	PZ-5	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.

Piezometer	PZ-6	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-7	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-8	Quarterly depth to water measurement.
Piezometer	PZ-9	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-10	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-11	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-12	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-13	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-14	Quarterly depth to water measurement.
Piezometer	PZ-15	Quarterly depth to water measurement.

Depth-to-Ground Water 164 feet
Total Dissolved Solids (TDS) 3,400 mg/L

Permit Information

Application Received May 10, 2013
Public Notice Published [not yet published]
Discharge Permit Issued [effective date]
Discharge Permit Term Ends [term end date]
Permitted Discharge Volume Domestic – 23,000 gallons per day
Industrial – 4,224,835 gallons per day

NMED Contact Information

Mailing Address	Ground Water Quality Bureau P.O. Box 5469 Santa Fe, New Mexico 87502-5469
GWQB Telephone Number	(505) 827-2900
NMED Lead Staff	John Hall
Lead Staff Telephone Number	(505) 827-1049
Lead Staff Email	john.hall@state.nm.us

New Mexico Environment Department
Ground Water Quality Bureau

Inspection Report

Inspection Date: 1/14/2014 **DP #:** 831
Facility Name: Waste Isolation Pilot Plant (WIPP)

Facility Contact Information – Scheduling Inspection

☑ **Scheduled Inspection - provide contact information** ☐ **Unannounced Inspection**

Person Contacted: George Basabilvazo

Phone Number: 575-234-7488

Facility Description

Waste Type: Dom - WW Impoundments, Mining - Salt Tailing Impoundments, Storm Water - Impoundments

Directions to Facility: From Carlsbad, take Hwy. 285 to 31. Go East on 31 for approximately 8 miles, and drive past the salt lake. Take 128 East for approximately 10 miles. Turn left on to WIPP Rd. and drive for approximately 5 miles. Facility map is attached.

Inspection Information

Start Time: 1:30 **End Time:** 5:00

NMED Inspector(s): Melissa Halick, Russell Isaac

Verify that NMED identification was presented: ☑ Yes ☐ No

Facility Representative(s) present during the Inspection/Discussion: George Basabilvazo, and two environmental contractors for WIPP

Reason for Inspection: permit pre-approval

If "other", describe reason for inspection:

Discussion, Observations and Information Obtained

Initial discussion included a brief overview of the site. The facility is on 34 acres with one disposal and three storm water control impoundments, three impoundments that collect runoff from three salt tailing piles, and an evaporative lagoon system (7 impoundments). The facility has four shafts that have been excavated to approximately 2,000 below surface – one air-intake shaft, one salt shaft, one exhaust shaft, and one disposal shaft that contains TRU waste (active disposal).

Storm Water Impoundments

Evaporation Pond A – will be renamed Storm Water Pond #3 in renewal permit. Some cattails in lagoon (non-root forming) - will not damage 60 mil HDPE liner. Can see that minor repairs have been made near the top of the impoundment. Collects storm water from the west 1/3 of facility (approximately 12 acres) – fresh water. Liner is in good condition, was installed ~2006.

Pond #1 – will be renamed Storm Water Pond #1 in the renewal permit. Liner is in good condition.

Pond #2 – will be renamed Storm Water Pond #2 in the renewal permit. Liner is in good condition.

H-19 – approximately 1 foot of sediment in the corners of impoundment. Accepts purge water and non-hazardous water from exhaust shaft (after analyzed). Impoundment is in decent condition with no visible damage. Very low liquid level. Permittee stated that they may look into reclamation and closure if they chose not to replace the pond liner in the future. Not essential for facility operations.

Salt Piles and Salt Pile Impoundments

SPEP (Impoundment) – will be renamed Salt Storage Pond #1 in renewal permit. Collects runoff from geosynthetic covered Salt Pile. Lined ditch that is south of the Capped Salt Pile drains into the SPEP. Liner is intact and clear of brush. Liquid level was low.

SSEB #1 (Impoundment) – will be renamed Salt Storage Pond #2 in renewal permit. Double lined impoundment with leak detection system. Drains to an additional storage pond to the west (SSEB #2) if permitted freeboard cannot be maintained. Liquid level was not approaching freeboard. A large volume of salt deposits was present. Liner is in good condition.

SSEB #2 (Impoundment) – will be renamed Salt Storage Pond #3 in renewal permit. Double lined impoundment with leak detection system. Liquid level was very low with minimal salt deposits. Site personnel mentioned that the sump pumps are checked every quarter and that the liquid collected between the liners is pumped back into the impoundments. Impoundment was constructed to collect overflow from SSEB #1.

Capped Salt Pile – will be renamed Salt Cell #1 in renewal permit. Area has been reseeded and berms on top of pile are in good condition. The topographic low area at the top of the pile drains to a lined conveyance that discharges to the SPEP. Pile was reconfigured to minimize erosion and runoff. During inspection erosion was minimal.

SEP A (Salt Pile) – will be renamed Salt Cell #2 in the renewal permit. Salt pile is no longer active. Lined ditch north of the salt pile drains to SSEB #1. Not reseeded or capped with geosynthetic liner.

SEP B (Salt Pile) – will be renamed Salt Cell #3 in the renewal permit. Active salt pile – salt tailings transferred to this location as excavation activities continue. Currently, an unrelated company (Texas) is hauling away salt from active pile for free.

Domestic Wastewater Impoundments

2 Primary Lagoons (1A and 1B) – low volume of accumulated sludge. Liquid levels were low – approximately 5 feet of freeboard. Site personnel mentioned that the ponds are inspected daily as part of the facility wastewater operations. They also estimate wastewater discharge using the water supply for the facility – no irrigation at the facility. Liners are in good condition.

2 Polishing Lagoons (2A and 2B) – liners are in good condition. Clear of brush.

3 Evaporation Lagoons (3A, 3B, and 3C) – Evaporation Pond A is permitted to take additional water from other resources – storm water, purge water, processing water, etc. Documented in DP-file. Evaporation Ponds 3B and 3C are not permitted to accept additional liquid generated at the facility. Liquid levels in all evaporation lagoons were very low. Some deposits within the evaporation lagoons appear to be salt deposits (most likely from the high TDS water supply). Sand bags were placed at the bottom of Evaporation Pond 3C to hold down the liner (not enough volume).

The wastewater treatment area was surrounded by locked fences with signs displayed in English and Spanish approximately every 10 feet.

Photographic Documentation

Photos Taken? ☑ Yes - see attached ☐ No

Sample Information

Samples Collected? ☐ Yes ☑ No

Samples Collected by: Choose an item.

Sample Id #s and locations:

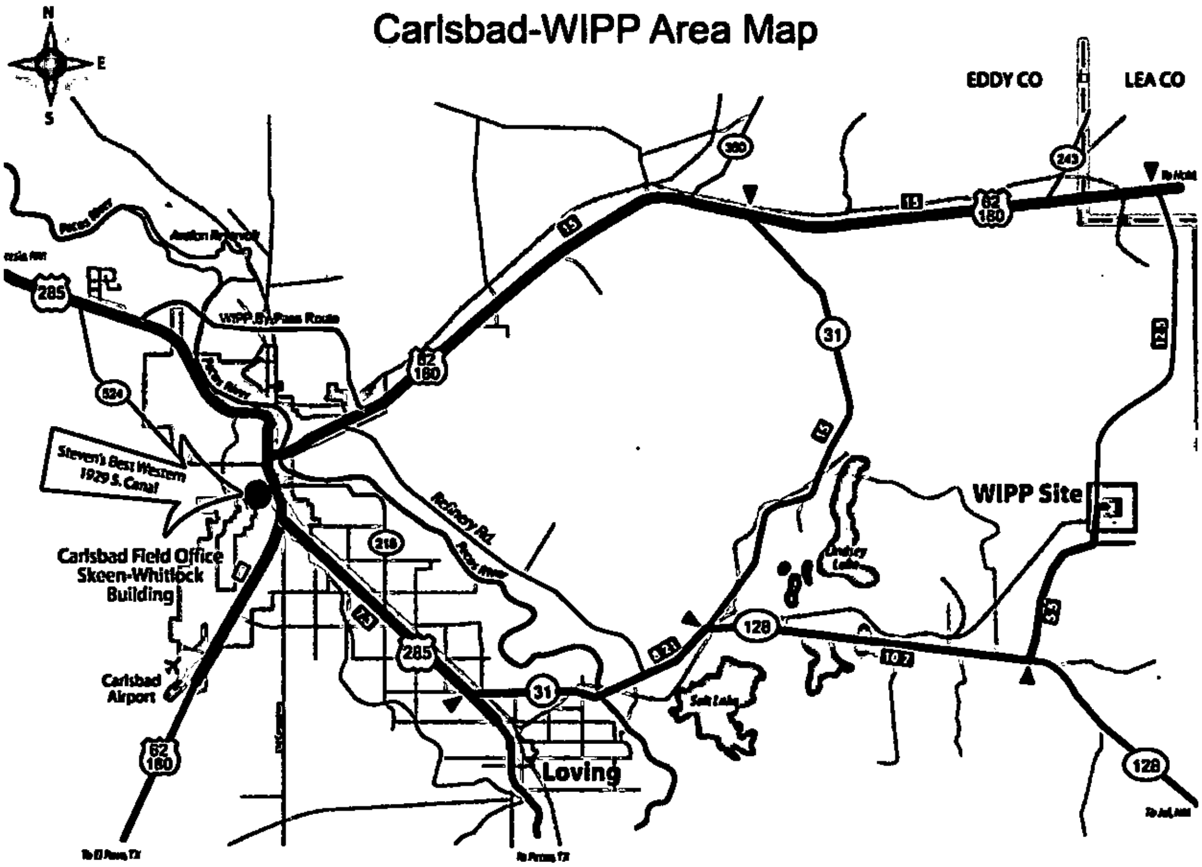
Were samples split between permittee and NMED? ☐ Yes ☐ No ☑ N/A

Did the Facility Representative request copies of NMED's sampling results? ☐ Yes ☐ No ☑ N/A

Monitoring Well Camera Inspection

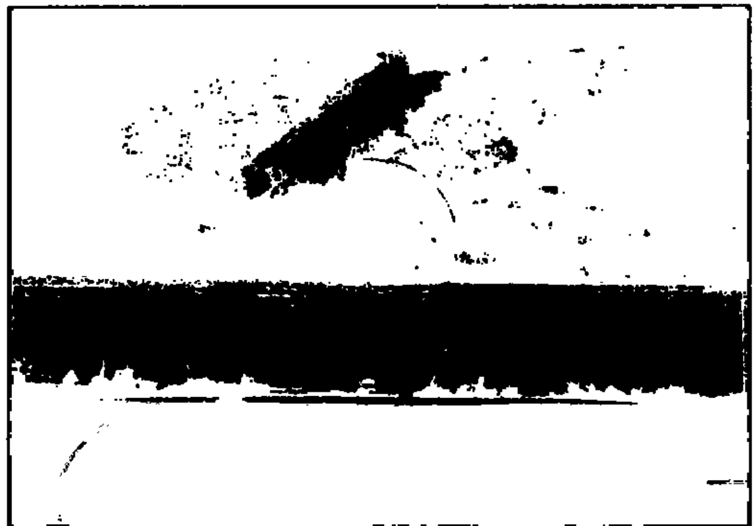
Monitoring well camera inspection conducted? ☐ Yes - see attached report(s) ☑ No

Initials of Report Preparer: MAH

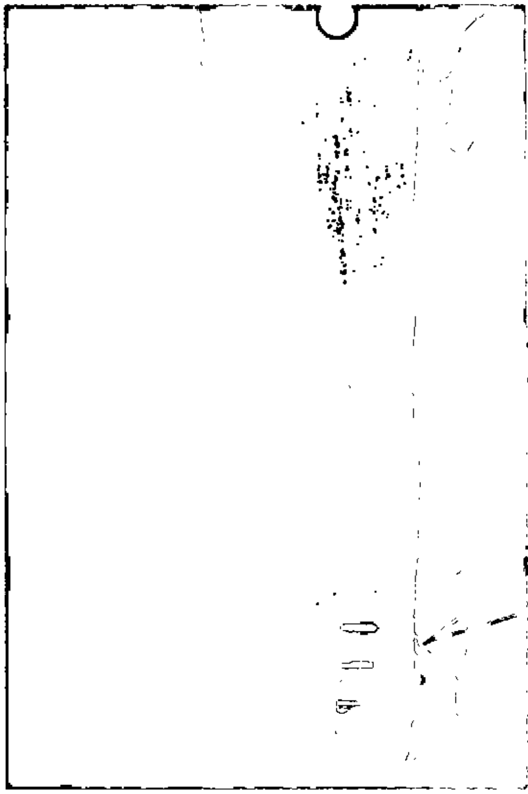

Carlsbad-WIPP Area Map
N
E
S
EDDY CO
LEA CO
WIPP Site
Steven's Best Western 1829 S. Canal
Carlsbad Field Office Skeen-Whitlock Building
Carlsbad Airport
Loving
WIPP By-Pass Route
Refinery Rd.
Pecos River
Salt Lake
285
62 180
31
128
216
524
360
243

Salt Pile evap. pond - New name will be Salt Storage Pond#1 - West of ~~on~~ capped salt pile.

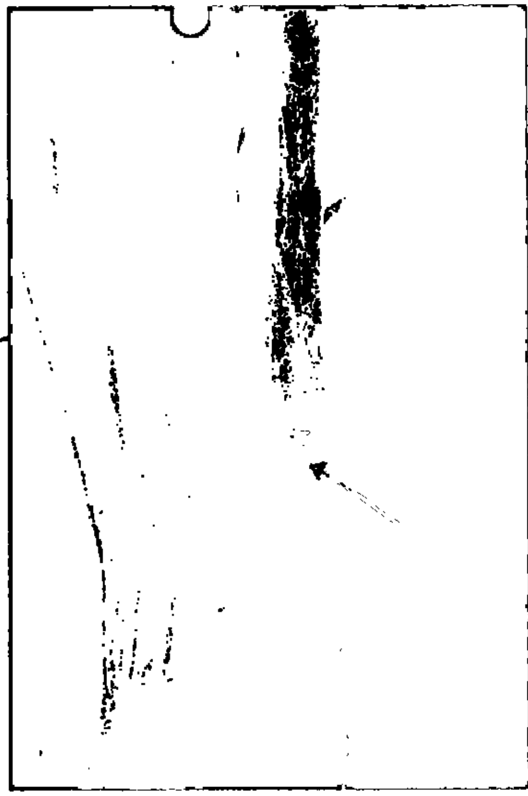
Storm water runoff impoundment - Stormwater pond #3 Westside of facility - Formerly evap. pond A



Lined drainage conveyance from Salt storage pile to SPEP. drains top of salt pile.

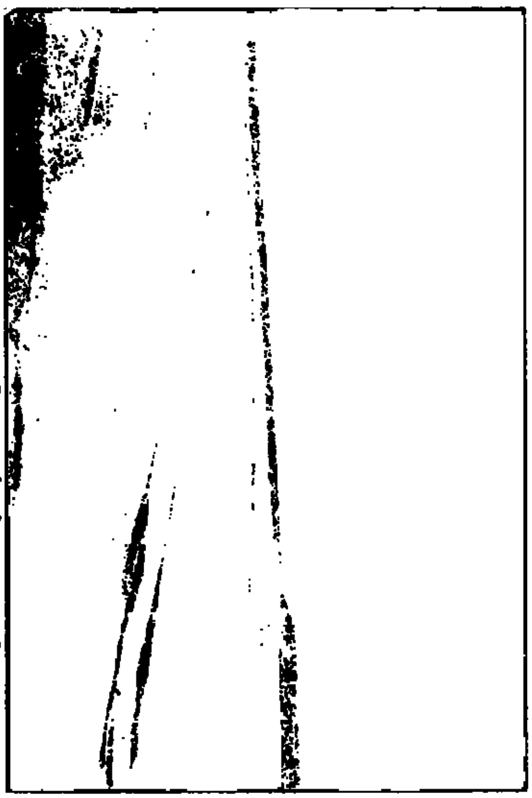


same PZ

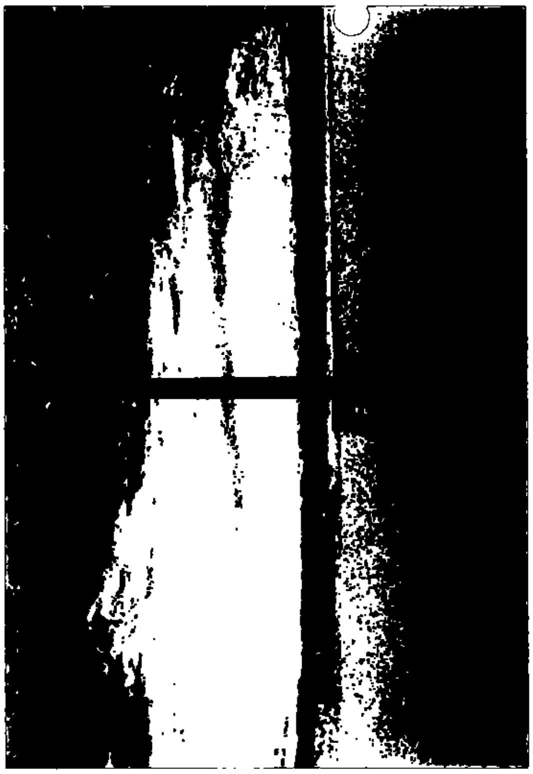


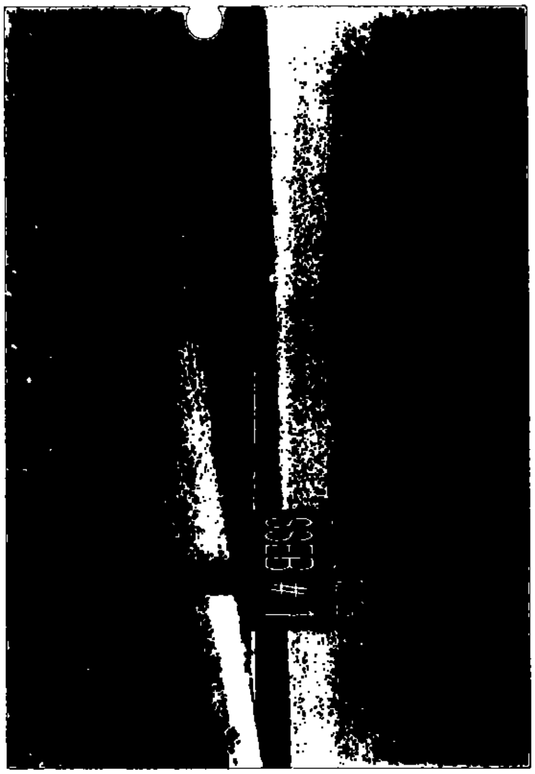
PZ SW of to corner of SSEB

Salt storage extension Basin - West of Cell A of Salt storage extension.



SSEB#1 drains runoff from cell A+B SSE piles.

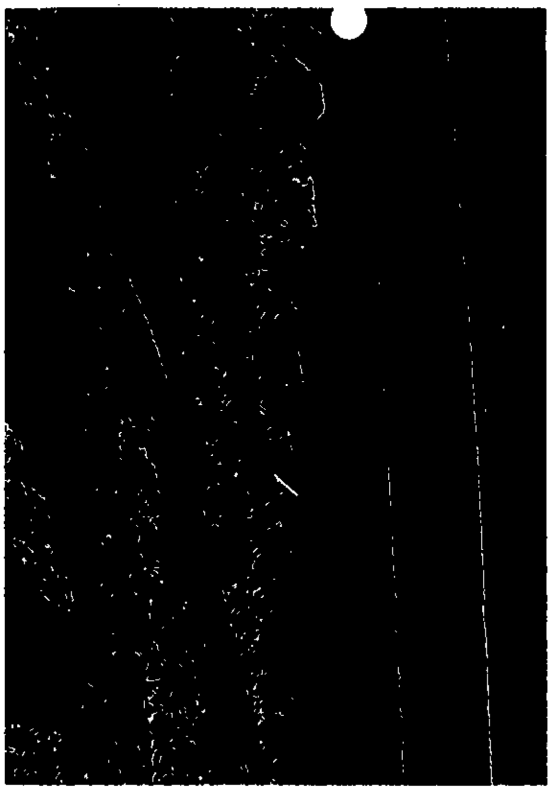


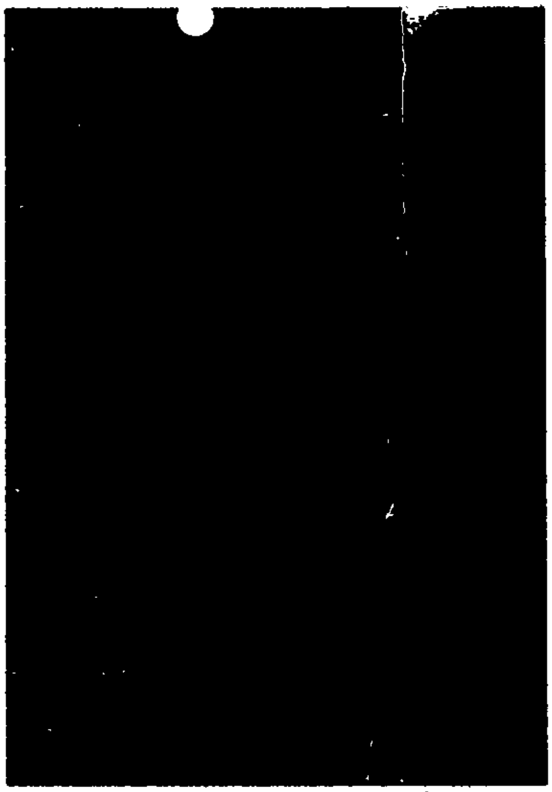


Salt Precipitating on drainage Pipe

lined ditch on North side of Cell A SSE pile.

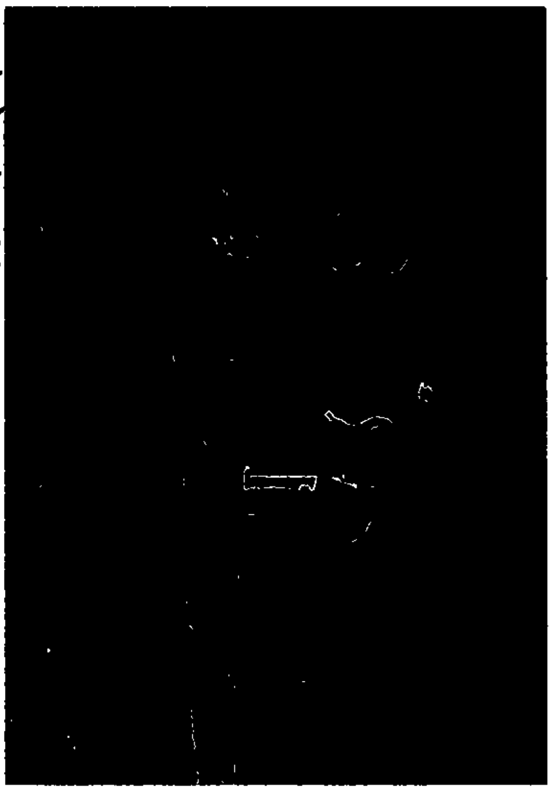
lined ditch draining to evap salt pile ponds





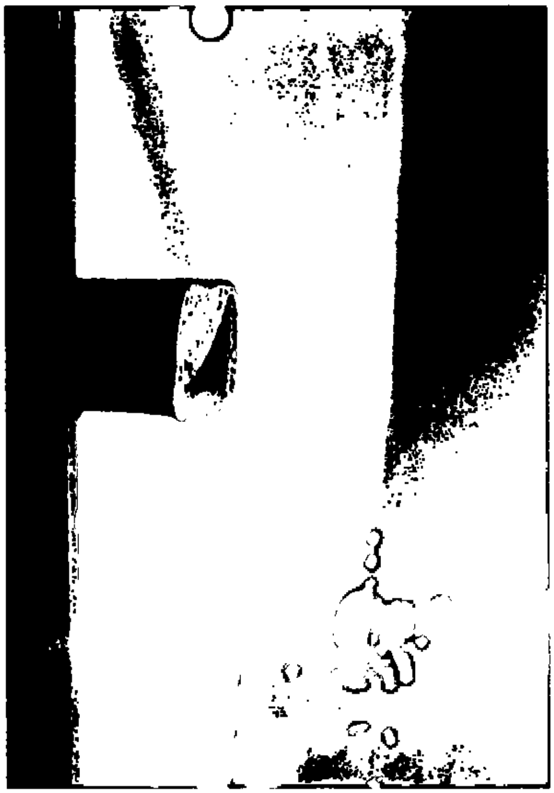
Evap ponds 2 & 1
stormwater runoff impoundments

inside fenced ww lagoon area

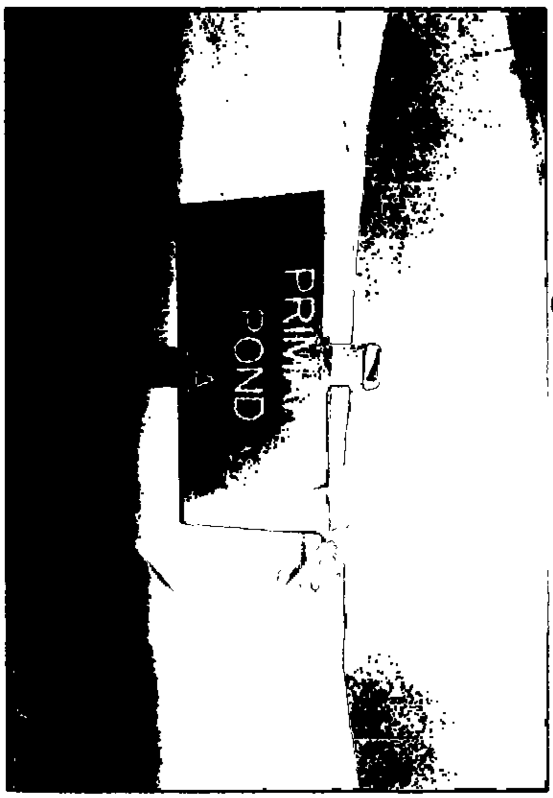


Pipe - sewage for primary pond 1A

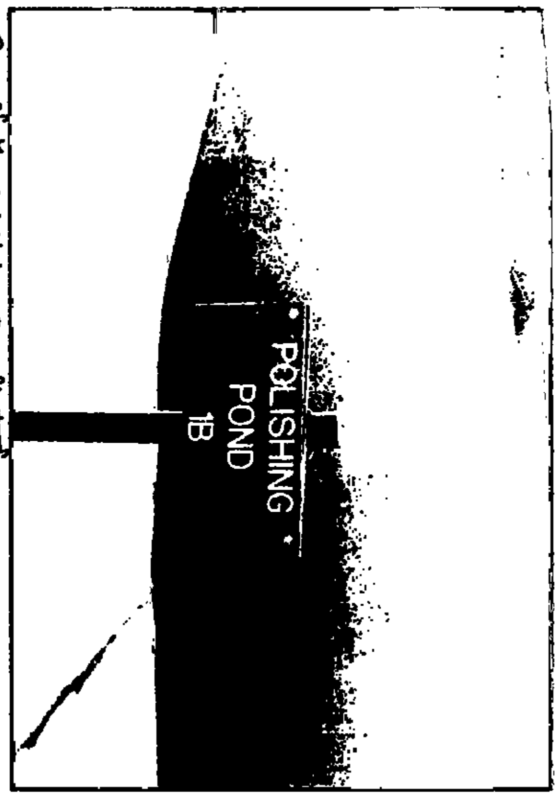
2



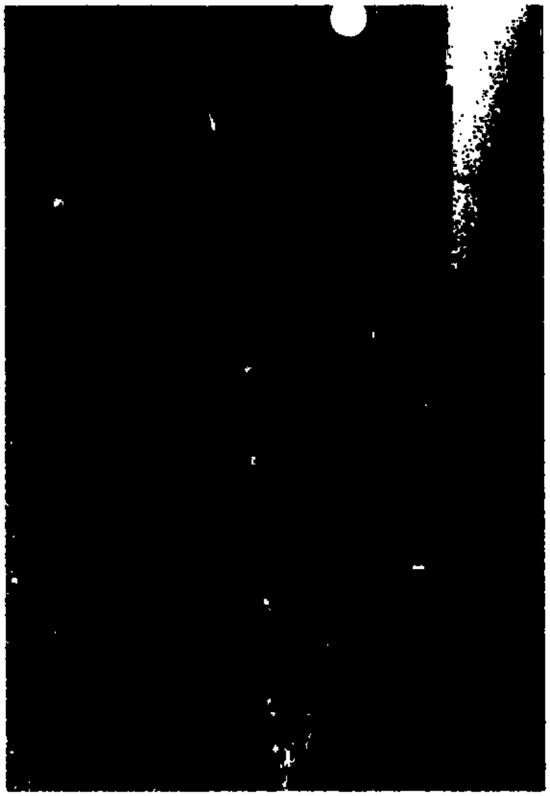
2A



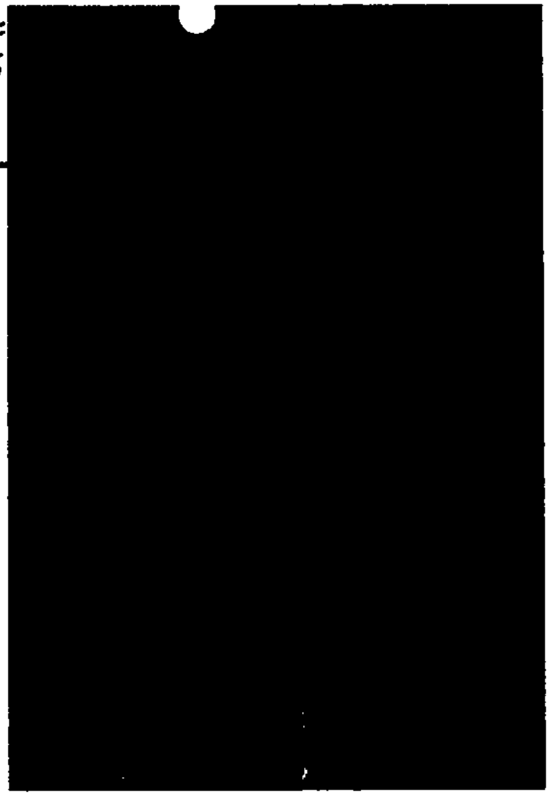
One of the polishing ponds



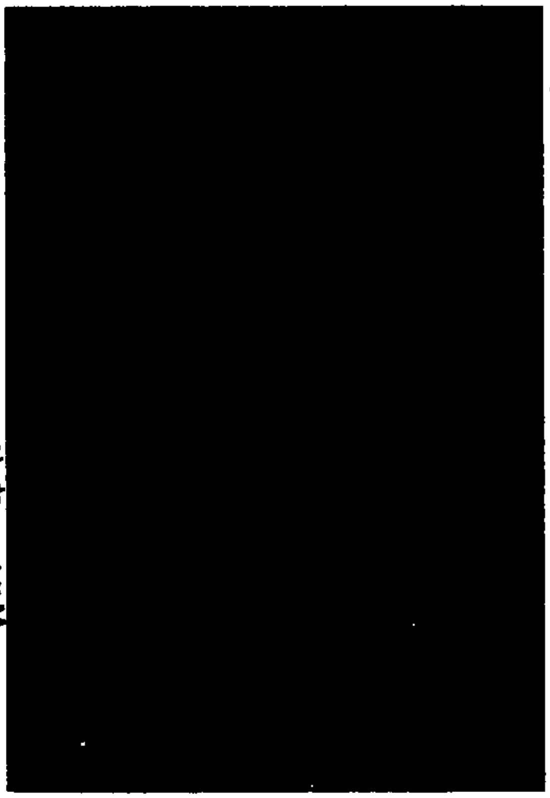
Sewage lagoon Evap Pond #3



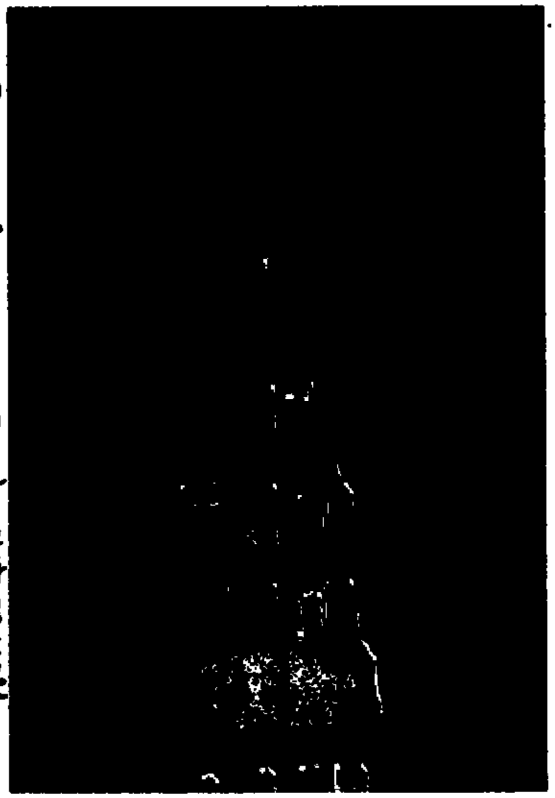
H-19 pond



Picture of WIPP layout - photo on wall.



Picture of a room in panel - photo on wall



Halick, Melissa, NMENV

From: Halick, Melissa, NMENV
Sent: Thursday, January 02, 2014 9:18 AM
To: 'Basabilvazo, George - DOE'
Subject: RE: map

Hi George,

Thanks for sending the map and directions. I will touch base with you on January 13, 2014 to confirm our meeting/tour.

Kindest regards,
Missy

Missy Halick
Geoscientist
New Mexico Environment Department
Ground Water Quality Bureau - Pollution Prevention Section

1190 St. Francis Dr.
PO Box 5469
Santa Fe, NM 87501
O: 505.827.1046; F: 505.827.2965

From: Basabilvazo, George - DOE [mailto:George.Basabilvazo@wipp.ws]
Sent: Tuesday, December 31, 2013 10:48 AM
To: Halick, Melissa, NMENV
Subject: map

<<Carlsbad-WIPP Map>>

Attached is a map for your use. There are two ways to access the WIPP site. The dark blue highlight on the map is for the southern access and is used by most WIPP workers the drive in from Carlsbad. I recommend you initially try the northern access route it is four lane to the WIPP turn off. The northern access is via 62/180 to Hobbs and the WIPP turn off is about 30 miles east of Carlsbad. Once your turn south on the WIPP access road the WIPP Facility is located about 12.5 miles south of the turn off. I look forward to meeting you and showing you the surface areas around WIPP. The traffic around southeast New Mexico (e.g., Carlsbad and WIPP) is very heavy with oil and gas traffic so please use extra caution and I recommend driving with your headlights on.

If you have any question please call.

Best regards,

George

Halick, Melissa, NMENV

From: Basabilvazo, George - DOE <George.Basabilvazo@wipp.ws>
Sent: Tuesday, December 31, 2013 10:48 AM
To: Halick, Melissa, NMENV
Subject: map
Attachments: Carlsbad-WIPP Map.pdf

<<Carlsbad-WIPP Map>>

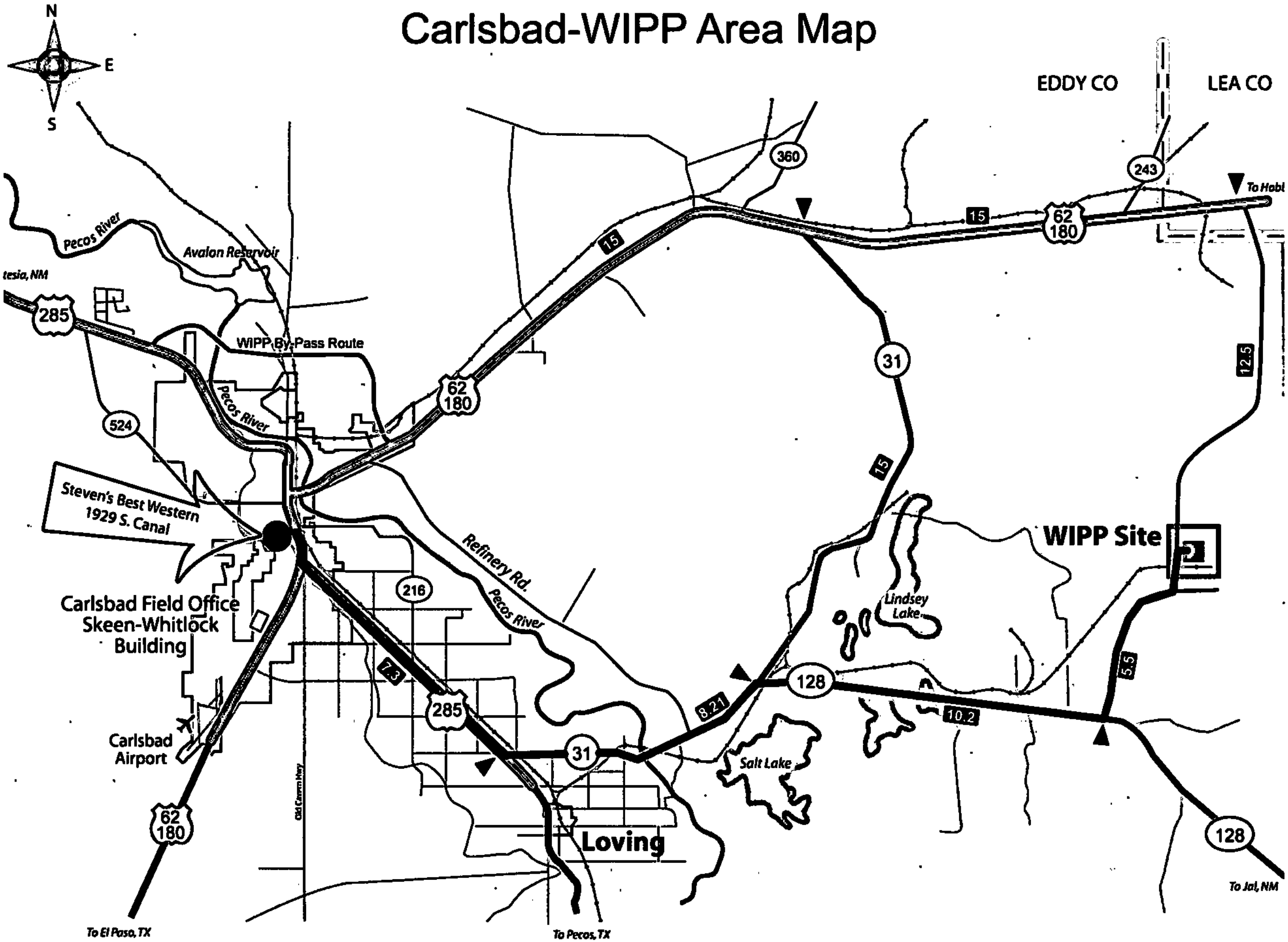
Attached is a map for your use. There are two ways to access the WIPP site. The dark blue highlight on the map is for the southern access and is used by most WIPP workers the drive in from Carlsbad. I recommend you initially try the northern access route it is four lane to the WIPP turn off. The northern access is via 62/180 to Hobbs and the WIPP turn off is about 30 miles east of Carlsbad. Once your turn south on the WIPP access road the WIPP Facility is located about 12.5 miles south of the turn off. I look forward to meeting you and showing you the surface areas around WIPP. The traffic around southeast New Mexico (e.g., Carlsbad and WIPP) is very heavy with oil and gas traffic so please use extra caution and I recommend driving with your headlights on.

If you have any question please call.

Best regards,

George

Carlsbad-WIPP Area Map



Halick, Melissa, NMENV

From:	Halick, Melissa, NMENV
Sent:	Thursday, January 02, 2014 8:43 AM
To:	'Basabilvazo, George - DOE'
Subject:	RE: public notice

Hi George,

Thanks for sending the PN-1 materials. This will complete the requirements as listed in 20.6.2.3108. I will update the file.

Happy New Year!

Missy

Missy Halick
Geoscientist
New Mexico Environment Department
Ground Water Quality Bureau - Pollution Prevention Section

1190 St. Francis Dr.
PO Box 5469
Santa Fe, NM 87501
O: 505.827.1046; F: 505.827.2965

From: Basabilvazo, George - DOE [mailto:George.Basabilvazo@wipp.ws]
Sent: Tuesday, December 31, 2013 9:28 AM
To: Halick, Melissa, NMENV
Subject: public notice

Melissa,

Attached is the letter to Clint in June 2013. When I reviewed the records package on Monday 12/23/13 I noticed that the form was not signed. I am including the signed form. Please contact me with any questions.

Best regards,

<<letter to Cliint June 2013.pdf>> <<13-0807 Affidavit of Public Notice Completion.pdf>>

George T. Basabilvazo

Director, Office of Environment, Safety & Health

DOE/Carlsbad Field Office

P.O. Box 3090

Carlsbad, New Mexico 88221

Ph: (575) 234-7488

Cell: (575) 706-0083

Halick, Melissa, NMENV

From: Basabilvazo, George - DOE <George.Basabilvazo@wipp.ws>
Sent: Tuesday, December 31, 2013 9:28 AM
To: Halick, Melissa, NMENV
Subject: public notice
Attachments: letter to Cliint June 2013.pdf; 13-0807 Affidavit of Public Notice Completion.pdf

Melissa,

Attached is the letter to Clint in June 2013. When I reviewed the records package on Monday 12/23/13 I noticed that the form was not signed. I am including the signed form. Please contact me with any questions.

Best regards,

GROUND WATER

<<letter to Cliint June 2013.pdf>> <<13-0807 Affidavit of Public Notice Completion.pdf>>

JAN 01 2014

BUREAU

George T. Basabilvazo

Director, Office of Environment, Safety & Health

DOE/Carlsbad Field Office

P.O. Box 3090

Carlsbad, New Mexico 88221

Ph: (575) 234-7488

Cell: (575) 706-0083

AFFIDAVIT OF PUBLIC NOTICE COMPLETION

Renewal Permit

DP-831 (cm)

I certify, under penalty of law, that I have fulfilled the Ground Water Discharge Permit public notice requirements of Section 20.6.2.3108(C)1 and 2 NMAC.

✓ **I placed a synopsis of the public notice in English and in Spanish in a newspaper approved by NMED. A copy of the newspaper page containing the synopsis is enclosed.**

✓ **I sent the public notice flyer via certified mail, return receipt requested, to *(check box if applicant is not the owner)*:**

☐ **owner of the property of the proposed discharge locations – mailing address is enclosed.**

I am aware that there are significant penalties for false certification including the possibility of fines.

George T. Basabilvazo
Signature of Applicant

12-23-13
Date

George T. Basabilvazo
Printed Name

Director
Title

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUN 2 7 2013

Mr. Clint Marshall, Program Manager
Mining Environmental Compliance Section
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

Subject: Discharge Permit 831 Renewal Application – Public Notice Requirement Submission

Re: *Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant*; letter from Jerry Schoeppner, Chief Ground Water Quality Bureau to Mr. Jose Franco, Manager, Waste Isolation Pilot Plant, received on June 3, 2013

Dear Mr. Marshall:

The purpose of this letter is to provide you documentation that the Public Notice for the Waste Isolation Pilot Plant Discharge Permit 831 renewal application was published in the Carlsbad Current-Argus on June 13, 2013, and the signed Affidavit of Public Notice Completion. This submission to you satisfies the requirements noted in the *Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant* received on June 3, 2013, and the public notice of permit renewal as specified in 20.6.2.3108.D NMAC.

If you have any questions regarding this transmittal, please contact me at (575) 234-7488.

Sincerely,

George T. Basabilvazo

George T. Basabilvazo, Director
Office of Environmental, Safety, and Health

Enclosures (2)

cc: w/o enclosures

J. Kieling, NMED	*ED
T. Kliphuis, NMED	ED
J. Schoeppner, NMED	ED
CBFO M&RC	

*ED denotes electronic distribution

CBFO:OESH:GTB:ANC:13-0748:UFC 5486.00

AFFIDAVIT OF PUBLIC NOTICE COMPLETION

Renewal Permit

DP-831 (cm)

I certify, under penalty of law, that I have fulfilled the Ground Water Discharge Permit public notice requirements of Section 20.6.2.3108(C)1 and 2 NMAC.

- ✓ I placed a synopsis of the public notice in English and in Spanish in a newspaper approved by NMED. A copy of the newspaper page containing the synopsis is enclosed.
- ✓ I sent the public notice flyer via certified mail, return receipt requested, to *(check box if applicant is not the owner)*:
  - ☐ owner of the property of the proposed discharge locations – mailing address is enclosed.

I am aware that there are significant penalties for false certification including the possibility of fines.

Signature of Applicant	*Date*
Printed Name	*Title*

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JAN 01 2014
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PUBLIC NOTICE / NOTICIA PÚBLICA

Discharge Permit Application / Aplicación para Permiso de Descargue: For up to 23,000 gallons per day of domestic wastewater and 2,752,831 gallons per day of stormwater to a treatment and disposal system / Para un máximo de 23,000 galones por día de aguas residuals domésticas y 2,752,831 galones por día de aguas lluvias a un sistema de tratamiento y disposición

Applicant & Discharge Location / Solicitante & Sitio de Descarrga: Waste Isolation Pilot Plant (WIPP), on the Jal Highway, approximately 26 miles southeast of Carlsbad

For More Information / Para Más Información (DP-831):
Ground Water Quality Bureau / Sección de Agua Subterránea
NM Environment Department / Departamento del Medio Ambiente
(505) 827-2900
www.nmenv.state.nm.us/gwb (public notices)

Information in this public notice was provided by the applicants and will be verified by NMED during the permit application review process.

Halick, Melissa, NMENV

From:	Kliphuis, Trais, NMENV
Sent:	Thursday, December 12, 2013 4:07 PM
To:	Shore, Lawrence, NMENV
Cc:	Halick, Melissa, NMENV; Vollbrecht, Kurt, NMENV
Subject:	RE: WIPP GW Permit

Thanks for the information Larry. This sounds interesting. We are really swamped with big permit modification that is going to hearing. When a have some more time I will follow up with you.

Happy holidays.

Trais Kliphuis
WIPP Staff Manager
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive E, Building 1
Santa Fe, New Mexico 87505

Office: 505-476-6051
Front Desk: 505-476-6000

From: Shore, Lawrence, NMENV
Sent: Thursday, December 12, 2013 2:19 PM
To: Kliphuis, Trais, NMENV
Cc: Halick, Melissa, NMENV; Vollbrecht, Kurt, NMENV
Subject: RE: WIPP GW Permit

Hi Trais,

I don't know if you are aware of this but Intrepid Potash has applied to modify their DP-1681 to increase their brine injection rate from 2000 gpm to 3000 gpm. They intend to install three new brine production wells to generate this brine and the production wells will be screened across both the Culebra and the Magenta dolomites. I've attached their permit application that includes a map of where they intend to install these wells (IP-WS 5,6&7 on Figure PM-06). Their new brine mixture will then be sourced from the 1) production wells 1-4, 2)tailings brine recovery water (TBR) discharges from their tailings pile, and 3) production wells IP-WS-5,6&7. I wanted to give you a heads up on this and ask that you let me know if any concerns arise.

Also, I have been toying with the idea of incorporating WIPP's monitoring wells and water quality data into a common GIS database with Intrepid and Mosaic's monitoring wells. This would be a common GIS database that Melissa and HWB and others could access. I recognize from my reading of the WIPP compliance certification documents that WIPP or Sandia Labs is using Arc Info (at least they budgeted to purchase the software) and I am wondering whether WIPP or one of their contractors has actually created a GIS database with well locations and other topology? If they have, I would like to ask if you could put me in contact with the persons who would be able to give me access to their GIS files. If their data management system has not evolved to that stage yet, I 'd like to suggest that this might be one of the problems that our various agencies could work on collaboratively. Perhaps in the later part of January we could get together and talk about this and it would be good to include Melissa and someone from the SEO and the ISC as well.

Thanks,

Larry

From: Kliphuis, Trais, NMENV
Sent: Thursday, December 12, 2013 9:55 AM
To: Shore, Lawrence, NMENV
Subject: RE: WIPP GW Permit

Thanks Larry!

From: Shore, Lawrence, NMENV
Sent: Thursday, December 12, 2013 9:42 AM
To: Kliphuis, Trais, NMENV
Cc: Halick, Melissa, NMENV
Subject: RE: WIPP GW Permit

Hi Trais,
Melissa Halick is the person assigned to the WIPP DP. Her phone # is 827-1046, and she is in today.
Larry Shore

From: Kliphuis, Trais, NMENV
Sent: Thursday, December 12, 2013 9:22 AM
To: Shore, Lawrence, NMENV
Subject: WIPP GW Permit
Importance: High

Hi Larry,

Would you send me the contact for the WIPP GW permit? I'd like to touch base with that person. Thanks

Trais Kliphuis
WIPP Staff Manager
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive E, Building 1
Santa Fe, New Mexico 87505

Office: 505-476-6051
Front Desk: 505-476-6000

Halick, Melissa, NMENV

From: Halick, Melissa, NMENV
Sent: Tuesday, December 10, 2013 1:43 PM
To: 'George.Basabilvazo@wipp.ws'
Subject: PN-1 Materials and Site Tour/Inspection

Importance: High

Hi George,

Hopefully, I caught you before your long vacation. Just a quick reminder to email or mail the PN-1 materials to me, so that we can proceed with the discharge permit renewal.

Also, I was hoping to come for a site visit on Tuesday, January 14, 2014 around 1:30-2:00 pm. Will this time and date work for you?

Kindest regards,
Missy

Missy Halick
Geoscientist
New Mexico Environment Department
Ground Water Quality Bureau - Pollution Prevention Section

1190 St. Francis Dr.
PO Box 5469
Santa Fe, NM 87501
O: 505.827.1046; F: 505.827.2965

Halick, Melissa, NMENV

From:	Halick, Melissa, NMENV
Sent:	Tuesday, December 03, 2013 2:20 PM
To:	'Basabilvazo, George - DOE'
Subject:	RE: test

Hi George,

Thanks for calling and updating me on WIPP's progress. I will try my best to review all the files, so that when we schedule a tour early next year (possibly late January), I will be informed on the present status and regulatory requirements.

Kindest regards,
Missy

Missy Halick
Geoscientist
New Mexico Environment Department
Ground Water Quality Bureau - Pollution Prevention Section

1190 St. Francis Dr.
PO Box 5469
Santa Fe, NM 87501
O: 505.827.1046; F: 505.827.2965

From: Basabilvazo, George - DOE [mailto:George.Basabilvazo@wipp.ws]
Sent: Tuesday, December 03, 2013 2:10 PM
To: Halick, Melissa, NMENV
Subject: test

Melissa,

Is was a pleasure to visit with you today. I apologize for not getting back to you sooner. I will forward the information we discussed on the phone in a subsequent e-mail. My contact information is located below and please do not hesitate to call me with any questions.

Best regards,

George T. Basabilvazo

Director, Office of Environment, Safety & Health

DOE/Carlsbad Field Office

P.O. Box 3090

Carlsbad, New Mexico 88221

Ph: (575) 234-7488

Cell: (575) 706-0083

Halick, Melissa, NMENV

From: Basabilvazo, George - DOE <George.Basabilvazo@wipp.ws>
Sent: Tuesday, December 03, 2013 2:10 PM
To: Halick, Melissa, NMENV
Subject: test

Melissa,

Is was a pleasure to visit with you today. I apologize for not getting back to you sooner. I will forward the information we discussed on the phone in a subsequent e-mail. My contact information is located below and please do not hesitate to call me with any questions.

Best regards,

George T. Basabilvazo

Director, Office of Environment, Safety & Health

DOE/Carlsbad Field Office

P.O. Box 3090

Carlsbad, New Mexico 88221

Ph: (575) 234-7488

Cell: (575) 706-0083

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

AUG 2 9 2013

GROUND WATER
NOV 1 5 2013
BUREAU

Mr. John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Subject: Notification of Class 1 Permit Modification to the Waste Isolation Pilot Plant Hazardous Waste Facility Permit Number: NM4890139088-TSDF

Dear Mr. Kieling:

Enclosed is a Class 1 Permit Modification Notification for the following items:

- Revise a Course Outline
- Revise Table and Panel Figures to Include Panel 7
- Update Descriptions Related to Type B Packages
- Update TRUPACT-II and HalfPACT Figures

We certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact Mr. George T. Basabilvazo at (575) 234-7488.

Sincerely,

Jose R. Franco
Jose R. Franco, Manager
Carlsbad Field Office

for M.F. Sharif
M. F. Sharif, Project Manager
Nuclear Waste Partnership LLC

Enclosure

cc: w/enclosure
T. Kliphuis, NMED *ED
T. Blaine, NMED ED
C. Walker, Trinity Engineering ED
CBFO M&RC
*ED denotes electronic distribution

CBFO:OESH:GTB:ANC:13-0764:UFC 5487.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

GROUND WATER
NOV 15 2013
BUREAU

NOV 05 2013

Mr. John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Subject: Panel 6 Closure and Final Waste Emplacement Notifications

Dear Mr. Kieling:

The purpose of this letter is to notify the New Mexico Environment Department (NMED) that the Permittees intend to commence closure of Hazardous Waste Disposal Unit Panel 6 at the Waste Isolation Pilot Plant (WIPP) facility. This notification fulfills the requirements of the WIPP Hazardous Waste Facility Permit (Permit), NM48900139088-TSDF, Permit Part 6, Section 6.4 and Permit Attachment G, Section G-1b, *Requirements*, to notify NMED 60 days prior to the date on which closure activities are scheduled to begin, and Attachment G, Section G-1d(1), *Schedule for Panel Closure*, to notify the NMED 30 days prior to placing the final waste in a panel.

Final waste emplacement in Panel 6 is expected on or about January 29, 2014. Closure activities are expected to begin on or about January 29, 2014. The actual date is dependent on the availability of waste and may change.

We certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact Mr. George T. Basabilvazo at (575) 234-7488.

Sincerely,

Jose R. Franco, Manager
Carlsbad Field Office

M. F. Sharif, Project Manager
Nuclear Waste Partnership, LLC

cc:
T. Blaine, NMED * ED
T. Kliphuis, NMED ED
CBFO M&RC
*ED denotes electronic distribution

CBFO:OESH:GTB:ANC:13-0789:UFC 5487.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUN 27 2013

Mr. Clint Marshall, Program Manager
Mining Environmental Compliance Section
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

Subject: Discharge Permit 831 Renewal Application – Public Notice Requirement Submission

Re: *Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant*; letter from Jerry Schoeppner, Chief Ground Water Quality Bureau to Mr. Jose Franco, Manager, Waste Isolation Pilot Plant, received on June 3, 2013

Dear Mr. Marshall:

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If you have any questions regarding this transmittal, please contact me at (575) 234-7488.

Sincerely,

George T. Basabilvazo

George T. Basabilvazo, Director
Office of Environmental, Safety, and Health

Enclosures (2)

cc: w/o enclosures
J. Kieling, NMED *ED
T. Kliphuis, NMED ED
J. Schoeppner, NMED ED
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*ED denotes electronic distribution

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PUBLIC NOTICE / NOTICIA PÚBLICA

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Applicant & Discharge Location / Solicitante & Sitio de Descarrga: Waste Isolation Pilot Plant (WIPP), on the Jal Highway, approximately 26 miles southeast of Carlsbad

For More Information / Para Más Información (DP-831):
Ground Water Quality Bureau / Sección de Agua Subterránea
NM Environment Department / Departamento del Medio Ambiente
(505) 827-2900
www.nmenv.state.nm.us/gwb (public notices)

Information in this public notice was provided by the applicants and will be verified by NMED during the permit application review process.

GROUND WATER

JUN 28 2013

BUREAU

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JUN 27 2013

Mr. Clint Marshall, Program Manager
Mining Environmental Compliance Section
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

Subject: Discharge Permit 831 Renewal Application – Public Notice Requirement Submission

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George T. Basabilvazo, Director
Office of Environmental, Safety, and Health

Enclosures (2)

cc: w/o enclosures

J. Kieling, NMED	*ED
T. Kliphuis, NMED	ED
J. Schoeppner, NMED	ED
CBFO M&RC	

*ED denotes electronic distribution

GROUND WATER
JUN 28 2013
BUREAU

Enclosure 1

AFFIDAVIT OF PUBLIC NOTICE COMPLETION

1 Page

GROUND WATER

JUN 28 2013

BUREAU

AFFIDAVIT OF PUBLIC NOTICE COMPLETION

Renewal Permit

DP-831 (CM)

I certify, under penalty of law, that I have fulfilled the Ground Water Discharge Permit public notice requirements of Section 20.6.2.3108(C)1 and 2 NMAC.

- ✓ I placed a synopsis of the public notice in English and in Spanish in a newspaper approved by NMED. A copy of the newspaper page containing the synopsis is enclosed.
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I am aware that there are significant penalties for false certification including the possibility of fines.

George T. Basabilvazo
Signature of Applicant

6-27-13
Date

George T. Basabilvazo
Printed Name

Director of Environment, Safety and Health
Title

Enclosure 2

Public Notice-Current Argus

1 Page

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PUBLIC NOTICE / NOTICIA PÚBLICA

Discharge Permit Application / Aplicación para Permiso de Descargue: For up to 23,000 gallons per day of domestic wastewater and 2,752,831 gallons per day of stormwater to a treatment and disposal system / Para un máximo de 23,000 galones por día de aguas residuals domésticas y 2,752,831 galones por día de aguas lluvias a un sistema de tratamiento y disposición

Applicant & Discharge Location / Solicitante & Sitio de Descarrga: Waste Isolation Pilot Plant (WIPP), on the Jal Highway, approximately 26 miles southeast of Carlsbad

For More Information / Para Más Información (DP-831):
Ground Water Quality Bureau / Sección de Agua Subterránea
NM Environment Department / Departamento del Medio Ambiente
(505) 827-2900
www.nmenv.state.nm.us/gwb (public notices)

Information in this public notice was provided by the applicants and will be verified by NMED during the permit application review process.

~~G~~ROUND WATER
MAY 28 2013
BUREAU

The Waste Isolation Pilot Plant Hazardous Waste Facility Permit Community Relations Plan is Currently Being Updated

The U.S. Department of Energy Carlsbad Field Office and Nuclear Waste Partnership LLC (the Permittees) are seeking public comments to improve the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit Community Relations Plan (the Plan).

The Permittees also have proposed changes to the Plan that include:

- Co-Permittee name change from Washington TRU Solutions LLC to Nuclear Waste Partnership LLC, the current WIPP Project management and operating contractor
- Clarification to Section 3.5 of Plan that describes how members of the public may be added to Facility Mailing List
- Clarification to Section 3.7 to describe how public viewpoints can be documented for the record
- Changes to standardize capitalization and hyphenation

The Permittees' proposed changes to the Plan are identified by red text with a double underline for new text and a strikeout font for deleted information. See "Read the Plan."

We encourage members of the public to submit comments or suggestions. Your ideas will help us to provide a plan that continues to meet the public need for permit-related information. Comments may be submitted by:

- E-mail to Communityrelations@wipp.ws
- Access http://www.wipp.energy.gov/WIPPCommunityRelations/index.html online. Click on the "Comments" tab, type in your comments and submit them.
- Call the toll-free number at 1-866-271-9640 to speak directly to WIPP Project staff

Based on timely resolution of comments, text changes to the Plan will become effective on June 24, 2013.

The Permittees are required to post comments, consultations, communications, agreements and disagreements between the Permittees and members of the public on the Community Relations Plan Web page. Comments and suggestions will only be posted with the express consent of the contributor.

1.0 Introduction

1.1 Plan Required by Permit

This Community Relations Plan is a requirement of the Hazardous Waste Facility Permit (Permit) for the U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP) facility. The New Mexico Environment Department (NMED) re-issued the ten year Permit to the U.S. Department of Energy and Nuclear Waste Partnership LLC (NWP) ~~Washington TRU Solutions LLC~~ (the Permittees) in November 2010.

1.2 Participants

The intended participants to this Community Relations Plan are interested members of the public who reside within the state of New Mexico, and include individuals, organizations, special interest groups, federal, state and local government entities, tribal governments and tribal members.

1.3 Purpose

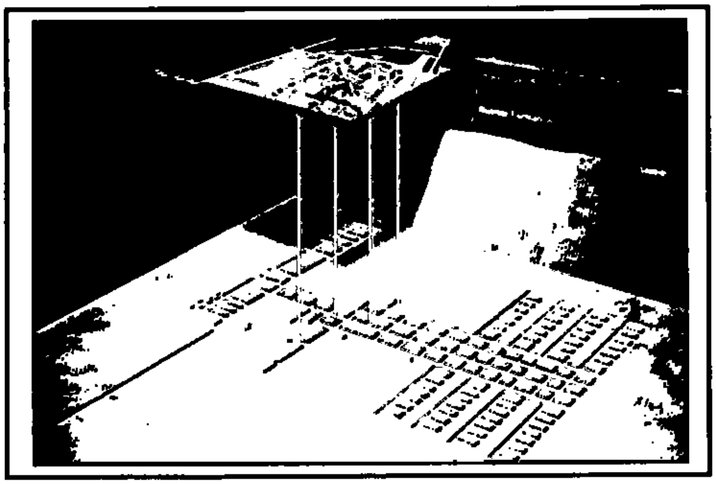
The purpose of the WIPP Hazardous Waste Facility Permit Community Relations Plan (the Plan) is to provide Permit-related information to communities and interested members of the public and to alert the public to opportunities for participation in the permit process. Permit-related activities include waste disposal operations, facility closure, post-closure and Permit-driven corrective actions.

The U.S. Department of Energy (DOE) operates the WIPP facility in a transparent manner. The DOE has conducted WIPP Project outreach programs in New Mexico for more than two decades to establish open working relationships with communities, tribal governments and residents statewide. The Permittees view this Plan as an opportunity to expand public participation and dialogue in the WIPP facility Permit process.

The Plan is web-based to reach a broad spectrum of New Mexico residents and tribal governments. Alternate methods to disseminate permit-related information to members of the public who may not have computer access are included in this Plan. These avenues of communication are further discussed in Section 3.0 How to Use this Plan.

2.0 Overview of the Waste Isolation Pilot Plant

So that members of the public may better understand the WIPP mission and Permit, this Plan begins with an overview of the WIPP facility.



The WIPP facility is owned and operated by the DOE through its Carlsbad Field Office (CBFO). Nuclear Waste Partnership LLC (NWP) ~~Washington TRU Solutions LLC (WTS~~ is the co-operator of the WIPP facility and performs day-to-day plant operation. The DOE and NWP ~~WTS~~ are co-Permittees to the Permit.

2.1 Location and Facility

The WIPP facility is located 26 miles southeast of Carlsbad, New Mexico. It is designed and operated for the safe disposal of transuranic, or TRU, radioactive waste resulting from U.S. nuclear defense programs.

In 1992, Congress withdrew 16 sections of land from the public domain to be used by the DOE for the WIPP facility. The WIPP facility consists of surface facilities to receive and prepare waste for disposal and an underground repository that includes disposal rooms excavated from a geologically stable salt formation nearly one-half mile underground.

2.2 TRU Waste

TRU waste is solid material such as protective clothing, rags, tools, soils and residues contaminated with radioactive elements–mostly plutonium. The majority of this waste resulted from government research and the production of nuclear weapons. TRU waste will also be generated as some DOE sites are decommissioned.

Some TRU waste contains non-radioactive chemicals such as solvents which are classified as hazardous waste under federal and state law. The WIPP Permit is required to manage and dispose of these TRU and hazardous "mixed" wastes.

The NMED regulates the management and disposal of the hazardous waste contained in TRU mixed waste. In 1999, NMED issued the initial WIPP Permit that allowed the DOE to receive its first waste shipment from Los Alamos National Laboratory in northern New Mexico for disposal at the WIPP facility. The Permit was renewed for a ten year period in 2010.

The project life cycle and the amount of waste to be disposed at the WIPP facility is detailed in the Permit as follows: "During the disposal phase of the facility, which is expected to last 25 years, the total amount of waste received from off-site generators and any derived waste will be limited to 175,600 cubic meters of TRU waste, of which up to 7080 cubic meters may be remote-handled TRU (RH-TRU) mixed waste. For purposes of the WIPP Permit, all TRU waste is managed as though it were mixed."

2.3 Regulatory Background and the Hazardous Waste Facility Permit

In 1976, the U.S. Congress passed the Resource Conservation and Recovery Act (RCRA) to regulate "cradle to grave" management of hazardous waste. In accordance with RCRA, the U.S. Environmental Protection Agency (EPA) can authorize states to implement their own hazardous waste regulatory programs in lieu of the federal program. The State of New Mexico is authorized to implement and enforce its own hazardous waste management program which includes regulating the hazardous components in TRU mixed waste that are disposed at the WIPP facility.

The EPA certifies DOE compliance with environmental standards for the disposal of radioactive materials such as the TRU waste disposed 2,150 feet underground. At five year intervals, the DOE must demonstrate to EPA through a recertification process that the WIPP underground repository will continue to safely contain radionuclides for 10,000 years.

This Plan is specific to the New Mexico Hazardous Waste Management Program.

3.0 How to use this Plan

3.1 Elements of the WIPP Community Relations Plan

The Permit identifies six objectives that this Plan is to address:

1. Establish working relationships with communities and interested members of the public.
2. Establish productive government to government relations between the U.S. Department of Energy and affected tribes and pueblos.
3. Inform communities and interested parties of permit activities.
4. Minimize disputes and resolve differences with communities and interested members of the public.
5. Provide timely responses to individual requests for information.
6. Establish mechanisms for communities and interested members of the public to provide feedback and input to the Permittees.

3.2 A Broad Approach to Communicating Permit Activities

The Permittees determined that the most effective way to meet Permit objectives is a universal approach to communications with individuals, organizations, special interest groups, federal, state and local government entities, tribal governments and tribal members in New Mexico. The Plan makes Permit-related information available to interested New Mexicans through various points of access.

Tribal governments and tribal members will be provided information about WIPP Permit-related actions in the same manner as that outlined in this Plan for communities, the general public and interested parties.

3.3 Community Relations Plan Web page

This Web page provides information on current permit activities and public meeting schedules, and includes a link to the *WIPP Permit Information Repository* where members of the public can access specific documents related to the current Permit and other Permit resources.

To assure public access, the Web page includes instructions for software required to view documents in the WIPP Permit Information Repository and provides free downloads to public reviewers, as needed.

Documents available in the WIPP Information Repository include:

- WIPP Hazardous Waste Facility Permit renewal application, Parts A and B
- A complete copy of the Permit, as it may be modified
- Permit modification notifications and requests associated with the Permit and any associated responses from the NMED
- Waste Minimization Report submitted per Permit Part 2, Section 2.4
- Extensions of time submitted per Permit Part 1, Section 1.10.3
- Corrective action documents submitted per Permit Part 8

- Written reports, such as notifications of planned changes, submitted per the Permit Part 1, Sections 1.7.11 and 1.7.13
- Notices of Deficiency or disapproval, responses, final approval letters and directives from the NMED associated with renewal permit applications, permit modifications and corrective action documents
- Notices of Violation or administrative compliance orders, and responses to such required by the NMED and directives from the NMED associated with the Permit
- Biennial Reports submitted per Permit Section Part 2, Section 2.14.2

3.4 Notifications in major newspapers

Notifications regarding substantive (Class 2 and 3) requests by the Permittees to modify the Permit are published in major local newspapers. Included in the notification is a description of the proposed permit change, dates for a public comment period, contact information at NMED and the WIPP Project , and the time, dates and locations for public meetings.

3.5 Facility mailing list

The facility mailing list consists of individuals, organizations, special interest groups, federal, state and local government entities, tribal governments and tribal members who have expressed interest in being notified by mail of WIPP permit-related actions. By regulation, the NMED maintains the WIPP facility mailing list; the Permittees are responsible for certain mail-outs to subscribers.

The facility mailing list benefits infrequent users of the Community Relations Web page and members of the public who do not have computer access. There are a number of opportunities to subscribe to the facility mailing list below. Please include your name, mailing address, phone number and organization, if any, when you subscribe to the list.

-

- Email the request to communityrelations@wipp.ws and request to be added to the list

- Email the request directly to the New Mexico Environment Department WIPP Web page at trais.kliphuis@state.nm.us

- Call 1-866-271-9640 and request Bobby St. John, Nuclear Waste Partnership ~~Washington TRU Solutions~~, to ~~add~~ forward your name to NMED for inclusion on the list

- Mail a request to subscribe:

Trais Kliphuis New Mexico Environment Department 2905 Rodeo Park Drive East Building 1 Santa Fe. N.M. 87505	OR	Bobby St. John Nuclear Waste Partnership ~~Washington TRU Solutions~~ P.O. Box 2078

- Sign up at WIPP Hazardous Waste Facility Permit public meetings

3.6 Email Notification Service

The Permittees also maintain a Permit-related email notification service. Subscribers to this service are assured timely email notification for a specific set of permit actions. Adding your name to the email notification service is quick and easy.

Just click here http://www.wipp.energy.gov/Stakeholders/Notice.aspx and follow the directions for sign up.

3.7 Public meetings

Federal and state regulations require hazardous waste facilities to schedule public meetings for proposed Class 2 and 3 permit modification requests. These public meetings provide the Permittees a forum to explain the purpose of the Permit modification request and for members of the public to ask questions and express their views by submitting written comments. The general public is notified of public meeting schedules in major local newspapers.

Interested members of the public are encouraged to monitor the Community Relations Web page, subscribe to the WIPP facility mailing list and email notification system for public meeting schedules related to Permit modification requests.

3.8 Community Relations Plan email address

A dedicated Community Relations Plan email address provides the public direct communication to Permittee staff for inquiries related to the permit. The email account is monitored by staff members during normal business hours, Monday through Friday, 7:30 a.m. to 4:30 p.m. The Permittees will respond to requests as quickly as possible, within the constraints of applicable regulations such as those involving dissemination of security or personal information.

That email address is communityrelations@wipp.ws.

3.9 Toll-free telephone number

A Community Relations Plan toll free telephone number is a convenient way to contact Permittee staff for permit-related information or questions. The toll free number will be staffed during normal business hours, Monday through Friday from 7:30 a.m.to 4:30 p.m.

The toll-free number is 1-866-271-9640.

3.10 Public outreach products

To increase public awareness of the Plan, the Community Relations Plan Web page address, toll-free telephone number and dedicated email address will be printed on WIPP Project information products and Permit- related public notifications in major local newspapers.

.0 Community Relations Plan Goals

4.1 Changes to the Plan

The goal of this Plan is to provide timely information to members of the public about Permit actions and opportunities for participation in the Permit process so that they can make informed decisions about Permit actions.

The Plan is intended to be useful and responsive to public information needs related to the Permit. It is a "living" document which is expected to change throughout the 10 year Permit period to accommodate public and Permittee input as well as new communication technologies.

In May of each year of the current Permit period, the Permittees will solicit comments and suggestions from interested stakeholders through major local newspapers, the facility mailing list and the Web-based Community Relations Plan. Periodic changes may be made to the Plan to enhance functionality and content. Members of the public are encouraged to send comments or suggestions to improve the Plan at any time. Comments may be sent by email (see **Comments** on the Web Page menu), or by mail to:

Bobby St. John, Nuclear Waste Partnership ~~Washington TRU Solutions~~, P.O. Box, 2078, Carlsbad, N.M., 88221

4.2 Resolving Differences between the Public and Permittees Regarding the Community Relations Plan

The Permittees will give careful consideration to public comments and suggestions, and work in consultation with communities and with interested members of the public to avoid disputes and to resolve differences regarding the Community Relations Plan.

The Permittees will address comments that require a response and provide the response to the community or individual who originated it. Responses specific to this Plan will be posted to the Community Relations Plan Web page, with the consent of the parties involved.

5.0 Resources

The Permittees will provide the resources necessary to maintain the Plan for as long as the Plan is a requirement of the Permit.

6.0 Records Management

Consistent with Permit requirements, the Permittees will document all Permit-related consultations, communications, agreements and disagreements between the Permittees and members of the public related to the development and administration of the Plan.

These communications and responses will become part of the WIPP facility operating record and will be posted annually to the Plan Web page, with the express consent of the commenting individual or group.

PUBLIC COMMENT
U.S. Department of Energy
Waste Isolation Pilot Plant Hazardous Waste Facility Permit
Community Relations Plan

WHO: The U.S. Department of Energy and Nuclear Waste Partnership LLC (the Permittees) are seeking public comments and suggestions to improve the Waste Isolation Pilot Plant Hazardous Waste Facility Permit Community Relations Plan as part of the WIPP Hazardous Waste Facility Permit (Permit Number: NM4890139088-TSDF) issued by the New Mexico Environment Department.

New Mexico residents, organizations, interest groups, federal, state and local government entities, tribal governments and tribal members are encouraged to provide comments or suggestions to the Permittees to enhance the Plan.

WHAT: The Community Relations Plan is designed to inform communities and interested members of the public about WIPP Hazardous Waste Facility Permit activities and opportunities for public participation in those activities.

PLAN ELEMENTS:

Part 1, Section 1.15.2 of the WIPP Hazardous Waste Facility Permit identifies six key elements of the Plan:

1. Establish working relationships with communities and interested members of the public.
2. Establish productive government to government relations between the U.S. Department of Energy and affected tribes and pueblos.
3. Inform communities and interested parties of permit activities.
4. Minimize disputes and resolve differences with communities and interested members of the public.
5. Provide timely responses to individual requests for information.
6. Establish mechanisms for communities and interested members of the public to provide feedback and input to the Permittees.

WHEN: The Permittees have proposed updates to the Plan which will be mailed to individuals on the WIPP Facility Mailing List by May 23, 2013, for comment. Proposed updates are available online at: http://www.wipp.energy.gov/WIPPCommunityRelations/index.html. Based on timely resolution of comments, changes to the Plan will become effective June 24, 2013.

HOW TO PROVIDE COMMENTS:

Contact the Permittees by e-mail, telephone or by mail to receive a copy of the updated WIPP Hazardous Waste Facility Permit Community Relations Plan and a comment form.

Comments and suggestions can be made online by accessing the Plan at: http://www.wipp.energy.gov/WIPPCommunityRelations/index.html and clicking on "Comments."

E-mail: communityrelations@wipp.ws

Toll free telephone number: 1-800-234-7280 – available during normal business hours, Monday through Friday, 7:30 a.m.-4:30 p.m. MST

Mailing address: Bobby St. John, Nuclear Waste Partnership, P.O. Box 2078, Carlsbad, NM 88221

New Mexico Environment Department
Ground Water Quality Bureau

DP Processing Form

All Facilities except Dairies

DP# 831 Reviewer Clint Facility Name Waste Isolation Pilot Plant	Date	Initial
Discharge Plan Application		
❖ DP Application Received ~~(circle one)~~: NEW RENEWAL ~~RENEWAL/MOD~~	5-10-13	ds
❖ Filing Fee Received (Amount: 100.00)	5-10-13	ds
❖ Plans and Specifications Received	5-10-13	ds
Public Notice		
❖ Public Notice 1 Published	6/5/13	ds

Dairy Facilities

DP#_____ Team Leader_____ Facility Name_____	Date	Initial
Discharge Plan Application		
❖ DP Application Received (*circle one*): NEW RENEWAL/MOD RENEWAL for CLOSURE		
❖ Fee(s) Received (Amount:_____)		
❖ Plans and Specifications Received		
Public Notice		
❖ Public Notice 1 Published		

COPY

New Mexico Environment Department
Ground Water Quality Bureau

Acknowledgement of Receipt

reviewer's initials CM

I, Alicia Sandoval hereby acknowledge receipt of
Check No. # 040739, dated 4/9/13
received in the amount of $ 100.00; or
cash received in the amount of $ ________
from Nuclear Waste Partnership.
Facility Name: Waste Isolation Pilot Plant
DP #: 831 AI ID: 318
Activity ID Number: PRD 20130001 (DP-Ren)

GWQB – Date of Receipt

GROUND WATER
MAY 10 2013
BUREAU

Administrative Fees

☒ $100.00 application filing fee

Permit Fees

☐ new facility
☒ renewal or ~~renewal/modification~~
☐ modification fee = $ ________

Other Fees

☐ $15.00 per poster:
poster(s) ______ x $15.00 = $ ________
☐ $150.00 temporary permission
☐ Other: $ ________
Explain: ________

Copy of Check (below):

Check Date: Apr 09, 2013 Vendor Number: 0000002475 Check No. 040739

NUCLEAR WASTE PARTNERSHIP, LLC
P.O. Box 2078
Carlsbad, NM 88221

CARLSBAD NATIONAL BANK
PO Box 1339
Carlsbad, NM 88220

040739

VOID

Date Apr 09, 2013 Pay Amount ***100.00***

Pay ****ONE HUNDRED AND XX / 100 DOLLAR****

To The Order Of
NEW MEXICO ENVIRONMENT DEPT.
PO BOX 5469
SANTA FE, NM 87502-5469

Jerry K. Fenner
Authorized Signature

DP-831

⑈040739⑈ ⑆112201797⑆ 65676⑈

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lieutenant Governor

1190 St. Francis Drive
P.O. Box 5469, Santa Fe, NM 87502
Phone (505) 827-2918 Fax (505) 827-2965
www.nmenv.state.nm.us

U.S. Postal Service
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Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
Jose R. Franco, Mana
US Dept. of Energy
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221
PS Form 3800, August 2006
7012 1640 0000 0457 1790

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

May 22, 2013

Jose Franco, Manager
Waste Isolation Pilot Plant
US Department of Energy
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

RE: Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant

Dear Mr. Franco:

The New Mexico Environment Department (NMED) received a Ground Water Discharge Permit Application for the above referenced facility on May 10, 2013. Pursuant to Section 20.6.2.3108 NMAC of the New Mexico Water Quality Control Commission Regulations (20.6.2 NMAC), NMED determined on May 15, 2013 that your application is administratively complete.

Within 30 days of the date when the US Postal Service first makes notice to you of its possession of this letter, you must provide public notice. Instructions and materials needed to complete the public notice are enclosed.

After NMED receives the completed proof of public notice, a technical reviewer will contact you if additional information is needed to process your application. If you have a deadline of concern in the interim or any questions, please call the Ground Water Quality Bureau at (505) 827-2900.

Sincerely,

Naomi David

for Jerry Schoeppner, Chief
Ground Water Quality Bureau

enc: Instructions for Completing Public Notice Requirements
Affidavit
Public Notice Flyer
Text for Newspaper Display Ad

INSTRUCTIONS FOR COMPLETING PUBLIC NOTICE REQUIREMENTS

Discharge Permit Renewal DP-831

Within 30 days of the date NMED deemed your Discharge Permit application administratively complete, you must provide public notice as follows:

1. **Mail a public notice flyer to the owner of the discharge site.**
   A copy of the enclosed public notice flyer must be sent via certified mail, return receipt requested, to the owner(s) of the discharge site(s), if the applicant is not the owner. The list of owners' names and addresses and the certified mail receipts must be submitted to NMED.

2. **Place a display ad in the newspaper.**
   A display ad 2 x 3 inches in size must be published for one day in a newspaper of general circulation in the location of the proposed discharge. The ad may not be placed in the classified or legal section. The text for the ad is enclosed. NMED approves publishing the ad in the following newspaper:

   Carlsbad Current-Argus

PROOF OF NOTICE. Within 15 days of completing the above requirements, the applicant must submit the following items as proof of notice to NMED:

- ✓ List of names and addresses of owners of discharge sites.
- ✓ Certified mail receipts for mailing to discharge site owner(s), if required.
- ✓ Copy of newspaper ad.

Send to NMED Ground Water Quality Bureau, PO Box 5469, Santa Fe, NM 87502.

Reviewer's Initials and Date MD 5/15/13

PUBLIC NOTICE

Discharge Permit Application

Waste Isolation Pilot Plant, DP-831

DP-831, Waste Isolation Pilot Plant, Jose Franco, Manager, proposes to renew the Discharge Permit for the discharge of up to 23,000 gallons per day of domestic wastewater and 2,752,831 gallons per day of storm water to a treatment and disposal system. Potential contaminants from this type of discharge include nitrogen compounds, sulfate, chloride, and total dissolved solids. The facility is located on the Jal Highway, approximately 26 miles southeast of Carlsbad, in Section 20, 28, and 29, T22S, R31E, Eddy County. Ground water beneath the site is at a depth of approximately 164 feet and has a total dissolved solids concentration of approximately 3,400 milligrams per liter.

The applicant is seeking a Discharge Permit for the proposed discharge. Provided the applicant has met applicable requirements, the New Mexico Environment Department (NMED) will propose a Discharge Permit containing limitations, monitoring requirements, and other conditions intended to protect ground water quality for present and potential future use. Information in this public notice was provided by the applicant and will be verified by the New Mexico Environment Department during the permit application review process. NMED will accept comments and statements of interest regarding the application and will create a facility specific mailing list for persons who wish to receive future notices.

You may send comments or statements of interest to:

Clint Marshall, DP-831
Ground Water Quality Bureau
PO Box 5469
Santa Fe, NM 87502.

For additional information, please call:
505-827-2900

Applicant
Jose Franco, Manager
Waste Isolation Pilot Plant
US Department of Energy
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

Public Notice Synopsis, DP-831
(for sign and newspaper display ad)

Newspaper display ad must be at least 2 inches by 3 inches in size and must be published for at least one day in a section other than the classifieds or legals.

<u>PUBLIC NOTICE / NOTICIA PÚBLICA</u>

Discharge Permit Application / Aplicación para Permiso de Descargue: For up to 23,000 gallons per day of domestic wastewater and 2,752,831 gallons per day of stormwater to a treatment and disposal system / Para un máximo de 23.000 galones por día de aguas residuales domésticas y 2.752.831 galones por día de aguas lluvias a un sistema de tratamiento y disposición

Applicant & Discharge Location / Solicitante & Sitio de Descarga: Waste Isolation Pilot Plant (WIPP), on the Jal Highway, approximately 26 miles southeast of Carlsbad

For More Information / Para Más Información (DP-831):
Ground Water Quality Bureau / Sección de Agua Subterránea
NM Environment Department / Departamento del Medio Ambiente
(505) 827-2900 www.nmenv.state.nm.us/gwb (public notices)

Information in this public notice was provided by the applicants and will be verified by NMED during the permit application review process.

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

GROUND WATER
MAY 10 2013
BUREAU

MAY 09 2013

Mr. Clint Marshall, Program Manager
Mining Environmental Compliance Section
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

Subject: Waste Isolation Pilot Plant Discharge Permit 831 Renewal Application

Dear Mr. Marshall:

Enclosed are three copies of the Discharge Permit 831 (DP-831) Renewal Application for the Waste Isolation Pilot Plant (WIPP) located in Eddy County, New Mexico and the $100.00 filing fee.

Please contact George T. Basabilvazo at (575) 234-7488, if you have any questions regarding this transmittal.

Sincerely,

José R. Franco, Manager
Carlsbad Field Office

Enclosures (7)

cc: w/o enclosures

J. Kieling, NMED	*ED
T. Kliphuis, NMED	ED
T. Skibitski, NMED	ED

*ED denotes electronic distribution

CBFO:OESH:GTB:ANC:13-0732:UFC 5485.00

GROUND WATER
MAY 1 0 2013
BUREAU

U.S. Department of Energy
Waste Isolation Pilot Plant
Carlsbad Field Office

2013 Discharge Permit 831
Renewal Application

May 2013

NEW MEXICO ENVIRONMENT DEPARTMENT
GROUND WATER QUALITY BUREAU

DISCHARGE PERMIT APPLICATION

GROUND WATER
MAY 10 2013
BUREAU

Type of Application. Check appropriate box.

☐ Application for new Discharge Permit -- new facility

☐ Application for new Discharge Permit -- existing (unpermitted) facility

☐ Application for Discharge Permit Renewal

☐ Application for Discharge Permit Modification
"Modification" is defined as a change to the permit requirements that result from a change in the location of the discharge, a significant increase in the quantity of the discharge, or a significant change in the quality of the discharge.

X Application for Discharge Permit Renewal and Modification

For an existing Discharge Permit, please indicate: DP Number 831 Expiration date 09/09/2013

Checklist of Application Components.

X Part A: Administrative Completeness.	*Instructions for completing the application are included on the form itself and on Supplemental Instructions for Parts A and B.* *You may fill out the application manually, or a Microsoft Word version may be downloaded from www.nmenv.state.nm.us (Ground Water Quality) and filled out electronically.*
X Part B: Operational, Monitoring, Contingency and Closure Plans, with required attachments. *Choose appropriate option*: ☐ Septic Tank System **X** General – Various Facility Types	
X Part C: Site Information, with required attachments.	
X $100 Filing Fee, payable to the New Mexico Environment Department. *Required from all applicants.* An additional fee will be assessed prior to permit issuance. Permit fees are listed in Section 20.6.2.3114 NMAC.	

Certification. Signature must be that of the person named in Item A-3 of Part A of the application.

I certify under penalty of law that I am knowledgeable about the information contained in this application. The information is, to the best of my knowledge and belief, true, accurate and complete.

Signature: Jose R Franco Date: 5/9/13

Printed Name: Jose R. Franco

Title: Manager

Send three complete copies of this application and the filing fee to:
Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
PO Box 5469
Santa Fe, NM 87502

Supplemental Information:

This Application reflects name changes of ponds, basins, and cells that better reflect the function of the structures as well as enhancing the order of the structures for their purpose. The new names are found throughout the application, however, drawings and maps reflect the previous names of the structures. When the Permit renewal is granted by the NMED-GWQB, initiation of the changes on the drawings will follow. The proposed name changes are listed below:

Sewage Treatment Facility Lagoons

Change From	**Change To**
Settling Pond 1A	Settling Lagoon 1
Setting Pond 2A	Settling Lagoon 2
Polishing Pond 1B	Polishing Lagoon 1
Polishing Pond 2B	Polishing Lagoon 2
Evaporation Pond A	Effluent Lagoon A
Evaporation Pond B	Effluent Lagoon B
Evaporation Pond C	Effluent Lagoon C
H-19 Evaporation Pond	Evaporation Pond H-19

Storm Water Intrusion Control Ponds

Change From	**Change To**
Storm Water Intrusion Pond 1	Storm Water Pond 1
Storm Water Intrusion Pond 2	Storm Water Pond 2
Storm Water Intrusion Pond A	Storm Water Pond 3
Salt Pile Evaporation Pond	Salt Storage Pond 1
Salt Storage Extension Basin I	Salt Storage Pond 2
Salt Storage Extension Basin II	Salt Storage Pond 3

Salt Storage Piles

Change From	**Change To**
Salt Pile	Salt Cell 1
Salt Extension Cell A	Salt Cell 2
Salt Extension Cell B	Salt Cell 3

Site and Preliminary Design Validation (SPDV) – No name change

Table of Contents

Part A: Administrative Completeness – [8 Pages]

Part B: Operational, Monitoring, Contingency and Closure Plans General Form (Various Facility Types) – [12 Pages]

Part C: Site Information – [4 Pages]

Attachment I – Sewage Treatment System and Evaporation Pond H-19 Drawings

25-C-004-W	Stabilization Lagoon Added Evaporation Pond – [1 Page]
23-C-012-W1	H-19 Evaporation Pond – [1 Page]

Attachment II – Storm Water Pond Drawings

23-C-011-W11	Salt Pile Infiltration Controls Storm Water Ponds No. 1 & No. 2 Plans and Sections – [1 Page]
23-C-011-W12	Salt Pile Infiltration Controls Storm Water Pond "A" New Topography and Details – [1 Page]

Attachment III – Salt Storage Evaporation Pond Drawings

23-C-011-W3	Salt Pile Infiltration Controls Salt Pile Evaporation Pond Plan and Details – [1 Page]
23-C-011-W9	Salt Pile Infiltration Controls Engineering Details – [1 Page]
23-Z-014-W2	Salt Pile Infiltration Controls New SSE Evaporation Pond Plan View – [1 Page]
23-Z-014-W3	Salt Pile Infiltration Controls New SSE Evaporation Pond Sections and Details – [1 Page]

Attachment IV – Salt Storage Cell Drawings

23-C-011-W4	Salt Pile Infiltration Controls Salt Pile South-North Cross Section – [1 Page]
23-C-011-W6	Salt Pile Infiltration Controls Salt Storage Extension North-South Cross Section – [1 Page]
23-C-011-W8	Salt Pile Infiltration Controls Engineering Details – [1 Page]
23-C-011-W10	Salt Pile Infiltration Controls Engineering Details – [1 Page]

Attachment V – Ground Water Monitor Well Maps and Information

Site Maps and Well Locations – [2 Pages]
Well Water Quality Sampling Results – [7 Pages]
Monitor Wells Survey Data and Well Logs – [22 Pages]

Attachment VI – Area Map and Soil Survey

Aerial Photos – [2 Pages]
Topographical Maps – [2 Pages]
Area Map – [1 Page]
Soil Survey – [1 Page]

Attachment VII – Design and Maintenance and Operation Procedures and Information

Sewage Treatment Plant Design Calculations – [27 Pages]

EA04AD3008-31-0	FacOps Stabilization Lagoon Round Sheet – [1 Page]
WP 02-EM1022	Site Discharge Area Inspections – [12 Pages]
WP 02-EM1023	Salt Storage Extension I and II Evaporation Basin Sump Water Removal – [7 Pages]
WP 04-GC1201	Sewage Lagoon System Operation – [9 Pages]

GROUND WATER

MAY 10 2013

BUREAU

GROUND WATER DISCHARGE PERMIT APPLICATION
PART A: ADMINISTRATIVE COMPLETENESS
All Facilities

A-1. Facility Information. See Supplemental Instructions to determine what constitutes the "facility." The physical location of the facility must be provided. If the facility does not have an address, the location can be described by road intersections, mile posts, or landmarks, as appropriate.

Facility Name: Waste Isolation Pilot Plant (WIPP)

Former Names (if any):

Physical address/location (mandatory): 26 miles east-southeast of Carlsbad, NM. Driving east from Carlsbad on U.S. Highway 62/180 turn onto the WIPP access road just east of mile marker 64, proceed 12.5 miles to the facility.

County: Eddy

Mailing address: P.O. Box 3090
Carlsbad, NM 88221-3090

Contact person: Mr. George Basabilvazo

Title: Director, Office of Environmental, Safety, and Health

Telephone number(s): 575-234-7488

Fax number: 575-234-7061 E-mail address: george.basabilvazo@wipp.ws

A-2. Type of Discharge and Type of Facility. See Supplemental Instructions.

Type of discharge: X Domestic ☐ Agricultural X Industrial ☐ Mining

Type of facility: The facility's primary mission is the disposal of defense generated transuranic (TRU) and TRU mixed waste in a geologic repository constructed using conventional mining techniques. Domestic wastewater is treated in the sewage treatment facility. Wastewater from industrial related activities is evaporated in synthetically lined ponds/lagoons. Stockpiles of excavated rock (primarily halite) are stored on site and associated storm water run-off is collected and evaporated in synthetically lined ponds.

A-3. Applicant Information. The applicant is the person or entity (e.g., corporation, partnership, organization, municipality, etc.) legally responsible for the discharge and for complying with the terms of the Discharge Permit. If the applicant is an entity, then the name and title of a contact person must be provided. This application must be signed by the applicant or contact person named here.

Applicant Name: U.S. Department of Energy, Carlsbad Field Office

Mailing address: P.O. Box 3090
Carlsbad, NM 88221-3090

Contact person: Mr. Jose R. Franco

Title: Manager

Telephone number(s) 575-234-7300

Fax number 575-234-7027 E-mail address jose.franco@wipp.ws

A-4. Consultant Information (if applicable). If the consultant is a company or organization, then the name and title of a contact person must be provided.

Consultant/Firm Name NA

Mailing address

Contact person

Title

Telephone number(s)

Fax number E-mail address

A-5. Permit Contact Information (if applicable). If someone other the applicant listed in Item A-3 or a consultant listed in Item A-4 is a primary contact for this application and/or facility, list here.

Permit Contact Name Mr. George Basabilvazo

Title Director, Office of Environmental, Safety, and Health

Mailing address P.O. Box 3090

Carlsbad, NM 88221-3090

Telephone number(s) 575-234-7488

Fax number 575-234-7061 E-mail address george.basabilvazo@wipp.ws

A-6. Ownership.

The applicant owns (check as appropriate): X the facility ☐ some discharge sites X all discharge sites

If other parties own the facility or any of the discharge sites, attach their names and contact information.

A-7. Discharge Quantity.

Your Discharge Permit will specify a maximum discharge volume, which is typically expressed as the maximum number of gallons per day that may be treated and/or disposed of. Please indicate below the maximum discharge volume for your facility. You must show how it was determined in Part B of your application. For further explanation, see Supplemental Instructions for Part B.

Sewage Treatment Facility (Settling Lagoons 1 & 2 and Polishing Lagoons 1 & 2):

Domestic effluent and non-hazardous industrial waste water from compressed air systems are discharged into the sewage system.

Maximum discharge volume: 23,000 gallons per day

Sewage Treatment Facility Effluent Lagoon A:

Maximum Discharge Volume: 50,000 gallons per day

Sewage Treatment Facility Effluent Lagoon B:

Maximum Discharge Volume: 50,000 gallons per day

Sewage Treatment Facility Effluent Lagoon C:

Maximum Discharge Volume: 50,000 gallons per day

Evaporation Pond H-19:

Maximum Discharge Volume: 50,000 gallons per day

Infiltration Control Ponds:

Salt Storage Pond 1:

Maintain 1 foot freeboard

Salt Storage Pond 2 interconnected with Salt Storage Pond 3:

Maintain 1 foot freeboard

Storm Water Pond 1, Storm Water Pond 2, and Storm Water Pond 3:

Maintain 1 foot freeboard.

A-8. Processing, Treatment, Storage and Disposal System. Briefly describe how wastewater, sludge, etc. is processed, treated, stored, and/or disposed of at your facility. See Supplemental Instructions for examples of system components.

A. Sewage Treatment Facility

The WIPP sewage treatment facility is a facultative system designed to meet the American Society of Civil Engineers and the Water Pollution Control Federation design criteria. The system contains parallel trains each consisting of an equally sized primary settling lagoons (Settling Lagoon 1 and Settling Lagoon 2) and polishing lagoons (Polishing Lagoon 1 and Polishing Lagoon 2) utilizing a passive biological treatment process. Incoming sewage enters the Settling Lagoon 1 or 2 where solids settle to the bottom of the lagoon and undergo bacterial digestion. The water then enters the Polishing Lagoon 1 or 2 where any small particles that did not settle in the Settling Lagoons will settle. All effluent water from the Polishing Lagoons is discharged into a synthetically lined pond (Effluent Lagoon A) for evaporation. The water in the Effluent Lagoon A either evaporates or flows into one of two additional Effluent Lagoons (Effluent Lagoons B and/or C) as needed to control freeboard in Effluent Lagoon A. In the event that any sludge is removed from the system, the sludge will be disposed of in accordance with 40 CFR Part 503 and 20.9.1.709 NMAC.

B. Wastewater Evaporation Ponds

Wastewaters from several sources at the facility described in Parts A-10 and B-1 of this application are evaporated in synthetically lined evaporation ponds. These ponds include the Evaporation Pond H-19 and Effluent Lagoons A, B, or C at the Sewage Treatment Facility. In the event that sediment accumulates to the point that the ponds are no longer suitable for the treatment of wastewater by evaporation, the sediment will be characterized to determine the appropriate disposition in accordance with all applicable federal and state regulations.

C. Salt Cell 2, Salt Cell 3, Salt Storage Pond 2, and Salt Storage Pond 3

The salt storage system consists of Salt Cell 2 with a run-off area of 326,350 sq. ft. and Salt Cell 3 with a run-off area of 272,850 sq. ft. which are used to stockpile salt (primarily halite) excavated during the construction and maintenance of the underground geologic repository. Each cell was constructed with six inches of prepared subgrade, a 60-mil high density polyethylene (HDPE) liner, a 200-mil Geonet drainage layer, an eight ounce geotextile fabric and covered with two feet of screened native soil. Each Cell is sloped toward the center which contains a collection trench and pipe for the conveyance of water west to the Salt Storage Pond 2 and Salt Storage Pond 3. Salt Storage Pond 2 and Salt Storage Pond 3 are constructed with a prepared subgrade, a 60-mil HDPE liner, a 200-mil Geonet cushion/drainage system, and a second 60-mil HDPE liner. In each of the ponds, the Geonet leak detection layer drains to a sump with an inclined riser to allow for water removal. Salt Storage Pond 2 and Salt Storage Pond 3 are connected by two 12 inch polyethylene pipes to prevent overflow of Salt Storage Pond 2. A one foot freeboard is maintained in both of these ponds. Non-hazardous brine water from well testing and mine related water accumulation may be disposed in Salt Storage Ponds 2 and 3.

D. Salt Cell 1 and Salt Storage Pond 1

Salt Cell 1 covers approximately 18.8 acres and was used for the storage of salt from the construction of the TRU Waste Repository using conventional mining techniques. To cover the now unused pile, the Salt Cell 1 crown was graded to a minimum two percent slope, covered with screened sand and a 60-mil HDPE line. The liner was covered with approximately 24 inches of native soils and seeded with Bureau of Land Management approved grass mix. The Salt Cell 1 has 3:1 side slopes and a two percent crown slope from the center north and west diverting storm water run-off to the salt cell runoff ditch with conveys run-off west to the three acre HDPE lined Salt Storage Pond 1.

E. Storm Water Ponds

Storm Water Ponds 1, 2, and 3 receive clean non-contact storm water from the WIPP facilities paved areas, roofs, air conditioner condensate, and domestic water from testing fire hydrants and hoses and draining domestic and fire water lines. Water from these ponds is retained for evaporation or used for industrial purposes as a recycle measure to preclude the use of fresh water. Water in Ponds 1, 2, and 3 may be transferred within the system to alleviate freeboard concerns and to provide an ease in removal as needed basis.

F. Site and Preliminary Design Validation (SPDV) Material Pile

The SPDV Material Pile is located immediately east of the WIPP facilities infrastructure. The SPDV pile was created during the design validation phase of the WIPP for the placement of construction materials resulting from the drilling of two 2,150 foot shafts and the underground excavation of connecting tunnels, exploratory tunnels, and four rooms. The materials in the SPDV pile include mined tailings interspersed with soil, rock and debris from the construction of the shafts. The SPDV pile encompasses approximately 10 acres and ranges in height from 7 to 20 feet above ground. The pile was closed by grading the contours and covering the pile with a geosynthetic liner, 2 feet of soil blended with rock and establishing native vegetation. Three shallow sub-surface monitoring wells are placed in the vicinity of this material pile to determine if any discharges have occurred from the pile.

A-9. Discharge Locations. List the locations of your facility and of all components of your processing, treatment, storage and/or disposal system. Examples of components include septic tanks, lagoons, leachfields, irrigation sites, mine stockpiles, etc. Additional examples are listed in the Supplemental Instructions. Latitude and longitude are optional unless township, range and section are not available. .

Components	Township	Range	Section(s)	Latitude	Longitude
Evaporation Pond H-19	22S	31E	NE, SE, NW-28	32 21.532	103 46.975
Effluent Lagoon A	22S	31E	NE, SE, NW-29	32 21.950	103 48.000
Effluent Lagoon B	22S	31E	NE, SE, NW-29	32 21.959	103 48.056
Effluent Lagoon C	22S	31E	NE, SE, NW-29	32 21.940	103 48.057
Settling Lagoons 1 and 2	22S	31E	NE, NW, NE-29	32 22.33	103 46.58
Polishing Lagoons 1 and 2	22S	31E	NE, SW, NW-29	32 21.939	103 47.973
Salt Cell 1	22S	31E	SW, NE, SE-20	32 22.495	103 47.620
Salt Storage Pond 1	22S	31E	NE, NW, SE-20	32 22.455	103 47.754
Salt Cells 2 and 3	22S	31E	NW, NE, SE-20	32 22.588	103 47.619
Salt Storage Pond 2	22S	31E	SE, NW, SE-20	32 22.589	103 47.746
Salt Storage Pond 3	22S	31E	SE, NW, SE-20	32 22.593	103 47.788
Storm Water Pond 1	22S	31E	SE, NW, SE-20	32 22.215	103 47.641
Storm Water Pond 2	22S	31E	SW, SE, SE-20	32 22.214	103 47.550
Storm Water Pond 3	22S	31E	SE, SE, SE-20	32 22.291	103 47.775
SPDV Material Pile	22S	31E	SW, SE, SW	32 22.268	103 47.176

A-10. Discharge Quality.

Indicate the expected quality of the discharge -- wastewater, leachate, sludge, etc. -- generated, stored, treated, processed and/or discharged at your facility. List the contaminants of concern and the expected concentrations. *Not all facilities need to characterize influent quality.* See Supplemental Instructions for typical contaminants and additional guidance.

Sewage Treatment Facility Influent (sewage)

Expected or Known Contaminants	Expected or Known Contaminants Indicate units: mg/L, CFU/100 ml, etc.	
	Incoming (Influent)	Final (Effluent)
Total Dissolved Solids (TDS)	200-5,000 mg/L	NA
Nitrate	0-7.0 mg/L	NA
Total Kjeldahl Nitrogen	4-130 mg/L	NA

*Values are calculated using data from Discharge Monitoring Reports April 2004 through July 2012.

Typical Contaminants in Wastewater Discharged to the Evaporation Pond H-19 or Sewage Treatment Facility Effluent Lagoons A, B or C (non-hazardous industrial wastewater)

Expected or Known Contaminants	Expected or Known Contaminants Indicate units: mg/L, CFU/100 ml, etc.	
	Incoming (Influent)	Final (Effluent)
Total Dissolved Solids (TDS)	0-400,000 mg/L	NA
Sulfate	0-8,500 mg/L	NA
Chloride	149,000 mg/L	NA
Lead	<5.0 mg/L Toxicity Characteristic Leachate Procedure	NA

Each value represents the range of waters described in Part B, Section B-1.B which can vary from minor TDS concentrations to totally saturated brine. Sulfate and chloride concentrations represent the 95th percentile upper tolerance limit for water from Water Quality Sampling Program Well 3 (WQSP-3) reported in the Waste Isolation Pilot Plant Annual Site Environmental Report for 2012 (DOE/WIPP-07-2225).

Salt Storage Pond 2 and 3 (storm water run-off and industrial non-hazardous wastewater)

Expected or Known Contaminants	Expected or Known Contaminants Indicate units: mg/L, CFU/100 ml, etc.	
	Incoming (Influent)*	Final (Effluent)
Total Dissolved Solids (TDS)	250,000 mg/L	NA
Chloride	223,000 mg/L	NA
Sulfate	11,000 mg/L	NA

Note: Current concentration of retained storm water, not an influent sample
*Values are the maximum value reported in Discharge Monitoring Reports from 2004 through 2012.

Salt Storage Pond 1 (storm water run-off)

Expected or Known Contaminants	Expected or Known Contaminants Indicate units: mg/L, CFU/100 ml, etc.	
	Incoming (Influent)*	Final (Effluent)
Total Dissolved Solids (TDS)	67,000 mg/L	NA
Chloride	50,500 mg/L	NA
Sulfate	478 mg/L	NA

*Values are the maximum value reported in Discharge Monitoring Reports from 2004 through 2012.

A-11. Ground Water Conditions.

All applicants must provide the depth to and pre-discharge TDS concentration of the ground water that could be affected by the discharge. Refer to Supplemental Instructions for details on how to obtain these values.

Indicate the depth to the most shallow ground water beneath the discharge site. If there are multiple discharge sites, indicate the range of depths.	Indicate pre-discharge total dissolved solids (TDS) concentration of most shallow ground water beneath the discharge site. Attach copies of analyses.
Depth to water (feet): 100 Reference: ☐ Measurement, nearby monitoring well ☐ Measurement, nearby supply well ☐ Well log from nearby well (attach copy) ☐ Office of the State Engineer http://www.ose.state.nm.us/ X Report or study (give citation here and attach relevant portion): Daniel B. Stephens & Associates (September 30, 2003) Water Budget Analysis of Shallow Subsurface Water at the Waste Isolation pilot Plant. ☐ Other (describe):	TDS (mg/L): 100,000 Reference: ☐ Analysis from upgradient monitoring well ☐ Analysis from on-site supply well ☐ Analysis from shallow nearby supply well X Concentration provided in previous Discharge Permit application ☐ Report or study (give citation here and attach relevant portion): ☐ Other (describe):

A-12. Public Notice. See Supplemental Instructions.

a) The public notice packet including instructions and materials should be sent to:

X Applicant ☐ Consultant ☐ Other: ______________________

b) Copies of the public notice packet (excluding sign) should be sent to:

X Applicant ☐ Consultant ☐ Other: ______________________

c) The applicant is required to provide public notice of this application by placing a display ad in a newspaper of general circulation near the location of the proposed discharge. Indicate newspaper you intend to place the ad in:

Newspaper: Carlsbad Current-Argus

d) *For new or modification applications only:* The applicant must post a sign for 30 days in a conspicuous location at or near the facility, as approved by NMED. One sign must be posted for each 640 contiguous acres or less of the discharge site. An additional notice must be posted at an off-site location conspicuous to the public. Describe the locations below where you intend to post the notices. You may also attach sketches or photographs.

At or near facility: N/A
2 by 3 feet in size

Off-site location: N/A
flyer size

Part B

GROUND WATER DISCHARGE PERMIT APPLICATION
PART B: OPERATIONAL, MONITORING, CONTINGENCY AND CLOSURE PLANS
GENERAL FORM (VARIOUS FACILITY TYPES)

Operational Plan *[Section 20.6.2.3106.C, 3109.C NMAC]*

B-1. Source(s) of the Discharge. Describe what generates the wastewater, sludge or other discharges processed and/or disposed of at your facility. Identify all sources. Attach additional pages, if needed. See Supplemental Instructions.

A. Sewage Treatment Facility influent typically includes:

1. Domestic wastewater from the facilities showers, restrooms, sinks and other plumbing features.
2. Industrial wastewaters from two compressed air systems at the facility are discharged to the sewage system by pumping the water from containers into manholes/drains at the site.

B. Wastewater evaporated in Effluent Lagoon A

Water from the Polishing Lagoons 1 and 2 flows into Effluent Lagoon A for evaporation. To maintain 1' freeboard, water will flow into Effluent Lagoons B and/or C as needed.

C. Wastewaters evaporated in effluent lagoons and evaporation ponds:

The following non-hazardous wastewaters are evaporated in the Evaporation Pond H-19 and/or Effluent Lagoon A, B, or C at the Sewage Treatment Facility:

1. Water from purging groundwater monitoring wells for sampling or occasionally developing groundwater monitoring wells. Water from the Culebra water bearing formation around the WIPP site is the predominant source of groundwater disposed of in evaporation ponds. Water from the Santa Rosa/Dewey Lake contact and the Dewey Lake Formation are also disposed of in these lagoons and ponds.
2. Water collected from the Waste Shaft Sump, Exhaust Shaft Interception Wells and other observation boreholes in the underground
3. Condensate from the Exhaust Shaft fan ductwork on the surface.
4. Miscellaneous non-hazardous wastewaters may occasionally be discharged to the sewage treatment facility or one of the effluent lagoons. Typically, these could include neutralized acids or bases and miscellaneous water from routine cleaning.

D. The Salt Storage Ponds 2 and 3

The Salt Storage Pond 2 receives salt contact storm water run-off containing high TDS and chlorides from storm water that has been in contact with mined salt tailings excavated from the WIPP underground facilities and placed in Salt Cells 2 and 3. Two 12 inch polyethylene pipes connect Salt Storage Pond 2 with Salt Storage Pond 3. This allows excess water in Pond 2 to flow into Pond 3 to avoid overflowing Pond 2.

The following wastewaters may be evaporated in the Salt Storage Pond 2 and 3:

1. Water from purging groundwater monitoring wells for sampling or occasionally developing groundwater monitoring wells. Water from the Culebra water bearing formation around the WIPP site is the predominant source of groundwater disposed of in evaporation ponds. Water from the Santa Rosa/Dewey Lake contact and the Dewey Lake Formation are also disposed of in these ponds.
2. Water collected from the Waste Shaft Sump, Exhaust Shaft Interception Wells and other observation boreholes in the underground
3. Condensate from the Exhaust Shaft fan ductwork on the surface.

E. **Salt Storage Pond 1**

This pond currently receives non-contact storm water run-off from the covered Salt Storage Pile.

F. **Storm Water Ponds 1, 2, and 3**

Storm Water Ponds 1, 2, and 3 receive clean non-contact storm water from the WIPP facility's paved areas, roofs, and air conditioner condensate, and occasionally clean domestic water from testing and repairing water lines, fire hydrants, and hoses. The water in these ponds is allowed to evaporate, or is used to irrigate vegetation established on the Salt Storage Pile.

B-2. Discharge Quantity. Describe the methods/calculations used to determine the maximum discharge volume listed in Item A-7 in Part A of your application. Attach additional pages, if needed. See Supplemental Instructions.

Sewage Treatment Facility:

The maximum design flow rate for the Sewage Treatment Facility is 23,000 gallons per day. The flow rate is of the Settling Lagoons 1 and 2 and Polishing Lagoons 1 and 2 is determined at their operating maximum depth of 6 feet and maintaining 1 foot of freeboard (Note: The drawings referenced in Part B, Section B-7 and included in Attachment I were revised to reflect the 2 feet of freeboard required by the April 29, 2003 discharge permit application).

Settling Lagoon Calculations:

At a water depth of 6 ft, the surface area of Settling Lagoons 1 and 2 is:

252 ft. x 92 ft. x 2 = 46,368 ft^2 = 1.065 acres

At a BOD_5 loading of 40 lbs/day/acre and the available area of 1.064 acres, the BOD_5 mass loading is:

40 lbs/day/acre x 1.064 acres = 42.58 lbs/day BOD_5

The average daily flow rate (Q) to produce a BOD_5 mass loading of 42.58 lbs/day is:

Q = 42.58 lbs/day / (8.38 lbs/Mgal/mg/l x 220 mg/l) = 0.02321 Mgal/day

Q = 23,000 gal/day

Settling Lagoons 1 and 2 can process 23,000 gal/day at an operating depth of 6 feet.

Using the flow rate of 23,000 gal/day in the calculations, the average hydraulic detention time (DT) for the primary treatment cells yields the following results:

At 3 ft., DT = 20 days

At 4 ft., DT = 28 days

At 6 ft., DT = 47 days

Polishing Lagoon Calculations:

At a BOD_5 loading of 40 lbs/day/acre and the average daily flow rate of 23,000 gal/day, the BOD_5 mass loading is:

0.023 Mgal/D x 8.34 lb/Mgal/mg/l x 100 mg/l = 19.18 lbs/day BOD_5

The required surface area to process 19.18 lbs/day BOD_5 is:

19.18 lbs/day / 40 lbs/day/acre = 0.48 acres = 20,909 ft^2

The available surface area of Polishing Lagoons 1 and 2 at a depth of 6 ft. is:

116 ft. x 92 ft. x 2 = 21,344 ft^2

Therefore, the two Polishing Lagoons are large enough to process the 23,000 gal/day average daily flow without exceeding a depth of 6 ft.

Using the flow rate of 23,000 gal/day in the calculation of average hydraulic detention time (DT) for the Polishing

Polishing Lagoons yields the following results:

At 3 ft., DT = 7.2 days

At 4 ft., DT = 9.6 days

At 6 ft., DT = 17.7 days

Effluent Lagoons B and C

The volume of 637,000 gallons per Effluent Lagoon B and C is based on the volume of each pond with one feet of freeboard. Conservatively, two feet of freeboard has been used in the calculations establishing the maximum discharge limit of 500,000 gallons. However, the proposed maximum discharge is that one foot of freeboard is maintained. Effluent Lagoons B and C have the same dimensions (224 feet in length, 92 feet wide and 6 feet deep with 3 foot horizontal to 1 foot vertical slopes). The volume of each pond with 2 feet of freeboard is shown on drawing 25-C-004-W in Attachment I. as 68,032 cubic feet (508,879 gallons).

Top Area = 92 ft. x 224 ft. = 20,608 sq. ft.

Middle Area = 80 ft. x 212 ft. = 16,960 sq. ft.

Bottom Area = 68 ft. x 200 ft. = 13,600 sq. ft.

Length of side = $[(4^2 + (4 \times 3)^2]^{1/2} = [16 + 144]^{0.5}$ = 12.65 ft.

Area of liner = [(92 ft + 68 ft) / 2) x 12.65 ft. x 2] + [(224 + 200 / 2) x 12.65) + 13,600]

= [80 x 12.65 x 2] + [212 x 12.65 x 2] + 13,600

= 2,024 + 5,363.6 + 13,600

= 20,987.6

Volume = 4 x [20,608 + (4 x 16,960 + 13,600)] / 6

= 4 x [20,608 + 67,840 + 13,600] / 6

= 4 x [102,048] / 6

= 68,032 cubic feet

= 68,032 ft^3 x 7.48 gal/ft^3 = 508,879 gallons

Effluent Lagoon A

Effluent Lagoon A is slightly smaller than Effluent Lagoons B and C, and is used mainly to received water from the Polishing Lagoons that has a low BOD load. Some non-hazardous wastewater from well testing may be introduced in Effluent Lagoon A. The total volume of Effluent Lagoon A is 566,610 gallons without any freeboard. Conservatively, two feet of freeboard has been used in the calculations establishing the maximum discharge limit of 302,536 gallons as seen on drawing 25-C-004-W in Attachment I. However, the proposed maximum discharge is that one foot of freeboard is maintained.

Evaporation Pond H-19

The volume of Evaporation Pond H-19 with one foot of freeboard is 46,268 cubic feet (346,085 gallons). Attachment I. contains drawing 23-C-012-W1of the Evaporation Pond H-19.

Salt Storage Ponds

1. Salt Storage Pond 1:

   Drainage Area = 690,100 sq. ft.

   Design Basis Storm Event = 3.9 inches

   Run-off from design basis storm event =

   690,100 ft^2 x 3.9 inches / 12 inches/ft. x 7.48 ft^3/gal = 1,677,633 gallons

2. Salt Storage Ponds 2 and 3:

2. Salt Storage Ponds 2 and 3:

Drainage Area = 1,047,800 sq. ft.

Design Basis Storm Event = 3.9 inches

Run-off from design basis storm event =

1,047,800 ft^2 x 3.9 inches / 12 inches/ft. x 7.48 ft^3/gal = 2,547,202 gallons

Storm Water Infiltration Control Ponds

Storm water Ponds 1, 2, and 3 and Salt Storage Ponds 1, 2, and 3 collect run-off storm water from the plant site and salt storage cells respectively. These ponds are designed to contain water from a 25 year 24 hour storm event and maintain a one foot freeboard. The table in Section B7 identifies the area and volume of run-off collected for each individual pond. Attachments II, III, IV, and V contain drawings showing design and locations of these ponds.

B-3. **Site Map.** Attach a site map showing the components of your proposed system and relevant surrounding features, clearly labeled, such as:

- treatment units
- lagoons
- tanks
- sumps
- manure separators
- land application fields
- domestic wastewater reuse areas
- pits
- stockpiles
- leachfields
- sludge drying beds
- roads
- buildings
- supply wells
- monitoring wells
- extraction/injection wells
- arroyos
- nearby water bodies such as ponds or canals
- property boundaries
- other permitted discharges
- required setbacks
- north arrow

If map is not to scale, mark distances on the map.

X Site maps is attached. Attachment VI contains two aerial photos and two topography maps show the location of the site. Attachment V contains one site map showing the locations of the shallow subsurface water monitoring wells and other regulated units of this permit, and another site map of the WIPP Water Quality Sampling Program Wells (WQSP 1-6 and 6A). The WQSP Wells 1-6 and 6A are monitored as part of the detection monitoring program for the Hazardous Waste Facility Permit. WQSP 6A monitors naturally occurring water in the middle Dewey Lake Formation and is designated as the monitor well for the Sewage Treatment Facility.

B-4. **Flood Protection**. Describe the methods used to prevent flooding and run-off at the facility (tank protection, berms, diversion channels, etc.)

The WIPP facility is within the Pecos River Basin. There are no perennial streams at the WIPP facility. At its nearest point, the Pecos River is about 12 miles southwest of the WIPP facility boundary. The maximum recorded flood on the Pecos River occurred near the town of Malaga, New Mexico on August 23, 1966, with a discharge of 120,000 cubic feet per second and a stage elevation of about 2,938 feet above mean sea level. The Surface elevation at the WIPP site is over 500 feet above the river bed and approximately 470 feet above the elevation of this maximum historical flood elevation. The potential for flash flooding is considered minimal because of the high percolation rate of the surrounding sand dunes and protection from flash floods from probable maximum precipitation events is provided by a system of peripheral interceptor berms and dikes. The Salt Cell area is within these peripheral berms. The sewage lagoons are graded to promote run-off, and berms have been constructed to minimize run-on in the events of a significant rainfall event. The Evaporation Pond H-19 is also graded to minimize run-on during precipitation events.

B-5. Plans and Specifications. For new facilities and for new components of existing systems, attach plans and specifications certified by a New Mexico registered professional engineer. *[Section 20.6.2.1202 NMAC]*

X Not applicable because no new facilities are proposed.

Plans and specifications are attached.

☐ Plans and specifications were previously submitted. Submittal date(s): ____________

B-6. Description of Components. Provide descriptive details of all components of your processing, treatment, storage and/or disposal system. Include all components listed under Item A-8 in Part A.

Component	Description (construction material, liner type, irrigation method, capacity, dimensions, area, etc.)
Settling Lagoon 1	60-mil HDPE, 128,772 ft^3 (796.499 gallons)*
Polishing Lagoon 1	60-mil HDPE, 55,466 ft^3 (314,871 gallons)*
Settling Lagoon 2	60-mil HDPE, 128,772 ft^3 (796,871 gallons)*
Polishing Lagoon 2	60-mil HDPE, 55,466 ft^3 (314,871 gallons)*
Effluent Lagoon A	30-mil linear low density polyethylene (LLDP), 75,750 ft^3 (483,252 gallons)*
Effluent Lagoon B	30-mil LLDP, 113,138 ft^3 (762,899 gallons)*
Effluent Lagoon C	30-mil HDPE, 113,138ft^3 (762,899 gallons)*
Evaporation Pond H-19	36-mil Hypalon®, 80,457 ft^3 (601,818 gallons)*
Salt Cell 2 and Salt Cell 3	60-mil HDPE, 200-mil Geonet Drainage layer, 2-feet of native soil cover, Cell A: 6.2 acres, Cell B: 5.2 acres, Total: 11.4 acres
Salt Storage Pond 2	Two 60-mil HDPE, 200-mil Geonet leak detection layer, 4,844,935 gallons*
Salt Storage Pond 3	Two 60-mil HDPE, 200-mil Geonet leak detection layer, 17,4849,456 gallons*
Salt Cell 1 (Run-off Ditches)	60-mil HDPE, 2 feet of native soil, 18.8 acres, 1.0 Acres
Salt Storage Pond 1	60-mil HDPE, 5,506,989 gallons*
Storm Water Pond 1	60-mil HDPE, 813,925 gallons*
Storm Water Pond 2	60-mil HDPE, 2,447,692 gallons*
Storm Water Pond 3	60-mil HDPE, 6,670,940 gallons*
Site and Preliminary Design Validation Material Pile	Geosynthetic liner, 2 feet of native soil blended with rock, 10 acres

*Total Cell Volume without freeboard

Attachments I, II, III, and IV contain drawings of each of the pond, lagoons, and salt storage cells mentioned in the table above.

B-7. Operational Plan. Attach a detailed description of how you operate your processing, treatment, storage and/or disposal system.

Animal feeding operations: include storm water management, nutrient management plans, method for mixing irrigation and wastewater.

Domestic wastewater treatment facilities: include pre-treatment, solids management, vegetation management for land application.

Facilities using reclaimed domestic wastewater above ground: include proposed water quality classification(s), effluent monitoring, setbacks, irrigation schedules, etc. that will result in protection of public health and the environment. Please refer to *NMED Ground Water Quality Bureau Guidance: Above-Ground Use of Reclaimed Domestic Wastewater* for further information. A copy of the guidance document is available on the NMED website **www.nmenv.state.nm.us** under "Ground Water Quality".

X Operational plan is attached. (See Attachment VII)

☐ Operational plan was previously submitted. Submittal date(s): ____________________

Sewage Treatment System:

Wastewaters are conveyed from WIPP facilities to the sewage treatment facility through a buried gravity flow system constructed of vitrified clay piping with approximately 80 feet of PVC piping. The wastewater totalizing flow meter is subject to erratic readings due to the buildup of solids on the weir and the low flows of effluent from the WIPP site facilities. Therefore, wastewater discharge is assumed to be equal to the volume of total domestic water use which is measured using a totalizing flow meter.

The Sewage Treatment Facility is a facultative lagoon system consisting of two parallel trains of one settling lagoon and one polishing lagoon. Both polishing lagoons discharge into one common evaporation lagoon (Effluent Lagoon A). Effluent Lagoon A discharges into Effluent Lagoon B and/or Effluent lagoon C. Each train of the facultative lagoon system is designed to accommodate the discharge of up to 23,000 gallons per day of domestic and industrial wastewater. Attachment I contains engineering drawing 25-C-004-W, Stabilization Lagoon and Evaporation Pond illustrating the construction of the WIPP sewage treatment facility.

When not in domestic sewage service, one settling lagoon, one polishing lagoon and Effluent Lagoons B and C are available to accept other miscellaneous non-hazardous wastewater. Primarily the Effluent Lagoons B and C are available for use as evaporation ponds to receive water generated from developing or purging groundwater-monitoring wells. Effluent Lagoon A may accept miscellaneous non-hazardous wastewater as long as 1 foot freeboard is maintained. Occasional groundwater pump tests are conducted on wells and can generate large volumes of water depending on the length of the test.

Evaporation Pond H-19

Wastewater is transferred to the Evaporation Pond H-19 in portable containers and transferred into the pond. The volumes of waste discharged to the evaporation pond are estimated using the time/volume method (e.g. two 55-gallon drums/day = 110 gallons/day). Wastewaters placed in Evaporation Pond H-19 are evaporated only, with no discharge or disposal to another facility. When sediments build up on the pond so that the pond does not operate properly, the sediments will be characterized and shipped off-site for proper disposal in accordance with applicable state and federal laws and regulations.

Infiltration Controls

A portion of the subsurface water contains elevated total dissolved solids and chlorides which are theorized to be elevated as the result of storm water infiltrating the salt cells north of the facility. The GWQB determined that WIPP needed a discharge permit for discharges to the subsurface from the salt cells. The DOE developed a conceptual design for nfiltration controls to minimize the migration of the subsurface shallow water and reduce the potential for impacts to the ıaturally occurring Dewey Lake water. A new salt storage area was constructed on a HDPE lined area that would divert salt contact storm water to a double lined pond with a leak collection sump. In addition to the controls proposed in the original NOI, the DOE proposed to line three storm water retention ponds to prevent the infiltration of clean storm water to the subsurface to further minimize the potential for the migration of the subsurface shallow water. The infiltration control evaporation and storm water infiltration control ponds are sized with a design basis using a 25-year, 24 hour storm event of 3.9 inches. The table below identifies the area and volume of run-off collected for each individual pond.

Evaporation Pond	Drainage Area (ft^2)	Run-off Volumes for Design basis 25-year/24 hour storm event (3.90 inches)[1]	Pond Capacity[2]
Salt Storage Pond 1	690,100	1,677,633 gallons	5,506,989 gallons
Salt Storage Pond 2	1,047,800[3]	2,547,202 gallons	4,170,732 gallons
Salt Storage Pond 3	2,752,700[3]	2,547,202 gallons	9,724,000 gallons
Storm Water Pond 3	1,642,199	3,992,186 gallons	6,670,940 gallons
Storm Water Pond 1	178,595	434,163 gallons	813,824 gallons
Storm Water Pond 2	387,681	942,452 gallons	2,447,692 gallons

[1] Run-off volumes assume 100% run-off since infiltration coefficients are unknown and can only be estimated. This also included the volume that falls onto the surface area of the pond.
[2] Capacity is the maximum capacity without assuming any freeboard.
[3] Current configuration with only Salt Cell A has a drainage area of 538,000 ft^2, run-off volumes for the 3.90 inch rainfall event is 1,307,878 gallons.

Salt Cell 1 and Salt Storage Pond 1
The Salt Cell 1 covers approximately 18.8 acres and was used for the storage of salt from the construction of the TRU waste repository using conventional mining techniques. The Salt Cell 1 crown was graded to a minimum two percent slope with screened sand and covered with a 60-mil HDPE liner. The liner was covered with approximately 24 inches of native soils and seeded with Bureau of Land Management approved native grasses. Salt Cell 1 has 3:1 side slopes and a two percent crown slope from the center north and west diverting storm water run-off west to the three acre Salt Storage Pond 1. Attachment IV contains engineering drawings for Salt Cell 1, and Attachment III contains engineering drawings for Salt Storage Pond 1.

Salt Cell 2, Salt Cell 3, Salt Storage Pond 2, and Salt Storage Pond 3
The salt storage extension consists of Salt Cells 2 and 3. Each cell was constructed with 6-inches of soil, a 60-mil HDPE liner, 200-mil Geonet, and covered with 24 inches of screened native soil. Each cell slopes two percent toward the center which contains a pipe for the collection of water which is diverted west to the Salt Storage Pond 1. The Salt Storage Pond 2 is constructed with a 60-mil HDPE liner, a 200-mil Geonet, and a second HDPE liner. The Geonet leak detection layer drains to a sump with an inclined riser for leak detection. The Salt Storage Pond 2 is connected via two 12 inch polyethylene pipe to the Salt Storage Pond 3. The Salt Storage Pond 3 is 560' long and 450' wide and is 22 feet in depth at the deepest point. It is constructed with a 60 mil HDPE liner over a 200 mil Geonet layer and a second HDPE 60 mil liner. The Salt Storage Pond 3 receives overflow water from Salt Storage Pond 2 to maintain 1 foot freeboard in Salt Storage Pond 2. Attachment IV contains engineering drawings for Salt Cell 2 and Salt Cell 3, and Attachment III contains engineering drawings for Salt Storage Pond 2 and Salt Storage Pond 3.

Non-Contact Storm Water Ponds
Storm Water Pond 1, Storm Water Pond 2, and Storm Water Pond 3 are each lined with 60-mil HDPE. The water collected in these ponds is clean non-contact storm water which meets the criteria described in 20.6.2.3105 NMAC, *Exemption from Discharge Permit Requirement.* The storm water collected in these ponds is run-off from the WIPP Site and/or clean domestic water from testing of the fire fighting system and from broken/repaired domestic water system distribution piping. This water is retained for evaporation or used for irrigation of the Salt Cell 1 cover. Attachment II contains engineering drawings for Storm Water Pond 1, 2, and 3.

Site and Preliminary Design Validation Material Pile
The SPDV pile was created during the design validation phase of the WIPP facility for placement of construction materials resulting from the drilling of two 2,150 foot shafts and the underground excavation of connecting tunnels, exploratory tunnels, and four rooms. The materials in the SPDV pile include mined tailings interspersed with soil, rock, and debris from the construction of the shafts. The SPDV Pile encompasses approximately 10 acres and ranges in height from 7 to ?0 feet above ground. The volume is approximately 168,000 cubic yards, which includes an area beneath the pile where soil was excavated prior to tailing placement.

In 1995, the SPDV pile was characterized to determine the chemical nature of wastes within the pile and to support selection of reclamation alternatives. ("Characterization of the Site Preliminary Design Validation Salt Pile," Daniel B. Stephens & Associates, Inc., January 5, 1996). The investigation determined that no remedial measures were required according to NMED guidelines. As a result of the study, stabilization and reclamation were recommended in order to prevent offsite transport of salt and brine solutions into the surrounding environment, and to blend the salt into the surrounding environment.

The reclaimed SPDV pile is unlikely to discharge to the groundwater due to the capping installed during reclamation and the fact that no brine liquid was added to the pile. However, as set forth in DP-831, additional shallow sub-surface monitoring wells were installed around the SPDV pile.

B-8. **System Maintenance**. Attach a description of the operations and maintenance procedures which ensure that your processing, treatment and disposal system functions properly; e.g., inspections, pumping schedules, equipment maintenance, etc.

X O & M procedures are attached. (See Attachment VII)

☐ O & M procedures were previously submitted. Submittal date(s): ____________

The sewage treatment facility is a facultative, no discharge system, requiring maintenance only in the event a broken valve or obvious damage to the liners or peripheral berm and fencing. The sewage treatment facility, associated effluent ponds and the Evaporation Pond H-19 are inspected weekly for adequate freeboard, signs of damage to the liners, septic conditions, erosion, intrusion of animals, or damage to the fences or berms.

The infiltration controls (storm water ponds, salt storage ponds, the SPDV pile, Salt Cells 1, 2, and 3) are inspected monthly for signs of erosion, damage to the liners, signs of burrowing animals, deep rooted plants that could penetrate the liner or other issues that need to be addressed. In the event of an unsatisfactory condition, corrective actions are initiated as appropriate.

Maintenance of the soil cover on the Salt Cell 1 and SPDV Pile is an on-going activity which can be impacted by severe storm events. In the event of significant erosion that cannot be repaired within three months of occurrence, the New Mexico Ground Water Quality Bureau (GWQB) will be notified and a corrective action plan submitted within 30 days of the time that it is apparent the repairs cannot be completed timely. Significant erosion for the SPDV pile is considered the point at which the liner is exposed or greater than four square feet of the liner is about to be exposed. Significant erosion for the Salt Cell 1 soil cover is considered to be the exposure of liner to the point that the liner could be subject to damage due to uplifting by the wind.

B-9. **Backflow Prevention.** If wastewater is used for land application or irrigation, describe methods used to protect wells from contamination by wastewater backflow. For new facilities or new systems at an existing facility, only air gap or reduced pressure valve assemblies are acceptable methods.

a) Clearly describe and/or sketch the location of air gaps or devices and attach specifications.

NA

b) Describe how devices are maintained.

NA

B-10. Water Rights. Animal feeding operations which land apply wastewater must attach documentation of irrigation water rights for the proposed land application fields, sufficient to sustain the intended crop rotation.

☐ Water right documentation is attached.

X Not applicable.

B-11. Past Ground Water Monitoring Results. *This item applies only to existing facilities seeking renewal and/or modification of a Discharge Permit that required ground water monitoring.*

a) Attach a graph or a table showing all analytical results from ground water sampling at your facility. If preparing graphs, a separate graph should be developed for each constituent, except that nitrate and TKN may be shown on the same graph. Multiple wells may be shown on the same graph. See Supplemental Instructions for sample table and graph.

b) If the monitoring results indicate that ground water standards have been violated or that there is an upward trend approaching standards, attach a description of what actions you have taken or will take to address the elevated concentrations. Ground water standards are listed in Section 20.6.2.3103 NMAC. See the Supplemental Instructions for frequently referenced standards.

Response to Parts a) and b) of Section B-11:

a) Attachment V contains a table with the groundwater monitoring results for each well that Discharge Permit, DP-831, requires monitoring for the shallow subsurface water at the Dewey Lake/Santa Rosa contact and WQSP 6A south of the discharge site in the middle Dewey Lake.
b) The analytical trend in the monitor wells shows a slight decrease in chloride concentration and in TDS since 2006.

Monitoring Plan *[Section 20.6.2.3107.A NMAC]*

B-12. Discharge Volumes. Describe how and where the monthly discharge volume at your facility will be. For all measuring devices, provide type, location, and units of measure including multipliers (e.g., gallons, gallons x 100, acre-ft, etc.) See Supplemental Instructions. Attach additional pages, if necessary.

The influent to the Sewage Treatment Facility is measured using an ultrasonic flow meter which reads the level (height) of water flowing over a weir in inches which is converted to gallons per minute. The meter display is located in the WIPP facility domestic water pump house. The ultrasonic monitoring device is located in manhole number 11 west of the pump house. The meter is subject to erratic readings due to low flows from the facility and material build-up on the weirs. For this reason the total domestic water use, which is also monitored with an ultrasonic continuous flow meter located at the domestic water pump house, may be used to determine the volumes discharged to the Sewage Treatment Facility.

Miscellaneous wastewater discharged to Evaporation Pond H-19, Effluent Lagoons A, B, and C, and Salt Storage Ponds 2 and 3 is recorded using the time volume method. (i.e., two 1,000 gallon containers per day = 2,000 gallons/day). Records of the date and volume discharged and the physical/chemical characteristics of the water are maintained.

B-13. Discharge Quality Monitoring. Discharge Permits typically require that the discharge (treated wastewater, sludge, septage, etc.) be sampled on a regular basis. The frequency of sampling varies by type of facility, as do the contaminants of concern. Domestic and agricultural Discharge Permits typically require sampling for total Kjeldahl nitrogen (TKN), nitrate-nitrogen (NO_3-N), total dissolved solids (TDS) and chloride on a quarterly or semi-annual basis.

If reclaimed domestic wastewater will be discharged for above ground uses, testing of the discharge for additional parameters is appropriate. Please refer to the *NMED Ground Water Quality Bureau Guidance: Above-Ground Use of Reclaimed Domestic Wastewater* for further information.

In the space below, provide a description or sketch of the sampling point(s) to be used for sampling the discharge at your facility.

Discharge Unit	Frequency	Sample Location	Parameters
Active Settling Lagoon 1 or Settling Lagoon 2	Semiannually	Grab sample from influent mixing zone	TDS, NO_3-N, TKN
Effluent Lagoon B	Semiannually	Grab sample from pond*	TDS
Effluent Lagoon C	Semiannually	Grab sample from pond*	TDS
Evaporation Pond H-19	Semiannually	Grab sample from pond*	TDS
Salt Storage Pond 1	Annually	Grab sample from pond*	TDS, Cl, SO_4
Salt Storage Pond 2	Annually	Grab sample from pond*	TDS
Salt Storage Pond 3	Annually	Grab sample from pond*	TDS
Storm Water Pond 1	Annually	Grab sample from pond*	TDS, Cl, SO_4
Storm Water Pond 2	Annually	Grab sample from pond*	TDS, Cl, SO_4
Storm Water Pond 3	Annually	Grab sample from pond*	TDS, Cl, SO_4

*Provided sufficient water is available in the pond for sampling.

Optional: In the space below (or as an attachment), you may propose revisions or additions to the standard discharge quality monitoring requirements. If you do, provide the rationale for your proposal.

No changes are proposed to the current DP-831 discharge quality monitoring requirements.

B-14. Ground Water Quality Monitoring. Discharge Permits typically require that ground water samples be collected quarterly from properly constructed monitoring wells located down gradient from discharge locations. The samples must be analyzed for contaminants of concern. For most domestic and agricultural Discharge Permits, the typical contaminants of concern are total Kjeldahl nitrogen (TKN), nitrate-nitrogen (NO_3-N), total dissolved solids (TDS) and chloride.

Optional: In the space below (or as an attachment), you may propose revisions or additions to the standard ground water monitoring requirements. If you do, provide the rationale for your proposal.

No changes are proposed to the current DP-831 ground water monitoring.

For existing facilities:

Indicate number of existing monitoring wells: 19

Attach copies of monitoring well logs.

X Well logs attached. ☐ Well logs cannot be located.

Well logs previously submitted. Submittal date(s): ____________

Attach copy of monitoring well survey (typically not applicable if fewer than 3 monitoring wells).

Survey attached. ☐ No survey has been conducted.

X Survey previously submitted. Submittal date(s): 12/20/2007

B-15. Other Monitoring. In addition to discharge volumes, discharge quality monitoring and ground water sampling, Discharge Permits typically require the following monitoring, depending on the type of facility:

- inspection and pumping of septic tanks, grease tanks, lift stations
- inspection of leachfields
- inspection of lagoons
- process testing for treatment plants
- land application data sheets (LADS)
- tracking of chemical fertilizer applications to land application areas
- soil sampling (agricultural and selected other facilities land applying wastewater)
- harvested plant material testing (agricultural facilities)

Optional: In the space below (or as an attachment), you may propose revisions or additions to the other standard monitoring requirements for your type of facility. If you do, provide the rationale for your proposal.

No other monitoring is proposed for the purpose of monitoring discharges covered by this permit application.

__Contingency Plan__ [Section 20.6.2.3107.A.10 NMAC]

B-16. System Failure. Describe your contingency plan in the event there is a failure of your wastewater or discharge system (e.g., wastewater back-up, pump failure, pipe breaks, tank overflow, leachfield failure, saturated fields etc.)

WIPP emergency response, maintenance, safety and environmental personnel are available to attempt to isolate or contain any discharge and conduct necessary repairs. An assessment of any release that should occur will be conducted to determine the extent of the release and appropriate decontamination or remedial actions. Samples will be taken to determine the extent and severity of contamination as deemed necessary. A corrective action plan will be developed based on communications with the NMED Ground Water Bureau. Reporting will be consistent with the requirements of 20.6.2.1203 NMAC.

B-17. Contingency Leachfield Location. *This item applies only if your disposal system includes a leachfield.* Identify a location on your site map (Item B-3) for a contingency leachfield in the event that your leachfield must be replaced. If no land is available for a contingency leachfield at an __existing__ facility, describe how you will address a failed leachfield. __New__ facilities must provide for a contingency leachfield location.

NA

B-18. Other Contingencies. Discharge Permits typically contain standard contingencies to address:

- exceeding wastewater quality limits
- violation of ground water or surface water standards
- spills or illegal releases of wastewater
- migration of soil nitrogen
- loading nitrogen above limit

Propose additional contingency plans, if appropriate:

NA

Closure Plan [Section 20.6.2.3107(A)11 NMAC]

B-18. Facility Closure and Post-Closure Monitoring. Discharge Permits contain standard requirements to address the closure of part or all of your discharge system, as follows:

- cap or plug lines to prevent the flow of wastewater to treatment or disposal system
- empty and remove or backfill tanks
- empty lagoons, perforate or remove liners, re-grade to surface topography
- appropriately dispose of solids
- regrade and cover stockpiles at mine facilities
- continue ground water monitoring for at least two years, longer as appropriate
- enact contingency plans if ground water standards are violated
- financial assurance may be required.

Propose additional closure plans in the space below or as an attachment, if appropriate:

Closure Plan

The closure plan will be based on existing decontamination and decommissioning plans and closure plans developed pursuant to the Hazardous Waste Facility Permit (HWFP), applicable federal regulations and requirements. The final Compliance Recertification Application (CRA), will be prepared during the final three years of the project, as WIPP operations approach completion.

The HWFP contain closure plan requirements and is available at **http://www.nmenv.state.nm.us/wipp/index.html**.

The detailed closure plan to be developed as part of the final CRA will include design engineering, construction and decommissioning details, borrow source locations, cut and fill plans, final drainage plans, sampling and remediation plans, confirmation and verification plans, and closure monitoring plans.

As required by the HWFP, once operations at the WIPP facility are completed, the entire facility will undergo decontamination and decommissioning prior to final closure. The objective of decontamination and decommissioning activities at the WIPP facility is to return the surface to as close to the pre-construction condition as reasonably possible, while protecting the health and safety of the public and the environment."

Part C

GROUND WATER DISCHARGE PERMIT APPLICATION
PART C: SITE INFORMATION
All Facilities

C-1. **Area Map.** Attach a current area map showing roads and clearly mark the location of your facility.

An Area Map is enclosed as Attachment VI.

C-2. **Directions to Site.** Provide driving directions to the site from the nearest town or, if located in a town, from an easily identifiable location.

From Carlsbad, NM take Highway 62/180 east toward Hobbs, NM. After entering Lea County turn south on the WIPP access road just east of mile marker 64. Continue south 12.5 miles to the WIPP facility parking lot on the east side of the road.

C-3. **Topographic Map.** Attach a copy of the appropriate US Geological Survey topographic map. You may provide just the relevant portion. USGS maps are available at many outdoor equipment stores or bookstores, from the USGS at www.usgs.gov or 1-888-ASKUSGS, and from commercial websites.

On the map clearly indicate the location of your facility. Also identify the approximate locations of all wells within 1,000 feet of your discharge locations. The Office of the State Engineer has a searchable database of supply wells on its website at www.ose.state.nm.us.

X USGS map attached with facility location and neighboring wells marked.

C-4. **Flood Potential.** Attach a copy of the latest Federal Emergency Management Agency (FEMA) flood map with your facility's location clearly marked, to the best of your ability. Information about how to obtain this map, formally known as a Flood Insurance Rate Map (FIRM) is available at www.fema.gov, insurance agencies or county government offices. A site specific analysis may be substituted.

FEMA map or site-specific analysis attached.

☐ Previously submitted and still up-to-date. Submittal date(s): __________

A FEMA flood map is not available for the WIPP facility. Part B-4 of this application contains a narrative discussion of the flood potential for the WIPP facility.

C-5. **Soils.** Attach either:

a) A copy of the appropriate Natural Resource Conservation Service (NRCS) soil survey map, with your site clearly identified to the best of your ability. Include the descriptive information for soils associated with the discharge locations. To obtain the map, contact your local NRCS office – there is one in every county.

b) A site-specific assessment showing the soils classifications. This is preferred over the more generalized NRCS surveys.

X NRCS soil survey or site-specific assessment attached. See Attachment VI

☐ Previously submitted. Submittal date(s): __________

C-6. **Geology.** Provide information on the geology beneath the site by attaching relevant portions of geologic reports, well logs for on-site or nearby wells, or site specific assessments. A variety of geology publications and resources are available from the New Mexico Bureau of Geology and Mineral Resources at http://geoinfo.nmt.edu or 505-835-5420 (Socorro). Well logs are available from the New Mexico State Engineer's Office at http://www.ose.state.nm.us/.

☐ Geologic report attached. X Well log(s) attached.

☐ Geologic information previously submitted. Submittal date(s): __________

Geological Formations as Measured at WQSP 4

Unit Description	Thickness (feet)	Water Bearing (Y/N)
Superficial Deposits/Santa Rosa Formation	78	No
Dewey Lake Redbeds Formation	510	Yes
Forty-Niner Member of the Rustler Formation	64	No
Magenta Member of the Rustler Formation	20	Yes
Tamarisk Member of the Rustler Formation	2	No
Culebra Member of the Rustler Formation	20	Yes
Los Medanos Member of the Rustler Formation	12	Partial

Source for Information: *Basic data Report for Water Quality Sampling Well 4* (DOE/WIPP-95-92154) which is near the Evaporation Pond H-19. For geological information relevant to the subsurface shallow water see the well logs in Attachment V.

C-7. Ground Water Hydrology. Ground water hydrology refers to the occurrence, distribution, movement and chemistry of ground water. The ground water hydrology at your site will determine in large part whether your discharge will adversely affect ground water quality. You may need to present detailed information in order to "demonstrate that the Discharge Permit will not result in concentrations in excess of the standards of Section 20.6.2.3103 NMAC or the presence of any toxic pollutant." (20.2.3106.C.7 NMAC)

At a minimum, provide information below on the direction of ground water flow. Ground water may not flow in the same direction as water on the surface of the ground. A monitoring well survey is one of the best methods to determine the direction of ground water flow at a particular site. Such surveys are routinely required for many Discharge Permit locations.

If a survey is not available, check with well drillers, the city water department, staff at the Office of the State Engineer, environmental consultants or other knowledgeable persons in your area. In addition, relevant reports have been published for some areas. See the OSE website at www.ose.state.nm.us or the NMBGMR website at http://geoinfo.nmt.edu.

Direction of ground water flow: See Description Below

If ground water flow shifts seasonally, describe here: NA

Reference:

X On-site well survey attached. ☐ Previously submitted. Submittal date(s): ________

☐ Nearby well survey attached. ☐ Previously submitted. Submittal date(s): ________

☐ Other. Specify: ________

☐ Relevant portion attached.

☐ Previously submitted. Submittal date(s): ________

Attach any additional information available about ground water hydrology at the site.

Shallow Subsurface Water

Daniel B. Stephens & Associates (September 30, 2003) Water Budget Analysis of Shallow Subsurface Water at the Waste Isolation Pilot Plant determined the following hydrological conditions for the subsurface shallow water at the WIPP Site:

Water level data indicates that a Water table mound exists near the Salt Storage Pond with a radial flow outward. A lens of shallow subsurface water occurs beneath a portion of the WIPP site at a depth of less than 100 ft below grade surface at the contact between the Santa Rosa Formation and the Upper Dewey Lake Redbeds Formation. The predominant flow of subsurface shallow water in the northern portion is eastward while the predominant flow in the southern portion is to the south. The hydraulic gradient beneath the WIPP administrative area is approximately 0.016 ft/ft toward the south. The seepage velocity has been calculated to be 0.24 feet per day using an effective porosity of 10 percent and the geometric mean hydraulic conductivity of 1.5 ft per day for wells PZ-06, PZ-07, PZ-10, and PZ-12. The formations containing shallow water yield generally less than one gallon per minute in monitoring wells and piezometers. Average TDS concentrations range from approximately 2,400 mg/l at PZ-10 to greater than 100,000 mg/l at PZ-09. The Santa Rosa Formation in this area was unsaturated at the WIPP during early pre-construction hydrological investigations indicating that the shallow subsurface water has occurred since that time. The origin of this water is believed to be primarily from anthropogenic causes.

A perched lens of water at the Santa Rosa/Dewey Lake contact that is believed to be anthropogenic has developed less than 100 feet below the surface. This water was not present at the time the WIPP shafts were constructed. The subsurface shallow water is believed to have originated due to WIPP related activities such as diverting storm water run-off from paved and unpaved areas to previously unlined retention basins.

Dewey Lake Redbeds Formation Water

In the vicinity of the WIPP facility surface structures, no water bearing zones are known to exist in the Dewey lake Redbeds Formation. Natural shallow groundwater occurs in the middle part of the Dewey Lake Redbeds Formation at the southern portion of the WIPP facility and to the south of the WIPP facility. Well WQSP-6A located 1.25 miles southwest of the Salt Storage Area contains natural Dewey Lake Ground Water at a depth of approximately 167 feet below ground surface. TDS values measured in WQSP-6A is approximately 3,800 mg/l.

Magenta Member of the Rustler Formation

In the vicinity of the WIPP facility, another water bearing geologic unit that exists beneath the Shallow Subsurface Water is the Magenta Member of the Rustler Formation at approximately 608 feet below ground surface. Due to pressure in the formation, water levels measured in wells completed in the Magenta rise to the potentiometric surface, approximately 315 feet below grade surface. The hydraulic gradient was generated from depth to water measurements from wells completed in the Magenta Member. Underneath the Salt Storage Area, the potentiometric surface is interpolated to be approximately 315 feet below ground surface. The TDS concentrations for Magenta wells were reported in the Title 40 CFR 191 Compliance Certification Application for the Waste Isolation Pilot Plant as ranging from 4,600 mg/l to 24,600 mg/l.

Culebra member of the Rustler Formation

The quality of the Culebra water sampled near WIPP is naturally poor and not suitable for human consumption or for agricultural purposes, because the TDS concentrations are generally above 10,000 mg/l. In 2011, TDS concentrations in the Culebra varied from a low of 14,950 mg/l to a high of 223,500 mg/l as reported in the Waste Isolation Pilot Plant Annual Site Environmental Report for 2010 (DOE/WIPP-11-2225). The groundwater of the Culebra is considered to be Class III water by EPA guidelines. Groundwater elevation measurements in the Culebra indicate that the flow of groundwater is north to south at the center of the WIPP facility. Regionally, the flow is from the north to the southwest. The discharge velocity across the WIPP Land Withdrawal Area ranged from the high of 1.30E-04 m/d (4.27E-04 ft/d) to a low of 1.34E-05 m/d (1.42E-04 ft/d). The average discharge velocity across the WIPP Land Withdrawal Area was calculated to be 1.06E-04 m/d (3.48E-04 ft/d). Typical segment gradients ranged from 0.002 to 0.006, hydraulic conductivity was set to 0.022 m/d (0.071 ft/d).

C-8. Other Permitted Discharge Locations. If applicable, list other locations of wastewater or stormwater discharges on your site that are not described in this application and indicate what permits apply to them. Examples include discharges from small septic systems (covered by Liquid Waste Permits, discharges to surface waters under a NPDES permit, a discharge covered by a separate Discharge Permit, etc. Be sure these other discharge locations are identified on the site map required in Item B-3.

Discharge Type	Permit Identification
NA	N/A
NA	N/A
NA	N/A
NA	N/A

C-9. Other Information. Describe below or attach any additional information to demonstrate that your proposed discharge plan will be protective of ground water quality, public health and property.

In general, ground water quality in vicinity of the WIPP facility is poor and is not present in sufficient quantity or quality to be suitable for the public drinking water supply. Naturally occurring Dewey lake water south of the facility could be used for livestock watering. Significant efforts have been taken in covering the existing Salt Cell 1, constructing a new salt storage area and containing run-off in a lined pond for evaporation. Additionally, other significant sources of recharge to the subsurface shallow water are also contained in lined ponds for evaporation. These efforts in addition to the natural hydrological and geological features present at the WIPP site make it unlikely that WIPP related activities will impact ground water that could be used for present or future use as a domestic or agricultural water supply.

Working Copy

WP 02-EM1022

Revision 8

Site Discharge Area Inspections

Technical Procedure

EFFECTIVE DATE: 04/18/13

Stewart Jones

APPROVED FOR USE

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CHANGE HISTORY SUMMARY

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGES
6	05/05/11	Added WP 02-2 to Baseline Documents Reworded last bullet in Prerequisite Actions Changed all references to Facultative Lagoon system to Sewage Treatment Facility Added Notes above Step 1.1 and Step 1.1.1 Added wording to Step 3.3.1 on what to do in case of significant erosion. Replaced Attachment 3 with updated map Deleted Attachment 4
7	01/22/13	• Editorial revision in accordance with MD 1.1.
8	04/18/13	• Deleted "Satisfactory Plant Growth" column in attachment 2. • Replaced attachment 3 with updated figure.

INTRODUCTION

This procedure provides instructions for inspecting the infiltration control areas. The term "infiltration control areas" refers to lined evaporation ponds and covered salt piles which are intended to minimize the infiltration of water that could contribute to the recharge of the shallow subsurface water beneath the Waste Isolation Pilot Plant (WIPP) site.

Performance of this procedure generates the following record(s), as applicable. Any records generated are handled in accordance with departmental Records Inventory and Disposition Schedules (RIDS).

- Attachment 1, Site Discharge Area Evaporation Pond Inspections
- Attachment 2, Salt Storage Area Inspections

REFERENCES			
DOCUMENT NUMBER AND TITLE	BASELINE DOCUMENT	REFERENCED DOCUMENT	KEY STEP
State of New Mexico Environment Department, Ground Water Quality Bureau Discharge Permit DP-831, most recent modification, or renewal	✓		
WP 02-2, *WIPP Discharge Permit 831 Monitoring Plan*	✓		
04-IM1000, *Issues Management Processing of WIPP Forms*		✓	
04-AD3008, *Shift Operating Logs and Round Sheets*		✓	

PRECAUTIONS AND LIMITATIONS

- Inspections shall be conducted during daylight hours.
- Inspections shall be performed monthly, at a minimum, and also following severe rainstorm events greater than or equal to 2 inches in 24 hours.
- Caution must be used when walking around ponds and ditches; the liner surfaces may be slippery, which could result in slips or falls.
- Performer must beware of snakes, spiders, and any other threatening wildlife.
- Performer must watch for rapidly changing or severe weather conditions.

- Requirements for personal protective equipment (PPE) include reflective vest, hard hat, steel-toed boots, and safety glasses, when an active construction zone is implemented in the area.

- This procedure may be performed by more than one individual, and may be completed over multiple days.

- Only exposed portions of the liners (i.e., portion not submerged under water or covered with soil) are required to be inspected.

- "Minor Erosion" is erosion that is leading to "Major Erosion."

- "Major Erosion" on the salt storage area (SSA) (covered salt pile) is characterized as sufficient soil erosion indicating that the liner integrity could be damaged by wind lifting up the liner. Major erosion for the Site and Preliminary Design Validation (SPDV) Pile is defined as when the liner is, exposed and wind action cause the liner to agitate in the wind. Major erosion around lined ponds and the Salt Storage Extension Area (SSE) is when the integrity of the anchor trench is threatened.

EQUIPMENT

- Binoculars

PREREQUISITE ACTIONS

- Outstanding deficiencies shall be noted on the current inspection form.

- Refer to Attachment 3, Inspection Area Locations, to verify the location of each inspection area.

If required inspection goes delinquent, go to 04-IM1000 and determine if a WIPP Form should be written.

PERFORMANCE

1.0 EVAPORATION POND INSPECTIONS

NOTE

The criteria for inspection of each pond listed below are listed in section 1.1. The results of each criterion are to be recorded on Attachment 1, Table 1, Site Discharge Area Evaporation Pond Inspections. A notation of "Sat" means satisfactory, and "Unsat" means unsatisfactory. Any necessary comments are to be recorded in the comments section. A comment section with no text entered, means no comments were recorded.

- Salt Storage Extension Basin I (SSEB-I)
- Salt Storage Extension Basin II (SSEB-II)
- Salt Pile Evaporation Pond (SPEP)
- Evaporation Basin A (EBA)
- Evaporation Pond 1 (PD1)
- Evaporation Pond 2 (PD2)

NOTE

The Sewage Treatment Facility and H-19 Evaporation Pond are inspected by Facility Site Operations Infrastructure under procedure 04-AD3008.

1.1 Inspect each Evaporation Pond for the following criteria:

NOTE

Not being able to record an elevation reading due to salt build up is not an unsatisfactory condition. The water level is unsatisfactory if 1 ft of freeboard is not maintained. In the SSEB I, note in the comment section if the water level is below, at, or above the effluent pipe to the SSEB-II, which is at an elevation of approximately 3413.8.

1.1.1 Pond Level: Record the level of water in each pond by reading the level indicated on the staff gauge to the nearest 10th of a foot. If staff gauge is encrusted with salt or there is wave action, make best possible estimate.

1.1.2 Freeboard: Verify one foot of freeboard is maintained in the SSEB-I, SSEB-II, and SPEP. The south east corner of the SPEP has a one foot freeboard mark on top of it (top of painted line) and SSEB-I has a one foot freeboard mark (top of painted line on berm between the SSEB-I and the Salt Storage Extension Area. Due to construction design, the freeboard for the SSEB-II is the same elevation as freeboard on the SSEB-I, the one foot freeboard on the east berm of the SSEB-I.

1.1.3 Verify ponds are relatively free of floating plants and debris.

NOTE

Berms and liner condition may be satisfactory with small plants. However, preventive measures may need to be taken if woody plants are revealed (e.g., spraying).

1.1.4 Verify that the berms and lined pond and are non-impactive of burrowing animals or deep rooted vegetation (i.e., salt cedar, mesquite, desert willow, etc.) that could damage the liner.

NOTE

Liner integrity may be satisfactory; however tears above the water line or near anchor trenches may need to be addressed for long term maintenance.

1.1.5 Liner integrity: Inspect the liner to verify the absence of holes, cuts, signs of abrasion. Verify that berms are not damaged by wind or water erosion.

NOTE

Some sediment is generally present in the ditches and removal should be done before the sediment becomes an obstruction to the flow of water to the respective basin/pond or results in the ditch overflowing during storm events.

1.1.6 Culverts/ditches and pond berms: Verify that influent culverts/ditches are free of debris that could impede flow into the pond.

1.2 Initial and date: Initial for the line item inspected and note the date in the appropriate column.

2.0 INSPECTION OF SALT STORAGE AREAS

NOTE

Each location listed below shall be inspected for the criteria listed in section 2.1. The results of each criterion should be recorded on Attachment 2, Table 2, Salt Storage Area Inspections. A notation of "Sat" means satisfactory, and "Unsat" means unsatisfactory. Any necessary comments should be recorded in the comments section.

- Salt Pile
- Salt Storage Extension (SSE)
- Site and Preliminary Design Validation (SPDV) Pile

2.1 Visually inspect each SSA listed above and perform the following:

2.1.1 Verify that no major wind or water erosion has occurred to the SSA or SPDV pile soil covers and that the integrity of the SSE anchor liner has not been impacted by erosion.

NOTE

Condition may be satisfactory with small plants. However, preventive measures may need to be taken (e.g., spraying).

2.1.2 Verify that deep rooted plants, (i.e., salt cedar, mesquite, desert willow, etc.) are not growing such that the roots could damage the liner on the SSA and SPDV Pile covers nor in the vicinity of the SSE anchor trench.

2.1.3 Verify that no evidence of burrowing animals are present in such a manner that could damage liner integrity.

2.1.4 Verify that liner integrity is in good condition.

2.1.5 Verify that stormwater run-off is not causing channelized erosion escaping containment systems that could damage liner.

2.1.6 Provide the inspector's initials and enter the date of inspection.

3.0 INSPECTION RESULT REPORTING

3.1 Inspectors, sign and date completed inspection form.

3.2 If an unsatisfactory condition is observed:

3.2.1 Correct the condition if possible and note corrective actions in the comments section (add additional pages if necessary).

3.2.2 Provide a description of any unsatisfactory conditions for which SEC needs to evaluate and coordinate corrective actions.

3.3 SEC, review inspection documentation and sign acknowledging the inspection results.

3.3.1 SEC, coordinate with EM&H and/or Operations and Maintenance to initiate corrective actions or note that no actions are necessary.

3.3.2 In the event of significant erosion or failure of vegetative success, a plan and schedule will be developed for repair by SEC within 90 days of discovery.

3.3.3 SEC, attach documentation (e.g., e-mail, memorandum, action request) to the inspection form and notify the inspector of actions taken.

3.3.4 SEC, file inspection documentation in accordance with SEC's RIDS.

Attachment 1 – Site Discharge Area Evaporation Pond Inspections

Table 1: Site Discharge Area Evaporation Pond Inspections

Evaporation Pond	Pond Level Step 1.1.1	≥ 1 foot Freeboard Step 1.1.2	Ponds Relatively Free of Floating Plants and Debris Step 1.1.3	Lined Areas Free of Deep-Rooted Vegetation/ Burrowing Animals Step 1.1.4	Liner Integrity Step 1.1.5	Ditch Free of Debris that Could Impede Flow Step 1.1.6	Inspector's Initials and Date
SSEB-I*							
SSEB-II*							
SPEP*							
EBA							
PD1							
PD2							

* Verify 1 foot of freeboard is maintained in the SSEB-I, SSEB II, and SPEP

Comments: ____

____

____

SEC Comments: ____

____

____

Inspector(s)

Print: ____________________ Signature: ____________________ Date: ____________

Print: ____________________ Signature: ____________________ Date: ____________

SEC Acknowledgment of Inspection Results:

Print: ____________________ Signature: ____________________ Date: ____________

Attachment 2 – Salt Storage Area Inspections

Table 2: Salt Storage Area Inspections						
Location	No Major Wind or Water Erosion Step 2.1.1	Verity Deep-rooted Plants are not growing such that they could damage the liner Step 2.1.2	No Damage from Burrowing Animals Step 2.1.3	Verify Liner Integrity is in Good Condition Step 2.1.4	Verify stormwater run-off is not escaping containment systems or ditches and that ditches or culverts are not obstructed with debris Step 2.1.5	Inspector's Initials and Date
Salt Storage Extension Area						
Covered Salt Pile						
SPDV Pile						

Comments: ____

____

____

SEC Comments: ____

____

____

Inspector(s)

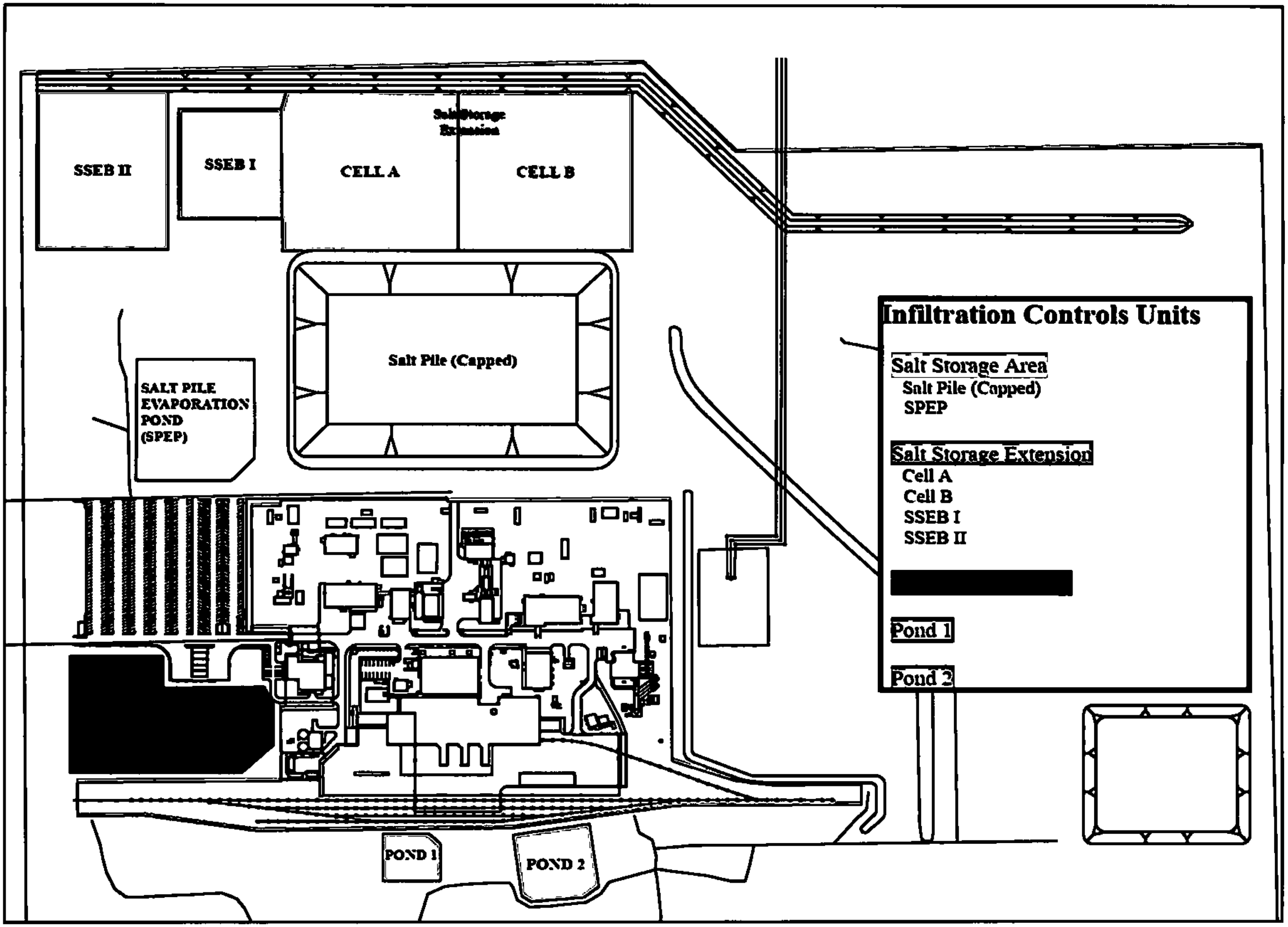
Print: ____________________ Signature: ____________________ Date: ______________

Print: ____________________ Signature: ____________________ Date: ______________

SEC Acknowledgment of Inspection Results:

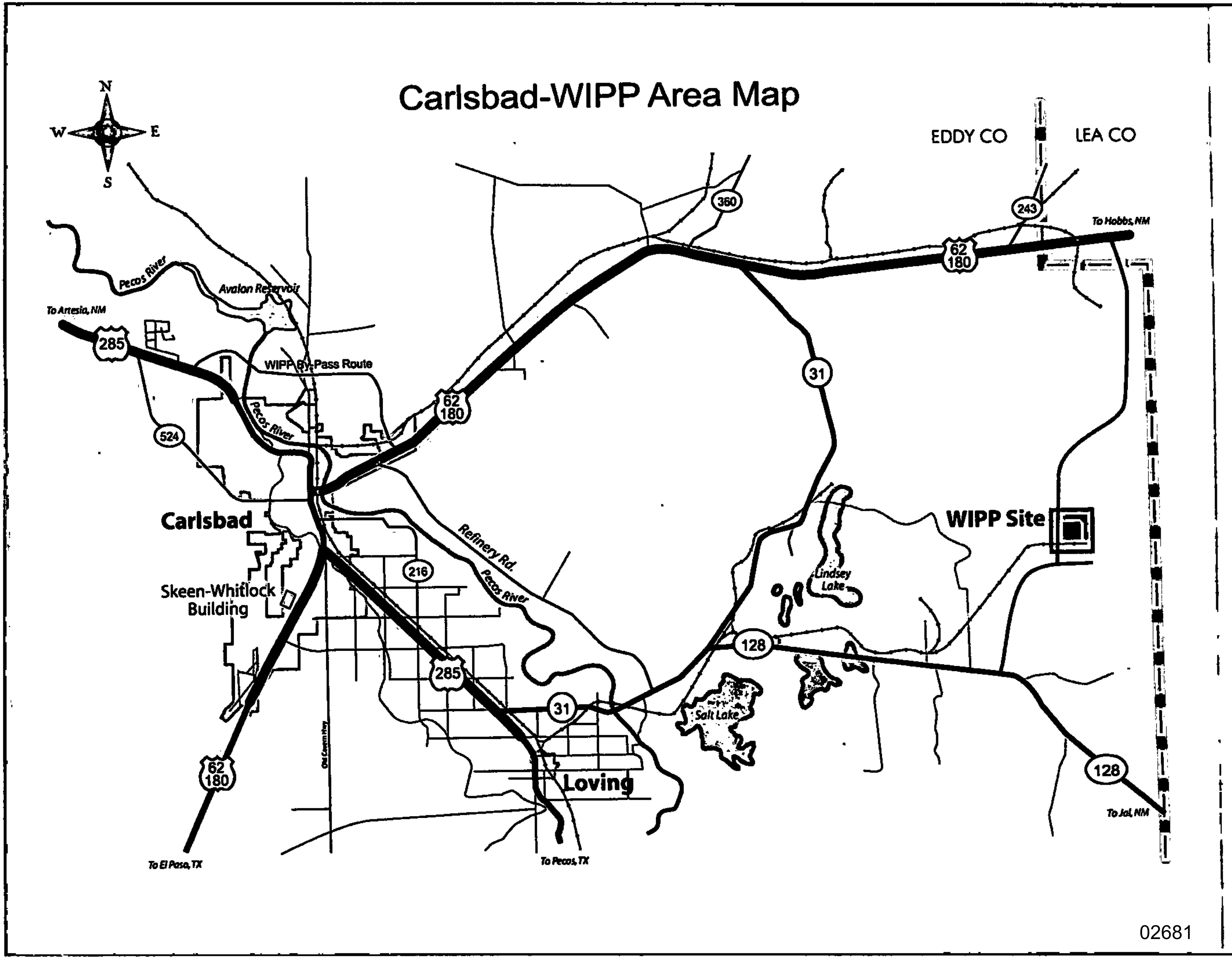
Print: ____________________ Signature: ____________________ Date: ______________

Attachment 3 – Inspection Area Locations

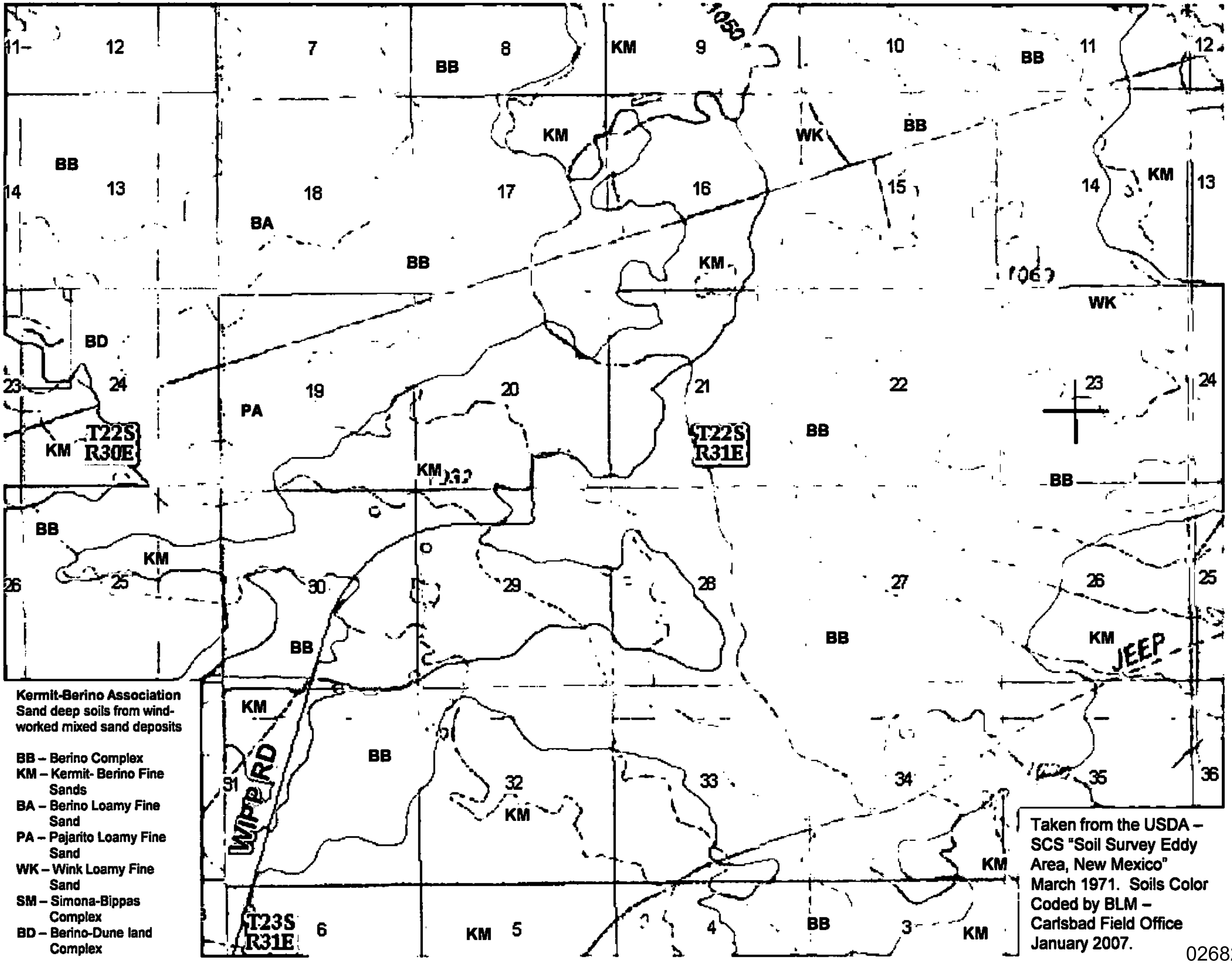


Two Aerial Photos
Livingston Ridge, NM
Los Medaños, New Mexico

Two Topographical Maps
Livingston Ridge, NM
Los Medaños, New Mexico


Carlsbad-WIPP Area Map
N
W
E
S
EDDY CO
LEA CO
360
243
To Hobbs, NM
62
180
Pecos River
Avalon Reservoir
To Artesia, NM
285
WIPP By-Pass Route
Pecos River
524
62
180
31
Carlsbad
Refinery Rd.
WIPP Site
Skeen-Whitlock
Building
216
Pecos River
Lindsey
Lake
128
285
31
Salt Lake
62
180
Loving
128
To Jal, NM
To El Paso, TX
To Pecos, TX

02681



Kermit-Berino Association
Sand deep soils from wind-worked mixed sand deposits

- BB – Berino Complex
- KM – Kermit- Berino Fine Sands
- BA – Berino Loamy Fine Sand
- PA – Pajarito Loamy Fine Sand
- WK – Wink Loamy Fine Sand
- SM – Simona-Bippas Complex
- BD – Berino-Dune land Complex

Taken from the USDA – SCS "Soil Survey Eddy Area, New Mexico" March 1971. Soils Color Coded by BLM – Carlsbad Field Office January 2007.

Sewage Treatment Plant Design Calculations
(03/14/1983)

27 Pages

Best Available Copy

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

CALC NO.	CS-CE-T-003
ORIGIN CLASS	III B
SHEET NO.	1 OF 36

DATE MICROFILMED 3/14/83
SPOOL NO. 198 FO, 0915C

BECHTEL JOB 12484
DEPARTMENT OF ENERGY
WASTE ISOLATION PILOT PLANT

STATEMENT OF PROBLEM

DESIGN OF SEWAGE TREATMENT PLANT
(USING BIOLOGICAL UNIT PROCESS - FACULTATIVE STABILIZATION LAGOONS)

SAR CHECKED ✓ SAR CHANGE REQ'D. NO SAR CHANGE REQUEST MADE NA

SOURCE OF DATA:
1. WIPP DESIGN CRITERIA, RMC-II A, AUGUST 1982
2. DOE ORDER 6430 (DRAFT) - GENERAL DESIGN CRITERIA
3. STATE OF NEW MEXICO WATER QUALITY CONTROL COMMISSION REGULATIONS, AMENDED JULY 2, 1981.

SOURCE OF FORMULAS & REFERENCES:
1. a) WASTEWATER TREATMENT PLANT DESIGN - ASCE NO. 36, WPCF NO. 8
b) DESIGN AND CONSTRUCTION OF SANITARY & STORM SEWERS - ASCE NO. 37, WPCF NO. 9
2. WASTEWATER ENGINEERING - METCALF AND EDDY INC, 1979.
3. WASTEWATER TREATMENT PLANT DESIGN - ASCE, PANJA, CESE, 1969

TITLE OF COMPUTER PROGRAM(S) USED

COMPUTER PROGRAM(S) VERIFICATION

TYPE OF CALCULATION: PRELIM. ✓ FINAL ✓ SUPERSEDES CALC. NO.

SUPERSEDED

REFERENCES	P & ID DWG. NO./REV. NO.	ENTITLED
1	24-C-041-000	SITE PLAN
2	25-F-041-010	SANITARY SEWAGE TREATMENT SYST., P&ID

	[illegible]	GA	[illegible]	DHS	11/5/[illegible]	[illegible]	[illegible]
		BY	DATE	CHK'D	DATE	APP'D	DATE

"WASTE STABILIZATION LAGOONS"
(FACULTATIVE LAGOONS)

DESIGN CRITERIA

* A. RMC-IIA, AUGUST 1982 (PAGE 1-21):

1. SITE POPULATION – 285 (DOE, OPERATING CONTRACTOR AND GUARD PERSONNEL)
19 (SUB-CONTRACTOR PERSONNEL)
TOTAL = 304 PERSONS *

2. NO. OF SHIFT OPERATION = 2 SHIFTS *

3. FLOW RATE CAPACITY = 50 GALLONS PER DAY PER PERSON OF RAW SEWAGE

4. TYPE OF RAW SEWAGE = MEDIUM STRENGTH WITH A FIVE DAY BIOCHEMICAL OXYGEN DEMAND (BOD_5) OF 220 MG/L.

5. TYPE OF SANITARY SEWAGE TREATMENT FACILITY = TWO PARALLEL STABILIZATION LAGOON PAIRS.

6. TYPE OF SEWAGE COLLECTION PIPING SYSTEM USED – GRAVITY TYPE

* B. NEW MEXICO WATER QUALITY CONTROL COMMISSION REGULATIONS AS AMENDED THROUGH JULY 2, 1981 (PAGE, 13):

LABORATORY ANALYSIS FOR THE QUALITY OF THE SEWAGE PLANT

1. BIO-CHEMICAL OXYGEN DEMAND (BOD) – LESS THAN 30 MG/L
2. CHEMICAL OXYGEN DEMAND (COD) – LESS THAN 125 MG/L
3. SETTLEABLE SOLIDS – LESS THAN 0.5 MG/L
4. FECAL COLIFORM BACTERIA – LESS THAN 500 ORGANISMS/100 ML
5. PH – BETWEEN 6.6 AND 8.6

* C. DOE ORDER 6430 (DRAFT) – GENERAL DESIGN CRITERIA, CHAPTER XII:

1. DESIGN CAPACITY OF TREATMENT FACILITY SHOULD NOT EXCEED KNOWN ... BY MORE THAN 30% OF THE AVERAGE DAILY

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

JOB NO.	12484
CALC. NO.	CS-25-F-003
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2. IN DESIGN OF COLLECTING LINES SERVING AREAS, PROVISIONS SHOULD BE MADE FOR APPROXIMATELY 25% ADDITIONAL CAPACITY OVER INITIAL REQUIREMENTS.

3. SEWER LINES SHALL BE LAID ON SUFFICIENT SLOPE TO PRODUCE VELOCITIES OF AT LEAST 2 FPS AT AVERAGE RATE OF FLOW.

4. ALL SEWAGE TREATMENT FACILITIES SHALL MEET AS A MINIMUM THE SECONDARY TREATMENT CRITERIA ESTABLISHED BY THE EPA.

REFERENCE:

WASTEWATER TREATMENT PLANT DESIGN - ASCE NO. 36, WPCF NO. 8

TABLE 1-2. Secondary Effluent Criteria for Publicly Owned Treatment Facilities

Parameter	Monthly Average	Weekly Average
* BOD, mg/l	30	45
* SS, mg/l	30	45
Fecal coliform bacteria, number/100 ml	200	400
pH	Within range of 6.0 to 9.0	

* NOTE: WITHIN THE RANGE OF THE LAB. ANALYSIS OF THE SEWAGE PLANT EFFLUENT & NEW MEXICO WATER QUALITY CONTROL COMMISSION REGULATION.

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

JOB NO. [illegible]	
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CHECKED BY [illegible]	DATE [illegible]

TABLE 7-3 TYPICAL COMPOSITION OF DOMESTIC SEWAGE
(All values except settleable solids are expressed in mg/liter)

Constituent	Concentration: Strong	Medium	Weak
Solids, total	1,200	720	350
Dissolved, total	850	500	250
Fixed	525	300	145
Volatile	325	200	105
Suspended, total	350	220	100
Fixed	75	55	30
Volatile	275	165	70
Settleable solids, (ml/liter)	20	10	5
Biochemical oxygen demand, 5-day, 20°C (BOD_5-20°)	300	200	100
Total organic carbon (TOC)	300	200	100
Chemical oxygen demand (COD)	1,000	500	250
Nitrogen, (total as N)	85	40	20
Organic	35	15	8
Free ammonia	50	25	12
Nitrites	0	0	0
Nitrates	0	0	0
Phosphorus (total as P)	20	10	6
Organic	5	3	2
Inorganic	15	7	4
Chlorides*	100	50	30
Alkalinity (as $CaCO_3$)*	200	100	50
Grease	150	100	50

*Values should be increased by amount in carriage water.

REFERENCE:
~~WASTE ENGINEERING~~
METCALF, EDDY INC.

NOTE:
DESIGN CRITERIA SEC-II A, MEDIUM STRENGTH, 200 BOD [illegible] RESEMBLES THE SEWAGE AS SHOWN IN THE ABOVE TABLE.

TABLE 12-20 DESIGN PARAMETERS FOR STABILIZATION PONDS

Parameter	Type of pond: Aerobic*	✱ Aerobic-anaerobic	Aerobic-anaerobic	Anaerobic	Aerated lagoons
Flow regime	Intermittently mixed	....	Mixed surface layer	....	Completely mixed
Pond size, acres	<10 multiples	2-10 multiples	2-10 multiples	0.5-2.0 multiples	2-10 multiples
Operation†	Series or parallel	Series or parallel	Series or parallel	Series	Series or parallel
Detention time, days†	10-40	7-30	7-20	20-50	3-10
Depth, ft	3-4	3-8	3-8	8-15	6-20
pH	6.5-10.5	6.5-9.0	6.5-8.5	6.8-7.2	6.5-8.0
Temperature range, °C	0-40	0-50	0-50	6-50	0-40
Optimum temperature, °C	20	20	20	30	20
BOD_5 loading, lb/acre/day‡	60-120	15-80	30-100	200-500	
BOD_5 conversion	80-95	80-95	80-95	50-85	80-95
Principal conversion products	Algae, CO_2, bacterial cell tissue	Algae, CO_2, CH_4, bacterial cell tissue	CO_2, CH_4, bacterial cell tissue	CO_2, CH_4, bacterial cell tissue	CO_2, bacterial cell tissue
Algal concentration, mg/liter	80-200	40-100	20-80		
Effluent suspended solids, mg/liter§	140-340	100-400	110-340	80-160	200-300

* Conventional aerobic ponds designed to maximize the amount of oxygen produced rather than the amount of algae produced.
† Depends on climatic conditions.
‡ Typical values (much higher values have been applied at various locations). Loading values are often specified by state control agencies.
§ Includes algae, microorganisms, and residual influent suspended solids. Values are based on an influent soluble BOD_5 of 200 mg/liter and, with the exception of the aerobic ponds, an influent suspended solids concentration of 200 mg/liter.

TABLE 22-IV. [illegible] Design Criteria for Waste Stabilization Lagoons

Parameter	Unmixed Aerobic	✱ Facultative	Aerated: Aerobic	Aerated: Facultative
Flow regime	—	—	Completely mixed	Mixed surf. layer
Lagoon size (acre multiples)	10 acre multiples	2-10 multiples	2-10 multiples	2-10 multiples
Operation	Series or parallel	Series or parallel	Series or parallel	Series or [illegible]
Hydraulic detention time (days)	10-40	7-30	2-10	7-20
Depth (ft)	3-4	3-8	6-20	3-8
[illegible]	3-4	6.5-8.5		
[illegible]	60-120	15-80	30-100	—
[illegible]	20	20	—	—
[illegible]	0-40	0-50	0-40	0-50
[illegible]	80-95	80-95	80-95	80-95
[illegible]	80-200	[illegible]	—	—
[illegible]	[illegible]	[illegible]	—	—
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	15-80	15-40	20-30	20-30
[illegible]	20-80	[illegible]	—	—
[illegible]	6.5-10.5	6.5-9.0	6.5-8.5	6.5-8.5
[illegible]	Algae	Algae	Aeration	Aeration
[illegible]	—	—	Aeration plus mixing	Aeration

[illegible] ft × 0.305 = m; lb/day/1,000 sq ft × 0.005 = kg/m²-d; lb/day/1,000 cu ft × 1.602 × 10⁻² [illegible]

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NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

PRIMARY TREATMENT CELLS

* AVERAGE DAILY FLOW :

CONSTRUCTION PHASE = 304 PERSONS × 50 GALS./DAY = 15,200 GALS/DAY
START-UP PHASE = 285 PERSONS × 50 GALS/DAY = 14,250 GALS/DAY
OPERATION PHASE (FINAL) = 15,200 GALS/DAY × 1.2 = 18,240 GALS/DAY
$\approx$ 18,500 GALS/DAY
$\approx$ 0.0185 MGD

* WASTE STRENGTH (SEWAGE INFLUENT QUALITY) =
SANITARY WASTES FROM LOW FLOW/WATER CONSERVATION TOILETS, SHOWERS AND FAUCETS, KITCHEN WASTE, NO INFILTRATION
= BOD_5 = 220 MG/L
TSS = 220 MG/L

* SIZING CRITERIA :

RECOMMENDED RANGES FOR BOD_5 LOADING :

1. 15-50 LB/DAY/ACRE FOR FACULTATIVE LAGOON (REFER TO TABLE 22-IV - EMPIRICAL DESIGN CRITERIA FOR WASTE STABILIZATION LAGOONS - ASCE NO. 36 (WPCF MANUAL OF PRACTICE NO. 8)

2. 15-50 LB/DAY/ACRE FOR AEROBIC-ANAEROBIC POND (REFER TO TABLE 12-10 - DESIGN PARAMETERS FOR STABILIZATION PONDS) WASTEWATER ENGINEERING - METCALF AND EDDY INC.

* SELECT 40 LBS/DAY/ACRE FOR BOD_5 LOADING

BOD_5 MASS LOADING

$$(0.0185\,MGD)\left(8.34\ \frac{\#\ per\ MG}{mg/l}\right)(220\ mg/L) = 34^{\#}/day\ BOD_5$$

* ACRES REQUIRED:

$$\frac{34\ LBS/DAY}{40\ LBS/DAY/ACRE} = 0.85 \text{ ACRES OF AIR/WATER SURFACE}$$

$$0.85\ ACRE \times \frac{43,560\ FT^2}{ACRE} = 37,027\ FT^2 \ *$$

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

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CONFIGURATIONS:

SPLIT/EQUAL FLOWS, PARALLEL ARRANGEMENT

L = 2 TO 3 W

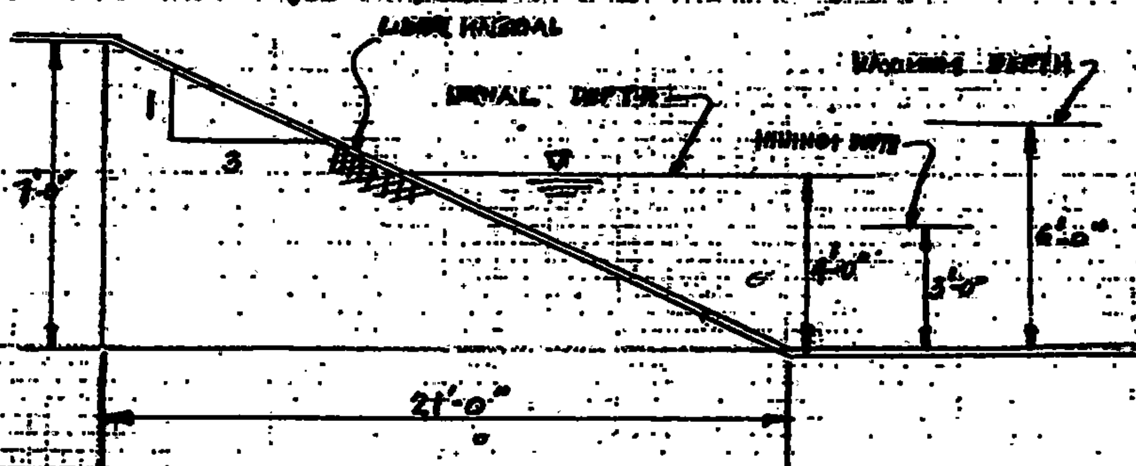
WATER DEPTHS:	FREEBOARD:
MINIMUM = 3 FT	4 FT
NORMAL = 4 FT	3 FT
MAXIMUM FLOOD/STORE = 6 FT	1 FT

OVERALL DEPTH; BERM TOE TO TOP = 7 FT.

USE 3:1 SIDE SLOPE (FOR MINIMUM LAND REQUIREMENT, AND EASE OF CONSTRUCTION)

TWO LAGOONS EA. AT 80' x 240' AT 3:1 TO PREVENT SHORT CIRCUITING AND TO INCREASE IN HYDRAULIC DETENTION TIME.

CHECK: = (80' x 240') x 2 = 38,400 FT² ≈ 37,027 FT²



[illegible] OF BERMS (DIMENSIONS)	TOP OF BERMS
[illegible] = 80' - 21' = 38 FT [illegible]	80 + (2 x 9) = [illegible] = 98 FT
[illegible] = 240' - 24' = 216 FT	240 + (2 x 10.5) = [illegible]

JOB NO.	12484
CALC. NO.	CS-75-F-003
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CHECKED BY	KLS DATE 11/2/[illegible]

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

* CORNER RADII

AT TOE FOR PREVENTION OF SOLIDS COLLECTION AND EASE OF LINER INSTALLATION. – 10'-0" MINIMUM

AT TOP = 10 + 21 = 31'-0" MINIMUM.

* VOLUME OF PRIMARY LAGOONS AT NORMAL OPERATING DEPTH OF 4'-0"

$$V = \frac{1}{3}\left[A_1 + A_2 + \sqrt{A_1 \times A_2}\right] \times h \quad \text{(FOR TRUNCATED PYRAMID)}$$

WHERE:

A_1 = WASTEWATER/AIR AREA = 80' × 240' = 19,200 FT^2

A_2 = CELL FLOOR AREA = 56' × 216' = 12,096 FT^2

h = HEIGHT OF WASTEWATER = 4'-0"

$$V_{1A} = \frac{1}{3}\left[19{,}200 + 12{,}096 + \sqrt{19{,}200 \times 12{,}096}\right] \times 4$$

$$= \frac{1}{3}\left[31{,}296 + \sqrt{232{,}243{,}200}\right] \times 4$$

$$= \frac{1}{3}\left[31{,}296 + 15{,}240\right] \times 4 =$$

$$= \frac{1}{3}\left[46{,}536\right] \times 4 = \frac{186{,}144}{3} = 62{,}048\ FT^3$$

$V_{1A} = V_{2A} = 62{,}048\ FT^3$ *

$V_T = V_{1A} + V_{2A} = 62{,}048 + 62{,}048 = 124{,}096\ FT^3$

AVERAGE HYDRAULIC DETENTION TIME

$$\frac{0.70 \times 124{,}096\ FT^3 \times 7.48\ GAL/FT^3}{18{,}500\ GAL/DAY} = 35\ \text{DAYS (OPERATIONAL PHASE)}$$

JOB NO.	12484
CALC. NO.	CS-75-F-003
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REV. NO.	3
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NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

* VOLUME OF PRIMARY CELLS AT PEAK OPERATING/FLOOD/STORAGE DEPTH OF 6 FEET.

$$V = \frac{1}{3}\left[A_1 + A_2 + \sqrt{A_1 \times A_2}\right] \times h$$

WHERE:

$A_1 = (56 + 2\times6\times3)\times(216+2\times6\times3) = 92' \times 252' = 23,184\ FT^2$.

$A_2 = 56' \times 216' = 12,096\ FT^2$

$h = 6\ FT.$

$$V_{1A} = \frac{1}{3}\left[23,184 + 12,096 + \sqrt{23,184 \times 12096}\right] \times 6$$

$$= \frac{1}{3}\left[35,280 + \sqrt{280,433,664}\right] \times 6 = \frac{1}{3}[35,280 + 16,746] \times 6$$

$$= \frac{1}{3}[52,026] \times 6 = \frac{312,156}{3}$$

$V_{1A} = V_{2A} = 104,052\ FT^3$

$V_T = V_{1A} + V_{2A} = 104,052 + 104,052 = 208,104\ FT^3$

* AVERAGE HYDRAULIC DETENTION TIME

$$= \frac{0.70 \times 208,104\ FT^3 \times 7.48\ GALS/FT^3}{18,570\ GALS/DAY}$$

$$= \frac{1,089,633}{18,570}$$

= 59 DAYS (FOR OPERATION PHASE)

JOB NO.	12984
CALC. NO.	05-25-F-002
SHEET NO.	10 OF 56
REV. NO.	3
CHECKED BY	WLS DATE 11/2/82

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

* VOLUME OF PRIMARY CELLS AT MINIMUM OPERATING DEPTH OF 3'-0":

$$V = \frac{1}{3}\left[A_1 + A_2 + \sqrt{A_1 \times A_2}\right] \times h$$

WHERE:

$$A_1 = (56 + 2 \times 3 \times 3) + (216 + 2 \times 3 \times 3) = 74' \times 234' = 17,316\ FT^2$$

$$A_2 = 56' \times 216' = 12,096\ FT^2$$

$$h = 3\ FT.$$

$$V_{1A} = \frac{1}{3}\left[17,316 + 12,096 + \sqrt{17,316 \times 12,096}\right] \times 3$$

$$= \frac{1}{3}\left[29,412 + \sqrt{209,454,336}\right] \times 3 = \frac{1}{3}\left[29,412 + 14,473\right] \times 3$$

$$= \frac{1}{3}\left[43,885\right] \times 3 = \frac{131,655}{3}$$

$$V_{1A} = V_{2A} = 43,885\ FT^3$$

$$V_T = V_{1A} + V_{2A} = 43,885 + 43,885 = 87,770\ FT^3$$

* AVERAGE HYDRAULIC RETENTION TIME:

$$= \frac{0.70 \times 87,770\ FT^3 \times 7.48\ GALS/FT^3}{18,570\ GALS/DAY}$$

$$= \frac{459,564}{18,570}$$

= 25 DAYS (FOR OPERATION PHASE)

JOB NO. 12684	
CALC. NO. CS-75-F-002	
SHEET NO. 11.	OF 26
REV. NO. 2	
CHECKED BY WLS	DATE 11/…

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

* STORAGE CAPACITY IN DAYS FOR PRIMARY CELLS (DEPTH FROM 3'-0" MINIMUM TO 6'-0" MAXIMUM WITH NO EVAPORATION)

$$\frac{(V_{6'-0"} - V_{3'-0"}) \times 7.48\ GALS/FT^3}{\text{FLOW RATE AT OPERATION PHASE}}$$

$$= \frac{(208,104 - 87,770) \times 7.48}{18,500}$$

$$= \frac{900,098}{18,500}$$

$$= 49.\ DAYS$$

NOTE: REFER TO WASTEWATER ENGINEERING - METCALF & EDDY, INC. PAGE 243:

Biochemical oxidation is a slow process and theoretically takes an infinite time to go to completion. Within a 20-day period, the oxidation is about 95 to 99 percent complete, and in the 5-day period used for the BOD test, oxidation is from 60 to 70 percent complete. The 20°C temperature used is an average value for slow-moving streams in temperate climates and is easily duplicated in an incubator. Different results would be obtained at different temperatures because biochemical reaction rates are temperature-dependent.

JOB NO.	12484
CALC. NO.	05-16-F-003
SHEET NO.	12 OF 26
REV. NO.	3
CHECKED BY	DLS DATE 11/2/82

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

POLISHING CELLS

Estimate the effluent quality using the data from Table 12-9:

$$(SS)_e = 0.20(BOD_5)_i + 0.20(BOD_5)_i + 0.1(SS)_i$$

$$= 0.20(220) + 0.20(220) + 0.1(220)$$

$$= 44 + 44 + 22 = 110 \text{ mg/l} \approx \text{USE } 100 \text{ MG/L}$$

$$(BOD_5)_e = 0.02(BOD_5)_i + 0.30(BOD_5)_i$$

$$= 0.02 \times 220 + 0.30 \times 220$$

$$= 4.4 + 66 = 70.4 \text{ mg/l} \approx \text{USE } 100 \text{ MG/L}$$

THEREFORE, EFFLUENT QUALITY IN THE POLISHING CELLS SHALL BE:

$$BOD_5 = 100 \text{ MG/L}$$

$$TSS = 100 \text{ MG/L}$$

[illegible]	[illegible]
CALC. NO.	06-16-F-003
SHEET NO.	13 OF 2[illegible]
REV. NO.	3
CHECKED BY	WLS DATE [illegible]

CALCULATION SHEET

NUCLEAR FUEL OPERATIONS

TABLE 12-9 APPLICATION AND EFFLUENT CHARACTERISTICS OF VARIOUS TYPES OF STABILIZATION PONDS AND POND SYSTEMS

Type of pond or pond system	Application	Effluent characteristics: Suspended solids, mg/liter*: Algae $(BOD_u)_i$	Micro-organisms $(BOD_u)_i$	Other $(SS)_i$	BOD_5, mg/liter†: Soluble $(BOD_5)_i$	Suspended $(SS)_i$
Aerobic (6-18 in. deep)	Nutrient removal, treatment of soluble organic wastes, production of algal cell tissue	0.5-1.2	0.2-0.5	Low	0.02-0.1	0.3-1.2
Aerobic (up to 60 in. deep)	Treatment of soluble organic wastes and secondary effluents	0.4-1.0	0.2-0.5	Low	0.02-0.1	0.3-1.0
✓ Aerobic-anaerobic (oxygen source: algae)	Treatment of untreated screened or primary settled wastewater and industrial wastes	0.2-0.8	0.2-0.5	0.1-0.4	0.02-0.1	0.3-1.0
Aerobic-anaerobic with and without effluent recirculation (oxygen source: surface aerators)	Treatment of untreated screened or primary settled wastewater and industrial wastes	0.02-0.1	0.2-0.5	0.1-0.4	0.02-0.1	0.3-0.8
Anaerobic	Treatment of domestic and industrial wastes	...	0.1-0.3	0.3-0.8	0.05-0.2	0.3-0.8
Anaerobic + aerobic-anaerobic with recirculation from aerobic-anaerobic to anaerobic	Complete treatment of wastewater and industrial wastes	...	0.2-0.5	0.05-0.25	0.05-0.1	0.3-0.8
Anaerobic + aerobic-anaerobic + aerobic pond system with recirculation from aerobic to anaerobic	Complete treatment of wastewater and industrial wastes with high bacterial removals	0.05-0.1	0.02-0.05	0.02-0.1	0.02-0.1	0.3-1.0

* Effluent suspended solids are composed of algae and other microorganisms, which are estimated in terms of influent $(BOD_u)_i$ and a fraction of the influent suspended solids $(SS)_i$.
† Effluent BOD_5 is composed of a fraction of the soluble influent BOD_5 $(BOD_5)_i$ plus a contribution from the effluent suspended solids $(SS)_i$.

TABLE 22-VII. Application, Advantages, and Disadvantages of the Different Lagoon Types

Parameter	Unaerated Aerobic	✓ Facultative	Aerated: Aerobic	Aerated: Facultative
Application	Nutrient removal; treatment of soluble organic wastes; secondary effluents	Treatment of raw domestic and industrial wastes	Treatment of raw domestic and industrial wastes	Treatment of raw domestic and industrial wastes
Advantages	Low operating and maintenance costs	Low operating and maintenance costs; high degree of treatment	Small volume and area; odor free; high degree of treatment; easier to operate	Small volume and area; odor free; high degree of treatment; easier to operate
Disadvantages	Large volume and area; possible odors	Large volume and area; possible odors	Significant maintenance and operation costs; high solids in effluent; foaming	Maintenance and operation costs; foaming

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NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

FACULTATIVE LAGOON DESIGN : POLISHING CELLS

FLOW : BASED ON AVERAGE DAILY FLOWS GENERATED (ASSUME NO EVAPORATION IN PRIMARY CELLS) = 18,500 GAL/DAY

WASTE STRENGTH · PRIMARY CELL EFFLUENT QUALITY WILL VARY WITH BOD, HYDRAULIC LOADINGS, WEATHER, OPERATIONS
WORST CASE = 100 MG/L

SIZING CRITERIA

$40\#\ BOD_5/ACRE\text{-}DAY$

BOD MASS LOADING :

$(0.0185MGD)(8.34\#/MG)(100\ MG/L\ BOD_5) = 15\#/D\ BOD_5$

ACRES REQUIRED :

$\frac{15\#/D}{40\#/D\text{-}ACRE} = 0.38$ ACRES OF AIR/WATER SURFACE

$0.38\ ACRES \times 43,560\ FT^2/ACRE = 16,553\ FT^2$

CONFIGURATION :

PARALLEL ARRANGEMENT, COMMON BERM SIDES, WASTE FLOW IN SERIES FROM EACH PRIMARY CELL, SPLIT/EQUAL FLOW

TWO CELLS, 80' × 104' (W×L) $\frac{L}{W} = 1.3$
CHECK : = (80' × 104') × 2 = 16,640 FT² ≅ 16,553 FT²

WATER DEPTHS :	FREEBOARD :
MINIMUM = 3 FT.	4 FT.
NORMAL = 4 FT.	3 FT.
MAXIMUM FLOOD/STORE = 6 FT	1 FT.

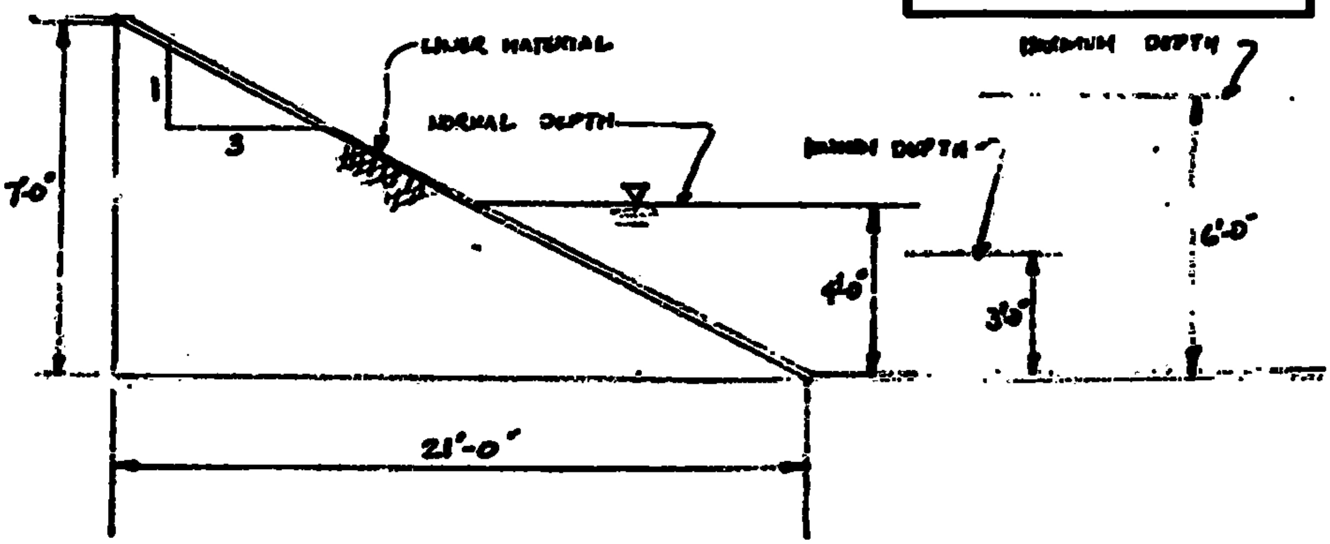
OVERALL DEPTH, BERM TOE TO TOP = 7 FT.

[illegible] : 3:1 SIDE SLOPE

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

JOB NO.	12101
CALC. NO.	05-X-F-003
SHEET NO.	15 OF 26
REV. NO.	3
CHECKED BY	AKS DATE 4/6/83



	TOE OF BERMS (DIMENSIONS)	TOP OF BERMS (DIMENSIONS)
WIDTH	80' − (2×4'×3') = 80 − 24 = 56 FT.	80' + (2×3×3) = 80 + 18 = 98 FT
LENGTH	104' − (2×4'×3') = 104 − 24 = 80 FT	104' + (2×3×3) = 104 + 18 = 122 FT

* <u>CORNER RADII</u>:

AT TOE FOR PREVENTION OF SOLIDS COLLECTION AND EASE OF LINER INSTALLATION = 10'-0" MINIMUM.

AT TOP 10' + 21' = 31'-0" MINIMUM

JOB NO.	12484
CALC. NO.	CS-75-F-003
SHEET NO.	16 OF 26
REV. NO.	3
CHECKED BY	MLS DATE [illegible]

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

B. VOLUME OF POLISHING CELLS AT NORMAL OPERATING DEPTH OF 4'-0":

$$V = \frac{1}{3}\left[A_1 + A_2 + \sqrt{A_1 \times A_2}\right] \times L$$

WHERE:

$A_1 = 80' \times 104' = 8320\ FT^2$

$A_2 = 58' \times 80' = 4480\ FT^2$

$L = 4\ FT.$

$$V_{1B} = V_{2B} = \frac{1}{3}\left[8320 + 4480 + \sqrt{8320 \times 4480}\right] \times 4$$

$$= \frac{1}{3}\left[12,800 + \sqrt{37273600}\right] \times 4 = \frac{1}{3}\left[12,800 + 6105\right] \times 4$$

$$= \frac{1}{3}\left[18,905\right] \times 4 = \frac{75,620}{3} = 25,207\ FT^3$$

$V_{1B} = V_{2B} = 25,207\ FT^3$

$V_T = V_{1B} + V_{2B} = 25,207 + 25,207 = 50,414\ FT^3$

* MINIMUM HYDRAULIC DETENTION TIME (DAYS)

$$= \frac{0.60 \times 50,414\ FT^3 \times 7.48\ GAL/FT^3}{18,570}$$

$$= \frac{226,258}{18,570} = 12\ DAYS$$

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

JOB NO.	12006
CALC. NO.	CS-15-F-003
SHEET NO.	17 OF 26
REV. NO.	3
CHECKED BY	WLS DATE 11/2/[illegible]

* VOLUME OF POLISHING CELLS AT PEAK OPERATING/FLOOD/STORAGE DEPTH OF 6 FEET:

$$V = \frac{1}{3}\left[A_1 + A_2 + \sqrt{A_1 \times A_2}\right] \times L$$

WHERE:

$A_1 = (56 + 2\times6\times3) \times (80 + 2\times6\times3) = 92' \times 116' = 10{,}672\ FT^2$

$A_2 = 56' \times 80' = 4{,}480\ FT^2$

$L = 6\ FT.$

$$V_{1B} = V_{2B} = \frac{1}{3}\left[10{,}672 + 4{,}480 + \sqrt{10{,}672 \times 4{,}480}\right] \times 6$$

$$= \frac{1}{3}\left[15{,}152 + \sqrt{47810560}\right] \times 6 = \frac{1}{3}\left[15{,}152 + 6915\right] \times 6$$

$$= \frac{1}{3}\left[22{,}067\right] \times 6 = \frac{132{,}402}{3} =$$

$V_{1B} = V_{2B} = 44{,}134\ FT^3$ *

$V_T = V_{1B} + V_{2B} = 44{,}134 + 44{,}134 = 88{,}268\ FT^3$

* AVERAGE HYDRAULIC DETENTION TIME (DAYS)

$$= \frac{0.60 \times 88{,}268\ FT^3 \times 7.48\ GALS/FT^3}{18{,}570\ GALS/DAY}$$

$$= \frac{462{,}171}{18{,}570} = 22\ DAYS$$

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

JOB NO.	12484
CALC. NO.	GS-15-F-003
SHEET NO.	18 OF 26
REV. NO.	3
CHECKED BY	RLS DATE [illegible]

* VOLUME OF POLISHING CELLS AT MINIMUM OPERATING DEPTH OF 3 FT:

$$V = \frac{1}{3}\left[A_1 + A_2 + \sqrt{A_1 \times A_2}\right] \times L$$

WHERE:

$A_1 = (56 + 2\times3\times3)\times(80 + 2\times3\times3) = 74' \times 98' = 7252\ FT^2$

$A_2 = 56' \times 80 = 4,480\ FT^2$

$L = 3\ FT.$

$$V_{1B} = V_{2B} = \frac{1}{3}\left[7252 + 4,480 + \sqrt{7252 \times 4480}\right] \times 3$$

$$= \frac{1}{3}\left[11,732 + \sqrt{32488960}\right] \times 3 = \frac{1}{3}\left[11,732 + 5700\right] \times 3$$

$$= \frac{1}{3}\left[17432\right] \times 3 = \frac{52,296}{3}$$

$V_{1B} = V_{2B} = 17,432\ FT^3$

$V_T = V_{1B} + V_{2B} = 17,432 + 17,432 = 34,864\ FT^3$

* AVERAGE HYDRAULIC DETENTION TIME (DAYS)

$$= \frac{0.60 \times 34,864 \times 7.48\ GAL/FT^3}{18,500\ GAL/DAY}$$

$$= \frac{182,236}{18,500} = 9\ DAYS.$$

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

JOB NO.	12484
CALC. NO.	CS-75-F-003
SHEET NO.	19 OF 26
REV. NO.	3
CHECKED BY	WKS DATE [illegible]

\# STORAGE CAPACITY IN DAYS FOR POLISHING CELLS (DEPTH FROM 3'-0" MINIMUM TO 6'-0" MAXIMUM WITH NO EVAPORATION)

$$\frac{(V_{6'-0''} - V_{3'-0''}) \times 7.48\ \mathrm{GAL/FT^3}}{\text{FLOW RATE AT OPERATION PHASE}}$$

$$= \frac{(88,208 - 34,804) \times 7.48}{18,500}$$

$$= \frac{399,462}{18,500}$$

$$= 22 \text{ DAYS}$$ #

JOB NO.	12484
CALC. NO.	CS-75-F-003
SHEET NO. 20	OF 26
REV. NO.	3
CHECKED BY MLS	DATE 11/2/??

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

CHLORINE CONTACT CHAMBER / STORAGE CELL

SIZING CRITERIA :

1. PROVIDE 30 MINUTES MINIMUM DETENTION TIME FOR DISINFECTION OF 18,500 GAL/DAY FLOW.

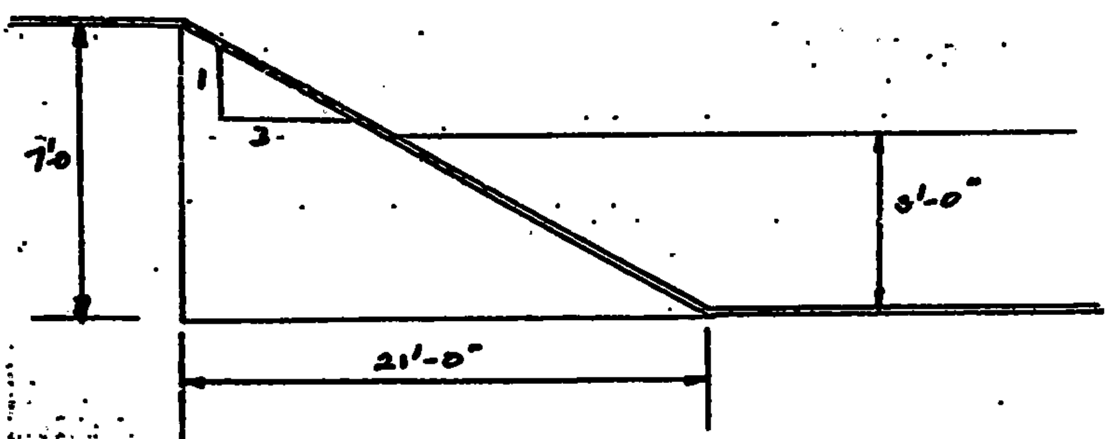
2. PROVIDE 80 TO 90 % OF THE WASTEWATER TO BE RETAINED FOR THE SPECIFIED CONTACT TIME (REF. PAGE 477, WASTEWATER ENGINEERING, METCALF & EDDY INC.)

VOLUME OF CONTACT CHAMBER/STORAGE CELL = $\frac{0.90 \times 18{,}500 \text{ GAL/DAY}}{7.48 \text{ GAL}/FT^3}$

$= 2,226 \ FT^3$ *

WASTEWATER 3 FEET IN STORAGE DEPTH.

CONFIGURATIONS : 3:1 BERM SLOPE AND SQUARE CONFIGURATION



[illegible] FLOOR AREA = 18'x18' @ TOP OF BERM

[illegible] BERM = (18 + 2x21) x (18+2x21) = 60' x 60'

02703

JOB NO.	12484
CALC. NO.	CS-15-F-003
SHEET NO.	21 OF 26
REV. NO.	3
CHECKED BY	WKS DATE 11/2/02

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

* VOLUME OF CONTACT CHAMBER / STORAGE CELL AT 3 FEET DEPTH:

$$V = \frac{1}{3}\left[A_1 + A_2 + \sqrt{A_1 \times A_2}\right] \times h$$

WHERE:

$$A_1 = (18 + 2\times3\times3) \times (18 + 2\times3\times3) = 36 \times 36 = 1296\ FT^2$$

$$A_2 = 18 \times 18 = 324\ FT^2$$

$$h = 3\ FT$$

$$V = \frac{1}{3}\left[1,296 + 324 + \sqrt{1,296 \times 324}\right] \times 3$$

$$= \frac{1}{3}\left[1,620 + \sqrt{419,904}\right] \times 3 = \frac{1}{3}\left[1620 + 648\right] \times 3$$

$$= \frac{1}{3}\left[2,268\right] \times 3 = 2,268\ FT^3$$

$$V = 2,268\ FT^3 \times 7.48\ GALS/FT^3 = 16,965\ GALS$$

$$\frac{16,965\ GALS}{18,500\ GALS} = 0.92 \approx 92\%$$ OF WASTEWATER TO BE RETAINED FOR STORAGE

CHLORINE FEED RATE CAPACITY (LB/HR) = [MAX. DOSAGE (PPM)] [MAX. FLOW (MGD)] × 8.34 LB/MIL GALLONS/PPM

REF. TABLE 1. PAGE 158 AND FIG 3 PAGE 165 OF WATER TREATMENT PLANT DESIGN, 1969 – ASCE, AWWA, CSSE

MAX. DOSAGE = 2 ppm *

CHLORINE FEED RATE CAPACITY = 2 × 0.0185 × 8.34 = 0.31 LB/DAY hr.

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

JOB NO.	[illegible]
CALC. NO.	05-[illegible]-003
SHEET NO. 22	OF 36
REV. NO.	3
CHECKED BY WLS	DATE [illegible]

TABLE 1

Representative Chlorine Dosage Required for Various Treatment Objectives and Other Uses

Treatment Objective	Chlorine Dosage ppm	Contact Time min	pH Range	Chlorine Residual Recommended		Alkalinity Consumed as $CaCO_3$
				Type	ppm	
Disinfection						
* Combined available chlorine residual	1.0-5.0	•		•	•	1.38 per ppm Cl_2
Free available chlorine residual	1.0-10.0				•	1.38 per ppm Cl_2
Breakpoint reaction	10 x NH_3 (as N) content	20+	6.5-8.5 (7.5 optimum)	•	•	1.38 per ppm Cl_2
Ammonia Removal						
Monochloramine formation	5 x NH_3 (as N) content	20+	>8.5	free	0.1	1.38 per ppm Cl_2
Dichloramine formation	10 x NH_3 (as N) content	20+	4.4-5.0	free	0.1	
Taste and Odor Control	10 x NH_3 (as N) content plus 1-5 ppm	20+		free	1.0	1.38 per ppm Cl_2
Phenol destruction (up to 200 ppm)	6-20 x phenol content	1.5-5 hr (stepwise)	7.0	free	variable	
Hydrogen Sulfide Removal						
Oxidation to sulfur	2.2 x H_2S content	instantaneous	6.0-8.8 (8 optimum)	free or combined	0.1	2.6 per ppm H_2S
Oxidation to sulfate	8.5 x H_2S content	instantaneous	6.5-9.0 (9 optimum)	free or combined		10 per ppm H_2S
Manganese Removal						
Oxidation to [illegible] form	1.3 x Mn content	up to 3 hr (variable)	7.0-10.0 (10 optimum)	free	0.5	3.4 per ppm Mn oxidized

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

JOB NO. 12684	
CALC. NO. CS-X-F-003	
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REV. NO. 3	
CHECKED BY WLS	DATE

EFFLUENT DISINFECTION

SINCE THERE'S A WIDE VARIATION IN LAGOON EFFLUENT FLOW RATES, CONVENTIONAL CHLORINATION USING GASEOUS CL_2 MAY PROVE DIFFICULT TO CONTROL OR MANAGE

AN ALTERNATE IS THE HYPOCHLORITE FEEDING USING DRY-FEED METHOD, IN WHICH THE MATERIAL IS RECEIVED, MEASURED AND DISPENSED IN DRY FORM (GRANULAR, POWDERED; OR TABLET FORMS OF HIGH TEST CALCIUM HYPOCHLORITE). SIMILAR TO DIAMOND SHAMROCK "SANURIL".

COSTS:

FROM LITERATURE - CHEMICAL REQUIREMENTS IN #/0.1000 GALLONS IS EQUAL TO $\frac{1}{100}$ OF DESIRED RESIDUAL IN PPM.

USING:

FOR 2 ppm RESIDUAL:

$$\frac{0.02}{1000\,GAL} \times (16,965\ GAL/DAY) = 0.34\#/DAY \ *$$

$$\frac{0.34\#/DAY \times \$2.70/\#}{16,965\ GAL/DAY} = \text{NEGLIGIBLE}$$

COST OF UNIT = \$300.00

REFERENCE: SEE CALCULATION SHEET NO. 12 OF W.L. SHIPMAN DATED 7/6/81.

* USE: 10 ppm.

$$\left(\frac{18,500\ GPD}{10^6}\right)(10\ ppm)(8.34) = 1.5\#/D$$

@ \$2.70/#

$$(\$2.\text{--})(1.5\#/D) = \$3.40/DAY \text{ CHEM. COSTS (YR. 1981)}$$

YR 3 ≈ \$4.--/DAY

NUCLEAR FUEL OPERATIONS

CALCULATION SHEET

JOB NO. 12484-006	
CALC. NO. CS-VS-F-003	
SHEET NO. 25 OF 26	
REV. NO. 3	
CHECKED BY WLS	DATE [illegible]

* FOR THE IMPACT OF EVAPORATION ON SANITARY LAGOON OPERATION AND WATER REUSE REFER TO SHEETS NO. 10, & 11 OF W.L. SHIPMAN CALCULATIONS, DATED 7/6/81.

* FOR LAGOON SYSTEM DETAIL OF CHLORINATION CONTACT/STORE CELL SEE SHT. NO. 14. OF THE CALCULATION OF W.L. SHIPMAN DATED 7/6/81

* FOR LAGOON EFFLUENT WEIR BOX SIDE VIEW REFER TO SHT. NO. 15.

* FOR PRESSURE LINE DETAIL SEE SHT. NO. 18

* FOR LAGOON HYDRAULIC PROFILE, WEIR SETTINGS REFER TO SHT. 19.

* FOR LAGOON EFFLUENT WEIR BOX TOP VIEW SEE SHT. NO. 16.

* FOR EROSION CHLORINATOR TOP & SIDE VIEW REFER TO SHT. 17.

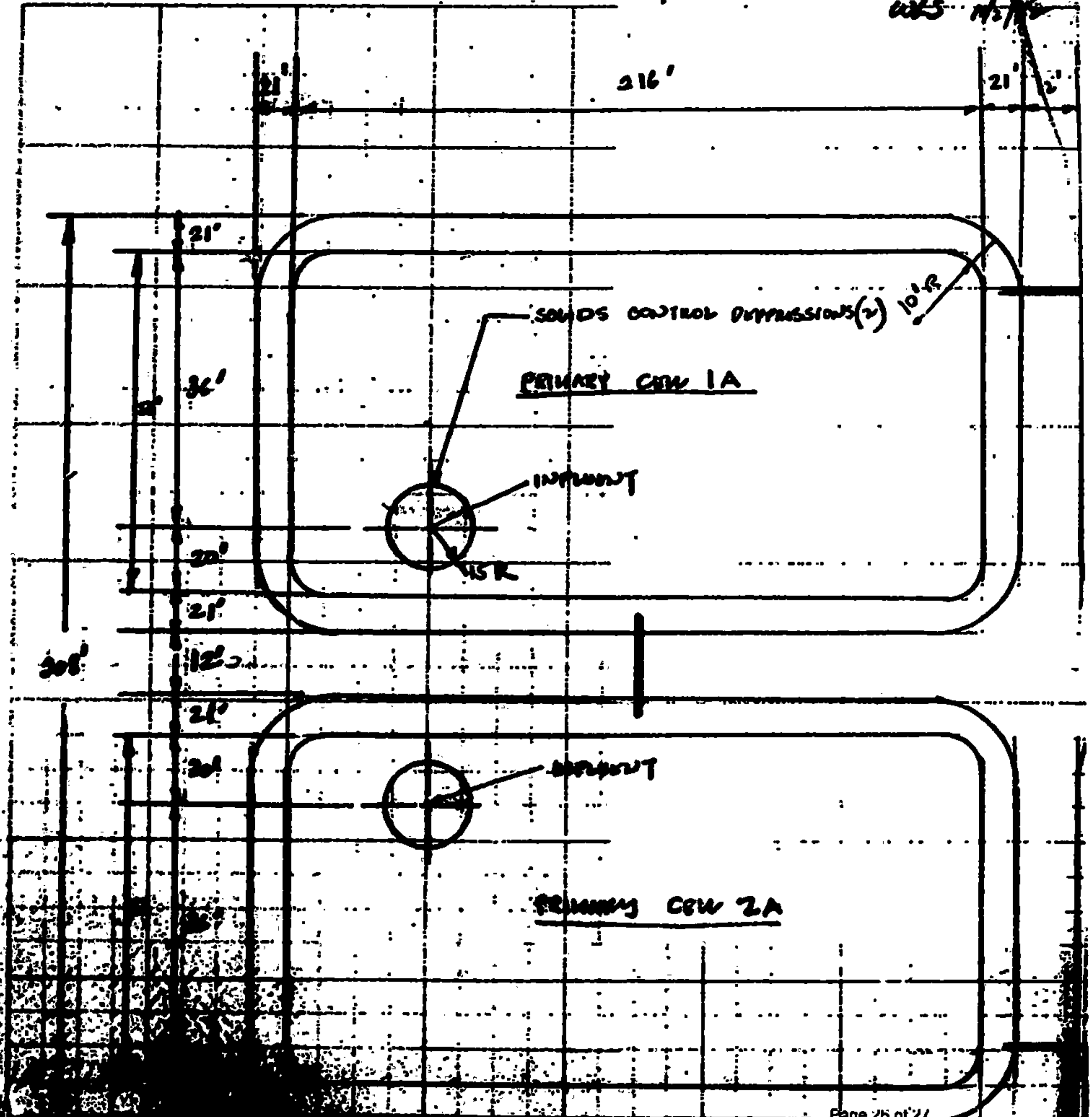
CALCULATION SHEET

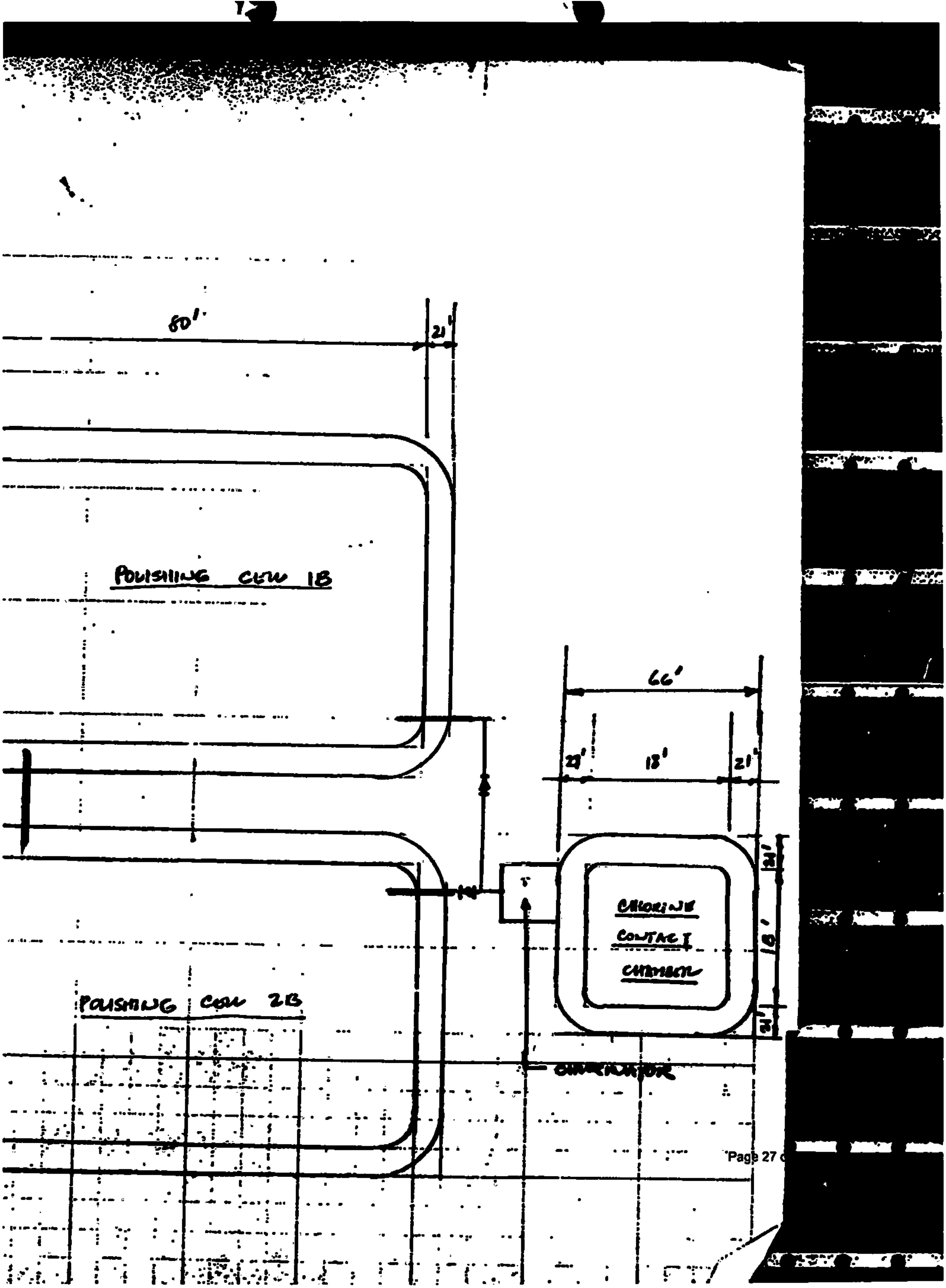
DATE ______

DESIGN BY G.T. Asuncion DATE 10/19/82 CHECKED BY ______ SHEET NO. 26 OF 26

PROJECT WIPP JOB NO. 12484

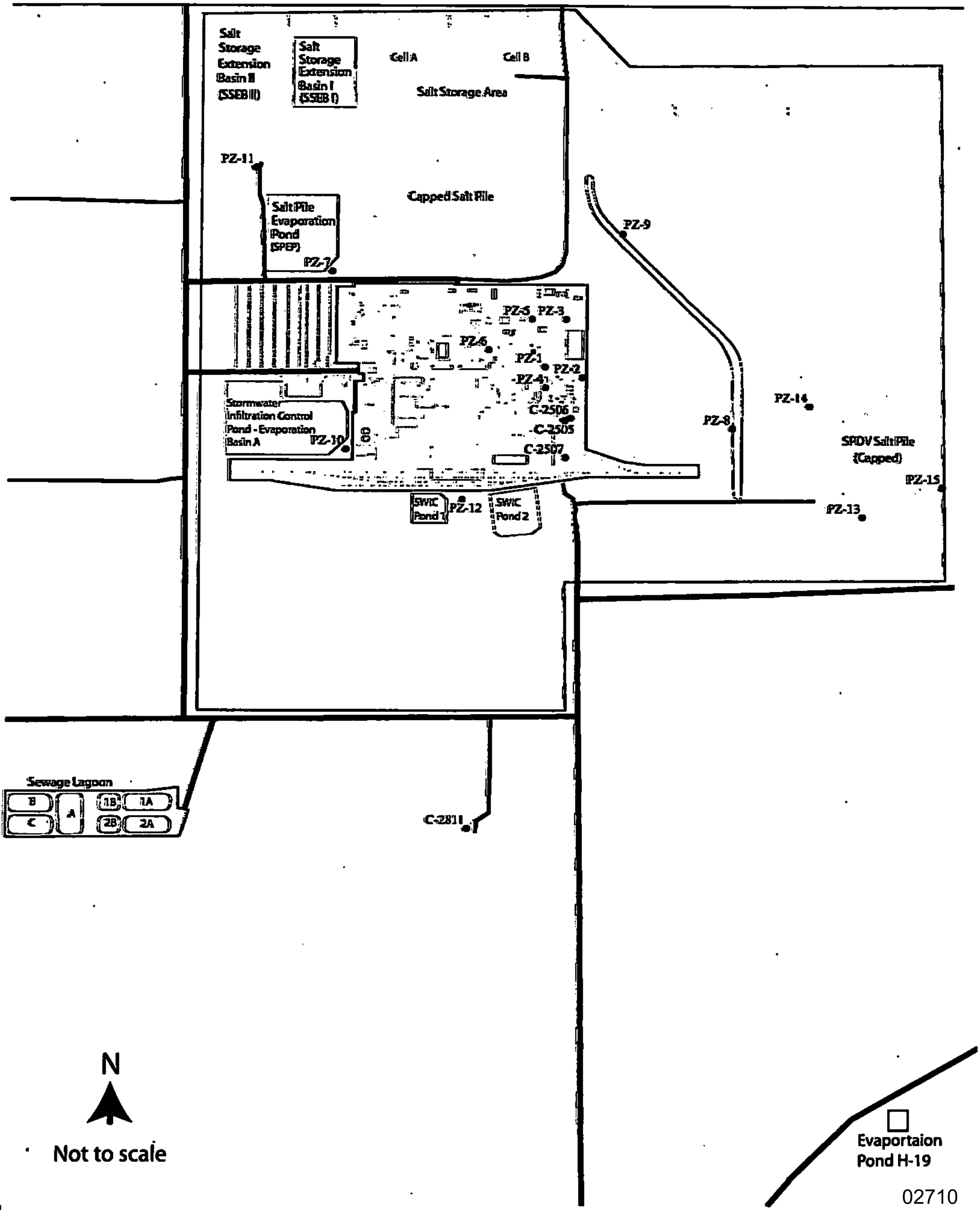
SUBJECT WASTE STABILIZATION LAGOON SYSTEM LAYOUT CALC-NO-CS-2-F003 FILE NO.



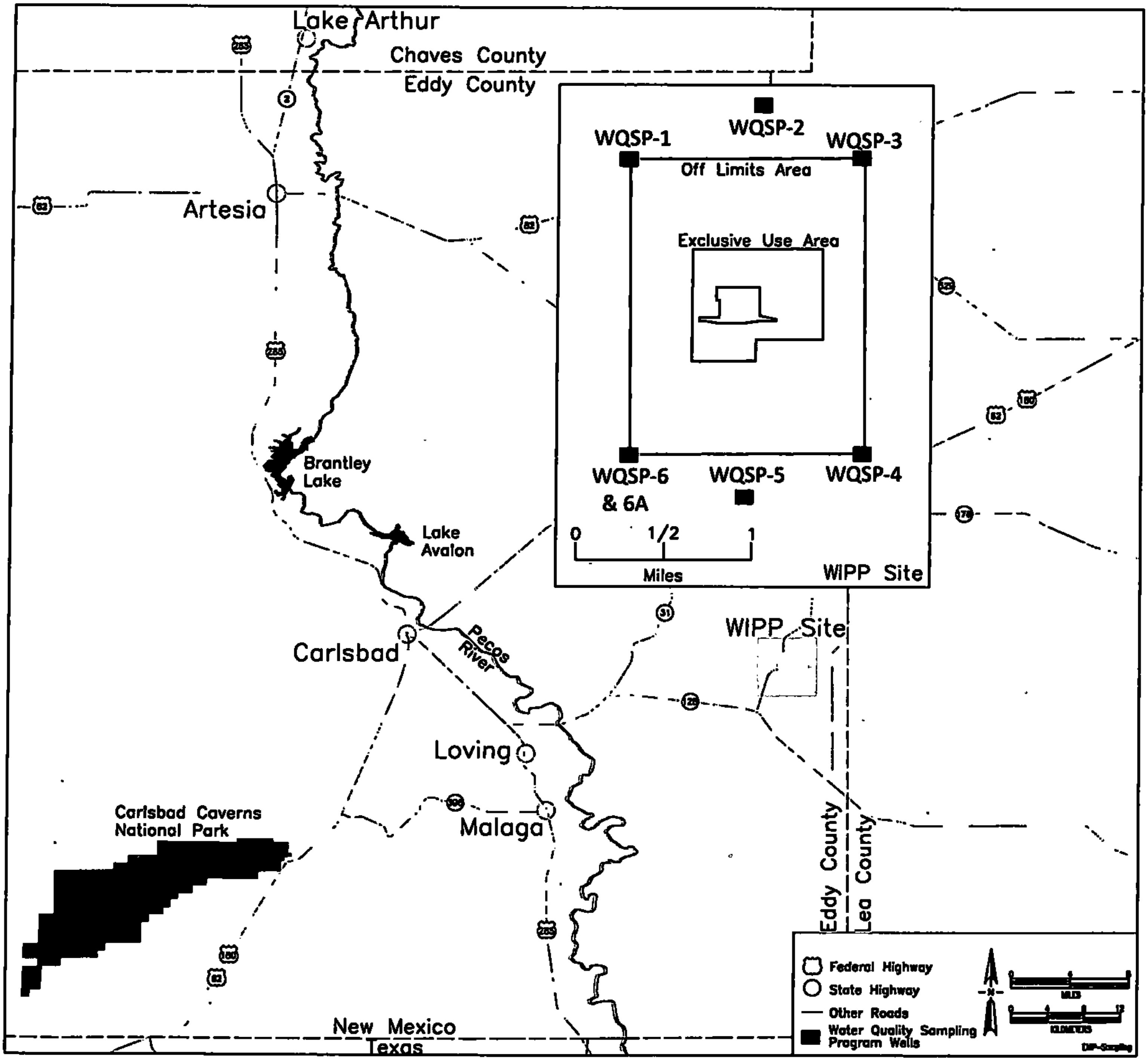


80'
21'
POLISHING CELL 1B
66'
21'
18'
21'
CHLORINE
CONTACT
CHAMBER
21'
18'
21'
POLISHING CELL 2B
CHLORINATOR

Shallow Subsurface Wells and Regulated Units



WQSP Well Locations



Well Water Quality Sampling Results

6 Pages

SSW and WQSP-6A Monitoring Historical Data							
	General Chemistry Parameters					Trace Metals	
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-1	6/21/04	<10	1,530	36,300	79,600	0.0440	<0.00500
PZ-1	11/09/04	1.30	6,530	45,700	85,800	0.106	<0.0100
PZ-1	5/17/05	1.47	2,640	62,300	100,500	0.0600	0.0770
PZ-1	10/11/05	2.59	1,950	54,900	74,800	0.0430	<0.0100
PZ-1	5/16/06	<2.5	2,490	62,400	113,000	0.0510	<0.0100
PZ-1	10/10/06	<1.00	1,390	55,300	70,200	<0.0500	<0.0250
PZ-1	5/09/07	2.70	2,220	63,000	107,000	<0.0500	<0.0250
PZ-1	10/09/07	<1.00	2,820	83,200	99,500	<0.1000	<0.0250
PZ-1	6/5/08	<2.0	2,100	57,000	98,000	0.667	0.00218
PZ-1	10/14/08	NA	2,200	59,000	94,000	NA	NA
PZ-1	05/19/09	NA	2,200	54,000	96,000	NA	NA
PZ-1	10/19/09	NA	2,300	66,000	101,000	NA	NA
PZ-1	5/25/10	NA	2,200	53,000	92,800	NA	NA
PZ-1	10/26/10	NA	1,800	62,000	96,100	NA	NA
PZ-1	05/24/11	NA	2,000	51,000	85,200	NA	NA
PZ-1	10/05/11	NA	2,000	50,000	84,600	NA	NA
PZ-1	05/16/12	NA	2,100	54,000	82,100	NA	NA
PZ-1	10/02/12	NA	2,110	48,100	84,200	NA	NA
PZ-5	6/21/04	20.7	1,340	28,800	55,200	0.0670	<0.00500
PZ-5	11/09/04	<2.50	1,820	47800	86,000	0.0940	<0.0100
PZ-5	5/17/05	2.96	3,260	46,000	65,400	0.0930	0.0670
PZ-5	10/11/05	5.14	769	14,000	32,800	0.0620	<0.0100
PZ-5	5/16/06	2.56	1,520	18,300	32,600	0.0710	<0.0100
PZ-5	10/10/06	5.04	1,330	28,800	47,400	<0.0500	<0.0250
PZ-5	5/09/07	4.60	1,640	17,300	32,400	<0.0500	<0.0250
PZ-5	10/09/07	<1.00	1,880	19,400	28,700	0.0710	<0.005
PZ-5	6/5/08	5.7	1,500	19,000	33,000	0.0801	0.00317
PZ-5	10/14/08	NA	1,400	13,000	25,000	NA	NA
PZ-5	05/19/09	NA	1,500	13,000	24,000	NA	NA
PZ-5	10/19/09	NA	1,600	14,000	20,200	NA	NA
PZ-5	5/25/10	NA	1,400	13,000	21,900	NA	NA
PZ-5	10/26/10	NA	1,400	13,000	20,800	NA	NA
PZ-5	5/24/11	NA	1,200	10,000	18,400	NA	NA
PZ-5	10/4/11	NA	1,300	13,000	19,800	NA	NA
PZ-5	05/16/12	NA	1,500	12,000	21,400	NA	NA
PZ-5	10/2/12	NA	1,340	9,870	18,600	NA	NA
PZ-6	6/21/04	21.2	2,860	70,500	134,000	0.0170	<0.00500
PZ-6	11/09/04	4.89	13,000	75,400	113,000	0.0600	<0.0100
PZ-6	5/17/05	4.25	3,610	109,000	160,500	0.0500	0.0540
PZ-6	10/11/05	<20.0	2,850	83,800	106,000	0.0210	<0.0100

SSW and WQSP-6A Monitoring Historical Data							
	General Chemistry Parameters					Trace Metals	
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-6	5/16/06	7.69	3,050	68,800	115,000	<0.0100	<0.0100
PZ-6	10/10/06	252	2,790	79,800	134,000	<0.0500	<0.0250
PZ-6	5/09/07	6.65	2,840	73,500	122,500	<0.0500	<0.0250
PZ-6	10/09/07	<1.00	3,080	81,000	105,000	<0.1000	<0.0250
PZ-6	6/5/08	6.1	2,100	47,000	81,000	0.0412	0.00259
PZ-6	10/14/08	NA	2,500	58,000	87,000	NA	NA
PZ-6	05/19/09	NA	2,700	61,000	89,000	NA	NA
PZ-6	10/19/09	NA	2,300	50,000	83,600	NA	NA
PZ-6	5/25/10	NA	2,300	47,000	82,100	NA	NA
PZ-6	10/26/10	NA	1,900	47,000	72,300	NA	NA
PZ-6	5/24/11	NA	1,700	37,000	67,700	NA	NA
PZ-6	10/5/11	NA	1,900	41,000	69,800	NA	NA
PZ-6	05/16/12	NA	1,800	41,000	67,200	NA	NA
PZ-6	10/2/12	NA	2,130	52,200	78,700	NA	NA
PZ-7	6/21/04	20.7	2,620	53,000	109,000	0.041	<0.00500
PZ-7	11/08/04	2.89	7,460	43,600	80,400	0.0880	<0.0100
PZ-7	5/16/05	4.02	2,530	42,100	65,900	0.0820	0.0940
PZ-7	10/10/05	6.37	2,770	61,000	88,000	0.0470	<0.0100
PZ-7	5/15/06	<5.3	3,190	54,100	139,000	0.0680	<0.0100
PZ-7	10/9/06	<1.00	2,890	66,800	81,500	<0.00100	<0.0500
PZ-7	5/07/07	5.15	3,190	64,800	119,000	<0.0200	0.0200
PZ-7	10/08/07	<1.00	2,660	45,600	65,000	0.0640	<0.00500
PZ-7	6/4/08	5.0	2,300	49,000	86,000	0.0635	0.00257
PZ-7	10/13/08	NA	1,700	27,000	42,000	NA	NA
PZ-7	05/18/09	NA	3,700	76,000	120,000	NA	NA
PZ-7	10/20/09	NA	4,200	67,000	106,000	NA	NA
PZ-7	5/24/10	NA	3,000	68,000	103,000	NA	NA
PZ-7	10/25/10	NA	3,000	75,000	103,000	NA	NA
PZ-7	05/23/11	NA	2,700	60,000	101,000	NA	NA
PZ-7	10/04/11	NA	3,100	81,000	116,000	NA	NA
PZ-7	05/15/12	NA	3,000	64,000	96,600	NA	NA
PZ-7	10/3/12	NA	4,380	67,500	106,000	NA	NA
PZ-8	10/15/07	0.677	500	7,440	15,000	0.039	<0.00500
PZ-8	6/6/08	1.8	630	11,000	16,000	0.0655	<0.001
PZ-9	6/21/04	<20.0	3,740	80,200	140,000	<0.0100	<0.00500
PZ-9	11/09/04	1.40	14,500	92,400	144,000	0.0660	<0.0100
PZ-9	5/17/05	2.82	5,090	182,000	164,000	0.0500	0.0710
PZ-9	10/11/05	<20.0	3,930	85,500	107,000	0.0220	<0.0100
PZ-9	5/16/06	3.01	4,350	84,700	153,000	0.0230	<0.0100
PZ-9	10/10/06	<20.0	3,370	102,000	135,000	<0.0500	<0.0250

SSW and WQSP-6A Monitoring Historical Data							
	General Chemistry Parameters					Trace Metals	
Monitoring Site	**Sample Date**	**Nitrate (mg/L)**	**Sulfate (mg/L)**	**Chloride (mg/L)**	**TDS (mg/L)**	**Selenium (mg/L)**	**Chromium (mg/L)**
PZ-9	5/09/07	3.28	4,320	89,600	164,000	<0.0500	<0.0250
PZ-9	10/09/07	<200	4,720	116,000	144,000	<0.0200	<0.0050
PZ-9	6/5/08	2.2	4,400	87,000	150,000	0.0351	0.00492
PZ-9	10/14/08	NA	4,100	96,000	140,000	NA	NA
PZ-9	05/19/09	NA	3,600	94,000	130,000	NA	NA
PZ-9	10/19/09	NA	4,000	77,000	139,000	NA	NA
PZ-9	5/25/10	NA	4,400	94,000	144,000	NA	NA
PZ-9	10/26/10	NA	4,300	95,000	149,000	NA	NA
PZ-9	05/24/11	NA	4300	83,000	147,000	NA	NA
PZ-9	10/04/11	NA	4600	99,000	153,000	NA	NA
PZ-9	05/16/12	NA	4,900	98,000	152,000	NA	NA
PZ-9	10/3/12	NA	4,440	99,700	141,000	NA	NA
PZ-10	6/14/04	3.81	469	368	1,714	0.0200	<0.00500
PZ-10	11/08/04	3.69	431	353	1,576	<0.0500	<0.0100
PZ-10	5/16/05	3.63	572	416	1,756	0.0440	0.0370
PZ-10	10/10/05	3.34	515	318	1,720	0.0150	<0.0100
PZ-10	5/15/06	3.42	539	460	1,830	0.0140	<0.0100
PZ-10	10/9/06	5.5	549	350	1,600	<0.00100	<0.0500
PZ-10	5/07/07	14.8	407	274	1,504	<0.0200	0.0200
PZ-10	10/08/07	<1.00	211	186	968	0.0260	<0.0050
PZ-10	6/4/08	4.5	390	300	1,500	0.0144	0.00119
PZ-10	10/13/08	NA	380	290	1,400	NA	NA
PZ-10	05/18/09	NA	530	460	1,800	NA	NA
PZ-10	10/20/09	NA	500	440	1,730	NA	NA
PZ-10	5/24/10	NA	500	370	1,680	NA	NA
PZ-10	10/25/10	NA	410	360	1,530	NA	NA
PZ-10	05/23/11	NA	400	310	1,620	NA	NA
PZ-10	10/04/11	NA	440	370	1,640	NA	NA
PZ-10	05/15/12	NA	450	410	1,650	NA	NA
PZ-10	10/1/12	NA	480	414	1,700	NA	NA
PZ-11	6/21/04	20.8	2,220	58,100	123,000	<0.0100	<0.00500
PZ-11	11/08/04	3.15	13,000	84,100	119,000	<0.0500	<0.0100
PZ-11	5/16/05	4.63	2,890	66,000	100,000	<0.0100	<0.0100
PZ-11	10/10/05	<20.0	2,950	84,300	129,000	0.0130	<0.0100
PZ-11	5/15/06	<5.3	3,090	71,000	133,000	<0.0100	<0.0100
PZ-11	10/9/06	<1.00	2,550	85,800	123,000	<0.00100	<0.0500
PZ-11	5/07/07	3.84	2,620	68,700	135,000	<0.0200	<0.0100
PZ-11	10/08/07	<1.00	2,970	94,400	108,000	<0.0200	<0.0050
PZ-11	6/4/08	3.9	2,100	65,000	110,000	0.0149	0.00216
PZ-11	10/13/08	NA	3,000	79,000	110,000	NA	NA

SSW and WQSP-6A Monitoring Historical Data							
	General Chemistry Parameters					Trace Metals	
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-11	05/18/09	NA	2,500	72,000	110,000	NA	NA
PZ-11	10/20/09	NA	3,200	64,000	112,000	NA	NA
PZ-11	5/24/10	NA	2,500	69,000	107,000	NA	NA
PZ-11	10/25/10	NA	2,300	77,000	100,000	NA	NA
PZ-11	05/23/11	NA	2,000	45,000	80,500	NA	NA
PZ-11	10/03/11	NA	2,300	65,000	92,200	NA	NA
PZ-11	05/15/12	NA	2,400	59,000	93,200	NA	NA
PZ-11	10/3/12	NA	2,220	53,000	95,600	NA	NA
PZ-12	6/14/04	11.2	773	5,320	9,700	0.0770	<0.00500
PZ-12	11/08/04	19.8	879	7,170	9,540	0.0660	<0.0100
PZ-12	5/16/05	8.85	679	3,730	5,890	0.0510	0.0540
PZ-12	10/10/05	426	805	3,790	7,740	0.0200	<0.0100
PZ-12	5/15/06	20.6	866	4,510	8,790	0.0190	<0.0100
PZ-12	10/9/06	13.2	795	5,340	9,150	<0.00100	<0.0500
PZ-12	5/07/07	10.8	831	3,780	7,010	<0.0200	0.0240
PZ-12	10/08/07	<1.00	958	4,310	6,200	0.0260	<0.0050
PZ-12	6/4/08	11	760	3,300	6,800	0.0291	0.00132
PZ-12	10/13/08	NA	850	3,300	7,000	NA	NA
PZ-12	05/18/09	NA	870	4,600	8,300	NA	NA
PZ-12	10/20/09	NA	980	6,500	10,100	NA	NA
PZ-12	5/24/10	NA	990	5,500	10,100	NA	NA
PZ-12	10/25/10	NA	990	5,800	10,300	NA	NA
PZ-12	05/23/11	NA	900	5,600	10,900	NA	NA
PZ-12	10/03/11	NA	900	6,800	13,100	NA	NA
PZ-12	05/15/12	NA	620	6,400	9,400	NA	NA
PZ-12	10/1/12	NA	503	5,290	9,780	NA	NA
PZ-13	10/10/07	12.4	2,670	150,000	245,500	<0.100	<0.00500
PZ-13	6/6/08	<200	2,600	170,000	240,000	0.0118	0.00316
PZ-13	10/13/08	NA	2,900	160,000	230,000	NA	NA
PZ-13	05/18/09	NA	3,300	180,000	240,000	NA	NA
PZ-13	10/20/09	NA	3,300	170,000	255,000	NA	NA
PZ-13	5/24/10	NA	3,000	170,000	240,000	NA	NA
PZ-13	10/26/10	NA	2,900	190,000	246,000	NA	NA
PZ-13	5/24/11	NA	2,700	150,000	248,000	NA	NA
PZ-13	10/4/11	NA	3,000	170,000	259,000	NA	NA
PZ-13	05/15/12	NA	3,300	160,000	252,000	NA	NA
PZ-13	10/2/12	NA	3,260	170,000	263,000	NA	NA
PZ-14	10/15/07	1.41	2,140	71,500	106,000	<0.0100	<0.00500
PZ-14	6/6/08	<100	3,300	130,000	180,000	0.0201	0.00168
PZ-15	10/15/07	2.97	169	764	2,060	0.022	<0.00500

SSW and WQSP-6A Monitoring Historical Data							
	General Chemistry Parameters					Trace Metals	
Monitoring Site	**Sample Date**	**Nitrate (mg/L)**	**Sulfate (mg/L)**	**Chloride (mg/L)**	**TDS (mg/L)**	**Selenium (mg/L)**	**Chromium (mg/L)**
PZ-15	6/6/08	12	160	460	1,600	0.00372	<0.001
C-2811	6/14/04	6.06	299	769	2,022	0.0470	<0.00500
C-2811	11/08/04	7.63	305	1,030	1,996	0.0540	<0.0100
C-2811	5/16/05	6.02	524	1,930	3,740	0.0580	0.0530
C-2811	10/10/05	7.48	584	2,250	4,410	0.0340	<0.0100
C-2811	5/15/06	6.94	511	1,760	3,740	0.0310	<0.0100
C-2811	10/9/06	6.05	402	1,310	2,100	<0.00100	<0.0500
C-2811	5/07/07	5.31	516	1,760	4,205	<0.0200	0.0310
C-2811	10/08/07	<1.00	635	2,980	3,860	0.0510	<0.0050
C-2811	6/4/08	5.7	390	1,300	2,800	0.00170	0.0350
C-2811	10/13/08	NA	320	1,000	2,100	NA	NA
C-2811	05/18/09	NA	360	1,200	2,300	NA	NA
C-2811	10/20/09	NA	320	1,000	2,120	NA	NA
C-2811	5/24/10	NA	340	920	2,090	NA	NA
C-2811	10/25/10	NA	370	1,100	2,470	NA	NA
C-2811	05/23/11	NA	350	960	2,370	NA	NA
C-2811	10/03/11	NA	340	910	2,330	NA	NA
C-2811	05/14/12	NA	320	810	1,870	NA	NA
C-2811	10/1/12	NA	337	862	2,100	NA	NA
C-2507	6/21/04	7.55	717	1,300	3,830	0.029	0.028
C-2507	11/09/04	7.58	824	1,380	3,350	0.0800	0.0140
C-2507	5/17/05	7.94	860	1,370	3,340	0.0780	0.0630
C-2507	10/11/05	6.13	920	1,630	3,240	0.0470	<0.0100
C-2507	5/16/06	7.37	1,040	1,930	5,300	0.0510	<0.0100
C-2507	10/10/06	2.9	943	3,640	1,740	<0.0500	<0.0250
C-2507	5/9/07	6.62	1,110	3,060	5,485	<0.0500	<0.0250
C-2507	10/9/07	<1.00	1,220	3,500	5,540	0.0550	0.007
C-2507	6/5/08	6.9	990	2,800	5,800	0.0637	0.00493
C-2507	10/14/08	NA	940	2,200	5,100	NA	NA
C-2507	5/19/09	NA	950	2,600	5,200	NA	NA
C-2507	10/19/09	NA	930	3,400	5,710	NA	NA
C-2507	5/25/10	NA	910	3,500	6,640	NA	NA
C-2507	10/26/10	NA	980	3,500	7,120	NA	NA
C-2507	5/24/11	NA	790	3,200	6,190	NA	NA
C-2507	10/5/11	NA	810	3,400	6,660	NA	NA
C-2507	05/16/12	NA	800	2,800	5,720	NA	NA
C-2507	10/1/12	NA	774	2,970	6,790	NA	NA
WQSP-6A	7/13/95	7.62	1,905	1,040	11,000	<0.006	<0.025
WQSP-6A	3/28/96	3.98	1,810	507	3,920	<0.013	<0.025
WQSP-6A	7/11/96	2.75	1,971	6,748	4,500	0.020	<0.025

SSW and WQSP-6A Monitoring Historical Data							
	General Chemistry Parameters					Trace Metals	
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
WQSP-6A	4/10/97	4.64	2,240	675	3,960	0.017	<0.025
WQSP-6A	7/10/97	4.04	2,560	660	3,840	<0.050	<0.1000
WQSP-6A	6/10/98	6.19	1,950	644	4,120	0.016	0.0015
WQSP-6A	11/3/98	11.00	2,100	770	4,100	0.220	<0.500
WQSP-6A	5/26/99	7.00	1,900	540	3,800	<0.100	<0.050
WQSP-6A	11/10/99	9.40	1,900	540	3,800	<0.050	<0.050
WQSP-6A	5/24/00	7.50	2,100	530	3,800	0.0129	<0.020
WQSP-6A	11/30/00	6.70	1,900	480	3,700	<0.0130	<0.025
WQSP-6A	6/6/01	6.37	1,900	536	3,680	0.0385	<0.025
WQSP-6A	11/14/01	3.67	1,900	414	4,600	<0.050	<0.010
WQSP-6A	5/22/02	5.52	1,930	487	3,540	<0.050	<0.010
WQSP-6A	11/20/02	5.61	2,090	419	3,685	<0.050	<0.010
WQSP-6A	5/21/03	4.74	1,950	384	3,650	<0.123	<0.050
WQSP-6A	11/19/03	<0.01	1,950	391	3,955	<0.219	<0.025
WQSP-6A	5/26/04	9.61	1,970	416	3,646	<0.025	<0.025
WQSP-6A	11/17/04	6.72	1,960	491	3,655	<0.025	<0.025
WQSP-6A	4/20/05	5.98	1,920	432	3,700	0.057	<0.025
WQSP-6A	10/19/05	<0.01	1,940	360	3,430	<0.025	<0.025
WQSP-6A	5/3/06	2.5	2,210	450	3,200	<0.025	<0.025
WQSP-6A	9/20/06	6.00	2,120	360	3,515	<0.025	<0.025
WQSP-6A	3/7/07	5.78	2,170	484	3,355	<0.025	<0.025
WQSP-6A	9/12/07	5.47	1,950	350	3,400	<0.025	<0.025
WQSP-6A	3/12/08	4.67	2,090	378	3,400	<0.025	<0.025
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	TKN (mg/L)	
WQSP-6A	9/10/08	5.69	2,030	348	3,150	< 5.0	
WQSP-6A	3/4/09	5.90	2,100	350	3,500	<1.0	
WQSP-6A	9/10/09	6.30	2,100	350	3,640	<1.0	
WQSP-6A	3/03/10	6.55	2,145	330	3,545	<1.0	
WQSP-6A	9/23/10	6.34	2,090	321	3,500	<1.0	
WQSP-6A	05/26/11	6.5	2,100	270	3,480	<1.0	
WQSP-6A	10/06/11	5.9	2,100	280	3,450	<1.0	
WQSP-6A	05/16/12	5.4	2,200	310	3,340	<1.0	
WQSP-6A	10/2/12	5.1	2,110	301	3,400	<1.0	
NA: Not analyzed, parameter not required, per DP-831 permit conditions.							

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WP 02-EM1023

Revision 1

Salt Storage Extension I and II Evaporation Basin Sump Water Removal

Technical Procedure

EFFECTIVE DATE: 06/03/11

Rick Salness

APPROVED FOR USE

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CHANGE HISTORY SUMMARY

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGES
1	06/03/11	Added steps 1.3, 1.4, 2.3, 2.4, and 2.5 to reflect process; added requirement for hearing protection for following JHA PROD-284.

INTRODUCTION [1]

This procedure provides the instructions necessary for personnel to perform the task of removing water from the leak detection sump. This process involves installation and operation of a surface-mounted utility pump.

Performance of this procedure generates the following record(s), as applicable. Any records generated are handled in accordance with departmental Records Inventory and Disposition Schedules.

- Attachment 1, Salt Storage Extension I & II Sump Water Removal Log

REFERENCES

BASELINE DOCUMENTS

- Utility Pump Users Manual
- WP 12-IS.01-5, *Industrial Safety Program - Hazardous Locations and Working Surfaces* (applicable sections)
- PROD-284, Salt Storage Extension I & II Evaporation Basin Sump Water Removal

REFERENCED DOCUMENTS

- Water Level Probe Owner's Manual
- Pump Owner's Manual

EQUIPMENT

- Utility Pump with flexible polyvinyl chloride hoses
- One-inch flow meter for volume measurement
- Radio/cell phone for communications
- Binoculars
- Personal floatation device
- Safety glasses
- Water Level Probe
- Hearing Protection
- Distilled water

PRECAUTIONS AND LIMITATIONS

- Care should be taken when working near slippery surfaces.

- Caution must be taken not to damage the synthetic liner with equipment, tools, or other devices.
- Safety glasses shall be worn to prevent eye injury.
- Hearing protection shall be worn when near utility pump.
- Personnel performing this procedure shall follow hazard controls in JHA PROD-284.

PREREQUISITE ACTIONS

NOTE

If needed, user should seek assistance when unloading equipment.
All work is to be suspended in case of inclement weather.

1.0 Perform pre-job safety briefing.

2.0 Ensure tubing has been installed to the maximum depth in the sump.

3.0 Ensure utility pump is primed before starting, and not run dry.

4.0 Inspect all connections hoses and fittings for damage and repair as needed.

PERFORMANCE

CAUTION

Running the pump with outlet pipe or nozzle closed may cause excessive back pressure and cause hoses to burst.

Pump should never be run dry, as running pump without water will cause seal failure.

NOTE

The installation process may be performed in any sequence if efficiency can be achieved and it is deemed appropriate by the technician performing the procedure.

1.0 PUMP INSTALLATION, GENERATOR SETUP, AND START-UP

- Place pump trailer as close as possible to the sump access port.
- Remove access port cover.

- Take sump water level measurement and record on Attachment 1.
- Slide intake flex hose into rigid tubing, below water level.
- Place discharge hose on pond.
- Prime pump, connect rigid tubing to intake, and direct discharge hose into graduated container.

2.0 WATER REMOVAL OPERATIONS

- Turn on pump to remove sump water.
- Record start time on Attachment 1.
- Record the time the sump water reaches the surface on Attachment 1.
- For the first 30 minutes, take flow meter readings every ten minutes; thereafter, take two flow meter readings per dewatering event.
- If sump cannot be emptied, contact Environmental Department manager for further instructions.
- Record all readings on Attachment 1.
- After sump water has been evacuated, turn off the pump, and record the time on Attachment 1.
- Obtain sump water level measurement and record on Attachment 1.

3.0 EQUIPMENT TAKEDOWN

- Remove hoses where required.
- Clean/rinse reusable equipment with distilled water.
- Store equipment accordingly.

4.0 FOLLOW-UP ACTIONS

4.1 Obtain sump water level elevation every working day for three consecutive working days.

4.2 Perform sump water evacuation as needed.

Attachment 1 – Salt Storage Extension I & II Sump Water Removal Log

SALT STORAGE EXTENSION I & II
SUMP WATER REMOVAL LOG

Page _____ of _____

Performed By:		
Print Name	Signature	Date
Sump ID:		
Time	Flow Rate	Comments
Reviewed By: Print Name	Signature	Date

Working Copy

WP 04-GC1201

Revision 10

Sewage Lagoon System Operation

Technical Procedure

EFFECTIVE DATE: 03/24/11

Dale Parrish

APPROVED FOR USE

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CHANGE HISTORY SUMMARY

REVISION NUMBER	DATE ISSUED	DESCRIPTION OF CHANGES
10	03/24/11	Editorial revision to correct number of feet of freeboard in last bullet in Precautions and Limitations.

INTRODUCTION

This procedure provides detailed instructions for operating the Sewage Lagoon System at the Waste Isolation Pilot Plant (WIPP).

No records are generated by the performance of this procedure.

REFERENCES

BASELINE DOCUMENTS

- Environmental Protection Agency Design Manual, *Municipal Wastewater Stabilization Ponds*, October 1983
- Environmental Protection Agency Handbook, *Sewage Treatment and Disposal*, October 1984
- Environmental Protection Agency Operations Manual, *Stabilization Ponds*, August 1977
- 24-C-045-W, WIPP Site Utilities, Sanitary Sewer
- 24-C-072-010, Stabilization Lagoon Grading & Fencing Plan & Sections
- 25-C-004-W, Stabilization Lagoon Added Evaporation Pond
- 25-C-020-010, Stabilization Lagoon Plan & Sections
- 25-C-021-010, Stabilization Lagoon Sections & Details
- 25-C-049-010, Yard Piping - Plant Site to Stabilization Lagoon Plan & Profile
- 25-D-004-010, Yard Piping & Stabilization Lagoon Valve Pits, Plans, Sections & Details

REFERENCED DOCUMENTS

- WP 12-IH.02-2, WIPP Industrial Hygiene Program - Confined Spaces

PRECAUTIONS AND LIMITATIONS

- Only personnel authorized by the Facility Shift Manager (FSM) will be allowed access into the fenced area of the Sewage Lagoon.
- The Sewage Lagoon perimeter fence gates shall remain locked during all times when the area is unoccupied.

- Operations within the Sewage Lagoon fenced area should be conducted during daylight hours, whenever possible.
- To reduce the possibility of short-cycling under-stabilized wastewater or raw sewage, discharging to the Evaporation Ponds should only be accomplished from off-service ponds, except in emergency situations.
- Operating and Maintenance personnel shall have current Tetanus immunizations. A record of Tetanus immunization must be on file with the site Health Services office.
- Protective clothing must be worn EXCEPT when performing routine discharging and maintenance.
- A minimum of two persons must be present at the work site when conducting maintenance and cleanup activities.
- All cuts, abrasions, and similar injuries must be promptly cleaned and treated by the site Health Services personnel or Emergency Services Technician.
- Eating, drinking, smoking, or chewing is prohibited within the Sewage Lagoon fenced perimeter.
- Since the Sewage Lagoon Chlorinator Pit is a permit-required confined space, compliance with WP 12-IH.02-2 is required.
- At the FSM's discretion, one set of primary and polishing pond cells along with an evaporation pond may be used and the remaining evaporative ponds placed in service as required.
- There are no required minimum levels for the evaporation ponds. The evaporation ponds should have at least one foot of freeboard.

PREREQUISITE ACTIONS

NOTE

Makeup water can be added to any pond by using domestic water hydrants DW-258-WH-001, DW-258-WH-002, OR DW-258-WH-003.

1.0 For the In Service settling and polishing ponds, maintain a depth between 30" and 42".

2.0 Verify that all overflow and underflow weir plates are properly installed into the effluent weir boxes of in-service settling and polishing ponds.

3.0 Verify following valves are in normal open condition, or that they have been aligned as directed by the FSM/Shift Manager:

- SW-258-V-011, Evaporation Pond A to Evaporation Pond B Cross-Connect Valve
- SW-258-V-012, Evaporation Pond A to Evaporation Pond C Cross-Connect Valve
- SW-258-V-013 Evaporation Pond B to Evaporation Pond C Cross-Connect Valve
- DW-258-V-001, Hydrant Isolation Valve
- DW-258-V-002, Hydrant Isolation Valve
- DW-258-V-003, Hydrant Isolation Valve

4.0 Monitor and observe operating parameters listed in Attachment 1, Operating Parameters, at LEAST weekly.

PERFORMANCE

1.0 PRIMARY CELL 1A/POLISHING CELL 1B OPERATION

1.1 Verify following valves are CLOSED:

- SW-258-V-001, Primary Cell 1A Inlet Valve
- SW-258-V-003, 1A to 2A Series Operation Valve
- SW-258-V-004, 1B to 2B Series Operation Valve
- SW-258-V-005, 1A to 1B Drain Valve

NOTE

Valve SW-258-V-006 may be left open with 1A and 1B ponds off-service as directed by FSM/Shift Manager OR as required for discharging in accordance with Section .0.

- SW-258-V-006, 1A to 1B Discharge Valve
- SW-258-V-009, 1B Discharge Valve

WARNING

Performance of following step may increase personnel health risk due to introduction of raw sewage into selected pond.

1.2 OPEN following valves:

- SW-258-V-001, Primary Cell 1A Inlet Valve
- SW-258-V-006, 1A to 1B Discharge Valve

1.3 Verify following valves are CLOSED:

- SW-258-V-002, Primary Cell 2A Inlet Valve

NOTE

Valve SW-258-V-008 may be left open with 2A and 2B ponds off-service as directed by FSM/Shift Manager OR as required for discharging in accordance with Section .0.

- SW-258-V-008, 2A to 2B Discharge Valve

2.0 PRIMARY CELL 2A/POLISHING CELL 2B OPERATION

2.1 Verify following valves are CLOSED:

- SW-258-V-002, Primary Cell 2A Inlet Valve
- SW-258-V-003, 1A to 2A Series Operation Valve
- SW-258-V-004, 1B to 2B Series Operation Valve
- SW-258-V-007, 2A to 2B Drain Valve

NOTE

Valve SW-258-V-008 may be left open with 2A and 2B ponds off-service as directed by FSM/Shift Manager OR as required for discharging in accordance with Section .0.

- SW-258-V-008, 2A to 2B Discharge Valve
- SW-258-V-010, 2B Discharge Valve

WARNING

Performance of following step may increase personnel health risk due to the introduction of raw sewage into selected pond.

2.2 OPEN following valves:

- SW-258-V-002, Primary Cell 2A Inlet Valve
- SW-258-V-008, 2A to 2B Discharge Valve

2.3 Verify following valves are CLOSED:

- SW-258-V-001, Primary Cell 1A Inlet Valve

NOTE

Valve SW-258-V-006 may be left open with 1A and 1B ponds off-service as directed by FSM/Shift Manager OR as required for discharging in accordance with Section .0.

- SW-258-V-006, 1A to 1B Discharge Valve

3.0 DISCHARGING TO EVAPORATION PONDS

3.1 **IF** lowering level of Primary Cell 1A/Polishing Cell 1B, **THEN** perform the following:

3.1.1 **GO TO** Section 2.0, place Primary Cell 2A/Polishing Cell 2B in service, secure filling Primary Cell 1A/Polishing Cell 1B, and **RETURN TO** Step 3.1.2.

3.1.2 OPEN SW-258-V-009, 1B Discharge Valve

3.1.3 **WHEN** pond levels approach 36", **THEN** CLOSE SW-258-V-009, 1B Discharge Valve.

3.2 **IF** lowering level of Primary Cell 2A/Polishing Cell 2B, **THEN** perform the following:

3.2.1 **GO TO** Step 1.1, place Primary Cell 1A/Polishing Cell 1B in service, secure filling Primary Cell 2A/Polishing Cell 2B, and **RETURN TO** Step 3.2.2.

3.2.2 OPEN SW-258-V-010, 2B Discharge Valve

3.2.3 **WHEN** pond levels approach 36", **THEN** CLOSE SW-258-V-010, 2B Discharge Valve.

Attachment 1 – Operating Parameters

OPERATING PARAMETERS

Color Indication	General Pond Condition
Dark sparkling green	Good, high pH and dissolved oxygen (DO).
Dull green to yellow	Poor, lowering pH and DO. Blue-green algae are becoming predominant.
Tan to Brown	• Fair, if due to a predominance of brown algae. • Poor, if due to silt or bank erosion.
Gray to Black	Very poor. Pond is septic with anaerobic conditions prevailing.
Wave Action	There should be good wave action when wind is blowing. The absence of good wave action may indicate anaerobic conditions or the presence of oil.
Plant Growth	There should be no plant growth in water that reduces or prevents good wave action. Plant growth along the banks which block wind must also be controlled.
Cleanliness	Inlet piping and outlet weirs must be kept clean and free of floating debris. Trash, caked scum, and debris must be broken up or removed as appropriate. Required cleanup may be accomplished as follows: • Use fire hoses attached to domestic water hydrants to break up floating debris and caked scum, and to reduce material buildup under inlet and discharge pipes. • Use garden rakes for shore maintenance. • Dispose of all removed trash in a proper container. • Notify Hazardous Waste Operations for removal of solid material.
Other	• Check condition of pond liners for evidence of leakage, abnormal wear, or tearing. • Check for erosion problems or evidence of burrowing animals. • Check condition of weir boxes and inspect visible weir plates for obvious damage. • Verify underground valves have covers properly installed. • Report any discrepancies promptly to FSM/Shift Manager.

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
1190 Saint Francis Drive / PO Box 5469
Santa Fe, NM 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

Michelle Lujan Grisham
Governor

Howie C. Morales
Lieutenant Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

May 3, 2019

Michael Brown, Director
Office of Environmental Protection
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, NM 88220
Sent via E-mail: mike.brown@cbfo.doe.gov

RE: Response to Notice of Intent to Discharge; Discharge Permit Not Required for Waste Isolation Pilot Plant, DP-831

Dear Mr. Brown:

The Ground Water Quality Bureau of the New Mexico Environment Department (NMED) received a Notice of Intent from you on April 9, 2018 regarding the proposed discharge of stormwater from the Waste Isolation Pilot Plant. The proposed discharge is located at 34 Louis Whitlock Road, approximately 26 miles southeast of Carlsbad, in Sections 20, 28, and 29, Township 22S, Range 31E, Eddy County.

The notice satisfies the requirements of Subsection A of 20.6.2.1201 NMAC, Ground and Surface Water Protection Regulations, (20.6.2 NMAC).

The proposed discharge is briefly described as follows:

> Stormwater collected in Stormwater Ponds 1, 2, and 3 will be used for dust control and compaction at a project site for construction of an industrial facility and at a construction site for building a highway bypass.

Based on the information provided in your Notice of Intent, NMED has determined that a Discharge Permit is not required as long as the discharge is as described. The discharge is exempt from the Discharge Permit requirement pursuant to Subsection A of 20.6.2.3105 NMAC because, according to the analytical results provided with the Notice of Intent, the discharge conforms to the ground water standards in Section 20.6.2.3103 NMAC.

Although a Discharge Permit is not being required for this discharge at this time, you are not relieved of liability should your operation result in actual pollution of surface or ground waters. Further, this decision by NMED does not relieve you of your responsibility to comply with any other applicable federal, state, and/or local laws and regulations, zoning requirements, plumbing codes, and nuisance ordinances.

If at some time in the future you intend to change the amount, character or location of your discharge, or if observation or monitoring shows that the discharge is not as described in your Notice of Intent, you must file a revised Notice of Intent with the Ground Water Quality Bureau.

If you have any questions, please contact either Avery Young at (505) 827-2909 or Steve Pullen, Program Manager of the Ground Water Pollution Prevention Section, at (505) 827-2962.

Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:AY

cc: Steve Pullen, Program Manager
Michael Kesler, District Manager, NMED District III
County File
Stewart Jones, AECOM, stewart.jones@wipp.ws
Bill Jaco, AECOM, bill.jaco@wipp.ws

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

APR 25 2019

RECEIVED
APR 29 2019
Ground Water Quality Bureau

Ms. Michelle Hunter, Bureau Chief
New Mexico Environment Department
Ground Water Quality Bureau
Harold Runnels Building
1190 Saint Francis Drive
P.O. Box 5469
Santa Fe, NM 87502

Subject: Discharge Permit 831 Permit Modification Renewal/Modification, Part III Additional Proposals and Conditions

Reference: Waste Isolation Pilot Plant Discharge Permit 831 Renewal/Modification Application, December 3, 2018

Dear Ms. Hunter:

The purpose of this letter is to request a modification to *Part III. Additional Proposals and Conditions* of the referenced Discharge Permit 831 (DP-831) to add a new Proposal, and to modify one Condition.

The U. S. Department of Energy, the permittee under DP-831, proposes to use storm water collected in Storm Water Ponds 1, 2, and 3 for site activities requiring non-potable fresh water. Under this proposal, the permittee would use uncontaminated storm water for dust control, soil compaction, and other construction activities, without first having to notify the Ground Water Quality Bureau (GWQB). The permittee is also requesting a modification to Condition 4, and by extension Condition 31, to include the discharge of excess storm water to the ground surface as a short-term corrective action, in the event that storm water accumulations exceed the minimum one foot of freeboard, without the need to notify the GWQB. Such discharges would occur only if analyses of storm water samples showed no ground water contaminants in excess of the standards in 20.6.2.3103 NMAC.

Discussions with Ms. Avery Young of your staff indicated that a Notice of Intent is currently needed prior to the use and/or discharge of storm water as proposed. Ms. Young suggested that the permittee request inclusion of these storm water management alternatives in the DP-831 Permit currently undergoing review by the GWQB, prior to issuance of the permit. Your consideration of this request is greatly appreciated.

If you have any questions about this request or require any additional information, please contact me at (575) 234-7476.

Sincerely,

Michael R. Brown, Director
Office of Environmental Protection

cc:
R. Maestas, NMED, HWB *ED
A. Young, NMED, GWQB ED
CBFO M&RC
*ED denotes electronic distribution

CBFO:OEP:MRB:SA:19-0223:UFC 5486.00

File Revie\ [illegible]-831 - Compliance Evaluation (CMF [illegible] 90001)

Agency Interest: 318 Waste Isolation Pilot Plant ([illegible]), Carlsbad

Activity: CMR20190001

Description | Checklist/Nonchecklist

Participants

Lead NMED Investigators:

Name	Title
Young, Avery	Geoscientist

Other NMED Investigators:

Name	Title

External Investigators:

Name	Organization

Person(s) Interviewed:

Name	Organization

Witnesses:

Name	Organization

Compliance Evaluation Details

Compliance Evaluation Type: Compliance

Duration

Start Date: 04/12/2019 Start Time:

End Date: 04/12/2019 End Time:

Supplemental Information

Samples Taken

Photos/Videos Taken

Area filled or Disturbed:

Units:

General Comments

No significant violations. File review conducted to construct a timeline for the upcoming DP renewal/mod action.

Related Monitoring Document(s):

Related Incidents & Incident Types

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

APR 09 2019

RECEIVED
APR 9 2019
Ground Water Quality Bureau

Ms. Michelle Hunter, Bureau Chief
New Mexico Environment Department
Ground Water Quality Bureau
Harold Runnels Building
1190 Saint Francis Drive
P.O. Box 5469
Santa Fe, NM 87502

Subject: NOTICE OF INTENT TO DISCHARGE

Dear Ms. Hunter:

The purpose of this letter is to transmit to you a Notice of Intent to Discharge (NOI) storm water from Storm Water collection ponds at the Waste Isolation Pilot Plant (WIPP) facility. The Department of Energy, the permittee under Discharge Permit 831, proposes to use storm water for dust control, and soil compaction associated with on-site construction activities (e.g., construction of the new filter building and the North Access Road bypass). Discussions with Ms. Avery Young of your staff indicated that a NOI is needed prior to the use of storm water for these purposes. Your consideration of this request is greatly appreciated. Enclosed are the NOI to Discharge, and applicable analytical data for the storm water.

If you have any questions about this request or require any additional information, please contact me at (575) 234-7476.

Sincerely,

Michael R. Brown, Director
Office of Environmental Protection

Enclosures (2)

cc: w/o enclosures
R. Maestas, NMED *ED
CBFO M&RC
*ED denotes electronic distribution

CBFO:OEP:MRB:SA:19-0220:UFC 5486.00

Ground Water Quality Bureau
RECEIVED

Enclosure 1
Notice of Intent to Discharge

New Mexico Environment Department
Ground Water Quality Bureau

Ground Water Quality Bureau
Notice of Intent to Discharge

For Department use Only:

Agency Interest Number 318

PRD Assigned 20190001

---

1. Name and mailing address of person proposing to discharge (Responsible Person):

Michael Brown
P.O. Box 3090; GSA
Carlsbad, NM 88220

Work Phone: 575-234-7476
Cell/Home Phone:
Fax:
Email: mike.brown@cbfo.doe.gov

2. Name and Position of person Completing Form:

Bill Jaco
Environmental Consultant

Work Phone: 575-234-8177
Cell/Home Phone:
Fax:
Email: bill.jaco@wipp.ws

3. Name of facility:

Waste Isolation Pilot Plant

4. Physical location of the discharge (if applicable, give street address, township, range, section, distance from closest town or landmark, directions to facility, location map):

Street Address: 34 Louis Whitlock Road, Carlsbad, NM 88220; 26 air miles east-southeast of Carlsbad, NM

5. Type of operation generating the discharge (e.g., agricultural facility, domestic wastewater discharge, industrial discharge, mining operation, etc.):

Construction activities at a Federal Government Industrial site

6. Source(s) of the discharge. Describe how the wastewater, sludge, or other discharges processed and/or disposed at your facility are generated. Identify all sources. Attach additional pages if needed:

Discharge will consist of storm water detained per DP-831 and used for dust control and compaction at a project site for construction of an industrial facility, and another construction site for building a highway bypass.

7. Expected contaminants in the discharge (e.g., nitrate-nitrogen, metals, organic compounds, salts, etc.) Include estimated concentration if known, and copies of results of laboratory analyses, if available:

Minerals from soil dissolved in stormwater. No hazardous constituents are present. TDS is less than 250 mg/L. See laboratory analyses enclosed.

New Mexico Environment Department
Ground Water Quality Bureau

Ground Water Quality Bureau
Notice of Intent to Discharge

For Department use Only:

Agency Interest Number________
PRD Assigned ________

8. Describe all components of wastewater processing, treatment, storage, and disposal system (e.g., pre-treatment units, impoundments(s), septic tank/leachfield, etc.). Include sizes, site layout map, plans, and specifications, etc. if available:

Storm water is collected in HDPE lined ponds and allowed to evaporate. Project engineers would like to use the storm water for compaction and dust control. A total of 7.8 million gallons of storm water are available.

9. Estimated maximum daily discharge volume in gallons per day. Provide water usage records or system sizing criteria if available:

N/A

10. Estimated depth to ground water (ft): 100 **Source of information** monitor well drilling logs

11. Current Total Dissolved Solids Concentration in Groundwater 100,000 mg/L

Signature: [signature] **Date:** 4-8-2019

Printed name: Ed Garza **Title:** CBFO Manager (Acting)

Certification by Responsible Person

I, Ed Garza [signature]**, hereby certify that the information and data submitted in this application are true and accurate as possible, to the best of my knowledge and professional expertise and experience.**

Signed this 8th **day of** April**,** 2019 **upon my oath or affirmation, before a notary of the State of** New Mexico

Please return this form to:
NMED Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, New Mexico 87502-5469

Telephone: 505-827-2900
Fax: 505-827-2965

OFFICIAL SEAL
YOLANDA F. NAVARRETE
Notary Public
State of New Mexico
My Commission Expires 5-17-21

Enclosure 2

Analytical Data

4102103

Chain of Custody/Request for Analysis

Control Number: № 7169

Waste Isolation Pilot Plant
P.O. Box 2078
Carlsbad, NM 88221-2078

Site Environmental Compliance

Project Contact: Francine Cohen
Date Samples Sent: 10-17-18
Project Contact Phone: 575-234-8078
Lab Destination: GEL LLC
Project Contact Email: francine.cohen@wipp.ws
Laboratory Contact: Valerie Davis

Page 1 of 1 PO NO. 510566

Sampling Program: WIPP Sampling Team

Sample Team Members: Francine Cohen, Jimmy Neatherlin

Sample Analysis Requested (No. of containers)

Preservative Type: {Fluoride chloride Sulfate TDS}

Sample Number	Sample Point Name	Date Collected	Time Collected	Sample Type	RCRA Metals (NI)	Herbicides	Pesticides	SVOC	VOC (HCl)	PCBs	TPH (SU)	Nitrate/Nitrite (SU)	Uranium Ra-226 Ra-228 (NI)		Comments
WST-18-080	Stormwater Pond #3	10-16-18	1230	W	1				3	1	1	1	1	1	
ms/msd for WST-18-080	Stormwater Pond #3	10-16-18	1230	W	1				3						
WST-18-081	Stormwater Pond #3	10-16-18	1240	W	1				3	1	1	1	1	1	
WST-18-082	FB-Pond Water	10-16-18	1250	W	1				3	1	1	1	1	1	

Turnaround Time Required: Rush X Normal ____ Sample Disposal: By Lab X Return to Client ____

Possible Hazards: Preservatives in Sample Jars.

Sample Type Codes: BR - Brine, W - Water, SE - Sediment, SO - Soil, SA - Salt

Preservatives: HC - Hydrochloric Acid, NI - Nitric Acid, SU - Sulfuric Acid

Chain of Custody Signatures: (Name, Date and Time)

Relinquished By:
1. Francine Cohen 10-17-18 /1010
2. ____
3. ____

Received By:
1. Jarrett [signature] 10:10 10-17-18
2. [signature] 10/18/18 0910
3. ____

Laboratory Information Only:

Custody Seal Intact? Yes No

Sample Temperature ____ °C

Other Comments:

WP02-EC1001

NICHOLS PRINTING, INC.

Volatile Analysis

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 25, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-080	Project:	PROS00114
Sample ID:	462103001	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:30		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
Volatiles by SW846 8260B "As Received"												
1,1,1-Trichloroethane	U	ND	0.333	1.00	ug/L		1	JEB	10/23/18	0041	1814748	1
1,1,2,2-Tetrachloroethane	U	ND	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	ND	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	ND	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	ND	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	ND	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	ND	0.333	1.00	ug/L		1					
Benzene	U	ND	0.333	1.00	ug/L		1					
Carbon tetrachloride	U	ND	0.333	1.00	ug/L		1					
Chloroform	U	ND	0.333	1.00	ug/L		1					
Ethylbenzene	U	ND	0.333	1.00	ug/L		1					
Methylene chloride	U	ND	1.67	5.00	ug/L		1					
Tetrachloroethylene	U	ND	0.333	1.00	ug/L		1					
Toluene	U	ND	0.333	1.00	ug/L		1					
Trichloroethylene	U	ND	0.333	1.00	ug/L		1					
Vinyl chloride	U	ND	0.333	1.00	ug/L		1					
Xylenes (total)	U	ND	1.00	3.00	ug/L		1					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	Volatiles by SW846 8260B "As Received"	50.9 ug/L	50.0	102	(71%-134%)
Bromofluorobenzene	Volatiles by SW846 8260B "As Received"	50.4 ug/L	50.0	101	(70%-131%)
Toluene-d8	Volatiles by SW846 8260B "As Received"	50.0 ug/L	50.0	100	(74%-124%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: October 25, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-081	Project:	PROS00114
Sample ID:	462103002	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:40		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
Volatiles by SW846 8260B "As Received"												
1,1,1-Trichloroethane	U	ND	0.333	1.00	ug/L		1	JEB	10/23/18	0105	1814748	1
1,1,2,2-Tetrachloroethane	U	ND	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	ND	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	ND	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	ND	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	ND	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	ND	0.333	1.00	ug/L		1					
Benzene	U	ND	0.333	1.00	ug/L		1					
Carbon tetrachloride	U	ND	0.333	1.00	ug/L		1					
Chloroform	U	ND	0.333	1.00	ug/L		1					
Ethylbenzene	U	ND	0.333	1.00	ug/L		1					
Methylene chloride	U	ND	1.67	5.00	ug/L		1					
Tetrachloroethylene	U	ND	0.333	1.00	ug/L		1					
Toluene	U	ND	0.333	1.00	ug/L		1					
Trichloroethylene	U	ND	0.333	1.00	ug/L		1					
Vinyl chloride	U	ND	0.333	1.00	ug/L		1					
Xylenes (total)	U	ND	1.00	3.00	ug/L		1					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	Volatiles by SW846 8260B "As Received"	52.1 ug/L	50.0	104	(71%-134%)
Bromofluorobenzene	Volatiles by SW846 8260B "As Received"	51.9 ug/L	50.0	104	(70%-131%)
Toluene-d8	Volatiles by SW846 8260B "As Received"	51.4 ug/L	50.0	103	(74%-124%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 25, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-082	Project:	PROS00114
Sample ID:	462103003	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:50		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
Volatiles by SW846 8260B "As Received"												
1,1,1-Trichloroethane	U	ND	0.333	1.00	ug/L		1	JEB	10/23/18	0130	1814748	1
1,1,2,2-Tetrachloroethane	U	ND	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	ND	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	ND	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	ND	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	ND	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	ND	0.333	1.00	ug/L		1					
Benzene	U	ND	0.333	1.00	ug/L		1					
Carbon tetrachloride	U	ND	0.333	1.00	ug/L		1					
Chloroform	U	ND	0.333	1.00	ug/L		1					
Ethylbenzene	U	ND	0.333	1.00	ug/L		1					
Methylene chloride	U	ND	1.67	5.00	ug/L		1					
Tetrachloroethylene	U	ND	0.333	1.00	ug/L		1					
Toluene	U	ND	0.333	1.00	ug/L		1					
Trichloroethylene	U	ND	0.333	1.00	ug/L		1					
Vinyl chloride	U	ND	0.333	1.00	ug/L		1					
Xylenes (total)	U	ND	1.00	3.00	ug/L		1					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	Volatiles by SW846 8260B "As Received"	51.9 ug/L	50.0	104	(71%-134%)
Bromofluorobenzene	Volatiles by SW846 8260B "As Received"	52.0 ug/L	50.0	104	(70%-131%)
Toluene-d8	Volatiles by SW846 8260B "As Received"	51.1 ug/L	50.0	102	(74%-124%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

PCB Analysis

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Certificate of Analysis

Report Date: October 24, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-080	Project:	PROS00114
Sample ID:	462103001	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:30		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB												
SW846 3535A/8082A PCB, Liquid "As Received"												
Aroclor-1016	U	ND	0.333	1.00	ug/L	0.010	1	JXM	10/24/18	0956	1814745	1
Aroclor-1221	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1232	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1242	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1248	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1254	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1260	U	ND	0.333	1.00	ug/L	0.010	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	AXH5	10/23/18	1350	1814743

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3535A/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3535A/8082A PCB, Liquid "As Received"	1.29 ug/L	2.00	64	(30%-113%)
Decachlorobiphenyl	SW846 3535A/8082A PCB, Liquid "As Received"	1.56 ug/L	2.00	78	(34%-130%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 24, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-081	Project:	PROS00114
Sample ID:	462103002	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:40		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB												
SW846 3535A/8082A PCB, Liquid "As Received"												
Aroclor-1016	U	ND	0.333	1.00	ug/L	0.010	1	JXM	10/24/18	1032	1814745	1
Aroclor-1221	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1232	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1242	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1248	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1254	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1260	U	ND	0.333	1.00	ug/L	0.010	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	AXH5	10/23/18	1350	1814743

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3535A/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3535A/8082A PCB, Liquid "As Received"	1.16 ug/L	2.00	58	(30%-113%)
Decachlorobiphenyl	SW846 3535A/8082A PCB, Liquid "As Received"	1.62 ug/L	2.00	81	(34%-130%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 24, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-082	Project:	PROS00114
Sample ID:	462103003	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:50		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB												
SW846 3535A/8082A PCB, Liquid "As Received"												
Aroclor-1016	U	ND	0.333	1.00	ug/L	0.010	1	JXM	10/24/18	1045	1814745	1
Aroclor-1221	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1232	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1242	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1248	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1254	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1260	U	ND	0.333	1.00	ug/L	0.010	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	AXH5	10/23/18	1350	1814743

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3535A/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3535A/8082A PCB, Liquid "As Received"	1.24 ug/L	2.00	62	(30%-113%)
Decachlorobiphenyl	SW846 3535A/8082A PCB, Liquid "As Received"	1.65 ug/L	2.00	83	(34%-130%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

Metals Analysis

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 26, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-080	Project:	PROS00114
Sample ID:	462103001	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:30		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA												
7470 Cold Vapor Hg Liquid "As Received"												
Mercury	U	ND	0.067	0.200	ug/L	1.00	1	MTM1	10/23/18	1133	1814492	1
Metals Analysis-ICP												
SW846 3005A/6010C RCRA Metals "As Received"												
Aluminum	U	ND	68.0	200	ug/L	1.00	1	TXT1	10/24/18	1845	1814281	2
Arsenic	U	ND	5.00	30.0	ug/L	1.00	1					
Barium		110	1.00	5.00	ug/L	1.00	1					
Boron		54.3	15.0	50.0	ug/L	1.00	1					
Cadmium	U	ND	1.00	5.00	ug/L	1.00	1					
Chromium	U	ND	1.00	5.00	ug/L	1.00	1					
Cobalt	U	ND	1.00	5.00	ug/L	1.00	1					
Copper	U	ND	3.00	10.0	ug/L	1.00	1					
Iron	U	ND	30.0	100	ug/L	1.00	1					
Lead	U	ND	3.30	10.0	ug/L	1.00	1					
Manganese	J	7.11	2.00	10.0	ug/L	1.00	1					
Molybdenum	U	ND	2.00	10.0	ug/L	1.00	1					
Nickel	U	ND	1.50	5.00	ug/L	1.00	1					
Selenium	U	ND	6.00	30.0	ug/L	1.00	1					
Silver	U	ND	1.00	5.00	ug/L	1.00	1					
Zinc	J	4.66	3.30	10.0	ug/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXM8	10/22/18	1757	1814280
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	10/22/18	1524	1814484

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6010C	

Notes:

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Certificate of Analysis

Report Date: October 26, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-080	Project:	PROS00114
Sample ID:	462103001	Client ID:	PROS001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 26, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-081	Project:	PROS00114
Sample ID:	462103002	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:40		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA												
7470 Cold Vapor Hg Liquid "As Received"												
Mercury	U	ND	0.067	0.200	ug/L	1.00	1	MTM1	10/23/18	1145	1814492	1
Metals Analysis-ICP												
SW846 3005A/6010C RCRA Metals "As Received"												
Aluminum	U	ND	68.0	200	ug/L	1.00	1	TXT1	10/24/18	1857	1814281	2
Arsenic	U	ND	5.00	30.0	ug/L	1.00	1					
Barium		106	1.00	5.00	ug/L	1.00	1					
Boron		52.2	15.0	50.0	ug/L	1.00	1					
Cadmium	U	ND	1.00	5.00	ug/L	1.00	1					
Chromium	U	ND	1.00	5.00	ug/L	1.00	1					
Cobalt	U	ND	1.00	5.00	ug/L	1.00	1					
Copper	U	ND	3.00	10.0	ug/L	1.00	1					
Iron	U	ND	30.0	100	ug/L	1.00	1					
Lead	U	ND	3.30	10.0	ug/L	1.00	1					
Manganese	J	6.76	2.00	10.0	ug/L	1.00	1					
Molybdenum	U	ND	2.00	10.0	ug/L	1.00	1					
Nickel	U	ND	1.50	5.00	ug/L	1.00	1					
Selenium	U	ND	6.00	30.0	ug/L	1.00	1					
Silver	U	ND	1.00	5.00	ug/L	1.00	1					
Zinc	J	3.78	3.30	10.0	ug/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXM8	10/22/18	1757	1814280
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	10/22/18	1524	1814484

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6010C	

Notes:

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Certificate of Analysis

Report Date: October 26, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-081	Project:	PROS00114
Sample ID:	462103002	Client ID:	PROS001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 26, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-082	Project:	PROS00114
Sample ID:	462103003	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:50		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA												
7470 Cold Vapor Hg Liquid "As Received"												
Mercury	U	ND	0.067	0.200	ug/L	1.00	1	MTM1	10/23/18	1147	1814492	1
Metals Analysis-ICP												
SW846 3005A/6010C RCRA Metals "As Received"												
Aluminum	U	ND	68.0	200	ug/L	1.00	1	TXT1	10/24/18	1901	1814281	2
Arsenic	U	ND	5.00	30.0	ug/L	1.00	1					
Barium	U	ND	1.00	5.00	ug/L	1.00	1					
Boron	U	ND	15.0	50.0	ug/L	1.00	1					
Cadmium	U	ND	1.00	5.00	ug/L	1.00	1					
Chromium	U	ND	1.00	5.00	ug/L	1.00	1					
Cobalt	U	ND	1.00	5.00	ug/L	1.00	1					
Copper	U	ND	3.00	10.0	ug/L	1.00	1					
Iron	U	ND	30.0	100	ug/L	1.00	1					
Manganese	U	ND	2.00	10.0	ug/L	1.00	1					
Molybdenum	U	ND	2.00	10.0	ug/L	1.00	1					
Nickel	U	ND	1.50	5.00	ug/L	1.00	1					
Selenium	U	ND	6.00	30.0	ug/L	1.00	1					
Silver	U	ND	1.00	5.00	ug/L	1.00	1					
Zinc	U	ND	3.30	10.0	ug/L	1.00	1					
Lead	U	ND	3.30	10.0	ug/L	1.00	1	TXT1	10/25/18	1419	1814281	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXM8	10/22/18	1757	1814280
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	10/22/18	1524	1814484

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6010C	
3	SW846 3005A/6010C	

Notes:

Certificate of Analysis

Report Date: October 26, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-082	Project:	PROS00114
Sample ID:	462103003	Client ID:	PROS001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 25, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-080	Project:	PROS00114
Sample ID:	462103001	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:30		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Fluoride		0.418	0.033	0.100	mg/L		1	MAR1	10/20/18	0111	1813992	1
Sulfate		13.2	0.133	0.400	mg/L		1					
Chloride		55.8	0.670	2.00	mg/L		10	MAR1	10/22/18	1042	1813992	2
Nutrient Analysis												
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"												
Nitrogen, Nitrate/Nitrite	U	ND	0.017	0.050	mg/L		1	AXH3	10/22/18	0657	1813860	3
Oil & Grease Analysis												
EPA 1664A/B n-Hexane Extractable Material (O&G) "As Received"												
Oil and Grease	U	ND	1.31	4.67	mg/L			DXB7	10/24/18	0628	1815066	4
Solids Analysis												
EPA 160.1 Dissolved Solids "As Received"												
Total Dissolved Solids	H	196	3.40	14.3	mg/L			KLP1	10/24/18	1403	1815091	5

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	EPA 353.2	
4	EPA 1664A/1664B	
5	EPA 160.1	

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 25, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-081	Project:	PROS00114
Sample ID:	462103002	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:40		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Fluoride		0.413	0.033	0.100	mg/L		1	MAR1	10/20/18	0234	1813992	1
Sulfate		13.2	0.133	0.400	mg/L		1					
Chloride		56.6	0.670	2.00	mg/L		10	MAR1	10/22/18	1206	1813992	2
Nutrient Analysis												
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"												
Nitrogen, Nitrate/Nitrite	J	0.0263	0.017	0.050	mg/L		1	AXH3	10/22/18	0700	1813860	3
Oil & Grease Analysis												
EPA 1664A/B n-Hexane Extractable Material (O&G) "As Received"												
Oil and Grease	U	ND	1.32	4.72	mg/L			DXB7	10/24/18	0628	1815066	4
Solids Analysis												
EPA 160.1 Dissolved Solids "As Received"												
Total Dissolved Solids	H	199	3.40	14.3	mg/L			KLP1	10/24/18	1403	1815091	5

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	EPA 353.2	
4	EPA 1664A/1664B	
5	EPA 160.1	

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 25, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-082	Project:	PROS00114
Sample ID:	462103003	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:50		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride	J	0.108	0.067	0.200	mg/L		1	MAR1	10/20/18	0302	1813992	1
Fluoride	U	ND	0.033	0.100	mg/L		1					
Sulfate	J	0.141	0.133	0.400	mg/L		1					
Nutrient Analysis												
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"												
Nitrogen, Nitrate/Nitrite	U	ND	0.017	0.050	mg/L		1	AXH3	10/22/18	0707	1813860	2
Oil & Grease Analysis												
EPA 1664A/B n-Hexane Extractable Material (O&G) "As Received"												
Oil and Grease	U	ND	1.31	4.67	mg/L			DXB7	10/24/18	0628	1815066	3
Solids Analysis												
EPA 160.1 Dissolved Solids "As Received"												
Total Dissolved Solids	HU	ND	3.40	14.3	mg/L			KLP1	10/24/18	1403	1815091	4

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 353.2	
3	EPA 1664A/1664B	
4	EPA 160.1	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

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QC Summary

Workorder: 462103

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Solids Analysis										
Batch 1815091										
QC1204142072 462103001 DUP										
Total Dissolved Solids		H 196	H	199	mg/L	0.717		(0%-5%)	KLP1	10/24/18 14:03
QC1204142071 LCS										
Total Dissolved Solids	300			287	mg/L		95.7	(95%-105%)		10/24/18 14:03
QC1204142070 MB										
Total Dissolved Solids			U	ND	mg/L					10/24/18 14:03

Notes:

The Qualifiers in this report are defined as follows:

<	Result is less than value reported
>	Result is greater than value reported
B	The target analyte was detected in the associated blank.
E	General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
H	Analytical holding time was exceeded
J	Value is estimated
N/A	RPD or %Recovery limits do not apply.
N1	See case narrative
ND	Analyte concentration is not detected above the detection limit
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
R	Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.
R	Sample results are rejected
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Z	Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
d	5-day BOD--The 2:1 depletion requirement was not met for this sample
e	5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes
h	Preparation or preservation holding time was exceeded

Radiological Analysis

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Report Date: October 25, 2018

Client Sample ID:	WST-18-080	Project:	PROS00114
Sample ID:	462103001	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date Time	Batch	Mtd.
Rad Alpha Spec Analysis													
Alphaspec U, Liquid "As Received"													
Pct Uranium-235	U	0.00	+/-				percent			JXR5	10/22/18 2133	1814519	1
Uranium-233/234	U	0.323	+/-0.418	0.637	+/-0.421	1.00	pCi/L						
Uranium-235/236	U	0.228	+/-0.363	0.502	+/-0.364	1.00	pCi/L						
Uranium-238	U	0.152	+/-0.337	0.592	+/-0.338	1.00	pCi/L						
Rad Gas Flow Proportional Counting													
GFPC Ra228, Liquid "As Received"													
Radium-228	U	1.28	+/-1.36	2.27	+/-1.41	3.00	pCi/L			JXC9	10/25/18 0840	1814329	2
Rad Radium-226													
Lucas Cell, Ra226, Liquid "As Received"													
Radium-226	U	0.250	+/-0.258	0.399	+/-0.263	1.00	pCi/L			PCW	10/25/18 1000	1814257	3

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, U-02-RC Modified
2	EPA 904.0/SW846 9320 Modified
3	EPA 903.1 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1814519	74.3	(15%-125%)
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"	1814329	57.2	(15%-125%)

Certificate of Analysis

Company :	AECOM Professional Solutions LLC		
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221	Report Date:	October 25, 2018
Contact:	Ms. Francine Cohen		
Project:	WIPP		
Client Sample ID:	WST-18-080	Project:	PROS00114
Sample ID:	462103001	Client ID:	PROS001

Parameter	Qualifier	Result Uncertainty	MDC	TPU	RL	Units	PF	DF Analyst	Date Time	Batch	Mtd.

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

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Certificate of Analysis

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Report Date: October 25, 2018

Client Sample ID:	WST-18-081	**Project:**	PROS00114
Sample ID:	462103002	**Client ID:**	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
Alphaspec U, Liquid "As Received"														
Pct Uranium-235	U	0.00	+/-				percent			JXR5	10/22/18	2133	1814519	1
Uranium-233/234	U	0.162	+/-0.370	0.665	+/-0.371	1.00	pCi/L							
Uranium-235/236	U	0.084	+/-0.236	0.252	+/-0.237	1.00	pCi/L							
Uranium-238	U	0.0381	+/-0.246	0.503	+/-0.246	1.00	pCi/L							
Rad Gas Flow Proportional Counting														
GFPC Ra228, Liquid "As Received"														
Radium-228	U	0.427	+/-1.35	2.49	+/-1.35	3.00	pCi/L			JXC9	10/25/18	0840	1814329	2
Rad Radium-226														
Lucas Cell, Ra226, Liquid "As Received"														
Radium-226	U	0.137	+/-0.322	0.610	+/-0.323	1.00	pCi/L			PCW	10/25/18	1000	1814257	3

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, U-02-RC Modified
2	EPA 904.0/SW846 9320 Modified
3	EPA 903.1 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1814519	85.6	(15%-125%)
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"	1814329	41.9	(15%-125%)

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AECOM Professional Solutions LLC
Address : Waste Isolation Pilot Plant
P.O. Box 2078, MS-452-09
Carlsbad, New Mexico 88221

Report Date: October 25, 2018

Contact: Ms. Francine Cohen
Project: WIPP

Client Sample ID: WST-18-081
Sample ID: 462103002

Project: PROS00114
Client ID: PROS001

Parameter	Qualifier	Result Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AECOM Professional Solutions LLC
Address : Waste Isolation Pilot Plant
P.O. Box 2078, MS-452-09
Carlsbad, New Mexico 88221

Report Date: October 25, 2018

Contact: Ms. Francine Cohen
Project: WIPP

Client Sample ID: WST-18-082
Sample ID: 462103003
Matrix: Water
Collect Date: 16-OCT-18
Receive Date: 18-OCT-18
Collector: Client

Project: PROS00114
Client ID: PROS001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
Alphaspec U, Liquid "As Received"														
Pct Uranium-235	U	0.00	+/-				percent			JXR5	10/23/18	1345	1814519	1
Uranium-233/234	U	-0.213	+/-0.446	1.36	+/-0.448	1.00	pCi/L							
Uranium-235/236	U	0.00	+/-0.511	0.760	+/-0.514	1.00	pCi/L							
Uranium-238	U	-0.197	+/-0.456	1.35	+/-0.458	1.00	pCi/L							
Rad Gas Flow Proportional Counting														
GFPC Ra228, Liquid "As Received"														
Radium-228	U	0.470	+/-0.672	1.16	+/-0.684	3.00	pCi/L			JXC9	10/25/18	0840	1814329	2
Rad Radium-226														
Lucas Cell, Ra226, Liquid "As Received"														
Radium-226	U	0.351	+/-0.295	0.384	+/-0.307	1.00	pCi/L			PCW	10/25/18	1000	1814257	3

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, U-02-RC Modified
2	EPA 904.0/SW846 9320 Modified
3	EPA 903.1 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1814519	37.2	(15%-125%)
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"	1814329	89.8	(15%-125%)

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company :	AECOM Professional Solutions LLC		
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221	Report Date:	October 25, 2018
Contact:	Ms. Francine Cohen		
Project:	WIPP		
Client Sample ID:	WST-18-082	Project:	PROS00114
Sample ID:	462103003	Client ID:	PROS001

Parameter	Qualifier	Result Uncertainty	MDC	TPU	RL	Units	PF	DF Analyst	Date Time	Batch	Mtd.

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

MAR 0 5 2019

Ms. Michelle Hunter, Chief
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

Subject: Groundwater Discharge Permit 831 Renewal/Modification Application – Affidavit of Public Notice Completion

Reference: New Mexico Environment Department correspondence from Michelle Hunter, Chief, Ground Water Quality Bureau, to Mr. Todd Shrader, Manager, CBFO, subject: Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant (WIPP), dated January 16, 2019

Dear Ms. Hunter:

The purpose of this letter is to provide the subject Affidavit of Public Notice Completion with the required enclosures. The signed Affidavit of Public Notice Completion, along with the copy of the newspaper public notice and the list of landowners who were sent the public notice flyer, are enclosed.

This affidavit is being provided pursuant to your directions in the referenced letter regarding *Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant* received on January 21, 2019, and the public notice of permit modification or renewal requirements as specified in 20.6.2.3108.D NMAC.

If you have any questions regarding this transmittal, please contact me at (575) 234-7476.

Sincerely,

Michael R. Brown, Director
Office of Environmental Protection

Enclosures (3)

cc: w/o enclosures

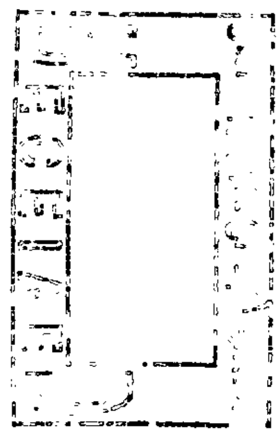
J. Kieling, NMED, HWB	*ED
R. Maestas, NMED, HWB	ED
A. Young, NMED, GWQB	ED
CBFO M&RC	

*ED denotes electronic distribution

RECEIVED
MAR 5 2019
Ground Water Quality Bureau

√ [illegible]

CBFO:OEP:MRB:AC:19-0217:UFC 5486.00



Enclosure 1

Affidavit of Public Notice Completion

New Permit or Permit Modification

DP-831

AFFIDAVIT OF PUBLIC NOTICE COMPLETION
New Permit or Permit Modification

DP-*831*

I certify, under penalty of law, that I have fulfilled the Ground Water Discharge Permit public notice requirements of Section 20.6.2.3108(B) NMAC.

✓ I posted a sign for 30 days displaying a synopsis of the public notice in English and in Spanish at or near the proposed facility in a conspicuous public location (or multiple locations) approved by NMED.

✓ I posted a public notice flyer at a conspicuous off-site location approved by NMED.

✓ I placed a synopsis of the public notice in English and in Spanish in a newspaper approved by NMED. A copy of the newspaper page containing the synopsis is enclosed.

✓ I sent the public notice flyer via 1st class mail to *(check box)*:

- ☐ owners of all properties within a 1/3 mile of the boundary of the property of the proposed discharge locations – mailing list is enclosed.
- ☒ owners of all adjacent property (if applicant owns all property within 1/3 mile) – mailing list is enclosed.

✓ I sent the public notice flyer via certified mail, return receipt requested, to *(check box)*:

- ☐ owner of the property of the proposed discharge locations (if applicant is not the owner) – mailing address is enclosed.

I am aware that there are significant penalties for false certification including the possibility of fines.

[signature] 3/05/2019
Signature of Applicant *Date*

Michael R. Brown Director, Environmental Protection Division
Printed Name *Title*

Enclosure 2

Carlsbad Current Argus

Public Notice Discharge Permit Renewal and Modification

DP-831

Carlsbad takes fourth at Artesia Invite event

SPORTS, 1B

CARLSBAD
CURRENT-ARGUS

TUESDAY, JANUARY 22, 2019 ▮ CURRENTARGUS.COM

PART OF THE USA TODAY NETWORK

PUBLIC NOTICE DISCHARGE PERMIT RENEWAL AND MODIFICATION	AVISO PÚBLICO RENOVACIÓN Y MODIFICACIÓN DE PERMISO DE DESCARGA
U.S. Department of Energy proposes to discharge up to 23,000 gallons per day (gpd) of domestic wastewater and 9,586,995 gpd of industrial wastewater to disposal systems. Discharge location: Waste Isolation Pilot Plant, off Highway 128, approximately 26 miles southeast of Carlsbad. For additional information, contact the New Mexico Environment Department and reference: DP-831 PN1.	El Departamento de Energía de los Estados Unidos propone descargar hasta 23.000 galones por día (gpd) de aguas residuales domésticas y hasta 9.586.995 gpd de aguas residuales industriales a sistemas de eliminación. Sitio de descarga: Waste Isolation Pilot Plant, junto a la carretera 128, aproximadamente a 26 millas al sureste de Carlsbad. Para información adicional comuníquese con el Departamento de Medio Ambiente de Nuevo México y ponga la referencia: DP-831 PN1.

(505) 827-2900 www.env.nm.gov/gwqb/public-notice

Enclosure 3

Mailing List of Landowners for DP-831

Public Notice Flyer

Mailing List of Landowners for DP-831 Public Notice

Ms. Kari Vasenden, Field Manager
U.S. Department of the Interior
Bureau of Land Management
Carlsbad Field Office
620 E. Greene St.
Carlsbad, NM 88220

Mr. Robert Kasuboski, Carlsbad District Resource Manager
New Mexico State Land Office
602 N. Canal, Suite B
Santa Fe, NM 88220

Mr. Jay Dee Logan
267 Smith Ranch Rd
Hobbs, NM 88240

Mr. Stacey Mills
P.O. Box 1358
Loving, NM 88256

MICHELLE LUJAN GRISHAM
Governor

HOWIE MORALES
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, New Mexico 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

JAMES KENNEY
Cabinet Secretary - Designate

January 16, 2019

Mr. Todd Shrader, Manager
U.S. Department of Energy, Carlsbad Field Office
P.O. Box 3090
Carlsbad, NM 88221

RE: Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-831, Waste Isolation Pilot Plant (WIPP)

Dear Mr. Todd Shrader,

The New Mexico Environment Department (NMED) received a Groundwater Discharge Permit Application for the above referenced facility on December 3, 2018. Pursuant to Section 20.6.2.3108 NMAC of the New Mexico Ground and Surface Water Protection Regulations (20.6.2 NMAC), NMED determined on January 7, 2019, that your application is administratively complete.

Within 30 days of the date this letter, you must provide public notice. Instructions and materials needed to complete the public notice are enclosed.

After NMED receives the completed proof of public notice, a technical reviewer will contact you if additional information is needed to process your application. If you have a deadline of concern in the interim or any questions, please call the Ground Water Quality Bureau at (505) 827-2900.
Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau

enc: Instructions for Completing Public Notice Requirements
Affidavit
Public Notice Flyer
Text for Newspaper Display Ad

cc: Mike Brown, Director, Environmental Protection mike.brown@cbfo.doe.gov

INSTRUCTIONS FOR COMPLETING PUBLIC NOTICE REQUIREMENTS

Discharge Permit DP-831 ☐ New ☒ Renewal/Modification ☐ Modification

Within 30 days of the date when the US Postal Service first makes notice to you of its possession of this letter, you must provide public notice as follows:

1. **Post sign(s) at the facility.**
   A sign 2 x 3 feet in size (or multiple signs if required) must be posted **at or near the facility for 30 days** in a conspicuous location approved by NMED. The text for the poster is enclosed. It is the responsibility of the applicant to provide the poster. NMED approves the following sign posting location(s).

   One sign to be posted at each entry point to the facility parking lot.

2. **Post a public notice flyer off-site.**
   The enclosed public notice flyer which must be posted **off-site** at a location conspicuous to the public and approved by NMED. NMED approves the following flyer posting location:

   One flyer to be placed at the Carlsbad Public Library

3. **Mail a public notice flyer to property owners within 1/3 mile.**
   A copy of the enclosed public notice flyer must be sent by 1st class mail to the owners of record of all properties within 1/3 mile from the boundary of the property where the discharge site is located. If there are no properties within 1/3 mile other than properties owned by the applicant, then the flyer must be mailed to the owners of record of the nearest adjacent properties.

   The names and addresses of property owners can be obtained from the county tax assessor's office. The list of property owners' names and addresses must be submitted to NMED.

4. **Mail a public notice flyer to the owner of the discharge site.**
   A copy of the enclosed flyer must be sent via certified mail, return receipt requested, to the owner(s) of the discharge site(s), if the applicant is not the owner. The list of owners' names and addresses and the certified mail receipts must be submitted to NMED.

5. **Place a display ad in the newspaper.**
   A display ad 3 x 4 inches in size must be published for one day in a newspaper of general circulation in the location of the proposed discharge. The ad may **not** be placed in the classified or legal section. The text for the ad is enclosed. NMED approves publishing the ad in the following newspaper:

   Carlsbad Current-Argus

PROOF OF NOTICE. Within 15 days of completing the above requirements, the applicant must submit the following items as proof of notice to NMED:

- ✓ Affidavit regarding the sign posting and mailing (form enclosed).
- ✓ List of names and addresses to whom the public notice flyer was mailed.
- ✓ List of names and addresses of owners of discharge sites.
- ✓ Certified mail receipts for mailing to discharge site owner(s), if required.
- ✓ Copy of newspaper ad.

Send to NMED Ground Water Quality Bureau, PO Box 5469, Santa Fe, NM 87502.

Reviewer's Initials and Date rws January 15, 2019

AFFIDAVIT OF PUBLIC NOTICE COMPLETION
New Permit or Permit Modification

DP-*831*

I certify, under penalty of law, that I have fulfilled the Ground Water Discharge Permit public notice requirements of Section 20.6.2.3108(B) NMAC.

- ✓ I posted a sign for 30 days displaying a synopsis of the public notice in English and in Spanish at or near the proposed facility in a conspicuous public location (or multiple locations) approved by NMED.
- ✓ I posted a public notice flyer at a conspicuous off-site location approved by NMED.
- ✓ I placed a synopsis of the public notice in English and in Spanish in a newspaper approved by NMED. A copy of the newspaper page containing the synopsis is enclosed.
- ✓ I sent the public notice flyer via 1st class mail to *(check box)*:
  - ☐ owners of all properties within a 1/3 mile of the boundary of the property of the proposed discharge locations – mailing list is enclosed.
  - ☐ owners of all adjacent property (if applicant owns all property within 1/3 mile) – mailing list is enclosed.
- ✓ I sent the public notice flyer via certified mail, return receipt requested, to *(check box)*:
  - ☐ owner of the property of the proposed discharge locations (if applicant is not the owner) – mailing address is enclosed.

I am aware that there are significant penalties for false certification including the possibility of fines.

______________________________	______________________________
Signature of Applicant	*Date*
______________________________	______________________________
Printed Name	*Title*

PUBLIC NOTICE

Receipt of Discharge Permit Application

DP-831, Waste Isolation Pilot Plant

DP-831, Waste Isolation Pilot Plant: The U.S. Department of Energy proposes to renew and modify the Discharge Permit for the discharge of up to 23,000 gallons per day of domestic wastewater and 9,586,995 gallons per day of industrial wastewater to disposal systems. Potential contaminants from this type of discharge include nitrogen compounds, dissolved solids, and chloride. The facility is located off Highway 128, approximately 26 miles southeast of Carlsbad, in Sections 20, 21, 28, and 29, T22S, R31E, Eddy County. Groundwater most likely to be affected is at a depth of approximately 100 feet and had a pre-discharge total dissolved solids concentration of 3,400 milligrams per liter.

Provided the applicant has met applicable requirements, the New Mexico Environment Department (NMED) will propose a Discharge Permit containing limitations, monitoring requirements, and other conditions intended to protect groundwater quality for present and potential future use. Information in this public notice was provided by the applicant and will be verified by NMED during the permit application review process. NMED will develop a Public Involvement Plan (PIP) to identify all communities potentially affected by the proposed permitted activity and expand public participation opportunities to accommodate the needs of those communities. The PIP will be posted online at https://www.env.nm.gov/gwqb/public-involvement-plans/ and placed at the NMED field office nearest to the proposed permitted activity. NMED will accept comments and statements of interest regarding the application and will create a facility specific mailing list for persons who wish to receive future notices.

Questions, comments, statements of interest, or requests for non-English language assistance should be directed to:
Ron Strauch, DP-831
Ground Water Quality Bureau
PO Box 5469
Santa Fe, NM 87502
(505) 827-2900

Applicant:
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, NM 88221

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Parts 5 and 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non- discrimination programs, policies or procedures, you may contact: Kristine Yurdin, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. If you believe that you have been discriminated against with respect to a NMED program or activity, you may contact the Non-Discrimination Coordinator identified above or visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination. Telephone conversation assistance is available through Relay New Mexico at no charge for people who are deaf, hard of hearing, or have difficulty speaking on the phone, by calling 1-800-659-1779; TTY users: 1-800-659-8331; Spanish: 1-800-327-1857.

Public Notice Flyer

AVISO PÚBLICO

Recibo de la Aplicación del Permiso de Descarga

DP-831, Waste Isolation Pilot Plant

DP-831, Waste Isolation Pilot Plant: El Departamento de Energía de los Estados Unidos propone renovar y modificar el Permiso de Descarga para la descarga de hasta 23.000 galones por día de aguas residuales domésticas y hasta 9.586.995 galones por día de aguas residuales industriales a sistemas de eliminación. Los posibles contaminantes asociados con este tipo de descarga incluyen compuestos de nitrógeno, sólidos disueltos y cloruro. La instalación está ubicada junto a la carretera 128, aproximadamente a 26 millas al sureste de Carlsbad, en las Secciones 20, 21, 28, y 29, T22S, R31E, condado de Eddy. El agua subterránea que tiene más probabilidad de verse afectada se encuentra a una profundidad aproximada de 100 pies y tenía una concentración de sólidos disueltos totales antes del vertido de 3.400 miligramos por litro.

Siempre que el solicitante cumpla con los requisitos aplicables, el Departamento de Medio Ambiente de Nuevo México (NMED, por sus siglas en inglés) propondrá para su aprobación un Permiso de Descarga que contiene limitaciones, requisitos de monitoreo, y otras condiciones destinadas a proteger la calidad del agua subterránea para su uso actual y potencial uso en el futuro. La información en esta notificación pública fue provista por los solicitantes y será verificada por NMED durante el proceso de revisión de solicitudes de permiso. NMED desarrollará un Plan de Participación Pública (PIP) para identificar a todas las comunidades potencialmente afectadas por la actividad permitida propuesta y ampliar las oportunidades de participación pública para acomodar las necesidades de esas comunidades. El PIP será publicado en línea en https://www.env.nm.gov/gwqb/public-involvement-plans/ y se colocará en la oficina de campo de NMED más cercana a la actividad autorizada propuesta. El NMED aceptará comentarios y declaraciones de interés con respecto a las solicitudes y creará listas de correo específicas de las instalaciones para las personas que deseen recibir avisos en el futuro.

Todas las preguntas, comentarios, declaraciones de interés o solicitudes de asistencia en otro idioma deben dirigirse a:
Ron Strauch, DP-831
La Oficina de Calidad de Aguas Subterráneas
PO Box 5469
Santa Fe, NM 87502
(505) 827-2900

Solicitante:
U.S. Department of Energy
Waste Isolation Pilot Plant
P.O. Box 3090
Carlsbad, NM 88221

NMED no discrimina por motivos de raza, color, origen nacional, discapacidad, edad o sexo en la administración de sus programas o actividades, según lo exigido por las leyes y los reglamentos correspondientes. NMED es responsable de la coordinación de los esfuerzos de cumplimiento y la recepción de indagaciones relativas a los requisitos de no discriminación implementados por 40 C.F.R. Partes 5 y 7, incluido el Título VI de la Ley de Derechos Civiles de 1964, según enmendada; Sección 504 de la Ley de Rehabilitación de 1973; la Ley de Discriminación por Edad de 1975, Título IX de las Enmiendas de Educación de 1972 y la Sección 13 de las Enmiendas a la Ley Federal de Control de Contaminación del Agua de 1972. Si usted tiene preguntas sobre este aviso o sobre cualquier programa, política o procedimiento de no discriminación de NMED, usted puede comunicarse con la Coordinadora de No Discriminación: Kristine Yurdin, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. Si usted piensa que ha sido discriminado/a con respecto a un programa o actividad de NMED, usted puede comunicarse con la Coordinadora de No Discriminación antes indicada o visitar nuestro sitio web en https://www.env.nm.gov/non-employee-discrimination-complaint-page/ para aprender cómo y dónde presentar una queja de discriminación. Hay disponible asistencia telefónica de conversación sin costo alguno a través de Relay New Mexico para personas sordas, con dificultades auditivas o que tengan dificultad para hablar por teléfono, llamando al 1-800-659-1779; usuarios de TTY: 1-800-659-8331; español: 1-800-327-1857.

Public Notice Synopsis, DP-831
(for poster and newspaper display ad)

Newspaper display ad must be at least 3 inches by 4 inches in size and must be published for at least one day in a section other than the classifieds or legals.

Poster must be made to be at least 2 feet by 3 feet in size and must be posted at or near the facility, in a location approved by the department, and conspicuous to the public for a period of 30 days. For more than 640 contiguous acres of a discharge site, or when the discharge site is not located on contiguous properties, additional posters may be required.

PUBLIC NOTICE
DISCHARGE PERMIT RENEWAL AND MODIFICATION

U.S. Department of Energy proposes to discharge up to 23,000 gallons per day (gpd) of domestic wastewater and 9,586,995 gpd of industrial wastewater to disposal systems. Discharge location: Waste Isolation Pilot Plant, off Highway 128, approximately 26 miles southeast of Carlsbad. For additional information, contact the New Mexico Environment Department and reference: DP-831 PN1.

AVISO PÚBLICO
RENOVACIÓN Y MODIFICACIÓN DE PERMISO DE DESCARGA

El Departamento de Energía de los Estados Unidos propone descargar hasta 23.000 galones por día (gpd) de aguas residuales domésticas y hasta 9.586.995 gpd de aguas residuales industriales a sistemas de eliminación. Sitio de descarga: Waste Isolation Pilot Plant, junto a la carretera 128, aproximadamente a 26 millas al sureste de Carlsbad. Para información adicional comuníquese con el Departamento de Medio Ambiente de Nuevo México y ponga la referencia: DP-831 PN1.

(505) 827-2900 www.env.nm.gov/gwqb/public-notice

New Mexico En... ...ment Department
Ground Water Quality Bureau

Ackno..._dgement of Receipt

I, Julie Kendall, hereby acknowledge receipt of Check No. 050904, dated 11/8/18 received in the amount of $ 100.00 from Nuclear Waste Partnership, LLC

Site/Facility Name: WIPP

DP #: 831 VRP #: ______

AI #: 318

Activity ID #: PRD or CRC ______

GWQB – Date of Receipt

RECEIVED
DEC 4 2018
Ground Water Quality Bureau

- [x] PPS permit fee
- [ ] ACS permit fee
- [ ] MECS permit fee - general
- [ ] MECS Permit fee - copper
- [ ] VRP fee
- [ ] Brownfields loan repayment (BCRLF)
- [ ] Poster Fee
- [ ] Other

Explain: ______

Copy of Check (below):

Nuclear Waste Partnership, LLC
P.O. Box 2078
Carlsbad NM 88221

Carlsbad National Bank
PO Box 1359
Carlsbad NM 88220

050904

Date Nov/08/2018 Pay Amount 100.00***

Pay ****ONE HUNDRED AND XX/100 DOLLAR ****

To The Order Of
NEW MEXICO ENVIRONMENT DEPT.
PO BOX 5469
SANTA FE NM 87505-5469

Authorized Signature

⑈050904⑈ ⑆112201797⑆ 65676⑈

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

DEC 0 3 2018

Ms. Michelle Hunter, Chief
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

Subject: Waste Isolation Pilot Plant Discharge Permit 831 Renewal/Modification Application

Dear Ms. Hunter:

The purpose of this letter is to submit the enclosed Discharge Permit 831 (DP-831) Renewal and Modification Application for the Waste Isolation Pilot Plant (WIPP), located in Eddy County, New Mexico. This Renewal and Modification Application is being submitted pursuant to Section 20.6.2.3106 NMAC. Enclosed are two copies of the signed DP-831 Renewal and Modification Application, a compact disc with the signed Application including documentation in a portable document format, and check number 050904 for the $100.00 filing fee.

If you have any questions regarding this transmittal, please contact Mr. M. Brown at (575) 234-7576.

Sincerely,

Mike Brown, Director
Environmental Protection Division

Enclosures (3)

cc: w/o Enclosures

S. Pullen, NMED	*ED
R. Strauch, NMED	ED
R. Maestas, NMED	ED

*ED denotes electronic distribution

RECEIVED
DEC 3 2018
Ground Water Quality Bureau

CBFO:OEP:MRB:AC:18-0369:UFC 5486.00

NEW MEXICO ENVIRONMENT DEPARTMENT
GROUND WATER QUALITY BUREAU

GROUND WATER DISCHARGE PERMIT APPLICATION

Instructions for completing the application are included in the form itself and in the Supplemental Instructions found at the back of the application. You may fill out the application manually, or a Microsoft Word version may be downloaded from www.env.nm.gov (Ground Water Quality) and filled out electronically. Timely processing of this application is contingent upon the technical completeness of the submission. Failure to provide all of the information pursuant to Section 20.6.2.3106 NMAC, following notice of technical deficiency, may result in denial of the application.

Send two complete paper copies AND one electronic copy of this application, with the filing fee to:

Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

Introduction

Facility Name: Waste Isolation Pilot Plant

GWQB – Date of Receipt
(Department Use Only)
RECEIVED
DEC 3 2018
Ground Water Quality Bureau

For Existing Discharge Permits:

DP Number: 831
Expiration Date: July 29, 2019

Type of Discharge (*check one*):

☒ Domestic
☐ Industrial
☐ Agricultural
☐ Mining

Type of Application (*check appropriate box*)

☐ New – new facility
☐ New – existing (unpermitted) facility
☐ Renewal only
☐ Modification only
"modification" includes a change in the location of a discharge, and/or increase in the quantity of the discharge, and/or a change in the quality of the discharge.
☒ Renewal and Modification

If this application is to *modify* or *renew and modify* a Discharge Permit, what is the reason for modification of the Discharge Permit? Describe the proposed changes that would result in modification, meaning a change in the location of a discharge, and/or an increase in the quantity of the discharge, and/or a change in the quality of the discharge.

This application is to renew and modify the Waste Isolation Pilot Plant Discharge Permit. The existing impoundments constitute the renewal aspect of this permit application, whereas the modification adds five new impoundments. The information provided in this permit application for Salt Cells 1, 2, and 3, Salt Storage Pond 1, and Salt Storage Pond 2/3, Storm Water Ponds 1, 2, and 3, the Facultative Sewage Treatment System (Effluent Lagoons A, B, and C, Settling Lagoons 1 and 2, and Polishing Lagoons 1 and 2), the Site Preliminary Design Validation (SPDV) Material Pile, and Evaporation Pond H-19 is for existing impoundments. These impoundments were approved in previous permit applications. No changes were made to the physical design, location, discharge quantity, or discharge quality of the Facultative Sewage Lagoon System impoundments since the last permit application submittal. No changes were made to the physical design, location, or discharge quality of the existing industrial wastewater impoundments, including the storm water ponds. However, except for Evaporation Pond H-19, the discharge quantity for the existing industrial wastewater impoundments and storm water control impoundments has increased. The previous industrial wastewater maximum daily discharge volume was based on a 24-hour, 25-year rainfall event (3.9 inches). Based on data collected at the facility, the 24-hour, 25-year rainfall event has been exceeded in recent years. Therefore, the criterion (intensity) is being modified to a 24-hour, 100-year rainfall event (5.84 inches), which will be used to estimate the industrial wastewater daily maximum discharge volume for these impoundments including storm water control. The industrial wastewater impoundment's design capacity is sufficiently large to accommodate this change (see Attachment 3 to this application for description of components including impoundment design capacities). The existing impoundments constitute the renewal aspect of this permit application. A summary table is provided below to summarize new runoff volumes from changing the design basis rainfall event.

Evaporation Pond	Drainage Area (sq. ft.)	Runoff Volumes (gallons) for 24-hr, 100-yr Storm Event (5.84 inches)	Pond Capacity (gallons)
Salt Storage Pond 1	690,100	2,512,148	4,440,128
Salt Storage Pond 2/3	1,047,800	3,814,271	26,642,264
Storm Water Pond 1	178,595	650,133	765,204
Storm Water Pond 2	387,681	1,411,262	2,612,016
Storm Water Pond 3	1,642,199	5,978,042	8,654,360

- Runoff calculations utilize the rational equation, where the runoff coefficient varies from 0 to 1 based on the composition of the surfaces. For conservatism, a runoff coefficient of 1 was used. This calculation also included the volume that falls onto the surface area of each pond, respectively.

- Pond capacity is based on Nuclear Waste Partnership, LLC (NWP) drawing 23-C-017-W1, DP-831 Discharge Permit Evaporation Ponds Depth vs Volume Tables.

- Salt Storage Pond 2 and Salt Storage Pond 3 are connected by two 12-inch polyethylene pipes to prevent overflow of Salt Storage Pond 2; therefore, these ponds act as one pond system (pond capacities on NWP drawing 23-C-017-W1 are added together).

- The value of 5.84 inches used for the 24-hour, 100-year rainfall event was taken from Technical Paper No. 40, Rainfall Frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years, U.S. Department of Commerce.

This renewal application also includes a modification to the Discharge Permit to add five new impoundments: Salt Cell 5, and Salt Storage Pond 5, which are associated with Shaft 5, and Storm Water Pond 4, Brine Retention Pond East, and Brine Retention Pond West, which are associated with the Permanent Ventilation System.

Salt Cell 5 adds a new salt storage location (Latitude: 32 22 21.02, Longitude: 103 48 7.44), which will receive overburden and salt from the construction of Shaft 5 and its associated underground connecting drifts.

Salt Storage Pond 5 (Latitude: 32 22 20.25, Longitude: 103 48 13.22) will receive both the leachate and storm water in contact with mined salt located in Salt Cell 5. Salt Storage Pond 5 will increase the quantity of the current industrial wastewater maximum permitted discharge volume by 1,292,499 gallons per day (gpd), which is based on the total inflow from a 24-hour, 100-year rainfall event (5.84 inches).

Brine Retention Pond East (Latitude: 32 22 19.05, Longitude: 103 47 23.19) and Brine Retention Pond West (Latitude: 32 22 19.05, Longitude: 103 47 23.19) will receive salt brine production from the Permanent Ventilation System's Salt Reduction Building operation. Each brine retention pond is designed to hold up to 14 days of expected average monthly salt brine production. One pond will be in service, while the other pond is closed for cleaning and brine removal. The quantity of brine production discharged into the brine retention ponds is approximately 2,210 gpd. When the brine retention ponds reach their allowed capacity, the accumulated brine will be transferred to Storm Water Pond 4.

Storm Water Pond 4 (Latitude: 32 22 12.04, Longitude: 103 47 18.98) will receive storm runoff from the facility's paved areas and roofs and also provide capacity to receive brine from both Brine Retention Pond East and Brine Retention Pond West. Storm Water Pond 4 will collect non-contact storm runoff at 1,857,927 gpd, which is based on the total inflow from a 24-hour, 100-year rainfall event (5.84 inches) plus 30,940 gpd of brine from the brine retention ponds. The 30,940 gallons is a batch load (accumulated over 14 days), which would be transferred from the brine retention ponds into Storm Water Pond 4.

The maximum daily discharge for the facility is a collective sum from both domestic wastewater and industrial wastewater. Domestic wastewater discharge into the Facultative Sewage Treatment System is up to 23,000 gpd. Industrial wastewater discharge is primarily from storm water runoff from a 24-hour, 100-year rainfall event (5.84 inches), which comes into contact with salt storage locations (salt cells). This discharge is collected into salt storage ponds. Secondary industrial wastewater discharges are from miscellaneous WIPP facility operations. Brine from the salt reduction building operation will be collected in Brine Retention Ponds East and West. Other industrial wastewaters (e.g. purging groundwater monitoring wells), will be discharged into either Effluent Lagoons B or C, or the Evaporation Pond H-19.

The list of the proposed maximum daily discharge rates for each of the active existing and new impoundments is provided in Attachment 1 of this Permit application and summarized below:

Total Domestic wastewater discharge:	23,000 gpd
Total Industrial wastewater discharge:	9,586,995 gpd
A) Effluent Lagoon B or C:	27,000 gpd
B) Evaporation Pond H-19:	50,000 gpd
C) Salt Storage Pond 1:	2,512,148 gpd
D) Salt Storage Pond 2/3:	3,814,271 gpd
E) Storm Water Pond 4:	1,888,867 gpd
F) Salt Storage Pond 5:	1,292,499 gpd
G) Brine Retention Ponds East/West:	2,210 gpd

Fees Included with Application

All applicants are required to submit a **$100 Application Filing Fee**. An additional fee will be assessed prior to permit issuance. Permit fees are listed in section 20.6.2.3114 NMAC. **Make checks payable to: NMED-Ground Water Quality Bureau**

Application Checklist

The following checklist has been provided to assist in ensuring that the application is complete prior to submission (*check all that apply*):

☒	Part I. Administrative Completeness ☒ $100 Application Filing Fee ☒ A. General Information ☒ B. Public Notice Information ☒ C. Public Notice Preparation
☒	Part II. Technical Completeness ☒ A. Discharge Volume and Description ☒ B. Identification and Physical Description of Facility ☒ C. Flow Metering ☒ D. Ground Water Monitoring ☒ E. Engineering and Surveying (electronic copies) ☒ F. Land Application Area
☒	Part III. Site-Specific Proposals
☒	Part IV. Electronic (PDF) format of Maps and Logs is required (additional paper copies of maps and logs are optional and may be requested by the Department if required for review) ☒ A. Surface Soil Survey and Vadose Zone Geology

	☒ B. Location Map ☐ C. Flood Zone Map.

Copies of Application

An applicant applying for a Discharge Permit shall submit **two paper copies of the signed application, and an electronic copy of the signed application including all supporting documentation,** to the address listed below.

☒ Two paper copies – completed and signed

☒ Electronic copy in portable document format (PDF) of the signed application and all supporting documentation (designs, maps, logs), on the following media *(choose one)*:

☒ Compact disc (CD)/DVD ☐ Flash drive

Send application and fees to the following address:
Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

Applicant's Signature

Signature must be that of the person listed as the legally responsible party on this application (Part I, 2a).

I, the applicant, attest under penalty of law to the truth of the information and supporting documentation contained in this application for a Ground Water Discharge Permit.

Signature: Todd [signature] Date: 11/29/18

Printed Name: Todd Shrader Title: Manager, Carlsbad Field Office

Part I. Administrative Completeness

General Information

1. Facility Information

See Supplemental Instructions to determine what constitutes a "facility." The physical address must be provided. If the facility does not have an address, the location can be described by road intersections, mile posts, or landmarks, as appropriate. See Supplemental Instructions for additional information.

Facility Name	Waste Isolation Pilot Plant (WIPP)
Discharge Permit #	DP-831
Physical Address	The facility is located off of the Jal Highway, approximately 26 miles southeast of Carlsbad, New Mexico; Sections 20, 28, and 29; Township 22 South; Range 31 East; Eddy County.
County	Eddy
Type of Facility	Federal Agency - U.S. Department of Energy
Driving Directions	Driving east from Carlsbad on U.S. Highway 62/180 turn onto the WIPP access road just east of mile marker 64, proceed 12.5 miles to the facility.

2. Contact Information

a) Applicant Information The applicant is the person or entity (e.g., corporation, partnership, organization, *municipality*, etc.) legally responsible for the discharge and for complying with the terms of the Discharge Permit. If the applicant is an entity, then the name and title of a contact person must be provided. This application must be signed by the applicant or contact person named here.

Applicant Name	U.S. Department of Energy, Carlsbad Field Office			Title	Federal Agency
Mailing Address	P.O. Box 3090				
	City	Carlsbad	State NM	Zip	88221
Contact Person	Mr. Todd Shrader			Title	Manager
	Office Number	575-234-7300		Fax Number	575-234-7027
Contact Information	Cell Number			E-mail	todd.shrader@cbfo.doe.gov

b) Facility Operator/Manager Information Provide the contact information for the facility operator or manager below. If the facility is required to have an operator certified by the State of New Mexico, please include the certification level of the operator named here.

Name	Mike Proctor			Title	Facility Operator
Mailing Address	P.O. Box 2078, MS 451-13				
	City	Carlsbad	State NM	Zip	88221

Contact Information	Office Number	575-234-8143	Fax Number	575-234-7027
	Cell Number		E-mail	mike.proctor@wipp.ws
	Cell Number		E-mail	
Certification Level (if applicable)	WS 2			

c) Consultant's Information (if applicable) If the consultant is a company or organization, then the name and title of a contact person must be provided here.

Company Name (1)						
Company Contact						
Mailing Address						
	City		State		Zip	
Contact Information	Office Number		Fax Number			
	Cell Number		E-mail			

Company Name (2)						
Company Contact						
Mailing Address						
	City		State		Zip	
Contact Information	Office Number		Fax Number			
	Cell Number		E-mail			

d) Permit Contact Information (if applicable) If someone other than the contacts listed above is a primary contact for this application and/or facility, list here.

Name	Mr. Mike Brown		Title	Director, Environmental Protection		
Mailing Address	P.O. Box 3090					
	City	Carlsbad	State	NM	Zip	88221
Contact Information	Office Number	575-234-7476	Fax Number	575-234-7061		
	Cell Number		E-mail	mike.brown@ cbfo.doe.gov		
Facility Affiliation	Waste Isolation Pilot Plant					

3. Ownership and Real Property Agreements [20.6.2.7HH NMAC]

The applicant owns (check as appropriate):

☒ The facility

☒ All discharge sites

☐ Some discharge sites

If someone other than the applicant owns the facility or any of the discharge sites, provide ownership information below. For any portion of the facility where the applicant is not the owner of record, the applicant shall submit a copy of any lease agreement or other agreement which authorizes the use of the real property for the duration of the term of the requested permit (typically five years). Lease prices or other prices may be redacted.

- If more than one person has ownership interest, or a partnership exists, list all persons with an ownership interest.
- If a corporate entity holds an ownership interest, provide the name of the corporate entity and the entity's registered agent as filed with the New Mexico Public Regulation Commission.

Name			Title		
Mailing Address					
	City		State		Zip
Contact Information	Office Number		Fax Number		
	Cell Number		E-mail		
Owns	☐ The facility		☐ A discharge site		
	☐ Attached – lease (or other authorized use) agreement				

Name			Title		
Mailing Address					
	City		State		Zip
Contact Information	Office Number		Fax Number		
	Cell Number		E-mail		
Owns	☐ The facility		☐ A discharge site		
	☐ Attached – lease (or other authorized use) agreement				

4. Public Notice Information

a) Proposed Maximum Daily Discharge Volume: 9,586,995 gallons per day
Note: Use the information from Part II.A.2 following its completion.

b) Depth-to-Most-Shallow Ground Water: 100 feet
Note: Use the information from Part II.A.2 following its completion.

c) Pre-Discharge Total Dissolved Solids Concentration in Ground Water
[Subsection C of 20.6.2.3106 NMAC]

Provide the concentration of total dissolved solids (TDS) in ground water prior to discharging from the facility. *Note: This information is likely the same as that submitted in the first application for a Discharge Permit for this facility.*

- Pre-discharge TDS concentration in ground water: 100,000 mg/L (ppm)
  - ☐ Attached – Copy of laboratory analysis report (if available)
- From what source was the sample collected (e.g., upgradient monitoring well, on-site supply well, nearest well within a one-mile radius of the facility)?

5. Facility Location

In the table below, describe the location for the entire facility by listing the Township, Range, and Section, and/or latitude and longitude for the locations of all components of the processing, treatment, storage, and/or disposal system. See Supplemental Instructions for additional information. [Paragraph (2) and (5) of Subsection C of 20.6.2.3106 NMAC]

Component[1] ID	Town ship	Range	Section(s)	Latitude	Longitude
See Attachment 2					

6. Processing, Treatment, Storage, and Disposal System

Briefly describe how wastewater, sludge, etc. is processed, treated, stored, and/or disposed of at your facility. Include each component listed in the table above.

Domestic Wastewater - Facultative Sewage Treatment System (Renewal)

Up to 23,000 gallons per day (gpd) of domestic wastewater is discharged to a synthetically lined impoundment system for disposal by evaporation. The WIPP facultative sewage treatment system contains parallel trains consisting of equally sized primary settling lagoons (Settling Lagoon 1 and Settling Lagoon 2) and polishing lagoons (Polishing Lagoon 1 and Polishing Lagoon 2) utilizing a passive biological treatment process. Incoming sewage enters Settling Lagoon 1 or 2 where solids settle to the bottom of the impoundment and undergo bacterial digestion. The influent to the settling lagoons is sampled twice per

[1] Components include: septic tanks, impoundments, treatment systems, irrigation sites, leachfields, monitoring wells, mine stockpiles, etc. Additional examples are listed in the Supplemental Instructions. Each component should have a unique ID, for example septic tank-1, monitoring well-3, etc.

year. The water then enters Polishing Lagoon 1 or 2 where any small particles that did not settle in the settling lagoons will settle. The effluent water from the polishing lagoons is discharged into a synthetically lined impoundment (Effluent Lagoon A) for evaporation. The water in the Effluent Lagoon A either evaporates or flows into one of two additional Effluent Lagoons (Effluent Lagoons B and/or C) as needed to control freeboard (1 foot) in Effluent Lagoon A. In the event that any sludge is removed from the system, the sludge will be disposed of in accordance with applicable local, state, and federal regulations, including 40 CFR Part 503, Standards for the Use and Disposal of Sewage Sludge. In addition to domestic wastewater, some miscellaneous industrial non-hazardous wastewater including wastewater from two compressed air systems at the facility may also be discharged into the Facultative Sewage Treatment System (Effluent Lagoon B or Effluent Lagoon C), as needed.

The following miscellaneous industrial non-hazardous wastewaters may be evaporated in Effluent Lagoon B or Effluent Lagoon C at the Facultative Sewage Treatment System:

1. Water from purging groundwater monitoring wells for sampling or occasionally developing groundwater monitoring wells. Water from the Culebra water bearing formation around the WIPP site is the predominant source of groundwater disposed of in evaporation ponds. Water from the Santa Rosa/Dewey Lake contact and the Dewey Lake Formation are also disposed of in these lagoons.

2. Water collected from the Waste Shaft Sump, Exhaust Shaft Interception Wells and other observation boreholes in the underground.

3. Condensate from the Exhaust Shaft fan ductwork on the surface. Condensate and miscellaneous water will be discharged on site only if testing proves them to be non-hazardous.

4. Miscellaneous non-hazardous wastewaters may occasionally be discharged to the Facultative Sewage Treatment System or one of the effluent lagoons. Typically, these could include small quantities of neutralized acids or bases and miscellaneous water from routine cleaning of equipment, air conditioner condensate, air compressor condensate, and water line tests.

Industrial Wastewater - Evaportation Pond H-19 (Renewal)

Brine, purge water, and miscellaneous industrial non-hazardous wastewater may be transferred to Evaporation Pond H-19, a separate, stand-alone synthetically-lined impoundment for disposal by evaporation. Miscellaneous wastewater is transported to Evaporation Pond H-19 in portable containers and discharged into the pond. The volume of waste discharged to the evaporation pond is estimated using the time/volume method (e.g. two 55-gallon drums/day, which equals 110 gallons/day). Wastewater discharged into Evaporation Pond H-19 is evaporated only, with no discharge or disposal to another facility. If sediments build up on the pond, the sediments are characterized and shipped off-site for proper disposal in accordance with applicable state and federal laws and regulations.

The following miscellaneous industrial non-hazardous wastewaters may be evaporated in Evaporation Pond H-19:

1. Water from purging groundwater monitoring wells for sampling or occasionally developing groundwater monitoring wells. Water from the Culebra water bearing formation around the WIPP site is the predominant source of groundwater disposed of in evaporation ponds. Water from the Santa Rosa/Dewey Lake contact and the Dewey Lake Formation are also disposed of in this impoundment.

2. Water collected from the Waste Shaft Sump, Exhaust Shaft Interception Wells and other observation boreholes in the underground.

3. Condensate from the Exhaust Shaft fan ductwork on the surface. Condensate and miscellaneous water will be discharged on site only if testing proves them to be non-hazardous.

Industrial Wastewater & Salt Storage Location - Salt Cell 2, Salt Cell 3, Salt Storage Pond 2/3 (Renewal and Modification)

Salt (primarily halite) and other subsurface materials mined during construction of the facility, as well as currently mined salt, are stored on the surface in stockpiles. The stockpiles that are being used to store salt currently, as it is mined out from the underground panels at the facility are Salt Cell 2 and Salt Cell 3. Up to 3,814,271 gpd of storm water runoff in contact with these salt stockpiles (based on a 24-hour, 100-year storm event - 5.84 inches) is collected in two double synthetically-lined storm water impoundments, which are connected as a single unit (Salt Storage Pond 2/3), each with a leak detection system.

Salt Cell 2 consists of a runoff area of 326,350 sq ft and Salt Cell 3 consists of a runoff area of 272,850 sq ft. Each salt cell was constructed with six inches of prepared subgrade, a 60-mil high density polyethylene (HDPE) liner, a 200-mil Geonet drainage layer, an eight ounce geotextile fabric and covered with two feet of screened native soil. Each salt cell is sloped toward the center which contains a collection trench and pipe for the conveyance of water to Salt Storage Pond 2 and Salt Storage Pond 3, respectively. Salt Storage Pond 2 and Salt Storage Pond 3 are constructed with a prepared subgrade, 60-mil HDPE liner, a 200-mil Geonet cushion/drainage layer, and a second 60-mil HDPE liner. In each of the salt storage ponds, the Geonet layer drains to a sump with an inclined riser to allow for water removal. Salt Storage Pond 2 is connected to Salt Storage Pond 3 by two 12-inch polyethylene pipes to prevent overflow of Salt Storage Pond 2. A one foot freeboard is maintained in both of these ponds. Non-hazardous brine from well testing and mine related water accumulation may be disposed of in Salt Storage Ponds 2/3. Wastewater discharged into Salt Storage Pond 2/3 is evaporated only, with no discharge or disposal to another facility.

Industrial Wastewater & Salt Storage Location - Salt Cell 1 and Salt Storage Pond 1 (Renewal)

A third salt stockpile, Salt Cell 1, is capped with a synthetic liner and earthen cover. Up to 2,512,148 gpd of storm water runoff in contact with this salt stockpile (based on a 24-hour, 100-year storm event - 5.84 inches) is collected in synthetically-lined diversion ditches, which is diverted to a synthetically-lined impoundment (Salt Storage Pond 1).

Salt Cell 1 covers approximately 18.8 acres and was used for the storage of salt from the construction of the Repository using conventional mining techniques. To cover the now unused pile, the Salt Cell 1 crown was graded to a minimum two percent slope, covered with screened sand and a 60-mil HDPE liner. The liner was covered with approximately 24 inches of native soils and seeded with approved grass mix. Salt Cell 1 is designed to divert storm water runoff to the diversion ditches, which conveys runoff to the syntehtically-lined Salt Storage Pond 1. Wastewater discharged into Salt Storage Pond 1 is evaporated only, with no discharge or disposal to another facility.

Storm Water Control - Storm Water Ponds 1, 2, and 3 (Renewal and Modification)

Storm Water Pond 1, Storm Water Pond 2, and Storm Water Pond 3 receive clean non-contact storm water from the WIPP facilities paved areas, roofs, air conditioner condensate, and from clean domestic water usage (e.g. fire hydrant testing). This runoff is not in contact with the salt stockpiles at the facility. The water collected in these ponds meets the criteria described in 20.6.2.3105 NMAC, Exemption from Discharge Permit Requirements. Water from these storm water ponds is retained for evaporation or used for industrial purposes as a recycle measure to preclude the use of fresh water. Water in Storm Water Ponds 1, 2, and 3 may be transferred within the system to alleviate freeboard concerns.

Salt Storage Location - SPDV Material Pile (Renewal)

The SPDV Material Pile is located immediately east of the WIPP facilities infrastructure. The pile was created as the shafts were excavated when construction first began at the WIPP site. The construction materials in the SPDV Material Pile included mine tailings interspersed with soil, rock and debris from the construction of the shafts and the underground excavation of connecting tunnels, exploratory tunnels, and four rooms. The SPDV Material pile encompasses approximately 10 acres and ranges in height from 7 feet to 20 feet above ground. In 1995, the SPDV Material Pile was characterized to determine the chemical nature of wastes within the pile and to support selection of reclamation alternatives ("Characterization of the Site Preliminary Design Validation Salt Pile", Daniel B. Stephens & Associates, Inc., January 5th, 1996). The investigation determined that no remedial measures were required according to New Mexico Environment Department (NMED) guidelines. As a result of the study, stabilization and reclamation were recommended to blend the salt into the surrounding environment and to prevent offsite transport of salt into the surrounding environment. The pile was closed in the year 2000 with a cover consisting of a synthetic liner installed on 6 inches of bedding material and covered with a minimum of three feet of earthen material. The reclaimed SPDV Material Pile is unlikely to discharge to the groundwater due to the capping installed during reclamation and the fact that no brine liquid was added to the pile. Three shallow sub-surface monitoring wells were placed in the vicinity of the SPDV Material Pile as a conservative measure to monitor groundwater.

Industrial Wastewater - Salt Cell 5 and Salt Storage Pond 5 (Modification - New Shaft)

Salt Cell 5 will be designed to contain 5,224,000 cubic feet of loose salt materials from the construction of Shaft 5 and the associated drifts. The cell will have a 60-mil HDPE liner with a protective soil layer on which dump trucks can place the salt without damaging the liner. The HDPE pipe will be installed to collect and transmit the leachate and runoff water within Salt Cell 5. The runoff and leachate water will drain into Salt Storage Pond 5 by gravity.

Salt Storage Pond 5 will be designed with a 60-mil HDPE geomembrane double liner with a leak detection, collection, and removal system installed between the liners. A geomembrane liner is defined as a high density polyethylene plastic liner, used for lining Salt Cell 5, and Salt Storage Pond 5 in accordance with NWP Specification E-Z-475, HDPE Geomembrane Liner, Geofabric, Geonet, and HDPE Pipe. The salt storage pond will have the capacity to hold 849,653 cu ft (6,355,404 gallons) at Elevation 3,390 feet with 24 inches of freeboard. The total inflow to the salt storage pond is based on a 24-hour, 100-year rainfall event (5.84 inches), which is estimated at 172,794 cu ft (1,292,499 gallons). The salt storage pond will be capable of containing and allowing for evaporation of the salt water solutions collected from Salt Cell 5. Wastewater discharged into Salt Storage Pond 5 will be evaporated only, with no discharge or disposal to another facility.

Industrial Wastewater - Brine Retention Pond East and West (Modification - Permanent Ventilation System)

The Brine Retention Ponds East and West will be installed in the area of the New Filter Building. Each brine retention pond will be designed to hold up to 14 days of expected average monthly production of brine (30,940 gallons) from the operations of the Salt Reduction System. The estimated daily rate of brine production is estimated at 2,210 gpd. One brine retention pond will be in service while the other brine retention pond is closed for evaporation and removing precipitated salt. To account for the 100-year rainfall event over 24 hours (5.84 inches), the brine retention ponds will be rotated approximately every two weeks, or as needed, to maintain 24 inches of freeboard during maximum inflow conditions, which allows for 6,162 cu ft (46,094 gallons) of storage in each brine retention pond. The brine retention ponds will be double lined with a 60-mil HDPE geomembrane liner with a leak detection, collection, and removal system. A geomembrane liner is defined as a high density polyethylene plastic liner, used for lining Brine Evaporation Ponds West and East, per NWP Specification E-Z-475, HDPE Geomembrane Liner, Geofabric, Geonet, and HDPE Pipe. The bottom of the brine retention ponds will have an epoxy coated concrete bottom on top of the geomembrane liner. The concrete will allow for removing the salt by mechanical means without damaging the liner. After the precipitated salt is removed, any remaining brine will be transported to Storm Water Pond 4 for evaporation.

Industrial Wastewater & Storm Water Control - Storm Water Pond 4 (Permanent Ventilation System)

Storm Water Pond 4 will be designed with a double HDPE geomembrane liner. A leak detection, collection, and removal system will be installed between the liners. The storm water runoff from the Safety Significant Confinement Ventilation System (SSCVS) area will be collected in storm drainage runoff ditches and catch basins and transferred into the storm water pond by storm drain lines. The rate of storm water runoff from the 24-hour, 100-year rainfall event (5.84 inches) is estimated at 1,857,927 gpd, which will collect in Storm Water Pond 4. The brine collected in Brine Retention Pond East and Brine Retention Pond West could also be transported to Storm Water Pond 4 for evaporation (30,940 gallons). Because the brine pond transfer could occur within one day, the maximum daily discharge rate estimated into Storm Water Pond 4 is 1,888,867 gallons (252,505 cu ft). The storm water pond has the capacity to contain 1,158,920 cu ft (8,669,324 gallons) of storm water/brine. Storm Water Pond 4 will be capable of evaporating the water and brine. In the event that brine or any brine constituents are removed from the system during cleaning/maintenance, the constituents will be disposed of in accordance with applicable laws and regulations.

7. Public Notice Preparation [20.6.2.3108 NMAC]

Once NMED has determined that your application is administratively complete, you must complete the applicant's public notice requirements of Section 20.6.2.3108 NMAC. Language for notifications will be mailed to you with an administratively complete determination. Note: Guidance and instructions for completion of applicant's public notice can also be found at the following link: *https://www.env.nm.gov/gwb/NMED-GWQB-PublicNotice.htm*. The information requested below will be used by NMED to approve or reject the proposed public notice newspaper and signage posting locations in accordance with Subsection A of 20.6.2.3108 NMAC. Note: Other requirements of Section 20.6.2.3108 NMAC not listed here, such as certified mailings to nearby landowners, may also apply.

a) Public Notice Posting Locations

Select the type of application you are submitting and provide the requested information. Language to be used in the required notifications will be included in the administratively complete packet.

☐ Renewal Application

1. Following receipt of an administrative completeness determination from NMED, the applicant is required to provide public notice of this application by placing a 2 inch by 3 inch display ad (classified or legal sections are not acceptable) in a newspaper of general circulation in the location of the proposed discharge. Indicate the newspaper in which you intend to place the ad. [Subsection C of 20.6.2.3108 NMAC]

Newspaper: ____________________

☒ New Application, Modification Application, or Renewal with Modification Application

1. Following receipt of an administrative completeness determination from NMED, the applicant is required to provide public notice of this application by placing a display ad (classified or legal

sections are not acceptable) in a newspaper of general circulation in the location of the proposed discharge. Indicate the newspaper in which you intend to place the ad. [Paragraph (4) of Subsection B of 20.6.2.3108 NMAC]

Newspaper: Carlsbad Current-Argus

2. Following receipt of an administrative completeness determination from NMED, the applicant is required to post a sign(s) (2 feet x 3 feet in size) for 30 days in a location conspicuous to the public at or near the facility. One sign must be posted for each 640 contiguous acres or less. NMED may require additional postings for facilities of more than 640 acres or when the discharge site(s) is not located on contiguous properties. Indicate the location(s) where you intend to display the sign(s). [Paragraph (1) of Subsection B of 20.6.2.3108 NMAC]

Note: Conspicuous location means a location where the sign is visible and legible to the public and the public has access (e.g., at facility entrance on public road).

- Is the entire facility (including all components and discharge sites) contained within **less than** 640 acres, and is the acreage contiguous?

  ☒ Yes - Indicate a sign location below.
  ☐ No – Indicate two sign locations below.

Sign Location(s): Entry to the facility parking lot - 2 entry points.

3. Following receipt of an administrative completeness determination from NMED, the applicant is required to post an additional notice (a flyer 8.5" X 11" or larger) for 30 days at an off-site location conspicuous to the public (e.g., public library). Indicate the location where you intend to display the flyer. [Paragraph (1) of Subsection B of 20.6.2.3108 NMAC]

Note: The U.S. Postal Service no longer allows the posting of flyers in post offices.

Flyer Location: Carlsbad Public Library

b) Mailing Instructions
a) The administrative completeness determination letter, including public notice instructions, should be sent to:

☒ Applicant ☐ Consultant

Part II. Technical Completeness

1. Discharge Volume and Description

a. Date of Initial Discharge at the Facility [Subsections A and B of 20.6.2.3106 NMAC]

Date of Initial Discharge: November 24, 1989

b. Determination of Maximum Daily Discharge Volume [Subsection C of 20.6.2.3106 NMAC]

See Supplemental Instructions for more information.

1. **Proposed maximum daily discharge volume:** 9,586,995 gallons per day.
(Note: Use this volume to complete Part I.4.a (Public Notice).

- Describe the methods and calculations used to determine this volume. Acceptable methods are described in the Supplemental Instructions. If you are relying on metered flows, attach a two-year record of meter readings.

Facultative Sewage Treatment System Capacity Calculation (Renewal):

The maximum design flow rate for the Facultative Sewage Treatment System is 23,000 gpd. The flow rate of Settling Lagoons 1 and 2 and Polishing Lagoons 1 and 2 is determined at their operating maximum depth of 6 feet and maintaining 1 foot of freeboard.

Settling Lagoons Capacity Calculations (Renewal):

At a water depth of 6 ft, the surface area of Settling Lagoons 1 and 2 is:
(252 ft) x (92 ft) x (2 lagoons) = 46,368 sq ft = 1.064 acres

At a Biochemical Oxygen Demand (BOD) loading of 40 lbs/day/acre and the available area of 1.064 acres, the BOD mass loading is:
(40 lbs/day/acre) x (1.064 acres) = 42.56 lbs/day BOD

The average daily flow rate (Q) to produce a BOD mass loading of 42.56 lbs/day is:
Q = (42.56 lbs/day) / [(8.38 lbs/Mgal/mg/l) x (220 mg/l)] = 0.023 Mgal/day
Q = 23,000 gpd

where 220 mg/l is the average Total Dissolved Solids (TDS) influent concentration and 8.38 lbs/Mgal/mg/l is a unit conversion factor for parts per million (ppm) to pounds specifically related to water.

Settling Lagoons 1 and 2 can process 23,000 gpd at an operating depth of 6 feet.
Using the flow rate of 23,000 gpd in the calculations, the average hydraulic detention time (DT) for the primary treatment cells yields the following results:

At 3 ft, DT = 20 days
At 4 ft, DT = 28 days
At 6 ft, DT = 47 days

Polishing Lagoons Capacity Calculations (Renewal):

At a BOD loading of 40 lbs/day/acre and the average daily flow rate of 23,000 gpd, the BOD mass loading is: (0.023 Mgal/day) x (8.38 lb/Mgal/mg/l) x (100 mg/l) = 19.27 lbs/day

where 100 mg/l is the average TDS concentration entering the polishing lagoons from the settling lagoons and 8.38 lbs/Mgal/mg/l is a unit conversion factor for ppm to pounds specifically related to water.

The required surface area to process 19.27 lbs/day BOD is:
(19.27 lbs/day) / (40 lbs/day/acre) = 0.48 acres = 20,909 sq ft

The available surface area of Polishing Lagoons 1 and 2 at a depth of 6 ft is:
(116 ft) x (92 ft) x (2 lagoons) = 21,344 sq ft

Therefore, the two polishing lagoons are large enough to process the 23,000 gpd average daily flow without exceeding a depth of 6 ft.

Using the flow rate of 23,000 gpd in the calculation of average hydraulic detention time (DT) for the polishing lagoons yields the following results:

At 3 ft, DT = 7.2 days
At 4 ft, DT = 9.6 days
At 6 ft, DT = 17.7 days

Effluent Lagoons B and C Capacity Calculation (Renewal)

The volume capacity of 670,208 gallons for Effluent Lagoons B and C is based on the volume of each lagoon with one foot of freeboard (NWP drawing 25-C-004-W). Conservatively, two feet of freeboard has been used in the original calculations establishing the maximum volume capacity of 500,000 gallons for each lagoon in previous permit applications. However, the proposed maximum discharge is that one foot of freeboard is maintained. Effluent Lagoons B and C have the same dimensions (224 feet in length, 92 feet wide and 6 feet deep with 3 foot horizontal to 1 foot vertical slopes).

The Effluent Lagoons B and C may receive up to 23,000 gpd from Effluent Lagoon A, as needed, to control freeboard in Effluent Lagoon A. Effluent Lagoons B and C also may receive miscellaneous industrial non-hazardous wastewaters from site operations as needed (e.g. purging groundwater monitoring wells, and water collected from the Waste Shaft Sump). These miscellaneous site operations are estimated to discharge up to an additional 27,000 gpd into these lagoons; therefore, the daily maximum discharge into Effluent Lagoons B and C is estimated at 23,000 gpd (domestic) and 27,000 gpd (industrial non-hazardous) for a total of 50,000 gpd.

Effluent Lagoon A (Renewal)

Effluent Lagoon A is smaller than Effluent Lagoons B and C, and is used mainly to receive water (23,000 gpd) from the polishing lagoons that have a low BOD load. Some non-hazardous wastewater from well testing may also be introduced into Effluent Lagoon A as well. The total volume capacity of Effluent Lagoon A is 566,610 gallons without any freeboard. One foot of freeboard establishes the maximum capacity of 427,976 gallons (NWP drawing 25-C-004-W).

Evaporation Pond H-19 (Renewal)

The volume of Evaporation Pond H-19 with one foot of freeboard (NWP drawing 23-C-012-W1) is 46,268 cubic feet (346,085 gallons). Evaporation Pond H-19 is used for miscellaneous wastewater transfer/discharge from underground experiments plus miscellaneous industrial non-hazardous wastewater from site operations (e.g. purging groundwater monitoring wells, and water collected from the Waste Shaft Sump). These discharges vary depending upon the type of underground experimentation taking place. Typical discharge volumes into

Evaporation Pond H-19 are estimated at 110 gpd with a maximum daily discharge rate up to 50,000 gpd.

Salt Storage Pond 1 (Renewal and Modification):

Drainage Area = 690,100 sq ft
Design Basis Storm Event = 5.84 in (based on the 24-hour, 100-year rainfall event)
Runoff from design basis storm event =
(690,100 sq ft) x (5.84 in) / (12 in/ft) x (7.48 gal/cu ft) = 2,512,148 gallons

Salt Storage Pond 2/3 (Renewal and Modification):

Drainage Area = 1,047,800 sq ft
Design Basis Storm Event = 5.84 in (based on the 24-hour, 100-year rainfall event)
Runoff from design basis storm event =
(1,047,800 sq ft) x (5.84 in) / (12 in/ft) x (7.48 gal/cu ft) = 3,814,271 gallons

Evaporation Pond	Drainage Area (sq. ft.)	Runoff Volumes (gallons) for 24-hr, 100-yr Storm Event (5.84 inches)	Pond Capacity (gallons)
Salt Storage Pond 1	690,100	2,512,148	4,440,128
Salt Storage Pond 2/3	1,047,800	3,814,271	26,642,264

Storm Water Infiltration Control Ponds (Renewal and Modification)

Storm Water Ponds 1, 2, and 3 and Salt Storage Pond 1 and Salt Storage Pond 2/3 collect runoff storm water from the facility site and salt storage cells respectively. These ponds were originally sized with design margin to contain water from a 24-hour, 25-year storm event (3.9 inches) and maintain one foot freeboard. Because there have been no changes to the physical design of these ponds, the following calculations are provided to ensure that the ponds are still adequately sized to handle the 24-hour, 100-year rainfall event (5.84 inches). Storm Water Ponds 1, 2, and 3 receive clean non-contact runoff. Salt Storage Pond 1 and Salt Storage Pond 2/3 receive contact runoff from Salt Storage Locations (Salt Cells).

Storm Water Pond 1 (Renewal and Modification):

Drainage Area = 178,595 sq ft
Design Basis Storm Event = 5.84 in (based on the 24-hour, 100-year rainfall event)
Runoff from design basis storm event =
(178,595 sq ft) x (5.84 in) / (12 in/ft) x (7.48 gal/cu ft) = 650,133 gallons

Storm Water Pond 2 (Renewal and Modification):

Drainage Area = 387,681 sq ft
Design Basis Storm Event = 5.84 in (based on the 24-hour, 100-year rainfall event)
Runoff from design basis storm event =
(387,681 sq ft) x (5.84 in) / (12 in/ft) x (7.48 gal/cu ft) = 1,411,262 gallons

Storm Water Pond 3 (Renewal and Modification):

Drainage Area = 1,642,199 sq ft
Design Basis Storm Event = 5.84 in (based on the 24-hour, 100-year rainfall event)
Runoff from design basis storm event =
(1,642,199 sq ft) x (5.84 in) / (12 in/ft) x (7.48 gal/cu ft) = 5,978,042 gallons

Evaporation Pond	Drainage Area (sq. ft.)	Runoff Volumes (gallons) for 24-hr, 100-yr Storm Event (5.84 inches)	Pond Capacity (gallons)
Storm Water Pond 1	178,595	650,133	765,204
Storm Water Pond 2	387,681	1,411,262	2,612,016
Storm Water Pond 3	1,642,199	5,978,042	8,654,360

Industrial Wastewater - Brine Retention Ponds East and West Capacity Calculation (Modification - Permanent Ventilation System)

Both brine retention ponds will be built side by side below existing ground elevation. They are lined with double HDPE Geomembrane liner and leak detection, collection and removal system in between liners. The liner installation shall be performed in accordance with the latest version of codes, specifications and standards from Geosynthetics Research Institute, Environmental Protection Agency, and the American Society for Testing and Materials.

The brine retention ponds will have a 14-in thick concrete bottom (on top of the liner). Each brine retention pond has 6,162 cu ft (46,094 gallons) of brine storage capacity (assuming 24 inches of freeboard). The capacity is based on a design calculation document from Cementation titled "Safety Significant Confinement Ventilation System Facility Brine Evaporation Pond East & West and Storm Water Pond 4", and Cementation drawings 101547-01-SD01-C140 and 101547-01-SD01-C440. The daily inflow to these brine retention ponds is based on the engineering design of the Salt Reduction System. While the other pond is filling, the off-use pond will be allowed to decant the salt for two to three weeks, then any remaining brine will be transported into Storm Water Pond 4 prior to cleaning. Evaporation in the ponds is negligible, since the residence time of the brine in the pond is relatively short (weeks versus months).

The brine retention pond surface area (A) receiving rain fall is 70 ft by 80 ft = 5,600 sq ft

Using the 24-hour, 100-year rainfall event, I = 5.84 inches

Assuming C = 1.0 (100% runoff)

Additional volume of water into the brine retention pond is estimated from peak discharge, calculated using the Rational Equation:

$Q = C * I * A = (1.0) \times [(5.84 \text{ in}) / (12 \text{ in/ft})] \times (5,600 \text{ sq ft}) = 2,725 \text{ cu ft}$
Reduced capacity for each brine retention pond = 6,162 cu ft - 2,725 cu ft = 3,437 cu ft

With monthly brine production = 7,386 cu ft; the brine retention pond would exceed its freeboard requirement after 14 days [capacity = (3,437 cu ft) / (7,386 cu ft) x (30 days) = 14 days].

Each brine retention pond can only be used for up to 14 days to ensure that 2 feet of freeboard is maintained when the 24-hour, 100-year rainfall event (5.84 inches) occurs on the 14th day.

Industrial Wastewater & Storm Water Control - Storm Water Pond 4 Capacity Calculation (Modification - Permanent Ventilation System)

Storm Water Pond 4 is a below existing grade pond with a berm, approximately 340 ft by 340 ft by 19 ft in depth, lined with a double HDPE geomembrane liner with a leak detection, collection, and removal system between the liners. According to Cementation NWP Drawing no. 101547-01-SD01-C150, using CAD calculation, the volume of water at Elevation 3,409 feet (12 inches of freeboard), is 1,158,920 cu ft (8,668,722 gallons) of water. This storm water pond will receive storm water runoff from the SSCVS area (watershed) of 394,782 sq ft according to SSCVS Civil Yard Drainage, Grading & Storm Water Drainage Drawings 416-C-017-W1 through W4.

Using the 24-hour, 100-year rainfall event of 5.84 inches, Storm Water Pond 4 will receive:

a. Storm water runoff from the SSCVS watershed area:
   (394,782 sq ft) x (5.84 inches) / (12 in/ft) = 192,127 cu ft (1,437,110 gal)

b. Rain fall in the 340 sq ft of pond area:
   (340 ft) x (340 ft) x (5.84 inches) / (12 in/ft) = 56,259 cu ft (420,817 gal)

The total storm water runoff into Storm Water Pond 4:
(192,127 cu ft) + (56,259 cu ft) = 248,386 cu ft (1,857,927 gal)

Annual brine production according to CB&I Federal Services, LLC, Salt Reduction Water and Material Balance, 500655-SRB-M-CAL-00012, Rev.0, Job No. 500655:
(7,386 cu ft / month) x (12 months) = 88,632 cu ft (662,967 gal)

If one year of brine is present in Storm Water Pond 4 from accumulated discharges from Brine Retention Pond East and Brine Retention Pond West (assume very low evaporation rates), the maximum volume from the design basis rainfall event (24-hour, 100-year event - 5.84 inches) plus accumulated brine, which may exist in Storm Water Pond 4 at one time:
(192,127 cu ft) + (56,259 cu ft) + (88,632 cu ft) = 337,018 cu ft (2,520,894 gallons)

Using CAD calculations, 337,018 cu ft will fill the pond up to less than 7 feet deep or just below elevation 3,399 feet. Maximum allowable water level, allowing 12 inches of freeboard is at Elevation 3,409 feet. Without counting the evaporation, Storm Water Pond 4 has the capacity to hold: (1,158,920 cu ft) / (337,018 cu ft) = 3.4 times the expected inflow (storm water runoff plus industrial wastewater discharges from one year of brine production).

Storm Water Pond 4 evaporation capability:

The total volume to be evaporated = 337,018 cu ft of water and brine.

When the water level in Pond 4 is at Elevation 3,398 feet, the surface area for pan evaporation is equal to 60,606 sq ft (according to CAD calculation).

Using NMSU Chihuahua Desert Rangeland Research Center rain gauge Evaporation data for:

July, August and September =	(14.59 in) + (12.57 in) + (9.38 in) = 36.54 in
October, November and December =	(7.71 in) + (5.45 in) + (4.42 in) = 17.58 in
January, February and March =	(4.77 in) + (5.78 in) + (9.46 in) = 20.01 in
April, May and June =	(12.49 in) + (14.47 in) + (15.76 in) = 42.72 in

Using the following Assumptions:

- Effective evaporative pan coefficient of 0.60. Studies conducted by the United States Department of Agriculture (USDA) indicate that coefficients for Class A land pans range from 0.60 to 0.82; however, a coefficient of 0.77 is recommended in the Pecos River Basin (Technical Report 54, New Mexico Water Use by Categories 2010, New Mexico Office of the State Engineer Water Use and Conservation Bureau, page 42). Because the effluent is expected to be at least 2.5% salt by volume, the lower value of 0.60 was chosen versus the recommended value of 0.77.

- Run-off coefficient 1.0 (100% runoff, 0% infiltration)

Total Coefficient = 0.60 x 1 = 0.60

Using CAD calculation based on Cementation NWP Drawing No. 101547-01-SD1-C150:

Depth (ft)	Elevation (ft)	Volume (cu ft)	Surface Area (sq ft)
0	3,392		45,630
1	3,393	46,800	47,980
2	3,394	95,979	50,388
3	3,395	147,596	52,855
4	3,396	201,708	55,380
5	3,397	258,375	57,964
6	3,398	317,655	60,606
7	3,399	379,606	63,306
8	3,400	444,287	66,066
9	3,401	511,757	68,883
10	3,402	582,073	71,760
11	3,403	655,295	74,694
12	3,404	731,482	77,688
13	3,405	810,690	80,739
14	3,406	892,980	83,850
15	3,407	978,409	87,018
16	3,408	1,067,036	90,246
17	3,409	1,158,920	93,532

At Elevation 3,398 feet, the surface water area in Storm Water Pond 4 is 60,606 sq ft.

	Evap. Rate (inches)	Evap. Area (sq ft)	Total Coefficient	Volume (cu ft)
July - Sept	36.54	60,606	0.60	110,727
Oct -Dec	17.58	60,606	0.60	53,272
Jan - Mar	20.01	60,606	0.60	60,636
Apr - Jun	42.72	60,606	0.60	129,454
			Total Annual Evaporation	354,089

Total inflow from the 24-hour, 100-year rainfall event (5.84 inches) plus accumulated brine from one year's worth of Salt Reduction System building operations into Storm Water Pond 4 is 337,018 cu ft, which is less than the total evaporation of 354,089 cu ft. This indicates that the runoff water, brine and rain collected in the pond will be evaporated when Storm Water Pond 4 is in service. The maximum water level in Storm Water Pond 4 will be below Elevation 3,399 feet and this level is 10 ft below the maximum allowable level of water at Elevation 3,409 feet to maintain a 12-inch freeboard.

New Shaft Facility Salt Cell 5 and Salt Storage Pond 5 (Modification - New Shaft)

Salt Storage Location - Salt Cell 5 (Modification - New Shaft)

Salt Cell 5 will be an above-ground facility, lined with a single HDPE geomembrane liner and a drainage and leachate collection and removal system that consists of a perforated HDPE pipe that will drain into Salt Storage Pond 5. The cell will have the capacity to store up to 5,224,000 cu ft of loose salt material (primarily halite).

Industrial Wastewater - Salt Storage Pond 5 (Modification - New Shaft)

Salt Storage Pond 5 will accept leachate and storm water runoff from Salt Cell 5 by gravity flow. The watershed area is 471 ft by 471 ft (Salt Cell 5 dimensions) added to 362 ft by 368 ft (Salt Storage Pond 5 top dimensions).
[(471 ft) x (471 ft)] + [(362 ft) x (368 ft)] = (221,841 sq ft) + (133,216 sq ft) = 355,057 sq ft

Q = C * I * A

Assuming C = 1.0 (100% runoff, 0% infiltration)
Using the 24-hour, 100-year rainfall event, I = 5.84 inches

Q = (1.0) x [(5.84 in) / (12 in/ft)] x (355,057 sq ft) = 172,794 cu ft (1,292,499 gal)

The volume required to store the storm water runoff from the 24-hour, 100-year rainfall event (5.84 inches) is 172,794 cu ft, which will only fill Salt Storage Pond 5 to about 3 feet deep or just below Elevation 3,384 feet (see table below).

From Cementation NWP WIPP Exhaust Shaft Area Ponds and Piles Salt Storage Pond 5 Plan Drawing No. 101547-01-SD01-C-130 Rev. 0, and using CAD calculation, the volume and surface area of the water at various elevations and depths are tabulated below:

and condensate from the Exhaust Shaft fan ductwork on the surface. The volume of waste discharged into the evaporation pond is estimated using the time/volume method (e.g. two 55-gallon drums/day = 110 gallons/day). Wastewaters placed in Evaporation Pond H-19 are evaporated only, with no discharge or disposal to another facility. If sediments build up on the pond, the sediments are characterized and shipped off-site for proper disposal in accordance with applicable state and federal laws and regulations.

Infiltration Controls (Renewal and Modification)

The Ground Water Quality Bureau (GWQB) determined that WIPP needed a discharge permit for discharges to the subsurface from the salt cells. The DOE developed a mitigation strategy for infiltration controls to minimize the migration of the subsurface shallow water and reduce the potential for impacts to the naturally occurring Dewey Lake water. A new salt storage area was constructed on a HDPE lined area that would divert salt contact storm water to a double lined pond with a leak collection sump. In addition to the controls proposed in the original Notice of Intent to Discharge (NOI), the DOE proposed to line three storm water retention ponds to prevent the infiltration of non-salt contact storm water to the subsurface to further minimize the potential for the migration of the subsurface shallow water. The infiltration control evaporation and storm water infiltration control ponds are sized to contain the 24-hour, 100-year rainfall design basis event of 5.84 inches. The table below identifies the area and volume of runoff collected for each individual pond.

Evaporation Pond	Drainage Area (sq ft)	Runoff Volumes (gallons) for 24-hr, 100-yr Storm Event (5.84 inches)	Pond Capacity (gallons)
Salt Storage Pond 1	690,100	2,512,148	4,440,128
Salt Storage Pond 2/3	1,047,800	3,814,271	26,642,264
Storm Water Pond 1	178,595	650,133	765,204
Storm Water Pond 2	387,681	1,411,262	2,612,016
Storm Water Pond 3	1,642,199	5,978,042	8,654,360

- Runoff calculations utilize the rational equation, where the runoff coefficient varies from 0 to 1 based on the composition of the surfaces. For conservatism, a runoff coefficient of 1 was used. This calculation also included the volume that falls onto the surface area of each pond, respectively."

- Capacity is based on NWP drawing 23-C-017-W1, DP-831 Discharge Permit Evaporation Ponds Depth vs Volume Tables.

- Salt Storage Pond 2 and Salt Storage Pond 3 are connected by two 12-inch polyethylene pipes to prevent overflow of Salt Storage Pond 2; therefore, these ponds act as one pond system. The pond capacities on NWP drawing 23-C-017-W1 are added together to better estimate the pond system capacity.

Industrial Wastewater & Salt Storage Location - Salt Cell 1 and Salt Storage Pond 1 (Renewal and Modification)

The Salt Cell 1 covers approximately 18.8 acres and was used for the storage of salt from the construction of the TRU waste repository using conventional mining techniques. The Salt Cell 1 crown was graded to a minimum two percent slope with screened sand and covered with a 60-mil HDPE liner. The liner was covered with approximately 24 inches of native soils and seeded with native grasses in accordance with applicable regulations. Salt Cell 1 has 3:1 side slopes and a two percent crown slope from the center north and west diverting storm water runoff west to the three acre Salt Storage Pond 1.

Industrial Wastewater & Salt Storage Location - Salt Cell 2, Salt Cell 3, Salt Storage Pond 2/3 (Renewal and Modification)

The current salt storage locations consist of Salt Cell 2 and Salt Cell 3. Each cell was constructed with 6 inches of soil, a 60-mil HDPE liner, 200-mil Geonet, and covered with 24 inches of screened native soil in accordance with applicable regulations. Each cell slopes two percent toward the center where there is a pipe to collect any water and divert it into Salt Storage Pond 2/3. The Salt Storage Pond 2 is constructed with a 60-mil HDPE liner, a 200-mil Geonet, and a second HDPE liner. The Geonet leak detection layer drains to a sump with an inclined riser for leak detection. The Salt Storage Pond 2 is connected via two 12-inch polyethylene pipe to the Salt Storage Pond 3. The Salt Storage Pond 3 is 560 ft long and 450 ft wide and is 22 feet in depth at the deepest point. It is constructed with a 60-mil HDPE liner over a 200-mil Geonet layer and a second HDPE 60-mil liner. The Salt Storage Pond 3 receives overflow water from Salt Storage Pond 2 to maintain 1 foot freeboard in Salt Storage Pond 2.

Storm Water Control - Non-Contact Storm Water Ponds (Renewal and Modification)

Storm Water Pond 1, Storm Water Pond 2, and Storm Water Pond 3 are each lined with 60-mil HDPE. The water collected in these ponds is clean non-salt contact storm water which meets the criteria described in 20.6.2.3105 NMAC, Exemption from Discharge Permit Requirement. Clean non-contact storm water sources from the WIPP facilities include paved roads and roofs. Other clean water sources of runoff include air conditioner condensate, and clean domestic water usage (e.g. fire hydrant testing). The storm water collected in these ponds is runoff from the WIPP Site and/or clean domestic water from testing of the fire fighting system and from broken/repaired domestic water system distribution piping. This water is retained for evaporation or used for irrigation of the Salt Cell 1 cover or other industrial/construction uses.

Salt Storage Location - SPDV Material Pile (Renewal)

The SPDV Material Pile was created during the design validation phase of the WIPP facility for placement of construction materials resulting from the drilling of two 2,150 foot shafts and the underground excavation of connecting tunnels, exploratory tunnels, and four rooms. The materials in the SPDV Material Pile include mine tailings interspersed with soil, rock, and debris from the construction of the shafts. The SPDV Material Pile encompasses approximately 10 acres and ranges in height from 7 to 20 feet above ground. The volume is approximately 168,000 cubic yards, which includes an area beneath the pile where soil was excavated prior to tailing placement.

In 1995, the SPDV Material Pile was characterized to determine the chemical nature of wastes within the pile and to support selection of reclamation alternatives ("Characterization of the Site Preliminary Design Validation Salt Pile," Daniel B. Stephens & Associates, Inc., January 5, 1996). The investigation determined that no remedial measures were required according to NMED guidelines. As a result of the study, stabilization and reclamation were recommended in order to prevent offsite transport of salt and brine into the surrounding environment, and to blend the salt into the surrounding environment.

The reclaimed SPDV Material Pile is unlikely to recharge the groundwater because of the evapotranspiration (ET) cap installed during reclamation, and the fact that no brine has been added to the pile. However, as set forth in DP-831, additional shallow sub-surface monitoring wells were installed around the SPDV Material Pile.

Salt Storage Location - Salt Cell 5 (Modification - New Shaft)

Salt Cell 5 will receive salt from the construction of Shaft 5 and the mining of associated drifts. The salt cell is designed to receive 5,224,000 cu ft of salt that will be placed in a 471 ft by 471 ft HDPE lined storge area. The maximum height of the salt cell is listed in design documents as approximately 36 ft high, but will be lower than this height once filled with the design volume of salt. Rain water from storm events will percolate through the salt pile to generate near saturated brine at the bottom of the cell. The brine at the bottom of the cell will enter a perforated HDPE pipe that diverts it into Salt Storage Pond 5.

Industrial Wastewater - Salt Storage Pond 5 (Modification - New Shaft)

Salt Storage Pond 5 is constructed in containment berms, and is double lined with 60-mil HDPE liner with leak detection, collection, and removal system installed between the liners. Salt Storage Pond 5 receives storm water that falls into the pond and into Salt Cell 5. The water from Salt Cell 5 is storm water that percolates through the salt in the cell. This water flows through a perforated HDPE pipe on the bottom of the cell, and into Salt Storage Pond 5. The brine is allowed to evaporate and is not discharged. Salt Storage Pond 5 may receive non-hazardous brine from the underground shaft sumps or Salt Storage Pond 2/3, or Storm Water Pond 4, as needed. Salt Storage Pond 5 will be maintained with a minimum 2-foot freeboard.

Industrial Wastewater - Brine Retention Ponds East and West (Modification - Permanent Ventilation System)

Both Brine Retention Ponds East and West are constructed below grade to a depth of approximately 7 ft total depth. They are lined with 60-mil HDPE double liner with an epoxy coated concrete bottom. The brine retention ponds will receive near saturated brine from the Salt Reduction System that removes salt from the air exhausted from the underground. Salt is removed from the air by a dust-reduction system. The dust reduction system panels are cleaned by water sprayed onto the panels, washing the dust/salt to storage tanks. The salt water is then allowed to drain into the brine retention ponds where it will fill one pond for approximately 14 days, then alternate to filling the other pond. The brine will be left to decant for approximately two to three weeks after which the supernatant will be transported into Storm Water Pond 4, and precipitated salt removed and taken to Salt Cell 2 or Salt Cell 3.

Industrial Wastewater & Storm Water Control - Storm Water Pond 4 (Modification - Permanent Ventilation System Renewal) Storm Water Pond 4 is bermed to prevent runoff from the area surrounding Storm Water Pond 4 to enter the pond. Storm Water Pond 4 is 340 sq ft by approximately 19 ft in depth. The pond is double lined with a 60-mil HDPE liner and a leak detection, collection, and removal system installed between the liners. Storm Water Pond 4 receives precipitation intercepted by the pond's surface, storm water from the SSCVS watershed area, and brine from Brine Retention Ponds East and West. Clean non-contact storm water sources from the WIPP facilities include paved roads and roofs. Other clean water sources of runoff include air conditioner condensate, and clean domestic water usage (e.g. fire hydrant testing). The storm water and brine are allowed to evaporate and are not discharged. Storm Water Pond 4 will be maintained with a minimum 1 foot freeboard.

2. **Identify other wastewater or stormwater discharges at the facility** not described in this application and indicate what other permits apply to them. Examples include discharges from small septic systems covered by Liquid Waste Permits, discharges to surface waters under a NPDES permit, a discharge covered by a separate Discharge Permit, etc. Be sure these other discharge locations are identified on the site map required in item Part II.B.1.

Other Discharges	Permit Number
None	

2. Identification and Physical Description of Facility

[Subsection C of 20.6.2.3106 NMAC]

a. Scaled Map

Provide a clear and legible scaled electronic map of the components of your proposed system and relevant surrounding features, indicating the location of all the following features present at the site:

- overall facility layout
- treatment units
- lagoons
- tanks
- sumps
- land application fields
- domestic wastewater re-use areas
- pits
- stockpiles
- leachfields
- sludge drying beds
- fences
- roads
- buildings
- supply wells
- monitoring wells
- extraction/injection wells
- arroyos
- nearby water bodies such as ponds or canals
- property boundaries
- other permitted discharges
- required setbacks
- north arrow

b. Description of Components

Provide descriptive details of all components of your processing, treatment, storage, and/or disposal system. Include all components listed in the table of Part I.5.

Component	Status[1]	Date of installation or construction (mm/dd/yyyy)	Description (construction material, liner type, irrigation method, capacity, dimensions, area, model number, etc.)
See Attachment 3			

[1] Status = **proposed**; **existing in use**; **existing not in use**, but proposed for use; **abandoned** without closure, not proposed for use; or **closed**

3. Flow Metering

Describe the facility's flow metering system. See Supplemental Instructions for more information.

Meter ID[1]	Proposed or Existing?	Influent or Effluent?	Location Description	Flow Type[2]	Meter Type[3]	Supporting Documents Attached
Domestic Water Meter	Existing	Influent	Influent to the Domestic Water System	Pumped	Closed-pipe	.

[1] Meter ID means the numbering or labeling system used to individually identify each meter (e.g., Meter-1, Irrigation Meter-1, etc.).
[2] Flow type - gravity flow or pressurized (pumped) flow
[3] Meter type - open channel such as a weir or flume, or a closed-pipe velocity meter such as an electromagnetic meter

4. Discharge Quality

Indicate the expected quality of the discharge (wastewater, leachate, sludge, etc.) that is generated, stored, treated, processed and/or discharged at your facility.

Note: Not all facilities need to characterize influent quality. See Supplemental Instructions for additional guidance.

Contaminants	Contaminants	
	Incoming (Influent)	Final (Effluent)
Nitrate as Nitrogen (NO_3-N, mg/L)[1]	See Attachment 4	
Total Kjeldahl Nitrogen (TKN, mg/L)[1]		
Total Dissolved Solids (TDS, mg/L)[1]		
Chloride (Cl, mg/L)[1]		
Total Suspended Solids (TSS, mg/L)[2]		
Biochemical Oxygen Demand (BOD, mg/L)[2]		
Fecal Coliform Bacteria (CFU/100 mL)[2]		
pH[3]		
Metals (attach list)[3]		
Organic Compounds (attach list)[3]		

1. Include for all domestic systems.
2. Include for domestic systems that use an advanced treatment process.
3. Include for industrial or mining systems if these are contaminants of concern. If metals or organic compounds are present in the discharge, attach a list of influent and effluent concentrations for each metal/organic compound.

5. Ground Water Monitoring

Discharge Permits typically require that ground water samples be collected quarterly from properly constructed monitoring wells located downgradient from discharge locations. The samples must be analyzed for contaminants of concern. For most domestic and agricultural Discharge Permits, the typical contaminants of concern are total Kjeldahl nitrogen (TKN), nitrate-nitrogen (NO_3-N), total dissolved solids (TDS), and chloride (Cl). For most industrial Discharge Permits, typical contaminants of concern are volatile and semi-volatile organic compounds (VOC's), polynuclear aromatic hydrocarbons (PAH's), polychlorinated biphenyls (PCB's), metals, and radionuclides. See Supplemental Instructions for additional information.

a. Depth-to-Most-Shallow Ground Water [Subsection C of 20.6.2.3106 NMAC]

1. Facilities *with* on-site monitoring wells

Provide the depth-to-most-shallow ground water from the most recent ground water levels obtained from monitoring wells at the facility. Depth-to-ground water shall be measured to the nearest 0.01 feet using standard methods and techniques [Subsection B of 20.6.2.3107 NMAC].

Depth-to-ground water is: 100 feet

Note: Use this depth to complete Part I.4.b (Public Notice).

2. **Facilities *without* on-site monitoring wells**

If a facility does not have a monitoring well intersecting most-shallow ground water, provide depth-to-most-shallow ground water for all wells on file located within one mile of the boundary of the facility. This information can be obtained from the Office of the State Engineer (http://www.ose.state.nm.us).

Depth-to-ground water is: _____ feet

Note: Use the range of depths from these records to complete Part I.4.b (Public Notice).

☐ Attached – Records from the Office of the State Engineer, including the following:
- location of each well by latitude/longitude and township, range, and section
- use of each well
- depth to ground water in each well
- total depth of each well

b. Ground Water Flow Direction [Subsection C of 20.6.2.3106 NMAC]

1. **Facilities with *three or more* on-site monitoring wells**

Provide ground water flow direction beneath the facility on a ground water elevation contour map. The ground water elevation contour map shall be developed based upon the most recent ground water levels and survey data obtained from on-site monitoring wells.

Flow Direction South

☒ Included – Ground water contour map from on-site monitoring wells

☐ Included – Monitoring well survey

☐ No survey has been conducted

☐ Survey previously submitted on _____ (date)

2. **Facilities with *less than three* on-site monitoring wells**

If a facility does not have at least three monitoring wells intersecting most-shallow ground water, provide ground water flow direction based upon either the most recent regional water level data or published hydrogeologic information. Attach the sources of information used to determine ground water flow direction. *Select all that apply.*

☐ Ground water flow direction of the most-shallow ground water beneath the facility based upon the *most recent regional water level data* is _____.
-- Reference: _____ (attach relevant portions)

☐ Attached - Survey data from nearby monitoring wells and a *ground water elevation contour map* indicating the direction of ground water flow.

☐ Ground water flow direction of the most-shallow ground water beneath the facility based upon *published hydrogeologic information* is _____.

-- Reference: _____ (attach relevant portions)

c. Monitoring Well Construction and Identification [Subsection C of 20.6.2.3106 NMAC; Subsection A of 20.6.2.3107 NMAC]

1. **For existing monitoring wells**
   Submit construction logs for all existing, on-site monitoring wells, which indicate the date of installation and well driller.

   ☐ Included - Construction logs for each existing monitoring well.

   ☒ Previously Submitted
   Date 12/20/2007

2. **For all monitoring wells** - Identify proposed and existing monitoring well (MW) locations.

MW ID[1]	Proposed or Existing?	Location Description[2] AND Latitude and Longitude	Screen Interval (ft)	Depth to Water
		See Attachment 5		

[1] MW ID (Monitoring Well ID) is the numbering or labeling system used to identify a MW (e.g., MW-1, MW-2, etc.).
[2] Example: 60 feet south of the top inside edge of the berm of Wastewater Impoundment-1

d. Past Ground Water Monitoring Results

This item applies only to existing facilities seeking renewal and/or modification of a Discharge Permit that required ground water monitoring. See Supplemental Instructions for additional information.

1. **Attach a graph or table showing all analytical results from ground water monitoring.**

e. Engineering and Surveying

Proposed New Structures or Improvements to Existing Structures

Include electronic plans and specifications for any *proposed* new structures or improvements to existing structures. All final plans and specifications must bear the stamp of a New Mexico licensed Professional Engineer.

- Proposed plans and specifications included (*Select all that apply)*

  ☒ Included for new structure(s)

  ☒ Included for improvements to an existing structure

  ☐ No proposals for new or improved structures

f. Land Application Area Information

For facilities proposing to apply reclaimed or treated wastewater to a land application area, provide calculations showing that nitrogen loading does not exceed 200 lbs/acre/year or that the amount of total nitrogen in the combined application of wastewater and fertilizer does not exceed by more than 25% the amount reasonably expected to be taken up by the crop(s) and removed by harvesting in any 12-month period. Forms to assist in these calculations can be found at: https://www.env.nm.gov/gwb/FORMS/NewMexicoEnvironmentDepartment-GroundWaterQualityBureau-Forms.htm.

☐ Attached – Nitrogen loading calculations

Part III. Additional Proposals and Conditions (if applicable)

In the space provided, propose revisions or additions to the standard Discharge Permit requirements. If you propose any revisions or additions, also provide the rational for your proposal.

Proposed modification to Condition 4, which requires that minimum of one foot of freeboard be preserved between the liquid level in the all impoundments and the elevation of the top of the impoundment liners. The proposal is to remove the one-foot freeboard requirement on Storm Water Ponds 1, 2, and 3. Clean storm water is not regulated. If these Storm Water Ponds over-top after a large rainfall event, or if the WIPP facility needs to transfer storm water from one pond to another to prevent over-topping, no formal notice to the Ground Water Quality Bureau is required. Any over-topping or transfer of water will be noted in the semi-annual reports.

Proposed modification to Condition 9, which requires measurement of the thickness of the solids blanket in storm water runoff impoundments. The proposal is to remove the requirement to measure the solids blanket in Salt Storage Pond 1, and Salt Storage Pond 2/3. The sludge generated from collection and evaporation of saturated brine is salt. The salt is hard packed and non-hazardous, and has no resemblance to the sludge blanket in the sewage lagoons. Because of the hard packed salt, a good estimate of depth is difficult to determine. Safety of personnel measuring the salt pack is a concern since it involves launching a boat down a steep, slick liner and rowing to the staff gauge to measure the depth of the salt pack.

Proposed modification to Condition 15, which requires that the volume of domestic influent discharged to the Facultative Lagoon System be measured monthly using a totalizing flow meter on the influent line of the Facultative Lagoon System. The proposal is to remove the requirement to use a totalizing meter on the influent line to the system and use the totalizing flow meter associated with the domestic water influent to the facility to determine flow to the Facultative Lagoon System.

Proposed modification to Condition 18, which requires that water samples be collected annually, after a significant storm event, from each of the storm water ponds. It is proposed that Condition 18 modified to define "significant" as storm events of 2 inches or greater in a 24-hour period. This definition removes the current ambiguity and will make Condition 18 consistent with Condition 11 in terms of the actionable criterion.

Proposed modification to Condition 22, which requires depth to the water table to be measured to the nearest hundredth of a foot (0.01 ft) quarterly in piezometers PZ-1 through PZ-13. The proposal is to remove PZ-8 from the list because PZ-8 had to be plugged and abandoned to allow continuation of a construction project at the WIPP facility. This well was no longer needed as it is not used for semi-annual groundwater sampling and will not impact the potentiometric map as there is sufficient coverage. This well also offered limited data as its water level (62.31 ft bgl) was always well below the middle of the screened interval (47.7 - 67.7 ft bgl). PZ-8 was plugged and abandoned to NMED standards on August 8th, 2018.

Proposed modification of Condition 23(b), which requires that three well volumes be purged from the well prior to sample collection well. It is proposed that Condition 23(b) be replaced with the following: Allow field-measured temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, and the temperature and specific conductance are within ±10% of the last three consecutive readings. The reason for this change is that 3 WBV depletes the well and stabilization typically occurs within one or two WBV. The excess water purged with 3 WBV is not beneficial. We propose to pump the well to + or - 10 % of the last three consecutive specific conductance readings.

Proposed modification to Condition 31, which prescribes actions to be taken in the event that a minimum of one foot of freeboard cannot be preserved in the impoundment(s). It is proposed that Condition 31 and 32 be modified pursuant to the desired changes to Condition 4.

Proposed modification to the Discharge Permit Summary, Page 2 of 5, Industrial Wastewater of the Discharge Permit Summary of DP-831, Type Evaporation Impoundment, and Designation Salt Storage Pond 1. Replace 1,677,633 gallons with 3,301,634 gallons (NWP DWG No 23-C-017-W1).

Proposed modification to the Discharge Permit Summary, Page 2 of 5, Industrial Wastewater of the Discharge Permit Summary of DP-831, Type Evaporation Impoundment, and Designation Salt Storage Pond 2. Replace 1,273,601 gallons with 3,402,759 gallons (NWP DWG No 23-C-017-W1).

Proposed modification to the Discharge Permit Summary, Page 2 of 5, Industrial Wastewater of the Discharge Permit Summary of DP-831, Type Evaporation Impoundment, and Designation Salt Storage Pond 3. Replace 1,273,601 gallons with 21,737,254 gallons (NWP DWG No 23-C-017-W1).

Proposed modification to the Discharge Permit Summary, Page 4 of 5, Ground Water Monitoring Locations, Type: Monitoring Well, Designation: PZ-8. Delete this monitoring well as it has been plugged and abandoned.

Part IV. Maps and Logs to be Attached

1. Surface Soil Survey and Vadose Zone Geology
[Subsection C of 20.6.2.3106 NMAC]

☒ Attached - Most recent regional soil survey map and associated descriptions identifying surface soil type(s).

☐ Attached - Lithologic logs for all existing on-site monitoring wells (if available).

2. Topographic Map [Subsection C of 20.6.2.3106 NMAC]

☒ Attached - Location map with topographic surface contours identifying all of the following features located within a one-mile radius of the facility:

- watercourses
- lakebeds
- sinkholes
- playa lakes
- springs (springs used to provide water for human consumption shall be so denoted)
- wells supplying water for a public water system
- private domestic water wells
- irrigation supply wells
- ditch irrigation systems
- acequias
- irrigation canals
- drains

3. Flood Zone Map [Subsection C of 20.6.2.3106 NMAC]

☐ Attached - Most recent 100-year flood zone map developed by the federal emergency management administration (FEMA) documenting flood potential for the facility.

Describe any engineered measures used for flood protection.

A berm currently runs the entire length of the facility on the north and east sides. This berm is designed to divert runon water around the facility, and will be extended to prevent runon for the Brine Retention Ponds.

4. Additional Information
Describe any additional relevant information.

Supplemental Instructions

Please note: Discharge Permits are required for a wide range of facilities that process, treat, store and/or dispose of wastewater, sludge, septage, leachate, contaminated soils, mine tailings, industrial waste, mine ore, waste rock, or other similar materials. For the purposes of this application form, the term "discharge" applies to any of these materials whether they are actually discharged or whether they represent only a potential discharge that could occur due to factors such as poor maintenance, improper installation, equipment failure or accidents.

Part I.1 Facility Information and Type of Facility

The "Facility" may be identified as:

- a treatment facility, such as a municipal wastewater treatment plant;
- the source of the discharge, such as a subdivision, or waste rock pile;
- a disposal facility or operation, such as for sludge or septage;
- the discharge location or end user of reclaimed wastewater, such as a golf course or cement plant;
- a storage and/or processing facility with off-site disposal;
- a collection of facilities, such as numerous comfort stations at a state park; or
- a project or operation, such as a construction project or a system to distribute reclaimed wastewater throughout a city.

Examples of a variety of facility types are categorized below. Please note, "Domestic" waste contains human excreta or originates from typical residential plumbing fixtures.

Industrial Waste

- Manufacturing
- Power plant
- Military installation
- Vehicle/equipment wash
- Mortuary
- Hydrocarbon landfarm
- Ground water remediation
- Ethanol plant
- Asphalt plant
- Remediation Systems

Mining Waste

- tailing impoundment
- mine dewatering
- waste rock pile
- smelter slag
- in-situ leach
- leach piles
- pipelines
- collection ponds
- concentrator – other beneficiation

Domestic Waste

- Municipal wastewater treatment plant
- Septage disposal
- Sludge disposal
- Mobile home/RV park
- Campground/park
- School/educational facility
- Restaurant
- Subdivision/apartment complex
- Unincorporated community
- Lodging/resort/spa
- Residential facility
- Commercial/shopping complex
- Laundromat
- Facility using reclaimed domestic wastewater

Agricultural Waste

- Dairy
- Food processing
- Slaughter facility
- Nursery/greenhouse
- Manufacture/processing of agricultural chemicals
- Feedlot
- Livestock truck washout

This listing is only a guide, as there can be crossover between categories. For example, a golf course might use treated industrial wastewater for irrigation. The type of facility in that case is "golf course" and the type of waste is "industrial." A mining operation may need a permit for its restroom and shower facilities. In that case, the type of facility is a "mining operation" and the type of discharge is "domestic waste."

Part I.5: Facility Location

The following are examples of treatment, storage, and disposal components of a wastewater system that should be included in this part.

Treatment Methods

- Septic tank
- Grease interceptor
- Oil/water separator
- Manure separator
- Wetlands
- Lagoon (indicate whether aerated and type of liner)
- Trickling filter
- Activated sludge (extended air, SBR, etc.)
- Sand filter
- Membranes
- Sludge drying bed
- Disinfection (specify type)
  - ➢ chlorination

Disposal Methods

- Leachfield
- Infiltration gallery
- Evaporation lagoon (indicate type of liner)
- Evaporation tank
- Impoundment
- Discharge to waters of the US (NPDES permit required)
- Ongoing land application (specify type)
  - ➢subsurface irrigation
  - ➢sprinkler irrigation
  - ➢flood irrigation
  - ➢drip irrigation
  - ➢surface spreading (solids)
  - ➢surface injection (solids)

- UV/ozone
- Water treatment plant
- Injection Wells
- Temporary uses of reclaimed wastewater
- Ongoing use of reclaimed wastewater for:
  - Manufacturing construction or dust control

Storage Methods

- Above/below ground tank
- Storage lagoon (indicate type of liner)
- Holding tank
- Pit toilet
- Stockpile
- Tailing impoundment

Part II.1 Proposed Maximum Daily Discharge Volume

Your Discharge Permit will allow for the treatment, processing and/or discharge of up to a specified volume, generally, a maximum number of gallons per day. The flow at your facility on any given day must not exceed this "maximum discharge volume." It is determined based on the expected contributions from the sources you identified Part II, 1, b, 1.

NMED will carefully review the basis of the maximum discharge volume you propose. Show all your calculations and assumptions.

Animal feeding operations must provide calculations based on the number of animals and water conservation practices in place.

Landfarms, disposal facilities, processing facilities typically identify the expected number of loads to be delivered.

For septic systems and wastewater treatment plants, the maximum discharge volume is also referred to as the "design flow." It includes a peaking or safety factor to guard against back-ups and overflows.

Municipal wastewater treatment facilities should identify the population served, growth assumptions, and expected per capita usage considering any contributing industries.

On-site domestic wastewater treatment facilities should rely on published design flows such as those provided in the NMED Liquid Waste Regulations (20.7.3 NMAC), the Uniform Plumbing Code or the USEPA On-site Wastewater Treatment Systems Manual.

For existing facilities, the maximum discharge volume may be based on a record of measured flows if no changes are anticipated. At least two years of flow data must be submitted, and the highest monthly discharge volume must be multiplied by a peaking factor of 1.5.
NMED will verify that your proposed or existing facility can handle maximum discharge volume you propose.

Be specific in describing all sources. Consider the following examples:

- Municipalities – identify particular industries or specialized facilities contributing wastewater.
- RV Parks – identify showers, dump stations, laundromat, etc.

- Subdivisions – identify homes, apartments, commercial developments, water softener backwash, etc.
- Landfarms or disposal facilities – specify type of materials accepted, e.g., residential septage, car wash grit trap waste, contaminated soils/water, treated municipal sludge, etc.
- Dairies – identify milking parlors, type of washdown used, sources of stormwater runoff, etc.
- Schools – identify cafeteria, gym, showers, etc.
- Truck stops – identify restaurant, showers, car wash, etc.
- Facilities receiving reclaimed wastewater – identify the treatment facility providing the reclaimed wastewater.
- Food processing and industrial facilities – describe the processes which produce the waste stream and chemicals used.
- Mines – identify processes including beneficiation, tailing, waste rock, leach facilities, pipelines, ponds, catchments, booster stations, in-situ leach facilities.

You do not need to include solid wastes, hazardous wastes or discharges being managed under other permits; however, these must be listed under Item C-7 in Part C of the application.

Part II.3: Flow Metering

You must provide a method for measuring the discharge volume (Section 20.6.2.3109.H.1 NMAC). At facilities with treatment or storage lagoons, it is necessary to measure both the volume entering the treatment system as well as the volume ultimately discharged.

If you land apply wastewater to more than one discharge location, you must be able to track the volume to each location.

If your facility is small and relies on gravity to carry wastewater to the treatment and disposal system, it may be acceptable to estimate the wastewater flow. This can be done by metering water usage and deducting the volume of water used for fresh-water irrigation, swimming pools, evaporative cooling, livestock watering or other uses that do not result in wastewater flowing to the treatment system.

Part II.4: Discharge Quality

Untreated wastewater entering a treatment facility (also referred to as "influent") must be characterized so that the treatment process can be evaluated. It is not necessary to provide influent quality for systems providing minimal treatment prior to discharge or disposal, such as systems relying on crop uptake for treatment (e.g., dairies), septic tank – leachfield systems, storage/processing facilities or evaporative systems. The final quality of the waste or wastewater disposed of or discharged must be characterized for all facilities.

For most agricultural and domestic facilities, the contaminants of concern include nitrate as nitrogen (NO_3-N), total Kjeldahl nitrogen (TKN), total dissolved solids (TDS), and chloride (Cl). For domestic facilities with advanced treatment, additional contaminants include total suspended solids (TSS), biochemical oxygen demand (BOD_5), and fecal coliform bacteria. Contaminants of concern at industrial and mining sites include pH, metals, and organic compounds. List all that apply.

Part II.E: Ground Water Monitoring

The depth to ground water beneath your facility and/or discharge site must be provided. This is true even if your facility or operation is intended to have no discharge. Discharge Permits are required for "no-discharge" lagoons, storage tanks, etc. because of the potential for a discharge to occur due to factors such as improper installation, poor maintenance, equipment failure or accidents.

The best way to determine the depth to water is to measure it in an on-site or nearby monitoring well. If a monitoring well is not available, the measurement may be from a water supply well. If there is a well but it is not possible to access it for a measurement, you could refer to the well log for that well and/or others in the vicinity. Well log information is available on the website of the State Engineer's office:

http://www.ose.state.nm.us/.

Be aware that water levels have dropped in many areas of the state, so more recent well logs in those areas are more reliable.

There may be a significant discrepancy in the depth to water in different wells, even when falling water levels is not a factor. One reason for this is that a water supply well may rely on a deep aquifer rather than water in the "first" or most shallow aquifer. Discharge Permits are intended to protect all ground water, so it is important to report the shallowest depth in the vicinity of your site.

The total dissolved solids (TDS) concentration of the ground water prior to discharge must be provided. As explained for the depth to water, this is true even if your facility or operation is intended to have no discharge. The TDS value provides a general indication of the quality of the ground water that could be affected by your operation.

The best way to obtain a pre-discharge TDS concentration is to sample an on-site or nearby well before your facility begins operating. It is better to sample a shallow rather than a deep well, if possible. It may be that a neighboring facility has existing analytical data for its Discharge Permit. (If so, be sure to obtain data from a non-impacted well.)

If there are no wells in your vicinity or it is not possible to sample them, you may find general TDS concentrations in reports available from sources such as a university, the State Engineer's Office (http://www.ose.state.nm.us/) or the US Geological Survey (http://nm.water.usgs.gov/).
If you are renewing or modifying your Discharge Permit, you may refer to the TDS concentration previously determined if there was a sound basis for it. Monitoring data or other information obtained since the permit was issued, however, may warrant listing a different value.

Part II.E.4: Past Ground Water Monitoring Results

A complete list of ground water standards can be found in Section 20.6.2.3103 NMAC. The standards for contaminants most frequently monitored under Discharge Permits are as follows:

Nitrate-nitrogen (NO_3-N)............10 mg/L
Chloride.................................... 250 mg/L
Total dissolved solids (TDS)... 1000 mg/L
Sulfate (SO_4)..............................600 mg/L
pH .... between 6 and 9

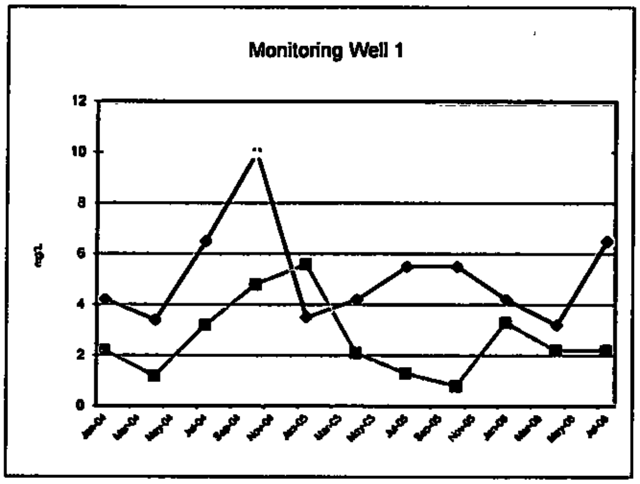
There is no ground water standard for total Kjeldahl nitrogen (TKN). Because TKN converts readily to nitrate as it moves through the vadose zone, however, concentrations approaching or exceeding 10 mg/L are of concern.

Additional parameters typically apply at mining or industrial facilities.

Some ground waters in the state have TDS or chloride concentrations that naturally exceed these standards. In that case, the standard is the naturally occurring level. You must provide documentation of such elevated natural conditions, such as analytical results from a non-impacted well.

An example table and graph follow:

	Monitoring Well 1	
Date	NO3-N	TKN
Jan-04	4.2	2.2
Apr-04	3.4	1.2
Jul-04	6.5	3.2
Oct-04	10	4.8
Jan-05	3.5	5.6
Apr-05	4.2	2.1
Jul-05	5.5	1.3
Oct-05	5.5	0.8
Jan-06	4.2	3.3
Apr-06	3.2	2.2
Jul-06	6.5	2.2



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Attachment 1

ATTACHMENT 1

Proposed Maximum Daily Discharge Volume

ATTACHMENT 1

Proposed Maximum Daily Discharge Volume

Receiving Body (Previously Permitted Impoundments)		Discharge Volume (gallons)
Domestic Wastewater	Settling Lagoons 1 and 2	23,000
	Polishing Lagoons 1 and 2	23,000
	Effluent Lagoon A	23,000
Domestic & Industrial Wastewater	Effluent Lagoon B	50,000 (23,000 domestic and 27,000 industrial)
	Effluent Lagoon C	50,000 (23,000 domestic and 27,000 industrial)
Industrial Wastewater	Evaporation Pond H-19	50,000
	Salt Storage Pond 1 (24-hour, 100-year rainfall event)	2,512,148
	Salt Storage Pond 2/3 (24-hour, 100-year rainfall event)	3,814,271
Storm Water Control (20.6.2.3105 NMAC)	Storm Water Pond 1 (24-hour, 100-year rainfall event)	650,133
	Storm Water Pond 2 (24-hour, 100-year rainfall event)	1,411,262
	Storm Water Pond 3 (24-hour, 100-year rainfall event)	5,978,042

Receiving Body (New Impoundments - Modifications)		Discharge Volume (gallons)
Industrial Wastewater	Storm Water Pond 4 (24-hour, 100-year rainfall event)	1,888,867 (1,857,927 non-contact storm water and 30,940 brine water)
	Salt Storage Pond 5 (24-hour, 100-year rainfall event)	1,292,499
	Brine Evaporation Pond East and West	2,210

Note 1: Settling Lagoons 1 and 2 receive the initial discharge from the WIPP facility of 23,000 gallons per day. Polishing Lagoons 1 and 2 receive water discharge from Settling Lagoons 1 and 2. Effluent Lagoon A receives discharge from the Polishing Lagoons 1 and 2. So, total discharge into the Facultative Sewage System is only 23,000 gallons per day.

Note 2: The Effluent Lagoons B and C may receive up to 23,000 gpd from Effluent Lagoon A, as needed, to control freeboard in Effluent Lagoon A. Effluent Lagoons B and C also may receive miscellaneous industrial non-hazardous wastewaters from site operations as needed (e.g. purging groundwater monitoring wells, and water collected from the Waste Shaft Sump). These miscellaneous site operations are estimated to discharge up to an additional 27,000 gpd into these lagoons; therefore, the daily maximum discharge into Effluent Lagoons B and C is estimated at 23,000 gpd (domestic) and 27,000 gpd (industrial non-hazardous) for a total of 50,000 gpd.

Note 3: Evaporation Pond H-19 is used for miscellaneous wastewater transfer/discharge from underground experiments plus miscellaneous industrial non-hazardous wastewater from site operations (e.g. purging groundwater monitoring wells, and water collected from the Waste Shaft Sump). These discharges vary depending upon the type of underground experimentation taking place. Typical discharge volumes into Evaporatation Pond H-19 are estimated at 110 gallons per day with a maximum daily discharge rate up to 50,000 gpd.

Note 4: Brine water from Brine Evaporation Pond East and Brine Evaporation Pond West may be discharged into Storm Water Pond 4 to control freeboard in the brine ponds. The brine evaporation ponds content may be discharged into Storm Water Pond 4 after 14 days as a batch operation. Because these brine evaporation ponds may generate 2,210 gpd of brine water, 30,940 gpd may be discharged as a batch load into Storm Water Pond 4 after 14 days.

Note 5: All of the water in Storm Water Pond 4 including the storm water runoff is conservatively being reported as industrial waterwater because brine water may be added to this storm water pond from the brine evaporation ponds to control freeboard in the brine ponds.

Attachment 2

ATTACHMENT 2

Facility Location

ATTACHMENT 2

Facility Location

Current/Previously Approved Impoundments					
Componenet ID	Township	Range	Section(s)	Latitude	Longitude
Effluent Lagoon A	22S	31E	SE, NE, NW-29	32 21.950	103 48.000
Effluent Lagoon B	22S	31E	SE, NE, NW-29	32 21.959	103 48.056
Effluent Lagoon C	22S	31E	SE, NE, NW-29	32 21.940	103 48.057
Settling Lagoons 1 and 2	22S	31E	SE, NE, NE-29	32 22.33	103 46.58
Polishing Lagoons 1 and 2	22S	31E	SE, NE, NW-29	32 21.939	103 47.973
Salt Cell 1	22S	31E	NW, NE, SE-20	32 22.495	103 47.620
Salt Cells 2 and 3	22S	31E	SW, SE, NE-20	32 22.588	103 47.619
Salt Storage Pond 1	22S	31E	NE, NW, SE-20	32 22.455	103 47.754
Salt Storage Pond 2	22S	31E	NE, SE, NE-20	32 22.589	103 47.746
Salt Storage Pond 3	22S	31E	NW, SE, NE-20	32 22.593	103 47.788
Storm Water Pond 1	22S	31E	NW, SE, SE-20	32 22.215	103 47.641
Storm Water Pond 2	22S	31E	SE, SE, SE-20	32 22.214	103 47.550
Storm Water Pond 3	22S	31E	NE, SW, SE-20	32 22.291	103 47.775
SPDV Material Pile	22S	31E	NW, SE, SW-21	32 22.268	103 47.176
Evaporation Pond H-19	22S	31E	SE, NE, SW-28	32 21.532	103 46.975

Modifications - Proposed New Impoundments					
Componenet ID	Township	Range	Section(s)	Latitude	Longitude
Salt Cell 5	22S	31E	NW, SE, SW-20	32 22 21.02	103 48 7.44
Salt Storage Pond 5	22S	31E	NW, SE, SW-20	32 22 20.25	103 48 13.22
Brine Evaporation Ponds East & West	22S	31E	NW, SW,SW-21	32 22 19.05	103 47 23.19
Storm Water Pond 4	22S	31E	SW, SW, SW-21	32 22 12.04	103 47 18.98

Attachment 3

ATTACHMENT 3

Description of Components

ATTACHMENT 3

Description of Components

Component	Status[1]	Date of Installation or construction (mm/dd/yyy)	Description (Construction material , liner type, irrigation method, capacity[2], dimensions, area, model number , etc.)
Settling Lagoon 1	Existing in use	1990	60-mil HDPE, 128,772 ft^3 (963,214 gallons)
Polishing Lagoon 1	Existing in use	1990	60-mil HDPE, 55,468 ft^3 (414,901 gallons)
Settling Lagoon 2	Existing in use	1990	60-mil HDPE, 128,772 ft^3 (963,214 gallons)
Polishing Lagoon 2	Existing in use	1990	60-mil HDPE, 55,468 ft^3 (414,901 gallons)
Effluent Lagoon A	Existing in use	1990	30-mil linear low density polyethylene (LLDP), 75,750 ft^3 (566,610 gallons)
Effluent Lagoon B	Existing in use	1992	30-mil LLDP, 113,138 ft^3 (846,257 gallons)
Effluent Lagoon C	Existing in use	1992	30-mil HDPE, 113,138 ft^3 (846,257 gallons)
Evaporation Pond H-19	Existing in use	July-95	36-mil Hypalon®, 80,457 ft^3 (601,860 gallons)
Salt Cell 2 and Salt Cell 3	Existing in use	October-06	60-mil HDPE, 200-mil Geonet Drainage layer, 2-feet of native soil cover, Cell A: 6.2 acres, Cell B: 5.2 acres, Total: 11.4 acres
Salt Storage Pond 2/3	Existing in use	Jan-04 (Pond 2) Apr-10 (Pond 3)	Each pond has a two 60-mil HDPE, 200-mil Geonet leak detection layer. The system capacity of Pond 2/3 is 3,561,553 ft^3 (26,642,264 gallons)
Salt Cell 1 (Run-off Ditches)	Closed	November-04	60-mil HDPE, 2 feet of native soil, 18.8 acres, 1.0 Acres
Salt Storage Pond 1	Existing in use	November-04	60-mil HDPE; 593,559 ft^3 (4,440,128 gallons)
Storm Water Pond 1	Existing in use	April-05	60-mil HDPE; 102,293 ft^3 (765,204 gallons)
Storm Water Pond 2	Existing in use	April-05	60-mil HDPE; 349,176 ft^3 (2,612,016 gallons)
Storm Water Pond 3	Existing in use	January-05	60-mil HDPE; 1,156,920 ft^3 (8,654,360 gallons)
Site Preliminary Design Validation Material Pile	Closed	circa 1984	Geosynthetic liner, 2 feet of native soil blended with rock, 10 acres
Storm Water Pond 4	Proposed	March 1, 2019	60-mil HDPE Geomembrane double lined; 1,158,840 ft^3 (8,668,722 gallons)
Salt Storage Pond 5	Proposed	March 1, 2019	60-mil HDPE Geomembrane double lined; 849,594 ft^3 (6,355,404 gallons)
Salt Cell 5	Proposed	March 1, 2019	60-mil HDPE Geomembrane lined, 5,224,000 ft^3
Brine Evaporation Pond East	Proposed	March 1, 2019	60-mil HDPE Geomembrane double lined; 8,338 ft^3 (62,375 gallons)
Brine Evaporation Pond West	Proposed	March 1, 2019	60-mil HDPE Geomembrane double lined; 8,338 ft^3 (62,375 gallons)

[1]Status = Proposed; Existing in use; Existing not in use, but proposed for use; Abandoned without closure, not proposed for use; or Closed

[2]Capacity = The listed capacity is the maximum physical volume of the pond(s) without freeboard.

Attachment 4

ATTACHMENT 4 (continued)

Contaminants	Storm Water Pond 1		Storm Water Pond 2		Storm Water Pond 3		Storm Water Pond 4	
	Contaminants		Contaminants		Contaminants		Contaminants	
	Incoming (Influent)	Final (Effluent)	Incoming (Influent)	Final (Effluent)	Incoming (Influent)	Final (Effluent)	Incoming (Influent)	Final (Effluent)
Nitrate as Nitrogen (NO_3-N, mg/L)[1]		None		None		None		None
Total Kjaldahl Nitrogen (TKN, mg/L)[1]		None		None		None		None
Total Dissolved Solids (TDS, mg/L)[1]	406	None	167	None	279	None	250,000	None
Chloride (Cl, mg/L)[1]	176	None	53	None	108	None	160,000	None
Total Suspended Solids (TSS, mg/L)[2]		None		None		None		None
Biochemical Oxygen Demand (BOD, mg/L)[2]		None		None		None		None
Fecal Coliform Bacteria (CFU/100 ml)[2]		None		None		None		None
pH[3]		None		None		None		None
Metals (attach list)[3]		None		None		None		None
Organic Compounds (attach List)[3]		None		None		None		None

Contaminants	Brine Evaporation Pond East		Brine Evaporation Pond West	
	Contaminants		Contaminants	
	Incoming (Influent)	Final (Effluent)	Incoming (Influent)	Final (Effluent)
Nitrate as Nitrogen (NO_3-N, mg/L)[1]		None		None
Total Kjaldahl Nitrogen (TKN, mg/L)[1]		None		None
Total Dissolved Solids (TDS, mg/L)[1]	250,000	None	250,000	None
Chloride (Cl, mg/L)[1]	160,000	None	160,000	None
Total Suspended Solids (TSS, mg/L)[2]		None		None
Biochemical Oxygen Demand (BOD, mg/L)[2]		None		None
Fecal Coliform Bacteria (CFU/100 ml)[2]		None		None
pH[3]		None		None
Metals (attach list)[3]		None		None
Organic Compounds (attach List)[3]		None		None

ATTACHMENT 5

Monitoring Well Locations

MW ID[1]	Proposed or Existing?	Location Description[2] AND Latitude and Longitude	Screen Interval (ft)	Depth to Water
PZ-1	Existing	Approximately 30' south of Building 486; 32.372369 Lat., -103.792029 Long.	42-62	41.21
PZ-2	Existing	Approximately 50' northeast of Building 413; 32.372203 Lat., -103.791407 Long.	42-62	41.75
PZ-3	Existing	Approximately 50' north of Building 489; 32.373043 Lat., -103.791671 Long.	42-65	44.03
PZ-4	Existing	Approximately 25' west of Building 413; 32.372036 Lat., -103.792033 Long.	40-60	44.79
PZ-5	Existing	Approximately 30' East of Building 253; 32.372048 Lat., -103.792223 Long.	42-65	42.58
PZ-6	Existing	Approximately 50' West of Building 482; 32.372576 Lat., -103.793028 Long.	42-62	42.56
PZ-7	Existing	Approximately 20' from Salt Storaget Pond 1 at the southeas Corner; 32.373759 Lat., -103.795669 Long.	46-71	35.93
PZ-8	Plugged and Abandoned (Aug 8th, 2018)	Inside the North-South RCRA Berm halfway between the Exhaust Shaft and the SPDV Pile; 32.371439 Lat., -103.788819 Long.	47.7-67.7	62.31
PZ-9	Existing	Outside the North-South RCRA Berm East of Salt Cell 1; 32.37429 Lat., -103.790668 Long.	45-75	58.25
PZ-10	Existing	Southeast corner of Storm Water Pond 3 approximately 20' from the edge of the pond; 32.37117 Lat., -103.795456 Long.	29-54	35.07
PZ-11	Existing	Approximately 75' northwest of Salt Storage Pond 1; 32.375299 Lat., -103.797013	42-82	43.72
PZ-12	Existing	Between Storm Water Pond 1 and Storm Water Pond 2; 32.370424 Lat., -103.793477 Long.	38-72	51.52
PZ-13	Existing	Aproximately 30' from the SPDV Pile at the Southwest Corner; 32.370099 Lat., -103.786601 Long.	61-76	64.83
PZ-14	Existing	Approximately 50' from the SPDV Pile at the Northwest Corner; 32.371722 Lat., -103.787508 Long	57-72	66.62
PZ-15	Existing	Approximately 30' from the SPDV Pile at the Southeast Corner; 32.370517 Lat., -103.785216 Long.	38.5-53.5	47.1
C-2811	Existing	Approximately 1,500' East of the Facultative Lagoon System; 32.365549 Lat., -103.793498 Long.	50-80	50.48
C-2505	Existing	Approximately 30' South of the Exhaust Shaft; 32.371545 Lat., -103.791704 Long.	44-69	44.38
C-2506	Existing	Approximately 30' East of the Exhaust Shaft; 32.371594 Lat., -103.79161 Long.	44.5-69	43.62
C-2507	Existing	Approximately 75' east of Building 245; 32.37101 Lat., -103.791707 Long.	43-73	44.22
WQSP-6A	Existing	Approximately 2,000' Southwest of the Facultative Lagoon System; 32.359831 Lat., -103.803943 Long.	152-177	168.21

[1]MW ID (Monitoting Well ID) is the numbering of labeling system used to identify a MW (e.g., MW-1, MW-2, etc.).
[2]Example: 60 feet south of the top inside edge of the Berm of Waste Water Impoundment-1

APPENDIX A - Existing Ponds/Impoundment Drawings & Information

DWG 25-C-004-W
DWG 23-C-017-W1

Appendix C

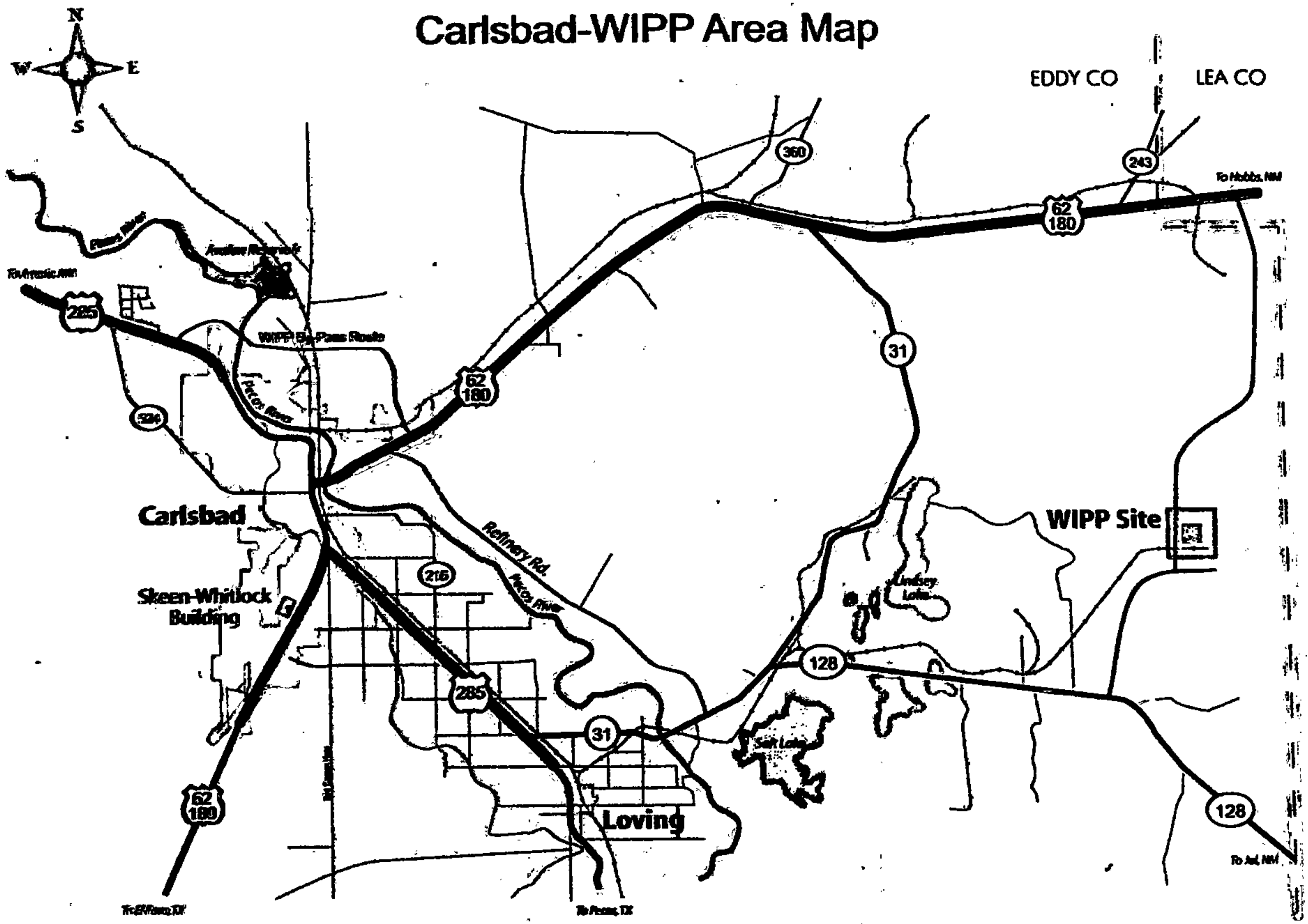
APPENDIX C - Shaft # 5 Pond Drawings

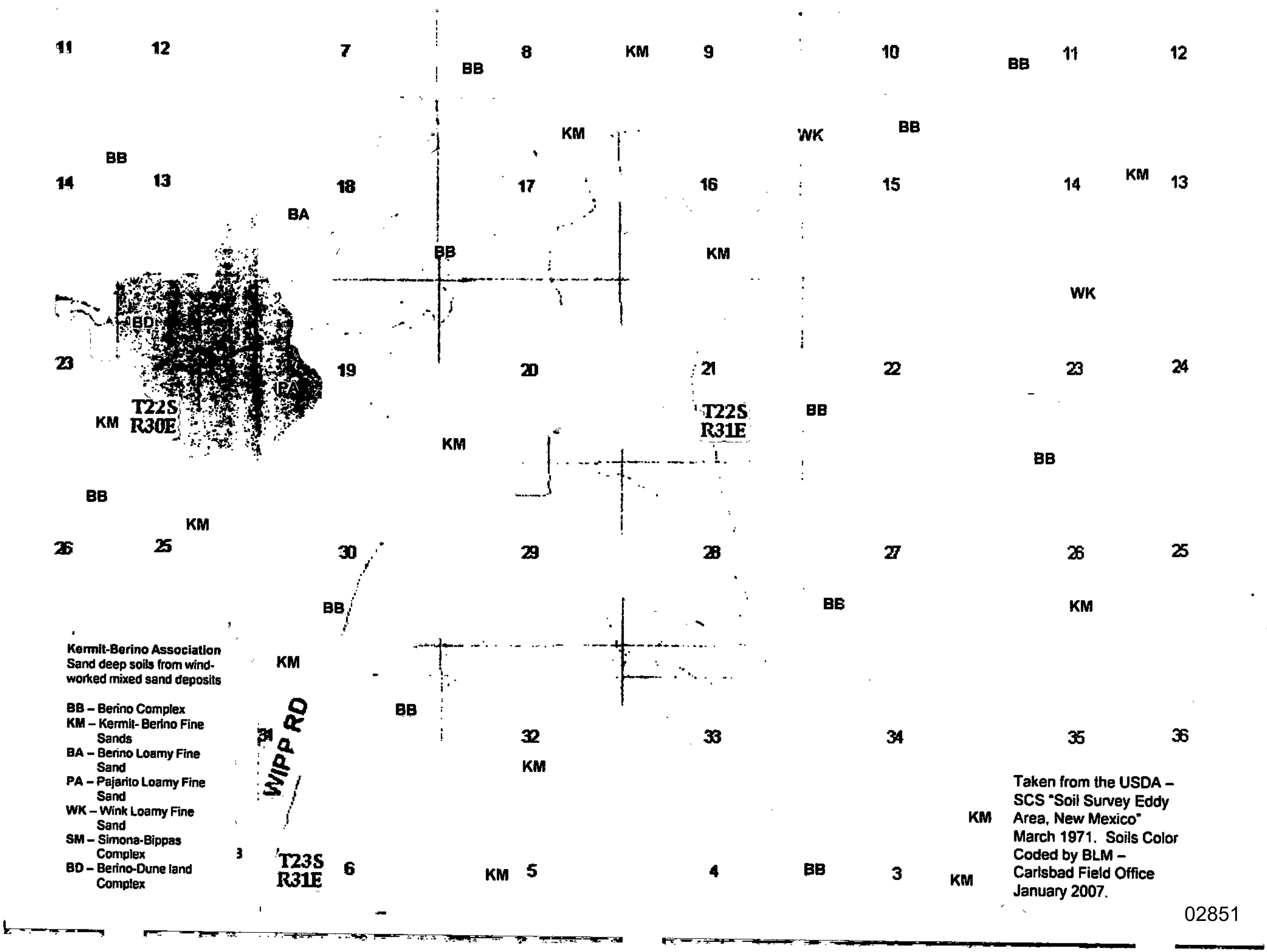
101547-01-SD01-C100
101547-01-SD01-C120
101547-01-SD01-C130
101547-01-SD01-C420
101547-01-SD01-C425
101547-01-SD01-C430
101547-01-SD01-C435

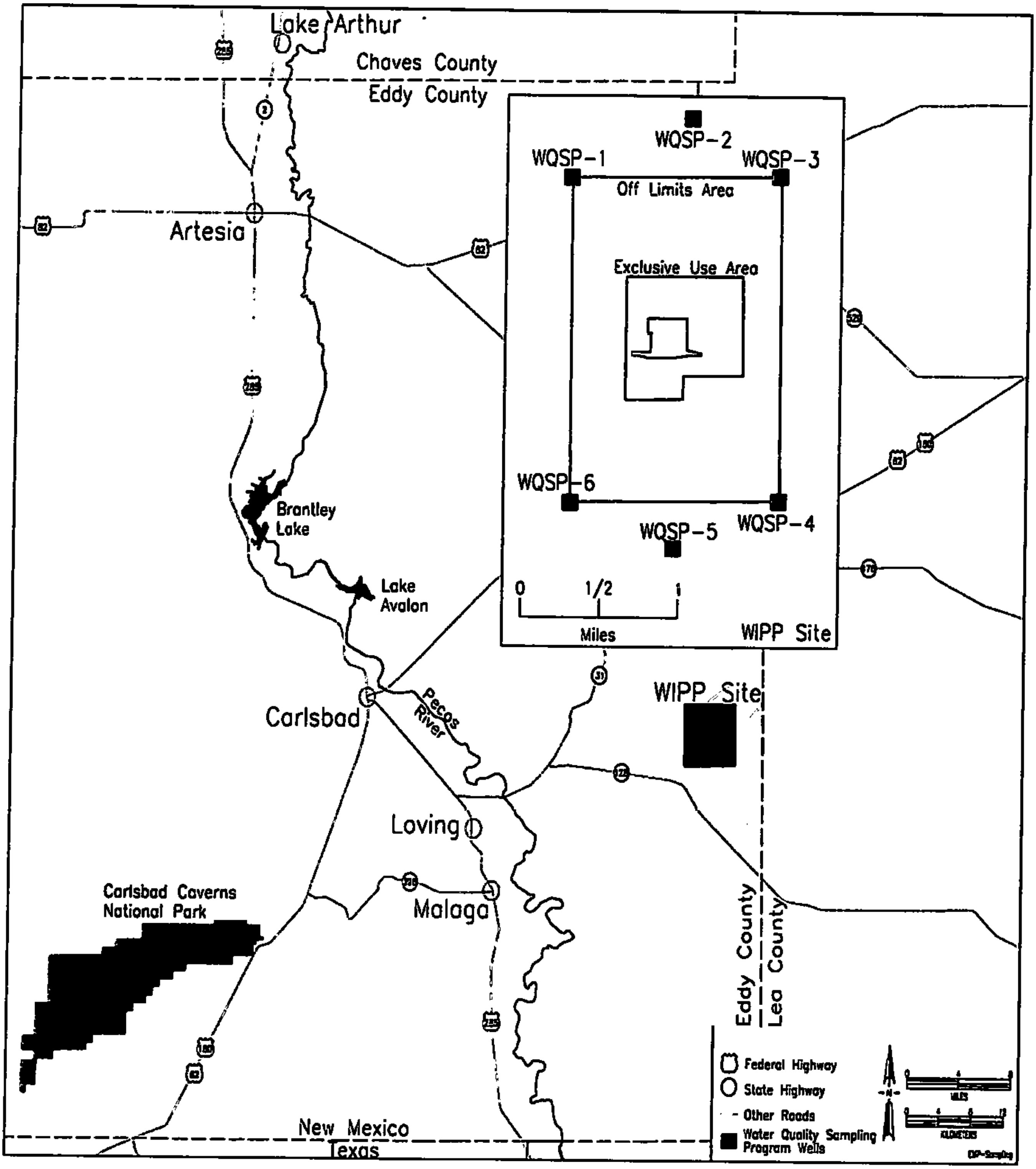
APPENDIX D - Miscellaneous Supporting Information

Carlsbad-WIPP Area Map
Geological Survey – Livingston Ridge Quadrangle
Geological Survey – Los Medanos Quadrangle
Existing Pond Area Map
Contour Interval in Feet Above Mean Sea Level
Watershed Areas for Existing Ponds
Shallow Subsurface Wells and Regulated Units Area Map
Past Ground Water Monitoring Results

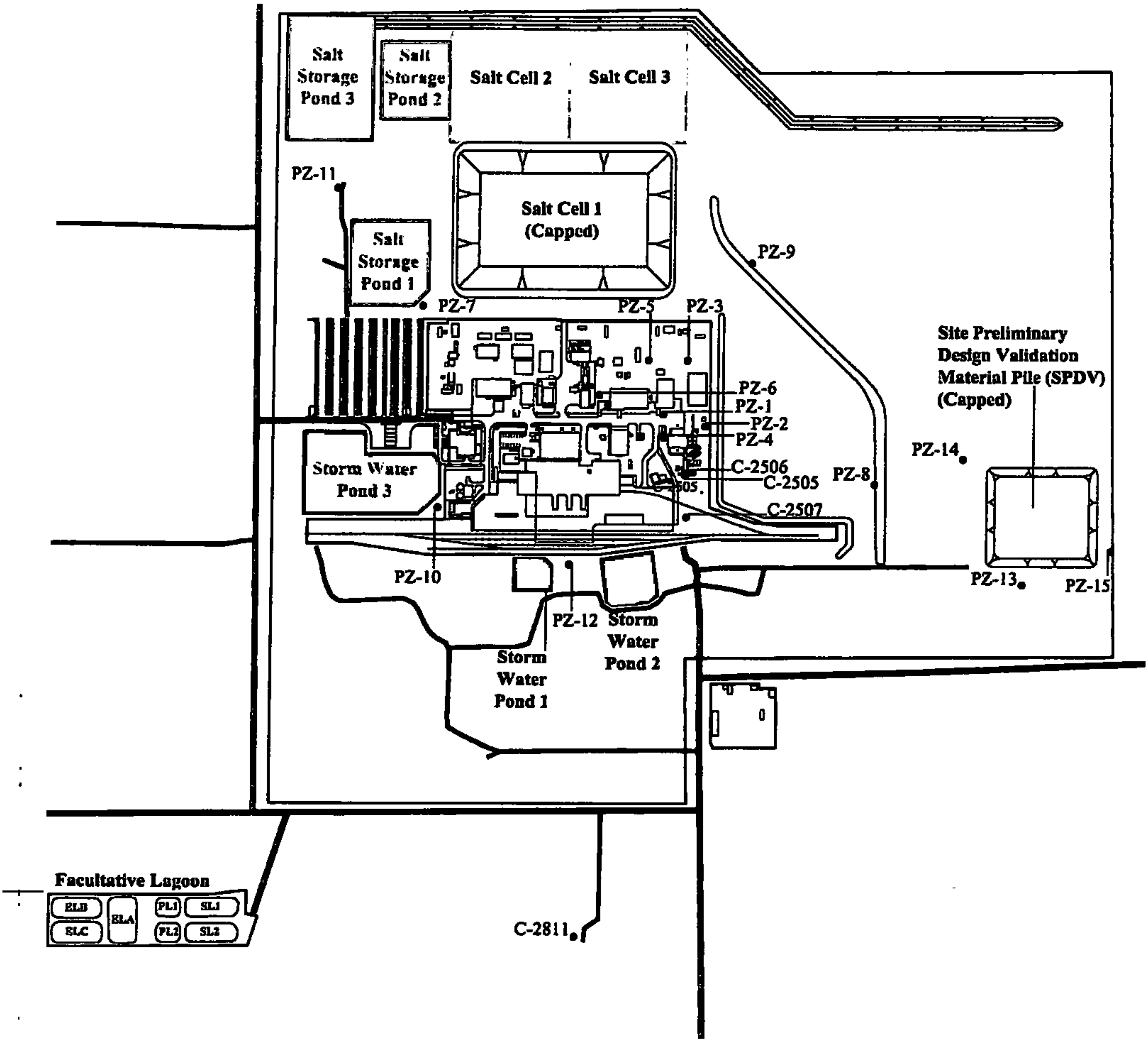
Carlsbad-WIPP Area Map




11
12
7
BB
8
KM
9
10
BB
11
12
KM
WK
BB
BB
14
13
18
17
16
15
14
KM
13
BA
BB
KM
WK
BD
23
19
20
21
22
23
24
PA
T22S
R30E
KM
T22S
R31E
BB
KM
BB
BB
KM
26
25
30
29
28
27
26
25
BB
BB
KM
Kermit-Berino Association
Sand deep soils from wind-worked mixed sand deposits
KM
BB – Berino Complex
KM – Kermit- Berino Fine Sands
BA – Berino Loamy Fine Sand
PA – Pajarito Loamy Fine Sand
WK – Wink Loamy Fine Sand
SM – Simona-Bippas Complex
BD – Berino-Dune land Complex
BB
WIPP RD
31
32
33
34
35
36
KM
KM
T23S
R31E
6
KM
5
4
BB
3
KM
Taken from the USDA – SCS "Soil Survey Eddy Area, New Mexico" March 1971. Soils Color Coded by BLM – Carlsbad Field Office January 2007.



Lake Arthur
Chaves County
Eddy County
Artesia
WQSP-2
WQSP-1
WQSP-3
Off Limits Area
Exclusive Use Area
WQSP-6
WQSP-4
WQSP-5
0
1/2
1
Miles
WIPP Site
Brantley Lake
Lake Avalon
Carlsbad
Pecos River
WIPP Site
Loving
Malaga
Carlsbad Caverns National Park
Eddy County
Lea County
New Mexico
Texas
Federal Highway
State Highway
Other Roads
Water Quality Sampling Program Wells



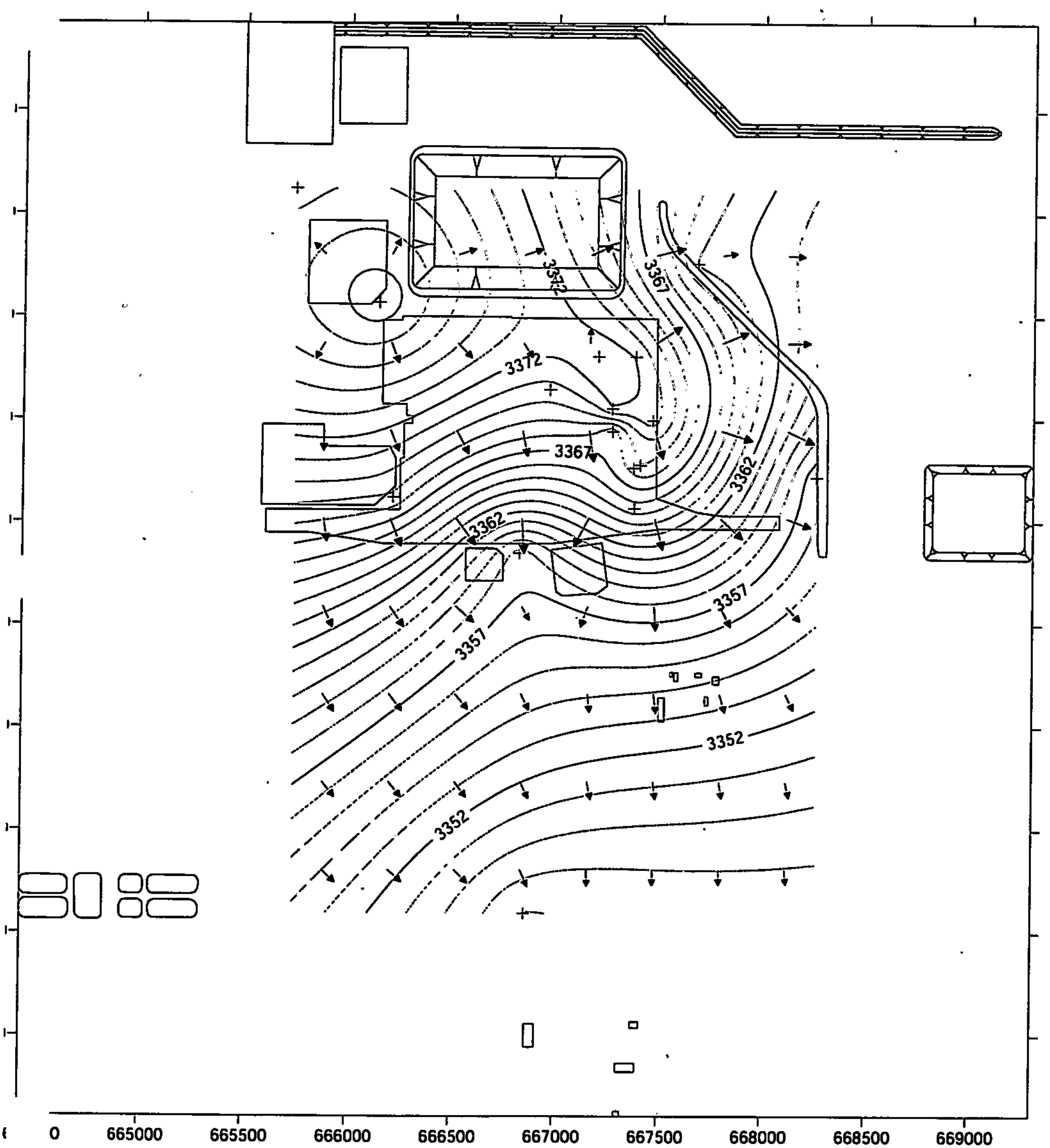
Legend

Salt Cells	Salt Storage Ponds	Storm Water Ponds	Facultative Lagoon
Salt Cell 1	Salt Storage Pond 1 (SSP1)	Storm Water Pond 1 (SWP1)	Settling Lagoon 1 (SL1)
Salt Cell 2	Salt Storage Pond 2 (SSP2)	Storm Water Pond 2 (SWP2)	Settling Lagoon 2 (SL2)
Salt Cell 3	Salt Storage Pond 3 (SSP3)	Storm Water Pond 3 (SWP3)	Polishing Lagoon 1 (PL1)
			Polishing Lagoon 2 (PL2)
			Evaporation Lagoon A (ELA)
			Evaporation Lagoon B (ELB)
			Evaporation Lagoon C (ELC)

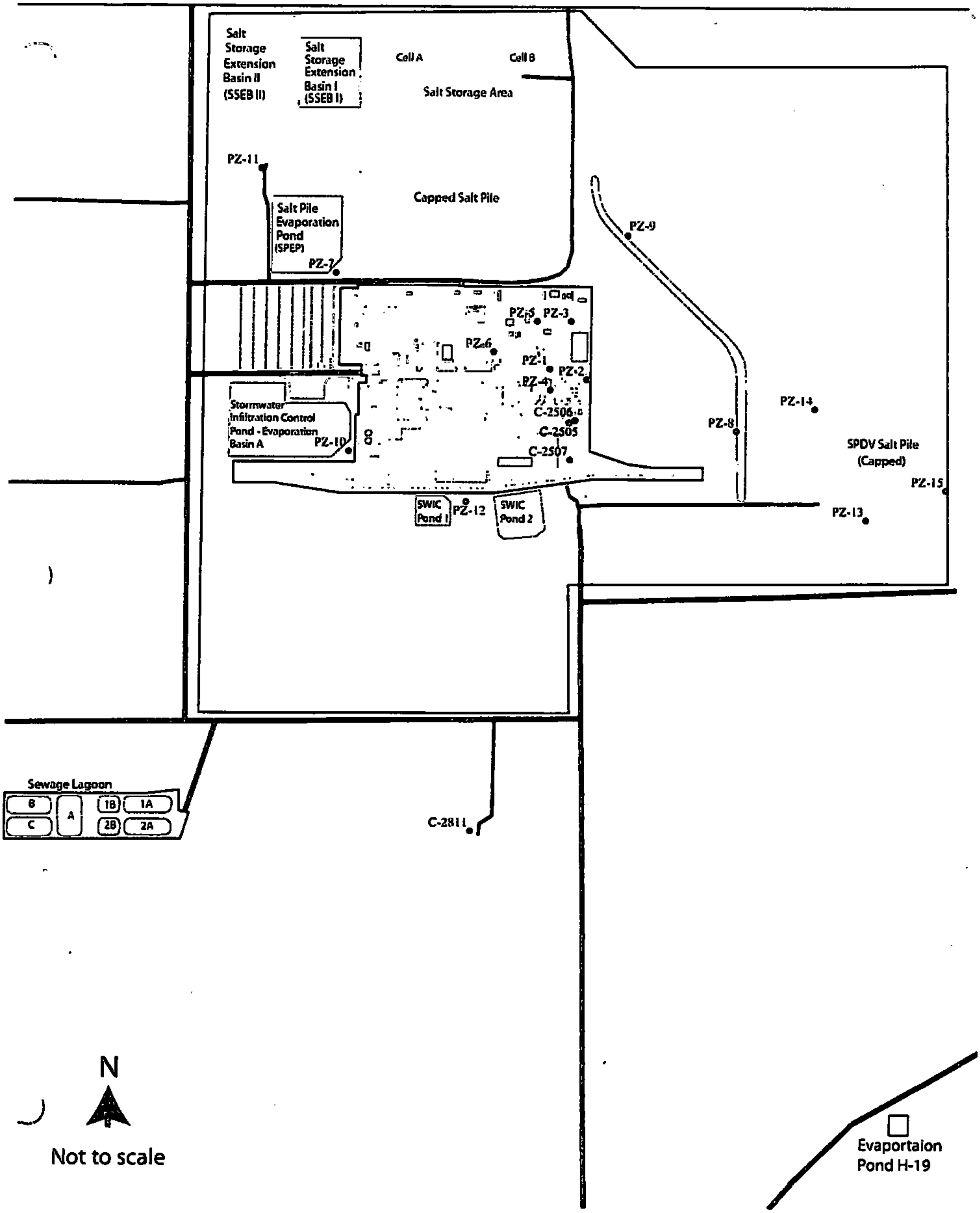
0 200 m

N

Contour Interval in Feet Above Mean Sea Level



Shallow Subsurface Wells and Regulated Units



Past Ground Water Monitoring Results
2004 Through 2017

	General Chemistry Parameters					Trace Metals	
Monitoring Site	**Sample Date**	**Nitrate (mg/L)**	**Sulfate (mg/L)**	**Chloride (mg/L)**	**TDS (mg/L)**	**Selenium (mg/L)**	**Chromium (mg/L)**
PZ-1	6/21/2004	<10	1,530	36,300	79,600	0.044	<0.00500
PZ-1	11/9/2004	1.3	6,530	45,700	85,800	0.106	<0.0100
PZ-1	5/17/2005	1.47	2,640	62,300	100,500	0.06	0.077
PZ-1	10/11/2005	2.59	1,950	54,900	74,800	0.043	<0.0100
PZ-1	5/16/2006	<2.5	2,490	62,400	113,000	0.051	<0.0100
PZ-1	10/10/2006	<1.00	1,390	55,300	70,200	<0.0500	<0.0250
PZ-1	5/9/2007	2.7	2,220	63,000	107,000	<0.0500	<0.0250
PZ-1	10/9/2007	<1.00	2,820	83,200	99,500	<0.1000	<0.0250
PZ-1	6/5/2008	<2.0	2,100	57,000	98,000	0.667	0.00218
PZ-1	10/14/2008	NA	2,200	59,000	94,000	NA	NA
PZ-1	5/19/2009	NA	2,200	54,000	96,000	NA	NA
PZ-1	10/19/2009	NA	2,300	66,000	101,000	NA	NA
PZ-1	5/25/2010	NA	2,200	53,000	92,800	NA	NA
PZ-1	10/26/2010	NA	1,800	62,000	96,100	NA	NA
PZ-1	5/24/2011	NA	2,000	51,000	85,200	NA	NA
PZ-1	10/5/2011	NA	2,000	50,000	84,600	NA	NA
PZ-1	5/16/2012	NA	2,100	54,000	82,100	NA	NA
PZ-1	10/2/2012	NA	2,110	48,100	84,200	NA	NA
PZ-1	5/14/2013	NA	1,840	35,800	74,400	NA	NA
PZ-1	10/22/2013	NA	2,050	42,500	100,000	NA	NA
PZ-1	5/13/2014	NA	2,010	44,000	76,000	NA	NA
PZ-1	10/14/2014	NA	2,090	46,700	84,800	NA	NA
PZ-1	5/13/2015	NA	1,830	40,800	73,400	NA	NA
PZ-1	11/10/2015	NA	1,740	37,100	75,800	NA	NA
PZ-1	5/31/2016	NA	1,740	42,900	79,600	NA	NA
PZ-1	9/28/2016	NA	1,940	34,000	67,000	NA	NA
PZ-1	5/31/2017	NA	1,890	37,600	71,200	NA	NA
PZ-1	10/10/2017	NA	1,900	36,100	63,900	NA	NA
PZ-5	6/21/2004	20.7	1,340	28,800	55,200	0.067	<0.00500
PZ-5	11/9/2004	<2.50	1,820	47800	86,000	0.094	<0.0100
PZ-5	5/17/2005	2.96	3,260	46,000	65,400	0.093	0.067
PZ-5	10/11/2005	5.14	769	14,000	32,800	0.062	<0.0100
PZ-5	5/16/2006	2.56	1,520	18,300	32,600	0.071	<0.0100
PZ-5	10/10/2006	5.04	1,330	28,800	47,400	<0.0500	<0.0250
PZ-5	5/9/2007	4.6	1,640	17,300	32,400	<0.0500	<0.0250
PZ-5	10/9/2007	<1.00	1,880	19,400	28,700	0.071	<0.005
PZ-5	6/5/2008	5.7	1,500	19,000	33,000	0.0801	0.00317
PZ-5	10/14/2008	NA	1,400	13,000	25,000	NA	NA
PZ-5	5/19/2009	NA	1,500	13,000	24,000	NA	NA
PZ-5	10/19/2009	NA	1,600	14,000	20,200	NA	NA
PZ-5	5/25/2010	NA	1,400	13,000	21,900	NA	NA
PZ-5	10/26/2010	NA	1,400	13,000	20,800	NA	NA
PZ-5	5/24/2011	NA	1,200	10,000	18,400	NA	NA

Past Ground Water Monitoring Results
2004 Through 2017

	General Chemistry Parameters					Trace Metals	
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-5	10/4/2011	NA	1,300	13,000	19,800	NA	NA
PZ-5	5/16/2012	NA	1,500	12,000	21,400	NA	NA
PZ-5	10/2/2012	NA	1,340	9,870	18,600	NA	NA
PZ-5	5/15/2013	NA	1,200	9,540	19,200	NA	NA
PZ-5	10/23/2013	NA	1,180	11,400	25,200	NA	NA
PZ-5	5/13/2014	NA	1,180	9,080	18,100	NA	NA
PZ-5	10/14/2014	NA	1,250	13,300	26,500	NA	NA
PZ-5	5/13/2015	NA	1,100	7,380	14,800	NA	NA
PZ-5	11/10/2015	NA	917	7,470	15,200	NA	NA
PZ-5	5/31/2016	NA	970	7,180	14,500	NA	NA
PZ-5	9/28/2016	NA	748	7,170	17,400	NA	NA
PZ-5	5/31/2017	NA	737	4,470	10,300	NA	NA
PZ-5	10/10/2017	NA	638	4,790	11,300	NA	NA
PZ-6	6/21/2004	21.2	2,860	70,500	134,000	0.017	<0.00500
PZ-6	11/9/2004	4.89	13,000	75,400	113,000	0.06	<0.0100
PZ-6	5/17/2005	4.25	3,610	109,000	160,500	0.05	0.054
PZ-6	10/11/2005	<20.0	2,850	83,800	106,000	0.021	<0.0100
PZ-6	5/16/2006	7.69	3,050	68,800	115,000	<0.0100	<0.0100
PZ-6	10/10/2006	252	2,790	79,800	134,000	<0.0500	<0.0250
PZ-6	5/9/2007	6.65	2,840	73,500	122,500	<0.0500	<0.0250
PZ-6	10/9/2007	<1.00	3,080	81,000	105,000	<0.1000	<0.0250
PZ-6	6/5/2008	6.1	2,100	47,000	81,000	0.0412	0.00259
PZ-6	10/14/2008	NA	2,500	58,000	87,000	NA	NA
PZ-6	5/19/2009	NA	2,700	61,000	89,000	NA	NA
PZ-6	10/19/2009	NA	2,300	50,000	83,600	NA	NA
PZ-6	5/25/2010	NA	2,300	47,000	82,100	NA	NA
PZ-6	10/26/2010	NA	1,900	47,000	72,300	NA	NA
PZ-6	5/24/2011	NA	1,700	37,000	67,700	NA	NA
PZ-6	10/5/2011	NA	1,900	41,000	69,800	NA	NA
PZ-6	5/16/2012	NA	1,800	41,000	67,200	NA	NA
PZ-6	10/2/2012	NA	2,130	52,200	78,700	NA	NA
PZ-6	5/15/2013	NA	2,060	47,900	86,900	NA	NA
PZ-6	10/22/2013	NA	2,120	46,000	90,500	NA	NA
PZ-6	5/13/2014	NA	2,040	46,600	80,800	NA	NA
PZ-6	10/14/2014	NA	2,160	49,800	80,400	NA	NA
PZ-6	5/13/2015	NA	2,180	49,200	77,000	NA	NA
PZ-6	11/10/2015	NA	1,900	37,500	69,200	NA	NA
PZ-6	5/31/2016	NA	1,680	31,000	50,500	NA	NA
PZ-6	9/28/2016	NA	1,330	21,900	43,100	NA	NA
PZ-6	5/31/2017	NA	1,230	21,000	39,300	NA	NA
PZ-6	10/10/2017	NA	1,260	20,800	37,500	NA	NA
PZ-7	6/21/2004	20.7	2,620	53,000	109,000	0.041	<0.00500
PZ-7	11/8/2004	2.89	7,460	43,600	80,400	0.088	<0.0100
PZ-7	5/16/2005	4.02	2,530	42,100	65,900	0.082	0.094
PZ-7	10/10/2005	6.37	2,770	61,000	88,000	0.047	<0.0100

Past Ground Water Monitoring Results
2004 Through 2017

	General Chemistry Parameters					Trace Metals	
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-7	5/15/2006	<5.3	3,190	54,100	139,000	0.068	<0.0100
PZ-7	10/9/2006	<1.00	2,890	66.800	81,500	<0.00100	<0.0500
PZ-7	5/7/2007	5.15	3,190	64,800	119,000	<0.0200	0.02
PZ-7	10/8/2007	<1.00	2,660	45,600	65,000	0.064	<0.00500
PZ-7	6/4/2008	5	2,300	49,000	86,000	0.0635	0.00257
PZ-7	10/13/2008	NA	1,700	27,000	42,000	NA	NA
PZ-7	5/18/2009	NA	3,700	76,000	120,000	NA	NA
PZ-7	10/20/2009	NA	4,200	67,000	106,000	NA	NA
PZ-7	5/24/2010	NA	3,000	68.000	103,000	NA	NA
PZ-7	10/25/2010	NA	3,000	75,000	103,000	NA	NA
PZ-7	5/23/2011	NA	2,700	60,000	101,000	NA	NA
PZ-7	10/4/2011	NA	3,100	81,000	116,000	NA	NA
PZ-7	5/15/2012	NA	3,000	64,000	96,600	NA	NA
PZ-7	10/3/2012	NA	4,380	67,500	106,000	NA	NA
PZ-7	5/13/2013	NA	3,050	58,500	112,000	NA	NA
PZ-7	10/22/2013	NA	3,100	61,100	126,000	NA	NA
PZ-7	5/13/2014	NA	2,650	35,400	114,000	NA	NA
PZ-7	10/13/2014	NA	3,530	74,500	136,000	NA	NA
PZ-7	5/12/2015	NA	3,240	68,200	118,000	NA	NA
PZ-7	11/9/2015	NA	2,960	44,900	114,000	NA	NA
PZ-7	5/24/2016	NA	3,790	75,400	109,000	NA	NA
PZ-7	9/27/2016	NA	2,850	51,600	99,300	NA	NA
PZ-7	5/30/2017	NA	2,890	59,800	111,000	NA	NA
PZ-7	10/9/2017	NA	2,170	36,800	80,100	NA	NA
PZ-8	10/15/2007	0.677	500	7,440	15,000	0.039	<0.00500
PZ-8	6/6/2008	1.8	630	11,000	16,000	0.0655	<0.001
PZ-9	6/21/2004	<20.0	3,740	80,200	140,000	<0.0100	<0.00500
PZ-9	11/9/2004	1.4	14,500	92,400	144,000	0.066	<0.0100
PZ-9	5/17/2005	2.82	5,090	182,000	164,000	0.05	0.071
PZ-9	10/11/2005	<20.0	3,930	85,500	107,000	0.022	<0.0100
PZ-9	5/16/2006	3.01	4,350	84,700	153,000	0.023	<0.0100
PZ-9	10/10/2006	<20.0	3,370	102,000	135,000	<0.0500	<0.0250
PZ-9	5/9/2007	3.28	4,320	89,600	164,000	<0.0500	<0.0250
PZ-9	10/9/2007	<200	4,720	116,000	144,000	<0.0200	<0.0050
PZ-9	6/5/2008	2.2	4,400	87,000	150,000	0.0351	0.00492
PZ-9	10/14/2008	NA	4,100	96,000	140,000	NA	NA
PZ-9	5/19/2009	NA	3,600	94,000	130,000	NA	NA
PZ-9	10/19/2009	NA	4,000	77,000	139,000	NA	NA
PZ-9	5/25/2010	NA	4,400	94,000	144,000	NA	NA
PZ-9	10/26/2010	NA	4,300	95,000	149,000	NA	NA
PZ-9	5/24/2011	NA	4300	83,000	147,000	NA	NA
PZ-9	10/4/2011	NA	4600	99,000	153,000	NA	NA
PZ-9	5/16/2012	NA	4,900	98,000	152.000	NA	NA

Past Ground Water Monitoring Results
2004 Through 2017

	General Chemistry Parameters					Trace Metals	
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-9	10/3/2012	NA	4,440	99,700	141,000	NA	NA
PZ-9	5/14/2013	NA	4,580	82,000	152,000	NA	NA
PZ-9	10/22/2013	NA	4,620	88,200	179,000	NA	NA
PZ-9	5/13/2014	NA	4,730	83,600	161,000	NA	NA
PZ-9	10/14/2014	NA	5,150	98,600	172,000	NA	NA
PZ-9	5/13/2015	NA	7,090	112,000	175,000	NA	NA
PZ-9	11/10/2015	NA	4,390	84,300	176,000	NA	NA
PZ-9	5/25/2016	NA	5,640	115,000	167,000	NA	NA
PZ-9	9/28/2016	NA	4,860	99,200	353,000	NA	NA
PZ-9	5/30/2017	NA	5,200	113,000	169,000	NA	NA
PZ-9	10/10/2017	NA	4,580	91,900	172,000	NA	NA
PZ-10	6/14/2004	3.81	469	368	1,714	0.02	<0.00500
PZ-10	11/8/2004	3.69	431	353	1,576	<0.0500	<0.0100
PZ-10	5/16/2005	3.63	572	416	1,756	0.044	0.037
PZ-10	10/10/2005	3.34	515	318	1,720	0.015	<0.0100
PZ-10	5/15/2006	3.42	539	460	1,830	0.014	<0.0100
PZ-10	10/9/2006	5.5	549	350	1,600	<0.00100	<0.0500
PZ-10	5/7/2007	14.8	407	274	1,504	<0.0200	0.02
PZ-10	10/8/2007	<1.00	211	186	968	0.026	<0.0050
PZ-10	6/4/2008	4.5	390	300	1,500	0.0144	0.00119
PZ-10	10/13/2008	NA	380	290	1,400	NA	NA
PZ-10	5/18/2009	NA	530	460	1,800	NA	NA
PZ-10	10/20/2009	NA	500	440	1,730	NA	NA
PZ-10	5/24/2010	NA	500	370	1,680	NA	NA
PZ-10	10/25/2010	NA	410	360	1,530	NA	NA
PZ-10	5/23/2011	NA	400	310	1,620	NA	NA
PZ-10	10/4/2011	NA	440	370	1,640	NA	NA
PZ-10	5/15/2012	NA	450	410	1,650	NA	NA
PZ-10	10/1/2012	NA	480	414	1,700	NA	NA
PZ-10	5/13/2013	NA	426	394	1,580	NA	NA
PZ-10	10/21/2013	NA	434	348	1,710	NA	NA
PZ-10	5/12/2014	NA	471	407	1,840	NA	NA
PZ-10	10/13/2014	NA	178	167	910	NA	NA
PZ-10	5/12/2015	NA	435	370	1,620	NA	NA
PZ-10	11/9/2015	NA	339	255	1,310	NA	NA
PZ-10	5/24/2016	NA	274	200	1,100	NA	NA
PZ-10	9/27/2016	NA	116	113	805	NA	NA
PZ-10	5/30/2017	NA	203	173	998	NA	NA
PZ-10	10/9/2017	NA	161	135	414	NA	NA
PZ-11	6/21/2004	20.8	2,220	58,100	123,000	<0.0100	<0.00500
PZ-11	11/8/2004	3.15	13,000	84,100	119,000	<0.0500	<0.0100
PZ-11	5/16/2005	4.63	2,890	66,000	100,000	<0.0100	<0.0100
PZ-11	10/10/2005	<20.0	2,950	84,300	129,000	0.013	<0.0100
PZ-11	5/15/2006	<5.3	3,090	71,000	133,000	<0.0100	<0.0100
PZ-11	10/9/2006	<1.00	2,550	85,800	123,000	<0.00100	<0.0500

Past Ground Water Monitoring Results
2004 Through 2017

	General Chemistry Parameters					Trace Metals	
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-11	10/8/2007	<1.00	2,970	94,400	108,000	<0.0200	<0.0050
PZ-11	6/4/2008	3.9	2,100	65,000	110,000	0.0149	0.00216
PZ-11	10/13/2008	NA	3,000	79,000	110,000	NA	NA
PZ-11	5/18/2009	NA	2,500	72,000	110,000	NA	NA
PZ-11	10/20/2009	NA	3,200	64,000	112,000	NA	NA
PZ-11	5/24/2010	NA	2,500	69,000	107,000	NA	NA
PZ-11	10/25/2010	NA	2,300	77,000	100,000	NA	NA
PZ-11	5/23/2011	NA	2,000	45,000	80,500	NA	NA
PZ-11	10/3/2011	NA	2,300	65,000	92,200	NA	NA
PZ-11	5/15/2012	NA	2,400	59,000	93,200	NA	NA
PZ-11	10/3/2012	NA	2,220	53,000	95,600	NA	NA
PZ-11	5/13/2013	NA	2,270	64,800	105,000	NA	NA
PZ-11	10/21/2013	NA	2,360	59,000	123,000	NA	NA
PZ-11	5/12/2014	NA	2,260	45,000	102,000	NA	NA
PZ-11	10/13/2014	NA	2,740	68,800	123,000	NA	NA
PZ-11	5/12/2015	NA	2,590	57,000	105,000	NA	NA
PZ-11	11/9/2015	NA	2,770	59,900	96,400	NA	NA
PZ-11	5/24/2016	NA	2,640	54,900	93,200	NA	NA
PZ-11	9/27/2016	NA	2,240	43,300	82,700	NA	NA
PZ-11	5/30/2017	NA	911	18,000	40,000	NA	NA
PZ-11	10/9/2017	NA	1,710	49,800	61,900	NA	NA
PZ-12	6/14/2004	11.2	773	5,320	9,700	0.077	<0.00500
PZ-12	11/8/2004	19.8	879	7,170	9,540	0.066	<0.0100
PZ-12	5/16/2005	8.85	679	3,730	5,890	0.051	0.054
PZ-12	10/10/2005	426	805	3,790	7,740	0.02	<0.0100
PZ-12	5/15/2006	20.6	866	4,510	8,790	0.019	<0.0100
PZ-12	10/9/2006	13.2	795	5,340	9,150	<0.00100	<0.0500
PZ-12	5/7/2007	10.8	831	3,780	7,010	<0.0200	0.024
PZ-12	10/8/2007	<1.00	958	4,310	6,200	0.026	<0.0050
PZ-12	6/4/2008	11	760	3,300	6,800	0.0291	0.00132
PZ-12	10/13/2008	NA	850	3,300	7,000	NA	NA
PZ-12	5/18/2009	NA	870	4,600	8,300	NA	NA
PZ-12	10/20/2009	NA	980	6,500	10,100	NA	NA
PZ-12	5/24/2010	NA	990	5,500	10,100	NA	NA
PZ-12	10/25/2010	NA	990	5,800	10,300	NA	NA
PZ-12	5/23/2011	NA	900	5,600	10,900	NA	NA
PZ-12	10/3/2011	NA	900	6,800	13,100	NA	NA
PZ-12	5/15/2012	NA	620	6,400	9,400	NA	NA
PZ-12	10/1/2012	NA	503	5,290	9,780	NA	NA
PZ-12	5/13/2013	NA	449	3,990	7,610	NA	NA
PZ-12	10/21/2013	NA	415	3,320	8,110	NA	NA
PZ-12	5/12/2014	NA	374	2,490	5,640	NA	NA
PZ-12	10/13/2014	NA	409	2,440	6,100	NA	NA

Past Ground Water Monitoring Results
2004 Through 2017

	General Chemistry Parameters					Trace Metals	
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-12	5/12/2015	NA	665	4,470	8,720	NA	NA
PZ-12	11/9/2015	NA	627	3,450	8,280	NA	NA
PZ-12	5/24/2016	NA	560	2,570	6,100	NA	NA
PZ-12	9/27/2016	NA	548	2,460	6,240	NA	NA
PZ-12	5/30/2017	NA	509	2,470	6,100	NA	NA
PZ-12	10/9/2017	NA	521	2,840	6,740	NA	NA
PZ-13	10/10/2007	12.4	2,670	150,000	245,500	<0.100	<0.00500
PZ-13	6/6/2008	<200	2,600	170,000	240,000	0.0118	0.00316
PZ-13	10/13/2008	NA	2,900	160,000	230,000	NA	NA
PZ-13	5/18/2009	NA	3,300	180,000	240,000	NA	NA
PZ-13	10/20/2009	NA	3,300	170,000	255,000	NA	NA
PZ-13	5/24/2010	NA	3,000	170,000	240,000	NA	NA
PZ-13	10/26/2010	NA	2,900	190,000	246,000	NA	NA
PZ-13	5/24/2011	NA	2,700	150,000	248,000	NA	NA
PZ-13	10/4/2011	NA	3,000	170,000	259,000	NA	NA
PZ-13	5/15/2012	NA	3,300	160,000	252,000	NA	NA
PZ-13	10/2/2012	NA	3,260	170,000	263,000	NA	NA
PZ-13	5/14/2013	NA	3,130	144,000	260,000	NA	NA
PZ-13	10/22/2013	NA	3,220	139,000	262,000	NA	NA
PZ-13	5/13/2014	NA	2,900	104,000	265,000	NA	NA
PZ-13	10/14/2014	NA	3,100	179,000	274,000	NA	NA
PZ-13	5/13/2015	NA	3,550	197,000	267,000	NA	NA
PZ-13	11/10/2015	NA	2,980	118,000	233,000	NA	NA
PZ-13	5/25/2016	NA	1,600	168,000	260,000	NA	NA
PZ-13	9/28/2016	NA	2,790	153,000	236,000	NA	NA
PZ-13	5/31/2017	NA	2,730	150,000	251,000	NA	NA
PZ-13	10/10/2017	NA	2,650	134,000	251,000	NA	NA
PZ-14	10/15/2007	1.41	2,140	71,500	106,000	<0.0100	<0.00500
PZ-14	6/6/2008	<100	3,300	130,000	180,000	0.0201	0.00168
PZ-15	10/15/2007	2.97	169	764	2,060	0.022	<0.00500
PZ-15	6/6/2008	12	160	460	1,600	0.00372	<0.001
C-2811	6/14/2004	6.06	299	769	2,022	0.047	<0.00500
C-2811	11/8/2004	7.63	305	1,030	1,996	0.054	<0.0100
C-2811	5/16/2005	6.02	524	1,930	3,740	0.058	0.053
C-2811	10/10/2005	7.48	584	2,250	4,410	0.034	<0.0100
C-2811	5/15/2006	6.94	511	1,760	3,740	0.031	<0.0100
C-2811	10/9/2006	6.05	402	1,310	2,100	<0.00100	<0.0500
C-2811	5/7/2007	5.31	516	1,760	4,205	<0.0200	0.031
C-2811	10/8/2007	<1.00	635	2,980	3,860	0.051	<0.0050
C-2811	6/4/2008	5.7	390	1,300	2,800	0.0017	0.035
C-2811	10/13/2008	NA	320	1,000	2,100	NA	NA
C-2811	5/18/2009	NA	360	1,200	2,300	NA	NA
C-2811	10/20/2009	NA	320	1,000	2,120	NA	NA
C-2811	5/24/2010	NA	340	920	2,090	NA	NA
C-2811	10/25/2010	NA	370	1,100	2,470	NA	NA

Past Ground Water Monitoring Results
2004 Through 2017

	General Chemistry Parameters					Trace Metals	
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
C-2811	5/23/2011	NA	350	960	2,370	NA	NA
C-2811	10/3/2011	NA	340	910	2,330	NA	NA
C-2811	5/14/2012	NA	320	810	1,870	NA	NA
C-2811	10/1/2012	NA	337	862	2,100	NA	NA
C-2811	5/13/2013	NA	328	872	2,090	NA	NA
C-2811	10/21/2013	NA	341	838	2,490	NA	NA
C-2811	5/13/2014	NA	297	865	2,250	NA	NA
C-2811	10/14/2014	NA	277	827	2,580	NA	NA
C-2811	5/12/2015	NA	586	1,430	3,460	NA	NA
C-2811	11/9/2015	NA	451	1260	3,300	NA	NA
C-2811	5/24/2016	NA	491	1,210	2,720	NA	NA
C-2811	9/27/2016	NA	422	1,100	2,820	NA	NA
C-2811	5/30/2017	NA	479	1,020	3,100	NA	NA
C-2811	10/9/2017	NA	375	1,110	2,640	NA	NA
C-2507	6/21/2004	7.55	717	1,300	3,830	0.029	0.028
C-2507	11/9/2004	7.58	824	1,380	3,350	0.08	0.014
C-2507	5/17/2005	7.94	860	1,370	3,340	0.078	0.063
C-2507	10/11/2005	6.13	920	1,630	3,240	0.047	<0.0100
C-2507	5/16/2006	7.37	1,040	1,930	5,300	0.051	<0.0100
C-2507	10/10/2006	2.9	943	3,640	1,740	<0.0500	<0.0250
C-2507	5/9/2007	6.62	1,110	3,060	5,485	<0.0500	<0.0250
C-2507	10/9/2007	<1.00	1,220	3,500	5,540	0.055	0.007
C-2507	6/5/2008	6.9	990	2,800	5,800	0.0637	0.00493
C-2507	10/14/2008	NA	940	2,200	5,100	NA	NA
C-2507	5/19/2009	NA	950	2,600	5,200	NA	NA
C-2507	10/19/2009	NA	930	3,400	5,710	NA	NA
C-2507	5/25/2010	NA	910	3,500	6,640	NA	NA
C-2507	10/26/2010	NA	980	3,500	7,120	NA	NA
C-2507	5/24/2011	NA	790	3,200	6,190	NA	NA
C-2507	10/5/2011	NA	810	3,400	6,660	NA	NA
C-2507	5/16/2012	NA	800	2,800	5,720	NA	NA
C-2507	10/1/2012	NA	774	2,970	6,790	NA	NA
C-2507	5/14/2013	NA	704	2,820	6,020	NA	NA
C-2507	10/21/2013	NA	692	3,270	8,350	NA	NA
C-2507	5/13/2014	NA	643	2,770	7,590	NA	NA
C-2507	10/14/2014	NA	693	3,830	9,180	NA	NA
C-2507	5/13/2015	NA	683	3,430	7,590	NA	NA
C-2507	11/10/2015	NA	605	2,800	6,850	NA	NA
C-2507	5/31/2016	NA	679	3,110	6,620	NA	NA
C-2507	9/28/2016	NA	626	2,960	7,280	NA	NA
C-2507	5/31/2017	NA	683	3,490	8,020	NA	NA
C-2507	10/10/2017	NA	627	2,890	7,270	NA	NA
WQSP-6A	7/13/1995	7.62	1,905	1,040	11,000	<0.006	<0.025
WQSP-6A	3/28/1996	3.98	1,810	507	3,920	<0.013	<0.025
WQSP-6A	7/11/1996	2.75	1,971	6,748	4,500	0.02	<0.025

Past Ground Water Monitoring Results
2004 Through 2017

		General Chemistry Parameters				Trace Metals	
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
WQSP-6A	4/10/1997	4.64	2,240	675	3,960	0.017	<0.025
WQSP-6A	7/10/1997	4.04	2,560	660	3,840	<0.050	<0.1000
WQSP-6A	6/10/1998	6.19	1,950	644	4,120	0.016	0.0015
WQSP-6A	11/3/1998	11	2,100	770	4,100	0.22	<0.500
WQSP-6A	5/26/1999	7	1,900	540	3,800	<0.100	<0.050
WQSP-6A	11/10/1999	9.4	1,900	540	3,800	<0.050	<0.050
WQSP-6A	5/24/2000	7.5	2,100	530	3,800	0.0129	<0.020
WQSP-6A	11/30/2000	6.7	1,900	480	3,700	<0.0130	<0.025
WQSP-6A	6/6/2001	6.37	1,900	536	3,680	0.0385	<0.025
WQSP-6A	11/14/2001	3.67	1,900	414	4,600	<0.050	<0.010
WQSP-6A	5/22/2002	5.52	1,930	487	3,540	<0.050	<0.010
WQSP-6A	11/20/2002	5.61	2,090	419	3,685	<0.050	<0.010
WQSP-6A	5/21/2003	4.74	1,950	384	3,650	<0.123	<0.050
WQSP-6A	11/19/2003	<0.01	1,950	391	3,955	<0.219	<0.025
WQSP-6A	5/26/2004	9.61	1,970	416	3,646	<0.025	<0.025
WQSP-6A	11/17/2004	6.72	1,960	491	3,655	<0.025	<0.025
WQSP-6A	4/20/2005	5.98	1,920	432	3,700	0.057	<0.025
WQSP-6A	10/19/2005	<0.01	1,940	360	3,430	<0.025	<0.025
WQSP-6A	5/3/2006	2.5	2,210	450	3,200	<0.025	<0.025
WQSP-6A	9/20/2006	6	2,120	360	3,515	<0.025	<0.025
WQSP-6A	3/7/2007	5.78	2,170	484	3,355	<0.025	<0.025
WQSP-6A	9/12/2007	5.47	1,950	350	3,400	<0.025	<0.025
WQSP-6A	3/12/2008	4.67	2,090	378	3,400	<0.025	<0.025
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	TKN (mg/l)	
WQSP-6A	9/10/2008	5.69	2,030	348	3,150	< 5	
WQSP-6A	3/4/2009	5.9	2,100	350	3,500	<1.0	
WQSP-6A	9/10/2009	6.3	2,100	350	3,640	<1.0	
WQSP-6A	3/3/2010	6.55	2,145	330	3,545	<1.0	
WQSP-6A	9/23/2010	6.34	2,090	321	3,500	<1.0	
WQSP-6A	5/26/2011	6.5	2,100	270	3,480	<1.0	
WQSP-6A	10/6/2011	5.9	2,100	280	3,450	<1.0	
WQSP-6A	5/16/2012	5.4	2,200	310	3,340	<1.0	
WQSP-6A	10/2/2012	5.1	2,110	301	3,400	<1.0	
WQSP-6A	5/14/2013	5.29	2,260	318	3,420	<1.0	
WQSP-6A	10/23/2013	5.85	1,840	284	3,540	<1.0	
WQSP-6A	5/14/2014	5.4	1,870	342	3,500	<1.0	
WQSP-6A	10/15/2014	5.38	2,000	285	3,360	<1.0	
WQSP-6A	5/14/2015	5.11	1,940	294	3,520	<1.0	
WQSP-6A	11/11/2015	5.45	1,840	296	3,290	<1.0	
WQSP-6A	5/25/2016	4.91	1,900	379	3,380	<1.0	
WQSP-6A	9/29/2016	5.61	1,860	286	3,490	<1.0	
WQSP-6A	6/1/2017	5.27	1,870	322	3,380	<1.0	
WQSP-6A	10/11/2017	4.87	1,880	342	3,390	<1.0	
NA: Not Analyzed, parameter not required, per permit conditions.							

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

OCT 3 0 2018

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NOV 2 2018
Ground Water Quality Bureau

Ms. Michelle Hunter, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Notification of Discharge: One Week Written Notifications and 15 Day Corrective Action Plan, Discharge Permit 831

Dear Ms. Hunter:

The purpose of this letter is to provide the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) with the subject notifications and corrective action plan pursuant to the Contingency Plan notification requirements in Discharge Permit 831 (DP-831) issued to the U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO). This notification is a follow up to the 24-hour notifications provided to Mr. R. Strauch on October 18, 2018 and October 24, 2018. This reflects the action plan verbally discussed with Mr. Strauch. The following items are being addressed per DP-831 Conditions 31 and 32, of the Permit Contingency Plan section.

Permit Condition 31

This Contingency Plan addresses the excess above freeboard in Storm Water Ponds 1, 2, and 3 with the need to discharge this excess storm water outside of Storm Water Pond 3 due to two separate storm events on October 16 – 18, 2018 and October 22 – 24, 2018. It is anticipated that this can be completed by November 7, 2018.

The October 16 – 18, 2018 Storm Event:

Rainfall ran directly into the storm water ponds and filled Storm Water Pond 2 to capacity. In order to prevent overtopping and to attain freeboard, WIPP facility personnel pumped storm water from Storm Water Pond 2 to Storm Water pond 3. Freeboard in Storm Water Pond 2 was attained, but additional rainfall caused Storm Water Pond 3 to fill to capacity and ultimately caused storm water to go over the outfall of Storm Water Pond 3. The CBFO proposes to pump storm water from Storm Water Pond 3 to the environment to attain one-foot freeboard. This will allow capacity in the Storm Water Pond 3 to be able to contain additional run-off in the event more rainfall occurs.

The October 22 – 24, 2018 Storm Event:

Before any pumping of Storm Water Pond 3 could commence, a second storm event during October 22 – 24, 2018 occurred filling Storm Water Pond 1 to above freeboard, and causing Storm Water Pond 3 to flow again through the outfall. CBFO again proposes to pump storm water from Storm Water Pond1 into Storm Water Pond 3, and to pump storm water from Storm Water Pond 3 to the environment to attain freeboard in both ponds.

CBFO:OEP:MRB:AC:18-0367:UFC 5486.00

As the current matter addresses storm water run-off only, no further corrective measures are proposed. The other evaporation ponds are associated with the sewage treatment facility and salt water containment, and these are well below freeboard.

Permit Condition 32

This report confirms the CBFO calls to Mr. Ron Strauch on October 18, 2018 notifying him of the discharge from Storm Water Pond 3, and October 24, 2018, informing the GWQB of the overflow of Storm Water Pond 3 and the need to pump storm water from Storm Water Pond 1 into Storm Water Pond 3, and then pump water from Storm Water Pond 3 to the environment to attain freeboard capacity. After freeboard is attained in the Storm Water Ponds 1 and 3, the DOE will end the discharge, and evaporation will continue to decrease water levels.

Contingency Plan Information

The following information (a-g) completes the one-week notification, required in Section 32 in the DP-831 Permit.

(a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility:

Person in charge of the facility:
Todd Shrader, Manager
P.O. Box 3090
Carlsbad, New Mexico, 88221
(575) 234-7300

Owner of the facility:
U.S. Department of Energy

Operator of the facility:
Nuclear Waste Partnership LLC

(b) Name and address of the facility:

U.S. Department of Energy
Waste Isolation Pilot Plant (WIPP)
26 miles southeast of Carlsbad, New Mexico off of State Highway 128
Carlsbad, NM 88220

(c) The date, time, location, and duration of the discharge:

Dates: October 18 – 19, 2018 and October 23 – 25, 2018
Time: N/A
Location: WIPP Facility (Latitude: 32 22.589, Longitude 103 47.746)
Duration of Discharge: October 188 –21, 2018 and
October 22 – 25, 2018

(d) The source and cause of the discharge:

Source: Runoff from the WIPP facility occurring from rainfall events October 16 - 18 and October 22 - 24, 2018.

Cause of discharge:

September 4, 2018 through September 10, 2018 the WIPP Facility received 4.61 inches of precipitation which filled Storm Water Pond 3. A report was sent to the GWQB and freeboard in Storm Water Ponds 2 and 3 were attained by pumping storm water from pond 2 to 3 and then from 3 to the environment. October 16 through October 19, 2018, the WIPP facility received an additional 1.3 inches of precipitation that caused Storm Water Pond 3 to overflow.

Then on October 22 – 24 the WIPP facility received another 1.34 inches of precipitation. On October 24, 2018, the CBFO informed the GWQB of the exceedance of freeboard in Pond 1 and the outflow of water from Storm Water Pond 3.

(e) A description of the discharge, including chemical composition:

The outflow from Storm Water Pond 3 was storm water runoff from the WIPP facility. Historical chemical sampling and analysis from storm water runoff have shown no exceedances of analyte limits (see attached recent analytical data). Samples collected consistent with DP-831 Condition 20 and the chemical composition will be noted in the next semi-annual report submitted to the GWQB.

(f) The estimated volume of the discharge:

There is no device for measuring the overflow of Storm Water Pond 3. Discharge volumes were estimated using standard stream flow calculations. Also, amounts of water outflow are conservative estimations. Storm Water Pond 3 has an engineered spillway to prevent erosion. Therefore, there is no erosion damage to pond berms or liner integrity. The estimated amount of outflow from the spillway and from pumping to the environment is as follows:

October 16-18 Storm Event
- Storm Water Pond 3 – 1,211,760 gallons.
  - This includes water from Storm Water Pond 2 pumped into Storm Water Pond 3 to attain freeboard in Storm Water Pond 2.

October 22-24 Storm Event
- Storm Water Pond 3 – 1,615,680 gallons

(g) Any actions taken to mitigate immediate damage from this discharge:

There was no damage from these discharges. To establish freeboard, excess storm water above freeboard will be pumped to the environment.

Corrective Action Plan

The following information (a-c) completes the 15-day Corrective Action Report/Plan required in Section 32 in the DP-831 Permit.

a) A description of proposed actions to prevent future unauthorized discharge.

Corrective measures include allowing Storm Water Pond 3 to overflow through the designed outflow. In addition, clean storm water will be pumped from Storm Water Ponds 1 and 3 to the environment to keep these ponds within permitted requirements. If additional rainfall occurs, the storm water will be allowed to overflow the Storm Water Ponds.

b) A description of proposed actions to prevent future unauthorized discharges of this nature.

The DOE attempts to contain as much storm water as possible in order to minimize recharge to an anthropogenic water table beneath the facility. When the rainfall amounts to more that can be managed to maintain freeboard, excess storm water is discharged.

c) A schedule for completion of proposed actions.

It is anticipated that freeboard in Storm Water Ponds 1 and 3 will be achieved by November 8, 2018.

Upon review of this matter, it is believed that this outflow of storm water runoff poses no threat to human health and environment. The corrective actions described are intended to meet all notification requirements of DP-831. No additional documentation transmittal to the GWQB is required, if events remain unchanged. If conditions or additional information changes the path forward, the NMED will be notified. Results of this effort will be included in the next semi-annual report submitted to the GWQB.

If you have any further questions regarding this matter or need additional information, please contact me at (575) 234-7476.

Sincerely,

Michael R. Brown, Director
Office of Environmental Protection

Enclosures

cc: w/enclosure

S. Pullen, NMED	*ED
R. Strauch, NMED	ED
R. Maestas, NMED	ED
CBFO M&RC	ED

*Denotes electronic distribution

CBFO:OEP:MRB:AC:18-0367:UFC 5486.00

Chloride, Sulfate, and Total Dissolved Analyses

For Storm Water Ponds 1, 2, and 3

Collected on October 3, 2018

10 pages

Data Review Report

DP-831 Infiltration Controls, Fall 2018
SDG 1810279
T502542-4

Table 1. Sample Summary

Date:	October 23, 2018
Requester:	Bill Jaco
Reviewer	Hnin Khaing
Sample Types:	DP-831 Infiltration Controls
Date Samples Collected:	October 03, 2018
Laboratory:	Hall Environmental Analysis Lab (HEAL)
Date Report Submitted by lab:	October 12, 2018
Date Samples Shipped/Method	October 3, 2018 by Fed Ex
Date Samples Received by lab:	October 4, 2018 1115
Sample Receipt Condition:	Samples intact at 1.2 deg. C
WIPP Chain of Custody/Request for Analysis:	10427
Analysis Results Reviewed:	Chloride, Sulfate, TDS
Analyses Reviewed and Reported in this Document:	Chloride, sulfate by EPA Method 300.0, TDS by Standard Method No. 2540C
Chloride, Sulfate Analysis Date(s):	October 6, 2018, October 8, 2018
TDS Analysis Date(s):	October 8, 2018

Sample Discussion

The NWP sample numbers and corresponding lab sample numbers are presented in Table 2 below. The sample numbers and corresponding locations are provided in Table 3 along with the analysis results. The sample set includes duplicate samples from Storm Water Pond 3 (SWP3). The sample set also included a field blank.

Table 2. 2018 Infiltration Control Sample Cross Reference

NWP Sample No.	Lab ID	Time Collected on 10/03/2018	Analytes
WR-SWP1-20181003-1.1	1810279-001	0839	Chloride, sulfate, TDS
WR-SWP2-20181003-1.1	1810279-002	0848	Chloride, sulfate, TDS
WR-SWP3-20181003-1.2	1810279-003	0901	Chloride, sulfate, TDS
WR-SWP3-20181003-2.2	1810279-004	0901	Chloride, sulfate, TDS
WR-Blk-20181003-1.1	1810279-005	0905	Chloride, sulfate, TDS

Sample Results Summary

The analysis results for the 2018 Infiltration Control samples are presented in Table 3 below.

Table 3. 2018 Infiltration Control Analysis Results

Sample No.	Location	Cl^-	SO_4^{--}	TDS
WR-SWP1-20181003-1.1	Storm Water Pond 1	37.8	5.33	131
WR-SWP2-20181003-1.1	Storm Water Pond 2	47.1	5.13	136
WR-SWP3-20181003-1.2	Storm Water Pond 3	59.9	11.5	206
WR-SWP3-20181003-2.2	Storm Water Pond 3	60.5	11.9	214
WR-Blk-20181003-1.1	Field Blank	ND	0.348	ND

ND - Not Detected

The analysis results in Table 3 show a close range of concentrations for chloride, sulfate, and TDS. The lowest concentrations for all three target analytes were detected in Storm Water Pond 1. The only analyte detected in the field blank sample was a trace of sulfate at less than one mg/L.

QC Analysis Results Summary

A limited number of QC analyses were performed for these routine anion and TDS measurements. QC samples were analyzed according to the standard methods used for the analyses and the laboratory standard operating procedures (SOPs). This batch of samples contained Initial Calibration Verification (ICV) standards, continuing calibration verification (CCV) standards, laboratory method blank (MB) samples; and a field blank sample. A laboratory control sample (LCS), which is a blank spike, was analyzed for chloride and sulfate; a LCS was analyzed for TDS; no matrix spike/matrix spike duplicate (MS/MSD) was analyzed and a field duplicate from field blank was analyzed for TDS. No LCS duplicates (LCSDs) were analyzed for determination of precision as relative percent difference (RPD).

The ICVs and CCVs met the accuracy objective of 90 to 110 percent recovery and are not shown in the table. The method blank results were all non-detect (ND). Thus there was no adverse effect on the accuracy of the sample analyses from the method blank sample analysis results. The only target analyte detected in the field blank sample was sulfate at 0.35 mg/L, which is negligible compared to the sample concentrations.

LCS and LCSD samples are blank spikes, i.e., distilled water spiked with a known concentration of the analytes. The recoveries provide an indication of whether the analyses are in control, and the analysis of the LCSD provides an indication of the precision of the analyses. The accuracy quality assurance objective for LCS/LCSD analyses are 90 to 110 percent recovery and a relative percent difference of the sample concentrations of less than 10 RPD for anions and less than 5 RPD for TDS. (However, LCSD samples were not analyzed for the target analytes in this sample batch.)

MS/MSD analyses provide an indication of whether the matrix of the sample may affect the accuracy of the analyses for the target analytes, and they also provide an indication of the precision of the analyses. The measurement quality objectives for accuracy are recoveries of 80 to 120 percent and a relative percent difference of the sample concentrations of less than 10 for anions and less than 5 for TDS. (However, MS/MSD samples were not analyzed in this sample batch.)

There are no firm precision requirements for field duplicate samples, but a RPD of less than 10 should be expected for two samples collected at the same time.

Table 4 shows results for the QC samples associated with the infiltration control samples.

Table 4. QC Analysis Results for the Fall 2018 Infiltration Control Samples

		Concentration, mg/L				
Sample	**Parameter**	**Native**	**Spike**	**Measured**	**% Rec.**	**RPD**
LCS	Chloride	0.0	5.00	4.8	95.5	NA
LCS	Sulfate	0.0	10.0	9.4	94.4	NA
LCS	TDS	0.0	1,000	1010	101	NA
BLK	TDS	0.0	0.0	ND	NA	NA
BLK Dup	TDS	0.0	0.0	ND	NA	0

NA-not applicable

The measurement quality objectives were met for the LCS analyses of chloride and sulfate. The measurement quality objectives were met for the analyses of the LCS for TDS. The only precision analysis was only performed for TDS on the field blank sample. Since TDS was not detected in the blank sample, RPD for the duplicate analysis is zero.

<u>Overall Data Package Summary</u>

The lab's data packet contained valid and usable data and information and should meet the needs of the DP-831 Program for analysis of infiltration control samples.

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Waste Isolation Pilot Plant		**Client Sample ID:** WR-SSP1-20181003-L1	
Project: ENVIRONMENTAL		**Collection Date:** 10/3/2018 8:39:00 AM	
Lab ID: 1810279-001	**Matrix:** AQUEOUS	**Received Date:** 10/4/2018 8:00:00 AM	

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Chloride	37.8	1.82	5.00		mg/L	10	10/6/2018 3:03:10 PM	R54697
Sulfate	5.33	1.25	5.00		mg/L	10	10/6/2018 3:03:10 PM	R54697
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: KS	
Total Dissolved Solids	131	20.0	20.0		mg/L	1	10/8/2018 5:22:00 PM	40832

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Waste Isolation Pilot Plant
Project: ENVIRONMENTAL
Lab ID: 1810279-002 **Matrix:** AQUEOUS

Client Sample ID: WR-SWP2-20181003-1.1
Collection Date: 10/3/2018 8:48:00 AM
Received Date: 10/4/2018 8:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Chloride	47.1	1.82	5.00		mg/L	10	10/6/2018 3:28:00 PM	R54697
Sulfate	5.13	1.25	5.00		mg/L	10	10/6/2018 3:28:00 PM	R54697
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: KS	
Total Dissolved Solids	136	20.0	20.0		mg/L	1	10/8/2018 5:22:00 PM	40832

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:				
	*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Waste Isolation Pilot Plant
Project: ENVIRONMENTAL
Lab ID: 1810279-003 **Matrix:** AQUEOUS

Client Sample ID: WR-SWP3-20181003-1.2
Collection Date: 10/3/2018 9:01:00 AM
Received Date: 10/4/2018 8:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Chloride	59.9	1.82	5.00		mg/L	10	10/6/2018 3:52:49 PM	R54697
Sulfate	11.5	1.25	5.00		mg/L	10	10/6/2018 3:52:49 PM	R54697
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: KS	
Total Dissolved Solids	206	20.0	20.0		mg/L	1	10/8/2018 5:22:00 PM	40832

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Waste Isolation Pilot Plant
Project: ENVIRONMENTAL
Lab ID: 1810279-004 **Matrix:** AQUEOUS

Client Sample ID: WR-SWP3-20181003-2.2
Collection Date: 10/3/2018 9:01:00 AM
Received Date: 10/4/2018 8:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Chloride	60.5	1.82	5.00		mg/L	10	10/6/2018 4:17:38 PM	R54697
Sulfate	11.9	1.25	5.00		mg/L	10	10/6/2018 4:17:38 PM	R54697
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: KS	
Total Dissolved Solids	214	20.0	20.0		mg/L	1	10/8/2018 5:22:00 PM	40832

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Waste Isolation Pilot Plant — **Client Sample ID:** WR-Blk-20181003-1.1
Project: ENVIRONMENTAL — **Collection Date:** 10/3/2018 9:05:00 AM
Lab ID: 1810279-005 — **Matrix:** AQUEOUS — **Received Date:** 10/4/2018 8:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 300.0: ANIONS							Analyst: MRA	
Chloride	ND	0.182	0.500		mg/L	1	10/8/2018 5:17:04 PM	R5473€
Sulfate	0.348	0.125	0.500	J	mg/L	1	10/8/2018 5:17:04 PM	R5473€
SM2540C MOD: TOTAL DISSOLVED SOLIDS							Analyst: KS	
Total Dissolved Solids	ND	20.0	20.0		mg/L	1	10/8/2018 5:22:00 PM	40832

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
PQL	Practical Quanitative Limit	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

ENVIRONMENTAL CHAIN-OF-CUSTODY / REQUEST FOR ANALYSIS RECORD

WASTE ISOLATION PILOT PLANT
P.O. BOX 2078
CARLSBAD, NM 88221-2078

Date Samples Shipped 10-3-18
Lab Contact Andy Freeman
Project Contact HNIN Khaing
Project Contact Phone (575) 234-8972
Lab Report Delivery to:
PO Box 2078 Mail Stop 462-09
Carlsbad, NM 88221-2078

CofC/RFA Control No. 10427
Carrier/Waybill Number - Fed Ex
Lab PO Number 50 2542-4

AEL # 1810279

Sample Number	Date/Time Collected	Sample Type	Sample Quantity	Container Type	Preservative	Requested Analysis
WR-SWP1-20181003-1.1	10-3-18 0839	Infiltration Control Ponds	500 mL	500 mL Plastic	≤4°C	Sulfate, Chloride, TDS
SWP2 1	0848					-01
SWP3 1.2	0901					-02
SWP3 2.2	0901					-03
BIK 1.1	0905					-04

A
N

Page 10 of 10

Special Instruction Comments: Turn around time (Rush) 7 day hold time
Temp- 22-10 (CF) = 12

Possible Hazards Nonhazard X Radiological___ Sewage___ Other___ Sample Disposal: Return To Client___ Disposal By Lab X

Signatures: (Name, Signature, Date and Time) **Laboratory Note Any Sample Discrepancies on "Special Instruction/Comment Line"

1. Relinquished By: Jerome Hernandez [signature] 10-3-18 1240
   Received By: Jazzmine Birkhead [signature] 10/4/18 08:00
2. Relinquished By: Fed Ex Overnight
   Received By:
3. Relinquished By:
   Received By:
   Relinquished By:
   Received By:

Toxics Analyses for Storm Water Ponds 1, 2, and 3

Collected October 16, 2018

27 Pages

4U2103

Chain of Custody/Request for Analysis

Control Number: № 7169

Waste Isolation Pilot Plant
P.O. Box 2078
Carlsbad, NM 88221-2078

Site Environmental Compliance

Project Contact: Francine Cohen
Project Contact Phone: 575-234-8078
Project Contact Email: francine.cohen@wipp.ws

Date Samples Sent: 10-17-18
Lab Destination: GEL LLC
Laboratory Contact: Valerie Davis

Page 1 of 1 PO NO. 510566

Sampling Program: WIPP Sampling Team

Sample Team Members: Francine Cohen, Jimmy Neatherlin

Sample Analysis Requested (No. of containers)

Sample Number	Sample Point Name	Date Collected	Time Collected	Sample Type	RCRA Metals (NI)	Herbicides	Pesticides	SVOC	VOC (HCl)	PCBs	TPH (SU)	Nitrate/Nitrite (SU)	Uranium Ra-226 Ra-228 (NI)		Preservative Type / Comments: Fluoride, chloride, Sulfate, TDS
WST-18-080	Stormwater Pond #3	10-16-18	1230	W	1				3	1	1	1	1	1	
ms/msd for WST-18-080	Stormwater Pond #3	10-16-18	1230	W	1				3						
WST-18-081	Stormwater Pond #3	10-16-18	1240	W	1				3	1	1	1	1	1	
WST-18-082	FB-Pond Water	10-16-18	1250	W	1				3	1	1	1	1	1	

Turnaround Time Required: Rush X Normal ____ Sample Disposal: By Lab X Return to Client ____

Possible Hazards: Preservatives in Sample Jars.

Sample Type Codes: BR - Brine, W - Water, SE - Sediment, SO - Soil, SA - Salt

Preservatives: HC - Hydrochloric Acid, NI - Nitric Acid, SU - Sulfuric Acid

Chain of Custody Signatures: (Name, Date and Time)

Relinquished By:
1. Francine Cohen 10-17-18 /1010
2. ____
3. ____

Received By:
1. [signature] 12:10 10-17-18
2. [signature] 10/18/18 0916
3. ____

Laboratory Information Only:

Custody Seal Intact? Yes No

Sample Temperature ____ °C

Other Comments:

WP02-EC1001

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Page 1 of 27

Volatile Analysis

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 25, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-080	Project:	PROS00114
Sample ID:	462103001	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:30		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
Volatiles by SW846 8260B "As Received"												
1,1,1-Trichloroethane	U	ND	0.333	1.00	ug/L		1	JEB	10/23/18	0041	1814748	1
1,1,2,2-Tetrachloroethane	U	ND	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	ND	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	ND	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	ND	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	ND	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	ND	0.333	1.00	ug/L		1					
Benzene	U	ND	0.333	1.00	ug/L		1					
Carbon tetrachloride	U	ND	0.333	1.00	ug/L		1					
Chloroform	U	ND	0.333	1.00	ug/L		1					
Ethylbenzene	U	ND	0.333	1.00	ug/L		1					
Methylene chloride	U	ND	1.67	5.00	ug/L		1					
Tetrachloroethylene	U	ND	0.333	1.00	ug/L		1					
Toluene	U	ND	0.333	1.00	ug/L		1					
Trichloroethylene	U	ND	0.333	1.00	ug/L		1					
Vinyl chloride	U	ND	0.333	1.00	ug/L		1					
Xylenes (total)	U	ND	1.00	3.00	ug/L		1					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	Volatiles by SW846 8260B "As Received"	50.9 ug/L	50.0	102	(71%-134%)
Bromofluorobenzene	Volatiles by SW846 8260B "As Received"	50.4 ug/L	50.0	101	(70%-131%)
Toluene-d8	Volatiles by SW846 8260B "As Received"	50.0 ug/L	50.0	100	(74%-124%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 25, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant
	P.O. Box 2078, MS-452-09
	Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP
Client Sample ID:	WST-18-081
Sample ID:	462103002
Matrix:	Water
Collect Date:	16-OCT-18 12:40
Receive Date:	18-OCT-18
Collector:	Client

Project: PROS00114
Client ID: PROS001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
Volatiles by SW846 8260B "As Received"												
1,1,1-Trichloroethane	U	ND	0.333	1.00	ug/L		1	JEB	10/23/18	0105	1814748	1
1,1,2,2-Tetrachloroethane	U	ND	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	ND	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	ND	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	ND	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	ND	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	ND	0.333	1.00	ug/L		1					
Benzene	U	ND	0.333	1.00	ug/L		1					
Carbon tetrachloride	U	ND	0.333	1.00	ug/L		1					
Chloroform	U	ND	0.333	1.00	ug/L		1					
Ethylbenzene	U	ND	0.333	1.00	ug/L		1					
Methylene chloride	U	ND	1.67	5.00	ug/L		1					
Tetrachloroethylene	U	ND	0.333	1.00	ug/L		1					
Toluene	U	ND	0.333	1.00	ug/L		1					
Trichloroethylene	U	ND	0.333	1.00	ug/L		1					
Vinyl chloride	U	ND	0.333	1.00	ug/L		1					
Xylenes (total)	U	ND	1.00	3.00	ug/L		1					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	Volatiles by SW846 8260B "As Received"	52.1 ug/L	50.0	104	(71%-134%)
Bromofluorobenzene	Volatiles by SW846 8260B "As Received"	51.9 ug/L	50.0	104	(70%-131%)
Toluene-d8	Volatiles by SW846 8260B "As Received"	51.4 ug/L	50.0	103	(74%-124%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 25, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP
Client Sample ID:	WST-18-082
Sample ID:	462103003
Matrix:	Water
Collect Date:	16-OCT-18 12:50
Receive Date:	18-OCT-18
Collector:	Client

Project: PROS00114
Client ID: PROS001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Volatile Organics												
Volatiles by SW846 8260B "As Received"												
1,1,1-Trichloroethane	U	ND	0.333	1.00	ug/L		1	JEB	10/23/18	0130	1814748	1
1,1,2,2-Tetrachloroethane	U	ND	0.333	1.00	ug/L		1					
1,1,2-Trichloroethane	U	ND	0.333	1.00	ug/L		1					
1,1-Dichloroethane	U	ND	0.333	1.00	ug/L		1					
1,1-Dichloroethylene	U	ND	0.333	1.00	ug/L		1					
1,2-Dibromoethane	U	ND	0.333	1.00	ug/L		1					
1,2-Dichloroethane	U	ND	0.333	1.00	ug/L		1					
Benzene	U	ND	0.333	1.00	ug/L		1					
Carbon tetrachloride	U	ND	0.333	1.00	ug/L		1					
Chloroform	U	ND	0.333	1.00	ug/L		1					
Ethylbenzene	U	ND	0.333	1.00	ug/L		1					
Methylene chloride	U	ND	1.67	5.00	ug/L		1					
Tetrachloroethylene	U	ND	0.333	1.00	ug/L		1					
Toluene	U	ND	0.333	1.00	ug/L		1					
Trichloroethylene	U	ND	0.333	1.00	ug/L		1					
Vinyl chloride	U	ND	0.333	1.00	ug/L		1					
Xylenes (total)	U	ND	1.00	3.00	ug/L		1					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	Volatiles by SW846 8260B "As Received"	51.9 ug/L	50.0	104	(71%-134%)
Bromofluorobenzene	Volatiles by SW846 8260B "As Received"	52.0 ug/L	50.0	104	(70%-131%)
Toluene-d8	Volatiles by SW846 8260B "As Received"	51.1 ug/L	50.0	102	(74%-124%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

PCB Analysis

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 24, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-080	Project:	PROS00114
Sample ID:	462103001	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:30		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB												
SW846 3535A/8082A PCB, Liquid "As Received"												
Aroclor-1016	U	ND	0.333	1.00	ug/L	0.010	1	JXM	10/24/18	0956	1814745	1
Aroclor-1221	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1232	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1242	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1248	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1254	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1260	U	ND	0.333	1.00	ug/L	0.010	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	AXH5	10/23/18	1350	1814743

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3535A/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3535A/8082A PCB, Liquid "As Received"	1.29 ug/L	2.00	64	(30%-113%)
Decachlorobiphenyl	SW846 3535A/8082A PCB, Liquid "As Received"	1.56 ug/L	2.00	78	(34%-130%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 24, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-081	Project:	PROS00114
Sample ID:	462103002	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:40		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB												
SW846 3535A/8082A PCB, Liquid "As Received"												
Aroclor-1016	U	ND	0.333	1.00	ug/L	0.010	1	JXM	10/24/18	1032	1814745	1
Aroclor-1221	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1232	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1242	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1248	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1254	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1260	U	ND	0.333	1.00	ug/L	0.010	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	AXH5	10/23/18	1350	1814743

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3535A/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3535A/8082A PCB, Liquid "As Received"	1.16 ug/L	2.00	58	(30%-113%)
Decachlorobiphenyl	SW846 3535A/8082A PCB, Liquid "As Received"	1.62 ug/L	2.00	81	(34%-130%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 24, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-082	Project:	PROS00114
Sample ID:	462103003	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:50		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Semi-Volatiles-PCB												
SW846 3535A/8082A PCB, Liquid "As Received"												
Aroclor-1016	U	ND	0.333	1.00	ug/L	0.010	1	JXM	10/24/18	1045	1814745	1
Aroclor-1221	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1232	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1242	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1248	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1254	U	ND	0.333	1.00	ug/L	0.010	1					
Aroclor-1260	U	ND	0.333	1.00	ug/L	0.010	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	SW3535A PCB SPE Extraction	AXH5	10/23/18	1350	1814743

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3535A/8082A	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
4cmx	SW846 3535A/8082A PCB, Liquid "As Received"	1.24 ug/L	2.00	62	(30%-113%)
Decachlorobiphenyl	SW846 3535A/8082A PCB, Liquid "As Received"	1.65 ug/L	2.00	83	(34%-130%)

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

Metals Analysis

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: October 26, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-080	Project:	PROS00114
Sample ID:	462103001	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:30		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA												
7470 Cold Vapor Hg Liquid "As Received"												
Mercury	U	ND	0.067	0.200	ug/L	1.00	1	MTM1	10/23/18	1133	1814492	1
Metals Analysis-ICP												
SW846 3005A/6010C RCRA Metals "As Received"												
Aluminum	U	ND	68.0	200	ug/L	1.00	1	TXT1	10/24/18	1845	1814281	2
Arsenic	U	ND	5.00	30.0	ug/L	1.00	1					
Barium		110	1.00	5.00	ug/L	1.00	1					
Boron		54.3	15.0	50.0	ug/L	1.00	1					
Cadmium	U	ND	1.00	5.00	ug/L	1.00	1					
Chromium	U	ND	1.00	5.00	ug/L	1.00	1					
Cobalt	U	ND	1.00	5.00	ug/L	1.00	1					
Copper	U	ND	3.00	10.0	ug/L	1.00	1					
Iron	U	ND	30.0	100	ug/L	1.00	1					
Lead	U	ND	3.30	10.0	ug/L	1.00	1					
Manganese	J	7.11	2.00	10.0	ug/L	1.00	1					
Molybdenum	U	ND	2.00	10.0	ug/L	1.00	1					
Nickel	U	ND	1.50	5.00	ug/L	1.00	1					
Selenium	U	ND	6.00	30.0	ug/L	1.00	1					
Silver	U	ND	1.00	5.00	ug/L	1.00	1					
Zinc	J	4.66	3.30	10.0	ug/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXM8	10/22/18	1757	1814280
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	10/22/18	1524	1814484

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6010C	

Notes:

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Certificate of Analysis

Report Date: October 26, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-080	Project:	PROS00114
Sample ID:	462103001	Client ID:	PROS001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst Date	Time Batch	Method

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 26, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP
Client Sample ID:	WST-18-081
Sample ID:	462103002
Matrix:	Water
Collect Date:	16-OCT-18 12:40
Receive Date:	18-OCT-18
Collector:	Client

Project: PROS00114
Client ID: PROS001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA												
7470 Cold Vapor Hg Liquid "As Received"												
Mercury	U	ND	0.067	0.200	ug/L	1.00	1	MTM1	10/23/18	1145	1814492	1
Metals Analysis-ICP												
SW846 3005A/6010C RCRA Metals "As Received"												
Aluminum	U	ND	68.0	200	ug/L	1.00	1	TXT1	10/24/18	1857	1814281	2
Arsenic	U	ND	5.00	30.0	ug/L	1.00	1					
Barium		106	1.00	5.00	ug/L	1.00	1					
Boron		52.2	15.0	50.0	ug/L	1.00	1					
Cadmium	U	ND	1.00	5.00	ug/L	1.00	1					
Chromium	U	ND	1.00	5.00	ug/L	1.00	1					
Cobalt	U	ND	1.00	5.00	ug/L	1.00	1					
Copper	U	ND	3.00	10.0	ug/L	1.00	1					
Iron	U	ND	30.0	100	ug/L	1.00	1					
Lead	U	ND	3.30	10.0	ug/L	1.00	1					
Manganese	J	6.76	2.00	10.0	ug/L	1.00	1					
Molybdenum	U	ND	2.00	10.0	ug/L	1.00	1					
Nickel	U	ND	1.50	5.00	ug/L	1.00	1					
Selenium	U	ND	6.00	30.0	ug/L	1.00	1					
Silver	U	ND	1.00	5.00	ug/L	1.00	1					
Zinc	J	3.78	3.30	10.0	ug/L	1.00	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXM8	10/22/18	1757	1814280
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	10/22/18	1524	1814484

The following Analytical Methods were performed:

Method	Description
1	SW846 7470A
2	SW846 3005A/6010C

Analyst Comments

Notes:

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Certificate of Analysis

Report Date: October 26, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant
	P.O. Box 2078, MS-452-09
	Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP
Client Sample ID:	WST-18-081
Sample ID:	462103002

Project: PROS00114
Client ID: PROS001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 26, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP
Client Sample ID:	WST-18-082
Sample ID:	462103003
Matrix:	Water
Collect Date:	16-OCT-18 12:50
Receive Date:	18-OCT-18
Collector:	Client

Project:	PROS00114
Client ID:	PROS001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Mercury Analysis-CVAA												
7470 Cold Vapor Hg Liquid "As Received"												
Mercury	U	ND	0.067	0.200	ug/L	1.00	1	MTM1	10/23/18	1147	1814492	1
Metals Analysis-ICP												
SW846 3005A/6010C RCRA Metals "As Received"												
Aluminum	U	ND	68.0	200	ug/L	1.00	1	TXT1	10/24/18	1901	1814281	2
Arsenic	U	ND	5.00	30.0	ug/L	1.00	1					
Barium	U	ND	1.00	5.00	ug/L	1.00	1					
Boron	U	ND	15.0	50.0	ug/L	1.00	1					
Cadmium	U	ND	1.00	5.00	ug/L	1.00	1					
Chromium	U	ND	1.00	5.00	ug/L	1.00	1					
Cobalt	U	ND	1.00	5.00	ug/L	1.00	1					
Copper	U	ND	3.00	10.0	ug/L	1.00	1					
Iron	U	ND	30.0	100	ug/L	1.00	1					
Manganese	U	ND	2.00	10.0	ug/L	1.00	1					
Molybdenum	U	ND	2.00	10.0	ug/L	1.00	1					
Nickel	U	ND	1.50	5.00	ug/L	1.00	1					
Selenium	U	ND	6.00	30.0	ug/L	1.00	1					
Silver	U	ND	1.00	5.00	ug/L	1.00	1					
Zinc	U	ND	3.30	10.0	ug/L	1.00	1					
Lead	U	ND	3.30	10.0	ug/L	1.00	1	TXT1	10/25/18	1419	1814281	3

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3005A	SW846 3005A for 6010C	JXM8	10/22/18	1757	1814280
SW846 7470A Prep	EPA 7470A Mercury Prep Liquid	AXS5	10/22/18	1524	1814484

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 7470A	
2	SW846 3005A/6010C	
3	SW846 3005A/6010C	

Notes:

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Certificate of Analysis

Report Date: October 26, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-082	Project:	PROS00114
Sample ID:	462103003	Client ID:	PROS001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

General Chem Analysis

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 25, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-080	Project:	PROS00114
Sample ID:	462103001	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:30		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Fluoride		0.418	0.033	0.100	mg/L		1	MAR1	10/20/18	0111	1813992	1
Sulfate		13.2	0.133	0.400	mg/L		1					
Chloride		55.8	0.670	2.00	mg/L		10	MAR1	10/22/18	1042	1813992	2
Nutrient Analysis												
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"												
Nitrogen, Nitrate/Nitrite	U	ND	0.017	0.050	mg/L		1	AXH3	10/22/18	0657	1813860	3
Oil & Grease Analysis												
EPA 1664A/B n-Hexane Extractable Material (O&G) "As Received"												
Oil and Grease	U	ND	1.31	4.67	mg/L			DXB7	10/24/18	0628	1815066	4
Solids Analysis												
EPA 160.1 Dissolved Solids "As Received"												
Total Dissolved Solids	H	196	3.40	14.3	mg/L			KLP1	10/24/18	1403	1815091	5

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	EPA 353.2	
4	EPA 1664A/1664B	
5	EPA 160.1	

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 25, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-081	Project:	PROS00114
Sample ID:	462103002	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:40		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Fluoride		0.413	0.033	0.100	mg/L		1	MAR1	10/20/18	0234	1813992	1
Sulfate		13.2	0.133	0.400	mg/L		1					
Chloride		56.6	0.670	2.00	mg/L		10	MAR1	10/22/18	1206	1813992	2
Nutrient Analysis												
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"												
Nitrogen, Nitrate/Nitrite	J	0.0263	0.017	0.050	mg/L		1	AXH3	10/22/18	0700	1813860	3
Oil & Grease Analysis												
EPA 1664A/B n-Hexane Extractable Material (O&G) "As Received"												
Oil and Grease	U	ND	1.32	4.72	mg/L			DXB7	10/24/18	0628	1815066	4
Solids Analysis												
EPA 160.1 Dissolved Solids "As Received"												
Total Dissolved Solids	H	199	3.40	14.3	mg/L			KLP1	10/24/18	1403	1815091	5

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	EPA 353.2	
4	EPA 1664A/1664B	
5	EPA 160.1	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC
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Certificate of Analysis

Report Date: October 25, 2018

Company :	AECOM Professional Solutions LLC
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221
Contact:	Ms. Francine Cohen
Project:	WIPP

Client Sample ID:	WST-18-082	Project:	PROS00114
Sample ID:	462103003	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18 12:50		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride	J	0.108	0.067	0.200	mg/L		1	MAR1	10/20/18	0302	1813992	1
Fluoride	U	ND	0.033	0.100	mg/L		1					
Sulfate	J	0.141	0.133	0.400	mg/L		1					
Nutrient Analysis												
EPA 353.2 Nitrogen, Nitrate/Nitrite "As Received"												
Nitrogen, Nitrate/Nitrite	U	ND	0.017	0.050	mg/L		1	AXH3	10/22/18	0707	1813860	2
Oil & Grease Analysis												
EPA 1664A/B n-Hexane Extractable Material (O&G) "As Received"												
Oil and Grease	U	ND	1.31	4.67	mg/L			DXB7	10/24/18	0628	1815066	3
Solids Analysis												
EPA 160.1 Dissolved Solids "As Received"												
Total Dissolved Solids	HU	ND	3.40	14.3	mg/L			KLP1	10/24/18	1403	1815091	4

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 353.2	
3	EPA 1664A/1664B	
4	EPA 160.1	

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

Radiological Analysis

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AECOM Professional Solutions LLC
Address : Waste Isolation Pilot Plant
P.O. Box 2078, MS-452-09
Carlsbad, New Mexico 88221

Report Date: October 25, 2018

Contact: Ms. Francine Cohen
Project: WIPP

Client Sample ID: WST-18-080
Sample ID: 462103001
Matrix: Water
Collect Date: 16-OCT-18
Receive Date: 18-OCT-18
Collector: Client

Project: PROS00114
Client ID: PROS001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
Alphaspec U, Liquid "As Received"														
Pct Uranium-235	U	0.00	+/-				percent			JXR5	10/22/18	2133	1814519	1
Uranium-233/234	U	0.323	+/-0.418	0.637	+/-0.421	1.00	pCi/L							
Uranium-235/236	U	0.228	+/-0.363	0.502	+/-0.364	1.00	pCi/L							
Uranium-238	U	0.152	+/-0.337	0.592	+/-0.338	1.00	pCi/L							
Rad Gas Flow Proportional Counting														
GFPC Ra228, Liquid "As Received"														
Radium-228	U	1.28	+/-1.36	2.27	+/-1.41	3.00	pCi/L			JXC9	10/25/18	0840	1814329	2
Rad Radium-226														
Lucas Cell, Ra226, Liquid "As Received"														
Radium-226	U	0.250	+/-0.258	0.399	+/-0.263	1.00	pCi/L			PCW	10/25/18	1000	1814257	3

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, U-02-RC Modified
2	EPA 904.0/SW846 9320 Modified
3	EPA 903.1 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1814519	74.3	(15%-125%)
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"	1814329	57.2	(15%-125%)

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company :	AECOM Professional Solutions LLC			
Address :	~~Waste Isolation Pilot Plant~~			
	P.O. Box 2078, MS-452-09			
	Carlsbad, New Mexico 88221		**Report Date:**	October 25, 2018
Contact:	Ms. Francine Cohen			
Project:	WIPP			

Client Sample ID:	WST-18-080	**Project:**	PROS00114
Sample ID:	462103001	**Client ID:**	PROS001

Parameter	Qualifier	Result Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company :	AECOM Professional Solutions LLC		
Address :	Waste Isolation Pilot Plant P.O. Box 2078, MS-452-09 Carlsbad, New Mexico 88221	Report Date:	October 25, 2018
Contact:	Ms. Francine Cohen		
Project:	WIPP		

Client Sample ID:	WST-18-081	Project:	PROS00114
Sample ID:	462103002	Client ID:	PROS001
Matrix:	Water		
Collect Date:	16-OCT-18		
Receive Date:	18-OCT-18		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
Alphaspec U, Liquid "As Received"														
Pct Uranium-235	U	0.00	+/-				percent			JXR5	10/22/18	2133	1814519	1
Uranium-233/234	U	0.162	+/-0.370	0.665	+/-0.371	1.00	pCi/L							
Uranium-235/236	U	0.084	+/-0.236	0.252	+/-0.237	1.00	pCi/L							
Uranium-238	U	0.0381	+/-0.246	0.503	+/-0.246	1.00	pCi/L							
Rad Gas Flow Proportional Counting														
GFPC Ra228, Liquid "As Received"														
Radium-228	U	0.427	+/-1.35	2.49	+/-1.35	3.00	pCi/L			JXC9	10/25/18	0840	1814329	2
Rad Radium-226														
Lucas Cell, Ra226, Liquid "As Received"														
Radium-226	U	0.137	+/-0.322	0.610	+/-0.323	1.00	pCi/L			PCW	10/25/18	1000	1814257	3

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, U-02-RC Modified
2	EPA 904.0/SW846 9320 Modified
3	EPA 903.1 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1814519	85.6	(15%-125%)
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"	1814329	41.9	(15%-125%)

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AECOM Professional Solutions LLC
Address : Waste Isolation Pilot Plant
P.O. Box 2078, MS-452-09
Carlsbad, New Mexico 88221

Report Date: October 25, 2018

Contact: Ms. Francine Cohen

Project: WIPP

Client Sample ID: WST-18-081
Sample ID: 462103002

Project: PROS00114
Client ID: PROS001

Parameter	Qualifier	Result Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.
TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company : AECOM Professional Solutions LLC
Address : Waste Isolation Pilot Plant
P.O. Box 2078, MS-452-09
Carlsbad, New Mexico 88221

Report Date: October 25, 2018

Contact: Ms. Francine Cohen
Project: WIPP

Client Sample ID: WST-18-082
Sample ID: 462103003
Matrix: Water
Collect Date: 16-OCT-18
Receive Date: 18-OCT-18
Collector: Client

Project: PROS00114
Client ID: PROS001

Parameter	Qualifier	Result	Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.
Rad Alpha Spec Analysis														
Alphaspec U, Liquid "As Received"														
Pct Uranium-235	U	0.00	+/-				percent			JXR5	10/23/18	1345	1814519	1
Uranium-233/234	U	-0.213	+/-0.446	1.36	+/-0.448	1.00	pCi/L							
Uranium-235/236	U	0.00	+/-0.511	0.760	+/-0.514	1.00	pCi/L							
Uranium-238	U	-0.197	+/-0.456	1.35	+/-0.458	1.00	pCi/L							
Rad Gas Flow Proportional Counting														
GFPC Ra228, Liquid "As Received"														
Radium-228	U	0.470	+/-0.672	1.16	+/-0.684	3.00	pCi/L			JXC9	10/25/18	0840	1814329	2
Rad Radium-226														
Lucas Cell, Ra226, Liquid "As Received"														
Radium-226	U	0.351	+/-0.295	0.384	+/-0.307	1.00	pCi/L			PCW	10/25/18	1000	1814257	3

The following Analytical Methods were performed

Method	Description
1	DOE EML HASL-300, U-02-RC Modified
2	EPA 904.0/SW846 9320 Modified
3	EPA 903.1 Modified

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"	1814519	37.2	(15%-125%)
Barium-133 Tracer	GFPC Ra228, Liquid "As Received"	1814329	89.8	(15%-125%)

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Company :	AECOM Professional Solutions LLC			
Address :	Waste Isolation Pilot Plant			
	P.O. Box 2078, MS-452-09			
	Carlsbad, New Mexico 88221		Report Date:	October 25, 2018
Contact:	Ms. Francine Cohen			
Project:	WIPP			

Client Sample ID:	WST-18-082	Project:	PROS00114
Sample ID:	462103003	Client ID:	PROS001

Parameter	Qualifier	Result Uncertainty	MDC	TPU	RL	Units	PF	DF	Analyst	Date	Time	Batch	Mtd.

Surrogate/Tracer Recovery	Test	Batch ID	Recovery%	Acceptable Limits

Notes:

The MDC is a sample specific MDC.

TPU and Counting Uncertainty are calculated at the 95% confidence level (1.96-sigma).

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
Lc/LC: Critical Level
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Mtd.: Method
PF: Prep Factor
RL: Reporting Limit
TPU: Total Propagated Uncertainty

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
1190 St. Francis Drive
P.O. Box 5469, Santa Fe, New Mexico 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

BUTCH TONGATE
Cabinet Secretary

BRUCE YURDIN
Acting Deputy Secretary

October 26, 2018

Todd Shrader, Manager
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, NM 88221

RE: Corrective Action Report Approval, Waste Isolation Pilot Plant (WIPP), DP-831, Storm Water Impoundment Overflow

Dear Mr. Shrader:

On September 4, 2018, the Ground Water Quality Bureau (Bureau) of the New Mexico Environment Department received notification of proposed corrective actions to restore freeboard in storm water impoundments at the above referenced facility, as required by Condition #31 of Discharge Permit Renewal, DP-831, dated July 29, 2014. On September 10, 2018, the GWQB received oral notification that additional precipitation had rendered the freeboard restoration infeasible and that a release of storm water was occurring. The GWQB received a Corrective Action Report regarding the release on September 14, 2018. The information submitted satisfies the requirements of Condition #32 of DP-831.

According to the Corrective Action Report, due to extreme precipitation storm water impoundment freeboard limits were exceeded on September 4, 2018, and again between September 7 and 10, 2018. Storm water was pumped from Storm Water Ponds 1 and 2 to Storm Water Pond 3, which has an engineered spillway. During the period of September 7 – 14, an estimated volume of 740,000 gallons of storm water flowed over the spillway of Storm Water Pond 3 or was pumped out to the ground surface. No sampling of the released water was conducted; however, historical chemical sampling and analysis from storm water runoff have shown no exceedances of analyte limits.

No corrective actions were taken to mitigate the release as the facility believes the storm water posed no threat to human health or the environment. Sampling of the storm water ponds for sulfate, chloride, and total dissolved solids after a significant storm event is required by Condition #18 of the Discharge Permit, with results to be submitted in the next semi-annual monitoring report.

The corrective actions taken are acceptable to NMED, and the Corrective Action Report is approved.

Additional corrective actions may be required if additional information becomes available indicating that the corrective actions taken are inadequate and/or ground water contamination occurs as a result of the described discharge.

If you have any questions regarding these issues, please contact Ron Strauch at (505) 827-1046 or Steve Pullen, Program Manager of the Pollution Prevention Section, at (505) 827-2962.

Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:RS

cc: Steve Pullen, Program Manager
Michael Kesler, District Manager, NMED District III
R. Maestas, NMED, HWB
Alysha L. Cole, Office of Environmental Protection, DOE, Alysha.Cole@cbfo.doe.gov

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

SEP 14 2018

GROUND WATER
SEP 17 2018
BUREAU

Ms. Michelle Hunter, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Notification of Discharge: One Week Written Notification and 15-Day Corrective Action Plan, Discharge Permit 831

Dear Ms. Hunter:

The purpose of this letter is to provide the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) with the subject notification, and corrective action plan pursuant to the Contingency Plan notification requirements in Discharge Permit 831 (DP-831), issued to the U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO). This notification is a follow-up to the 24-hour verbal notifications provided to Mr. Ron Strauch on September 4 and 10, 2018 and reflects the action plan discussed with Mr. Strauch. The following items are being addressed per DP-831 Conditions 31 and 32, of the Permit Contingency Plan section:

Permit Condition 31

Initial actions to reestablish freeboard were implemented on September 4, 2018, and were temporarily successful because additional precipitation occurred September 4 – 10, 2018.

This Contingency Plan addresses the excess above freeboard in Storm Water Ponds 2 and 3, with the intent to discharge this excess storm water outside of Storm Water Pond 3. It was anticipated that the transfer would have been completed by September 14, 2018.

Subsequent to the call to Mr. Strauch on September 4, another call was made to Mr. Strauch on September 10, after the WIPP facility received additional precipitation over the period September 7-10. With the soil saturated, this additional rainfall ran off into the storm water ponds, filling the ponds to capacity, and ultimately causing storm water to go over the outfall of Storm Water Pond 3. In addition, to maintain freeboard and prevent berm erosion around Storm Water Ponds 1 and 2, storm water was transferred to Storm Water Pond 3 as a corrective measure.

As the current matter addresses storm water runoff only, no further corrective measures are proposed. The other evaporation ponds, associated with the sewage treatment facility, and salt water containment are well below freeboard.

CBFO:OEP:MRB:AC:18-0352:UFC 5486.00

Permit Condition 32

This report confirms the call to Mr. Strauch on September 4 and September 10, 2018, informing the GWQB of the need to discharge storm water from Storm Water Pond 3 to the ground surface to maintain freeboard capacity. Storm water will be transferred from Storm Water Pond 2 to Storm Water Pond 3 to achieve the proper freeboard. After freeboard is attained in both of the Ponds, the DOE will end the discharge, and evaporation will continue to decrease water levels.

Contingency Plan Information

The following information (a-g) completes the one-week notification, required in Section 32 in the DP-831 Permit.

(a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility:

Person in charge of the facility:
Todd Shrader, Manager
P.O. Box 3090
Carlsbad, New Mexico, 88221
(575) 234-7300

Owner of the facility:
U.S. Department of Energy

Operator of the facility:
Nuclear Waste Partnership LLC

(b) Name and address of the facility:

U.S. Department of Energy
Waste Isolation Pilot Plant (WIPP)
26 miles southeast of Carlsbad, New Mexico off of State Highway 128
Carlsbad, NM 88220

(c) The date, time, location, and duration of the discharge:

Date: September 7-14, 2018
Time: N/A
Location: WIPP Facility (Latitude: 32 22.589, Longitude 103 47.746)
Duration of Discharge: September 7, 2018 – September 14, 2018.

(d) The source and cause of the discharge:

Source: Runoff from the WIPP facility occurring from high precipitation events September 4 – September 9, 2018.

Cause of discharge:

September 4, 2018 through September 10, 2018 the WIPP Facility received 4.61 inches of precipitation. On September 4, 2018, the CBFO informed the GWQB of the less-than-one foot of freeboard in Storm Water Pond 2 and outflow from Storm Water Pond 3.

(e) A description of the discharge, including chemical composition:

The outflow from Storm Water Pond 3 was storm water runoff from the WIPP facility. Historical chemical sampling and analysis from storm water runoff have shown no exceedances of analyte limits. Samples will be collected consistent with DP-831 Condition 20 and the chemical composition will be noted in the next semi-annual report submitted to the GWQB.

(f) The estimated volume of the discharge:

There is no device for measuring the overflow of Storm Water Pond 3. Discharge volumes were calculated using standard stream flow calculations. Also, amounts of water outflow are conservative estimations. Storm Water Pond 3 has an engineered spillway to prevent erosion. Therefore, there is no erosion damage to pond berms or liner integrity. The estimated amount of outflow from the spillway and from pumping to the ground surface is as follows:

Storm Water Pond 3 – 740,000 gallons

(g) Any actions taken to mitigate immediate damage from this discharge:

On September 6, 2018, water was pumped from the Storm Water Pond 2 into Storm Water Pond 3 at a rate of approximately 1,000 gallons per minute so that freeboard could be maintained in Pond 2.

Corrective Action Plan

The following information (a-c) completes the 15-day Corrective Action Report/Plan required in Section 32 in the DP-831 Permit.

a) A description of proposed actions to prevent future unauthorized discharge.

Corrective measures include allowing Storm Water Pond 3 to overflow through the designed outflow. In addition, clean storm water will be pumped from Storm Water Pond 3 to the ground surface to keep Storm Water Pond 3 within permitted requirements. If additional rainfall occurs, the storm water will be allowed to overflow the Storm Water Ponds.

b) A description of proposed actions to prevent future unauthorized discharges of this nature.

The DOE attempts to contain as much storm water as possible in order to minimize recharge to an anthropogenic water table beneath the facility. When the rainfall amounts to more that can be managed to maintain freeboard, excess storm water is discharged. Clean storm water is not regulated by the GWQB.

c) A schedule for completion of proposed actions.

Freeboard in Storm Water Ponds 1 and 2 have already been achieved. Recovery of freeboard in Storm Water Pond 3 was achieved on September 13, 2018.

Upon review of this matter, it is believed that this outflow of storm water runoff poses no threat to human health and environment. The corrective actions described are intended to meet all notification requirements of DP-831 with no additional documentation transmittal to the GWQB required, if events remain unchanged. If conditions or additional information changes the path forward, the GWQB will be notified. Results of this effort will be included in the next semi-annual report submitted to the GWQB.

If you have any further questions regarding this matter or need additional information, please contact me at (575) 234-7476.

Sincerely,

Michael R. Brown, Director
Office of Environmental Protection

cc:

S. Pullen, NMED, GWQB	*ED
R. Strauch, NMED, GWQB	ED
G. Huey, NMED, GWQB	ED
R. Maestas, NMED, GWQB	ED
CBFO M&RC	ED

*Denotes electronic distribution

CBFO:OEP:MRB:AC:18-0352:UFC 5486.00

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau
1190 St. Francis Drive
P.O. Box 5469, Santa Fe, New Mexico 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

BUTCH TONGATE
Cabinet Secretary

J.C. BORREGO
Deputy Secretary

August 17, 2018

Todd Shrader, Manager
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, NM 88221

RE: Corrective Action Report Approval, Waste Isolation Pilot Plant (WIPP), DP-831, Water Line Break

Dear Mr. Shrader:

On July 16, 2018, the Ground Water Quality Bureau of the New Mexico Environment Department (NMED) received oral notification of a release of water at the above referenced facility. A Corrective Action Report was received on July 24, 2018. The information submitted satisfies the requirements of Condition #32 of Discharge Permit Renewal, DP-831, dated July 29, 2014.

According to the Corrective Action Report, the water line at Building 384 ruptured, resulting in a release of approximately 36,000 gallons of uncontaminated water. The water did not flow through any waste management areas or chemical storage areas. Some portion of the flow was tracked to Storm Water Pond 3.

The corrective actions taken are described as follows:
As soon as the rupture of the water line was noticed, the fire pump was shut down and the ruptured portion of the system was isolated.

The corrective actions taken are acceptable to NMED, and the Corrective Action Report is approved.

Additional corrective actions may be required if additional information becomes available indicating that the corrective actions taken are inadequate and/or ground water contamination occurs as a result of the described discharge.

If you have any questions regarding these issues, please contact Ron Strauch at (505) 827-1046 or Steve Pullen, Program Manager of the Pollution Prevention Section, at (505) 827-2962.

Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:RS

cc: Steve Pullen, Program Manager
Michael Kesler, District Manager, NMED District III
R. Maestas, NMED, HWB
Alysha L. Cole, Office of Environmental Protection, Alysha.Cole@cbfo.doe.gov

Department of Energy
Carlsbad Field Office
P. O. Box 3090
.Carlsbad, New Mexico 88221

JUL 2 3 2018

Ms. Michelle Hunter, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Notification of Discharge: One Week Written Notification required by Discharge Permit 831

Dear Ms. Hunter:

The purpose of this letter is to inform the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) of an unauthorized discharge due to a ruptured fire water distribution line, as required by Discharge Permit 831 (DP-831) issued to the U.S. Department of Energy (DOE), Carlsbad Field Office (CBFO). The following items are being addressed per DP-831 Condition 32, Contingency Plan.

Permit Condition 32

This report confirms the CBFO call to Mr. Ronald Strauch on July 16, 2018, informing the GWQB of the water discharge that originated from a rupture in the water line. A portion of water did report to Storm Water Pond 3 but had no impact on pond capacity.

Contingency Plan Information

The following information (a-g) completes the one-week notification, required in Section 32 of the DP-831 Permit.

(a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility:

<u>Person in charge of the facility:</u>
Todd Shrader, Manager
U.S. Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, New Mexico, 88221
(575) 234-7300

<u>Owner of the facility:</u>
U.S. Department of Energy

<u>Operator of the facility:</u>
Nuclear Waste Partnership LLC

(b) Name and address of the facility:

U.S. Department of Energy
Waste Isolation Pilot Plant (WIPP)
26 miles southeast of Carlsbad, New Mexico, off State Highway 128
Carlsbad, NM 88220

(c) The date, time, location, and duration of the discharge:

Date: July 16, 2018
Time: 1157 hours MDT
Location: WIPP Facility (Latitude: 32 22.589, Longitude 103 47.746)
Duration of Discharge: 75 minutes

(d) The source and cause of the discharge:

Source: Water from the water line at Building 384.

Cause of discharge:

- On July 16, 2018, the water line at Building 384 ruptured. The rupture resulted in a discharge of 36,000 gallons of water before the pump could be shut down and the proper valves closed.

(e) A description of the discharge, including chemical composition:

The discharge from the water line is raw uncontaminated water from the water inlet to the WIPP facility. Raw water is supplied to the WIPP facility from the City of Carlsbad Double Eagle water field, which is provided directly to the WIPP facility. With the exception of chlorination, the water supplied to the WIPP Facility is of drinking water quality.

(f) The estimated volume of the discharge:

It is estimated the 36,000 gallons was discharged based on the water level drop in the water storage tank.

(g) Any actions taken to mitigate immediate damage from this discharge:

As soon as the rupture of the water line was noticed, and information was relayed to the Operations group, the fire pump was shut down and the ruptured portion of the system has been isolated.

Corrective Action Plan

Upon review of this matter, it is believed that this outflow of water poses no threat to human health and environment. The water did not flow through any waste management areas or chemical storage areas and therefore, did not collect contaminants. Since the water discharged was not contaminated and no damage to human health or the environment occurred, it is requested by the DOE that this matter be closed with no additional reporting necessary under the WIPP DP-831 Groundwater Permit.

If you have any further questions regarding this matter or need additional information, please contact me at (575) 234-7476.

Sincerely,

Michael R. Brown, Director
Office of Environmental Protection

cc:

S. Pullen, NMED, GWQB	*ED
R. Strauch, NMED, GWQB	ED
R. Maestas, NMED, HWB	ED
CBFO M&RC	ED

*Denotes electronic distribution

CBFO:OEP:MRB:AC:18-0340:UFC 5486.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JAN 3 0 2017

GROUND WATER
FEB 0 1 2017
BUREAU

Ms. Michelle Hunter, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Notification of Discharge: One Week Written Notification required by Discharge Permit 831

Dear Ms. Hunter:

The purpose of this letter is to inform the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) of an unauthorized discharge due to a ruptured water line, as required by Discharge Permit 831 (DP-831) issued to the U.S. Department of Energy (DOE), Carlsbad Field Office (CBFO). The following items are being addressed per Permit Condition 32 of the permit's Contingency Plan section.

Permit Condition 32

This report confirms the CBFO call to Mr. Steven Huddleson on January 24, 2017, informing the GWQB of the fire water discharge that originated from a rupture in the fire water line during testing of the fire water pump. A portion of fire water did report to Storm Water Pond 3, but had no impact on pond capacity.

Contingency Plan Information

The following information (a-g) completes the one-week notification, required in Section 32 in the DP-831 Permit.

(a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility:

<u>Person in charge of the facility:</u>
Todd Shrader, Manager
P.O. Box 3090
Carlsbad, New Mexico, 88221
(575) 234-7300

<u>Owner of the facility:</u>
U.S. Department of Energy

Operator of the facility:
Nuclear Waste Partnership, LLC

(b) Name and address of the facility:

U.S. Department of Energy
Waste Isolation Pilot Plant (WIPP)
26 miles southeast of Carlsbad, New Mexico off of State Highway 128
Carlsbad, NM 88220

(c) The date, time, location, and duration of the discharge:

Date: January 23, 2017
Time: 1410 hours
Location: WIPP Facility (Latitude: 32 22.589, Longitude 103 47.746)
Duration of Discharge: 20 minutes

(d) The source and cause of the discharge:

Source: Fire water from the fire water line at building 971.

Cause of discharge:

On January 23, 2017, the fire water line at building 971 ruptured during a fire water pump test discharging 30,000 gallons of water before the pump could be shut down and the proper valves closed.

(e) A description of the discharge, including chemical composition:

The discharge from the fire water line is raw water from the water inlet to the WIPP facility. Raw water is supplied to the facility from the City of Carlsbad Double Eagle water field, which is provided directly to the WIPP facility. With the exception of chlorination, the water supplied to the WIPP Facility is of drinking water quality.

(f) The estimated volume of the discharge:

It is estimated that 30,000 gallons of water was discharged due to the water level drop in the fire water storage tank. This estimate of the water discharge is a conservative estimation.

(g) Any actions taken to mitigate immediate damage from this discharge:

As soon as the rupture of the fire water line was noticed and information was relayed to the Fire Engineers performing the pump test, the fire pump was shut down. The fire water system was immediately isolated in the area of the ruptured line.

Corrective Action Plan

Upon review of this matter, it is believed that this outflow of fire water poses no threat to human health and environment. The water did not flow through any waste management areas or chemical storage areas and therefore, did not collect contaminants. Since the water discharged was not contaminated and no damage to human health or the environment occurred, it is requested by the DOE that this matter be closed with no additional reporting requirement necessary under the WIPP DP-831 Groundwater Permit.

If you have any further questions regarding this matter or need additional information, please contact me at (575) 234-7488.

Sincerely,

George T. Basabilvazo

George T. Basabilvazo, Director
Office of Environmental Protection

cc:
S. Pullen, NMED *ED
S. Huddleson, NMED ED
CBFO M&RC
*Denotes electronic distribution

CBFO:OEP:GTB:AC:17-1011:UFC5486.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

SEP 19 2016

GROUND WATER
SEP 21 2016
BUREAU

Ms. Michelle Hunter, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Notification of Intent to Discharge, Discharge Permit 831

Dear Ms. Hunter:

The purpose of this letter is to submit the Notification of Intent (NOI) to discharge storm water to the ground surface. This is a follow-up to our verbal discussion on this matter with Mr. Greg Huey, of your organization, on September 6, 2016. This information is being provided to the Ground Water Quality Bureau in accordance with NMAC 20.6.2.1201.

The action of this NOI is to dispose of some of the accumulated storm water in order to create adequate capacity for any additional precipitation that might occur. Historical sampling and chemical analysis of storm water runoff have shown analytes to be within the regulatory limits.

If you have any further questions regarding this matter or need additional information, please contact me at (575) 234-7488.

Sincerely,

George T. Basabilvazo

George T. Basabilvazo, Director
Environmental Protection Division

Enclosure

cc:

A. Stone, CBFO	*ED
A. Ward, CBFO	ED
G. Huey, NMED	ED
S. Pullen, NMED	ED
CBFO M&RC	

CBFO:OEP:GTB:AC:16-3307:UFC5486.00

bcc:

A. Stone, CBFO	*ED
A. Ward, CBFO	ED
P. Breidenbach, NWP	ED
J. Blankenhorn, NWP	ED
D. Cook, NWP	ED
B. R. Hill, NWP	ED
M. Love, NWP	ED
C. Navarrette, NWP	ED
B. Shagula, NWP	ED
R. Chavez, RES	ED
K. Day, RES	ED
J. Haschets, RES	ED
W. Jaco, RES	ED
S. Jones, RES	ED
S. Kouba, RES	ED
H. Moore, RES	ED
W. Most, RES	ED
R. Salness, RES	ED
M. Viehweg, RES	ED
A. Waldram, RES	ED

*ED denotes electronic distribute

For Department use Only:

Agency Interest Number________
PRD Assigned _________

1. Name and mailing address of person proposing to discharge (Responsible Person):

George Basabilvazo
Department of Energy – Carlsbad Field Office
P.O. Box 3090
Carlsbad, NM 88221

Work Phone: 575-234-7488
Cell/Home Phone: 575-706-0083
Fax: 575-234-7061
Email: george.basabilvazo@cbfo.doe.gov

2. Name and Position of person Completing Form:

Bill Jaco
Engineer
Regulatory and Environmental Services

Work Phone: 575-234-8177
Cell/Home Phone: NA
Fax:
Email: bill.jaco@wipp.ws

3. Name of facility:

Waste Isolation Pilot Plant

4. Physical location of the discharge (if applicable, give street address, township, range, section, distance from closest town or landmark, directions to facility, location map):

Waste Isolation Pilot Plant facility, 26 miles southeast of Carlsbad, NM, 34 Louis Whitlock Road

5. Type of operation generating the discharge (e.g., agricultural facility, domestic wastewater discharge, industrial discharge, mining operation, etc.):

Treatment, Storage and Disposal Facility

6. Source(s) of the discharge. Describe how the wastewater, sludge, or other discharges processed and/or disposed at your facility are generated. Identify all sources. Attach additional pages if needed:

Rain water running off of the facility is collected in evaporation ponds and allowed to evaporate. During extended or heavy rainfall events these ponds can reach capacity. Pumping the storm water onto the land surrounding the facility in a controlled manner prevents erosion, and allows for additional capacity when impending storm events are in the forecast.

7. Expected contaminants in the discharge (e.g., nitrate-nitrogen, metals, organic compounds, salts, etc.) Include estimated concentration if known, and copies of results of laboratory analyses, if available:

A portion of the storm water is from the parking lot and could have a minute amount of petroleum products which could be expected in the discharged storm water. Suspended silt will settle out in the storm water ponds. The majority of the storm water is from WIPP facility areas such as roof tops, service roads, and areas between buildings.

For Department use Only:

Agency Interest Number________
PRD Assigned ________

8. Describe all components of wastewater processing, treatment, storage, and disposal system (e.g., pre-treatment units, impoundments(s), septic tank/leachfield, etc.). Include sizes, site layout map, plans, and specifications, etc. if available:

There is no processing associated with this discharge of storm water.

9. Estimated maximum daily discharge volume in gallons per day. Provide water usage records or system sizing criteria if available:

Approximately 200,000 gallons per day for the storm period to drain the Storm Water Ponds to collect forecasted rain.

10. Estimated depth to ground water (ft): 164 Source of information DP-831 Page 2 of 22

11. Current Total Dissolved Solids Concentration in Groundwater approximately 3,400 mg/L

Signature: George T. Basabilvazo Date: 9-19-16

Printed name: George T. Basabilvazo Title: Director

Certification by Responsible Person

I, George T. Basabilvazo, hereby certify that the information and data submitted in this application are true and accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this 19 day of September, 2016, upon my oath or affirmation, before a notary of the State of

Yolanda F. Navarrete

Please return this form to:
NMED Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, New Mexico 87502-5469

Telephone: 505-827-2900
Fax: 505-827-2965

OFFICIAL SEAL
YOLANDA F. NAVARRETE
Notary Public
State of New Mexico
My Commission Expires 5-17-2017

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

SEP 0 8 2016

GROUND WATER
SEP 1 2 2016
BUREAU

Ms. Michelle Hunter, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Notification of Discharge: One Week Written and 15 Day Corrective Action Plan, Discharge Permit 831

Dear Ms. Hunter:

The purpose of this letter is to notify the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) of an unauthorized discharge due to excessive precipitation and present a short-term corrective action plan as required by Discharge Permit 831 (DP-831) issued to the U.S. Department of Energy (DOE), Carlsbad Field Office (CBFO). The following items are being addressed per Permit Conditions 31 and 32, of the permit's Contingency Plan section.

Permit Condition 31

This Contingency Plan addresses the excess above freeboard in Storm Water Ponds 1 and 3 and the need to place this excess storm water into Salt Storage Ponds 1 and 3. It is anticipated that this can be completed by September 15, 2016.

As the current situation addresses storm-water run off only, the CBFO requests that no further corrective measures be implemented. The other evaporation ponds are associated with the sewage treatment facility and salt-water containment.

Permit Condition 32

This report confirms the CBFO call to Mr. Greg Huey on September 1, 2016, informing the NMED GWQB of the need to transfer storm water from Storm Water Ponds 1 and 3 to maintain freeboard capacity. Storm water will be transferred to Salt Storage Ponds 1 and/or 3 to achieve the proper freeboard in Storm Water Ponds 1 and 3. The salt storage ponds will still have freeboard capacity remaining after receiving water from the storm water ponds.

Contingency Plan Information

The following information (a-g) completes the one-week notification, required in Section 32 in the DP-831 Permit.

(a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility:

CBFO:OEP:GTB:AC:16-3306:UFC5486.00

Person in charge of the facility:
Todd Shrader, Manager
P.O. Box 3090
Carlsbad, New Mexico, 88221
(575) 234-7300

Owner of the facility:
U.S. Department of Energy

Operator of the facility:
Nuclear Waste Partnership, LLC

(b) Name and address of the facility:

U.S. Department of Energy
Waste Isolation Pilot Plant (WIPP)
26 miles southeast of Carlsbad, New Mexico off of State Highway 128
Carlsbad, NM 88220

(c) The date, time, location, and duration of the discharge:

Date: August 31 - September 1, 2016
Time: N/A
Location: WIPP Facility (Latitude: 32 22.589, Longitude 103 47.746)
Duration: August 31, 2016 - September 1, 2016

(d) The source and cause of the discharge:

Source: Runoff from the WIPP facility occurring from high precipitation events during the period August 23 - September 1, 2016.

Cause of discharge:

During the period August 23, 2016, through September 1, 2016, the WIPP Facility received approximately 11 inches of precipitation. On September 1, 2016, the CBFO informed the NMED GWQB of the less-than-one foot of freeboard in Storm Water Pond 1 and outflow from Storm Water Pond 3. The CBFO then initiated the short-term corrective measure of pumping water from Storm Water Ponds 1 and 3 into Salt Storage Pond 3.

(e) A description of the discharge, including chemical composition:

The outflow from Storm Water Pond 3 was storm water runoff from the WIPP facility. Historical sampling and chemical analysis of storm water runoff have always shown analytes to be within the regulatory limits. Samples will be collected, consistent with Permit Condition 20, and the chemical composition will be noted in the next semi-annual report submitted to the NMED GWQB.

(f) The estimated volume of the discharge:

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There is no device for measuring the overflow of Storm Water Pond 3. Discharge volumes were estimated using standard stream flow calculations and are conservative. The estimated amount of outflow is as follows:

Storm Water Pond 3 – 303,000 gallons

(g) Any actions taken to mitigate immediate damage from this discharge:

On August 30, 2016, water was pumped from the Storm Water Pond 1 into Storm Water Pond 3, which had sufficient spare volume to contain the water and prevent outflow. After additional significant rainfall, water was pumped from Storm Water Pond 3 into Salt Storage Pond 3 to attain a one-foot freeboard in Storm Water Pond 3. Storm Water Pond 3 has an engineered spillway to prevent erosion.

Corrective Action Plan

The following information (a-c) completes the 15-day Corrective Action Report/Plan required in Section 32 in the DP-831 Permit.

a) A description of proposed actions to prevent future unauthorized discharge.

Corrective measures include pumps and piping to transfer storm water from Storm Water Pond 3 to Salt Storage Pond 3. Salt Storage Pond 3 has the capacity of 22,881,320 gallons and currently contains approximately 13,500,000 gallons, leaving approximately 9,300,000 gallons of capacity. The amount of water to be pumped into Salt Storage Pond 3 will only be equal to the amount needed to maintain one foot of freeboard in Storm Water Ponds 1 and 3. If additional rainfall occurs, more water will need to be transferred to Salt Storage Pond 3. If more storage capacity is needed, Salt Storage Pond 1 can be used or other storm-water management strategies will be evaluated.

b) A description of proposed actions to prevent future unauthorized discharges of this nature.

The pumping system includes a pump that transfers water from Storm Water Ponds 1 and 2 into Storm Water Pond 3. Water from Storm Water Pond 3 is then transferred by another pump into Salt Storage Pond 3 to maintain a one-foot freeboard. The transfer of this storm water is anticipated to be completed by September 15, 2016.

c) A schedule for completion of proposed actions.

To prevent the reoccurrence of the overflow of the Storm Water Pond 3, a system of piping from one pond to the other has been established.

Upon review of this event, it is believed that this outflow of storm-water runoff poses no threat to human health and environment. The corrective actions described are intended to meet all notification requirements of DP-831 with no requirements for additional documentation transmittal to the NMED GWQB, should these corrective measures be successful. Any changes in conditions or to the proposed corrective actions will be communicated to the NMED

SEP 0 8 2016

GWQB in a timely manner. Results of this effort will be included in the next semi-annual report submitted to the NMED GWQB.

If you have any further questions regarding this matter or need additional information, please contact me at (575) 234-7488.

Sincerely,

George T. Basabilvazo

George T. Basabilvazo, Director
Office of Environmental Protection

cc:

S. Pullen, NMED	*ED
G. Huey, NMED	ED
CBFO M&RC	ED

*Denotes electronic distribution

CBFO:OEP:GTB:AC:16-3306:UFC5486.00

Pullen, Steve, NMENV

From:	George Basabilvazo <george.basabilvazo@cbfo.doe.gov>
Sent:	Wednesday, September 07, 2016 11:05 AM
To:	Pullen, Steve, NMENV
Cc:	stewart.jones@wipp.ws; Holcomb, Sarah, NMENV; Huey, Greg, NMENV; Huddleson, Steven, NMENV
Subject:	RE: WIPP discharge notification 9/1/2016

Steve,

Yes the corrective action proposals that were in our 2015 letter were accomplished. We acquired two additional pumps and established a piping system. The piping system is staged near the ponds to facilitate timely connection and pumping.

Thanks.

George T. Basabilvazo
Director, Environmental Protection
DOE/Carlsbad Field Office
P.O. Box 3090
Carlsbad, New Mexico 88221
Ph: (575) 234-7488
Cell: (575) 706-0083

From: Pullen, Steve, NMENV [mailto:steve.pullen@state.nm.us]
Sent: Wednesday, September 07, 2016 9:45 AM
To: George Basabilvazo
Cc: stewart.jones@wipp.ws; Holcomb, Sarah, NMENV; Huey, Greg, NMENV; Huddleson, Steven, NMENV
Subject: RE: WIPP discharge notification 9/1/2016

Good morning George,

Please verify whether the corrective action proposals in the attached letter have been accomplished, specifically the establishment of a piping system to transfer fluids between ponds and "new water pumps will be fitted to be quickly installed [to address excessive storm water]."

Good luck with the impending storm and thank you,

Steve Pullen
Environmental Scientist
NMED/Ground Water Quality Bureau
Polution Prevention Section
steve.pullen@state.nm.us
(505) 827-2962

From: Huddleson, Steven, NMENV
Sent: Wednesday, September 07, 2016 7:55 AM
To: Huey, Greg, NMENV; Pullen, Steve, NMENV
Cc: george.basabilvazo@cbfo.doe.gov; stewart.jones@wipp.ws; Holcomb, Sarah, NMENV
Subject: RE: WIPP discharge notification 9/1/2016

Agree. But I believe this is not the first time that storm events have overtopped the impoundments, correct?

From: Huey, Greg, NMENV
Sent: Tuesday, September 06, 2016 4:30 PM
To: Pullen, Steve, NMENV
Cc: george.basabilvazo@cbfo.doe.gov; Huddleson, Steven, NMENV; stewart.jones@wipp.ws
Subject: RE: WIPP discharge notification 9/1/2016

Steve,

In follow-up to last week's spill report, Stewart Jones (WIPP) called today to request permission to discharge stormwater from the surfaces discussed below onto bare ground surrounding the facility during upset conditions. Particularly, during the anticipated rainfall predicted to accompany Hurricane Newton this weekend. They are concerned that their impoundments are already at capacity and the predicted storms will cause additional uncontrolled discharges.

I granted his request and asked that he follow up with a summary of actions taken to prevent uncontrolled discharges through land application of stormwater from the lined impoundments to areas surrounding the facility.

Thank you,

Greg

Gregory Huey
Industrial Team Leader
Ground Water Quality Bureau
NM Environment Department
P (505) 827-6891

New Mexico
ENVIRONMENT
Department

From: Huey, Greg, NMENV
Sent: Thursday, September 01, 2016 11:51 AM
To: Pullen, Steve, NMENV
Cc: george.basabilvazo@cbfo.doe.gov; Huddleson, Steven, NMENV
Subject: WIPP discharge notification 9/1/2016

Steve,

Representatives from WIPP called today to verbally report a discharge as required by DP-831.

Rick Chavez, Stewart Jones, and George Basabilvazo (cc) called to discuss the overtopping of lined stormwater impoundments at the facility.

WIPP has received over 9" of rain in the past week and their typically adequate impoundments are at capacity. Stormwater from the exterior of facility structures and parking lots is directed through a series of engineered ditches and culverts through spillways to stormwater impoundments. One of these impoundments overtopped and released to a road bar ditch where it infiltrated into the bare ground.

Previous sampling shows that surface runoff from these areas does not typically carry contaminants in excess of standards.

The operators will follow up with a 7-day written report as required.

Thank you,

-Greg

Gregory Huey
Industrial Team Leader
Ground Water Quality Bureau
NM Environment Department
P (505) 827-6891

New Mexico
ENVIRONMENT
Department

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

JAN 2 8 2016

GROUND WATER
FEB 0 2 2016
BUREAU

Ms. Michelle Hunter, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Semi-Annual Discharge Monitoring Report for July 1, 2015 through December 31, 2015, Discharge Permit 831

Dear Ms. Hunter:

The purpose of this letter is to transmit to you the Waste Isolation Pilot Plant Discharge Monitoring Report, including the required attachments on compact disk, for the period of July 1 through December 31, 2015. This report is required by Discharge Permit 831.

If you have any further questions regarding this report or require any additional information, please contact Anthony Stone at (575) 234-7475.

Sincerely,

Anthony Stone FOR

George T. Basabilvazo, Director
Environmental Protection Division

Enclosure (2)

cc: w/o Enclosures

R. Maestas, NMED *ED
CBFO M&RC
*ED denotes electronic distribution

- See DISK IN MONITORING FOLDER

02933

CBFO:EPD:GTB:ELN:16-0502:UFC 5486.00

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

NOV 0 5 2015

Ms. Michelle Hunter, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Corrective Action Report/Plan, Discharge Permit 831

Dear Ms. Hunter:

The purpose of this letter is to provide the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) a description of the actions taken to restore the required freeboard for the storm water evaporation ponds as authorized in the Contingency Plan section to Discharge Permit 831 (DP-831) issued to the U.S. Department of Energy (DOE), Carlsbad Field Office (CBFO). The following items are being addressed per Permit Condition 31 of the permit's Contingency Plan section.

Permit Condition 31

On Wednesday evening October 21, 2015, the WIPP facility received approximately 2.2 inches of rain. On Thursday morning, October 22, it was discovered that Storm Water Ponds 1, 2, and 3 had exceeded their one foot freeboard levels, but did not overtop their liners. Pumping efforts began Thursday morning to lower the water level of all three ponds by pumping the clean storm water into Salt Storage Pond 3. Initial actions reestablished freeboard on Storm Water Ponds 1 and 2 within 72 hours. The one foot freeboard for Storm Water Pond 3 was achieved by Tuesday, October 27, within 128 hours by continuing to take the short-term corrective action of pumping.

The other evaporation ponds are associated with the sewage treatment facility and salt water storage ponds. These evaporation ponds are not experiencing issues with their freeboard capacity.

The short-term corrective action restored the one foot of freeboard in the storm water ponds. The corrective actions described in this report were protective of human health and the environment and are intended to meet the notification requirements and reporting/corrective action plan requirements of DP-831, Condition 31. The CBFO requests that no further corrective measures be implemented for this event as the short-term action restored the required freeboard.

If you have any further questions regarding this matter or need additional information, please contact me at (575) 234-7488.

Sincerely,

George T. Basabilvazo

George T. Basabilvazo, Director
Environmental Protection Division

cc:

S. Pullen, NMED-GWQB	*ED	P. Breidenbach, NWP	ED
T. Shrader, CBFO	ED	J. Blankenhorn, NWP	ED
C. Gadbury, CBFO	ED	R. Chavez, RES	ED
A. Stone, CBFO	ED	CBFO M&RC	
A. Ward, CBFO	ED	*ED denotes electronic distribution	

CBFO:EPD:GTB:MN:15-2249:UFC 5486.00

NEW MEXICO
ENVIRONMENT DEPARTMENT

Harold Runnels Building
1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, New Mexico 87502-5469
Phone (505) 827-2900 · Fax (505) 827-2965
www.env.nm.gov

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Governor

JOHN A. SANCHEZ
Lieutenant Governor

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Environmental Protection D
Department of Energy, Car
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Carlsbad, NM 88221
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PS Form 3800, July 2014

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

October 27, 2015

George Basabilvazo, Director
Environmental Protection Division
Department of Energy, Carlsbad Field Office
P.O. Box 3090
Carlsbad, New Mexico 88221

RE: WIPP - Response to Notification of Discharge, Implementation of Corrective Action, and Submittal of Corrective Action Report
Discharge Permit 831

Dear Mr. Basabilvazo,

This letter responds to the U.S. Department of Energy, Carlsbad Field Office (Permittee) correspondence dated October 15, 2015, (Notification) notifying the New Mexico Environment Department (NMED) of actions to reestablish allowable freeboard in specific storm water retention ponds and actions planned to avoid future similar occurrences. The Notification was provided in accordance with Discharge Permit DP-831 (Permit) Contingency Plan requirements.

The Notification states that during the period from October 3, 2015, through October 6, 2015, exceptionally high precipitation occurred in the area contributing runoff to Storm Water Ponds 1, 2 and 3, resulting in the storm water pond system reaching capacity on October 8, 2015. At that time the one-foot freeboard limit specified at Permit Condition #4 was exceeded and approximately 100 gallons of storm water outflow occurred. Subsequent inspections of all associated ponds found no evidence of erosion or damage to the ponds.

As a result of the excessive precipitation, the exceedance of the storm water system capacity, and associated Permit requirements, the Permittee performed the following actions:

1. On October 6, 2015, fluid was pumped from Storm Water Pond 2 to Storm Water Pond 3.
2. On October 8, 2015, transfer of excess fluid in Storm Water Ponds 1, 2 and 3 to Salt Storage Ponds 1 and 3 was initiated. This action conforms to Permit Condition 31.

3. On October 9, 2015, the Permittee contacted NMED informing the agency of the necessity to maintain the applicable freeboard and to transfer fluid to Salt Storage Ponds. This action conforms to the 24 hour notification requirement of Permit Condition #32. An agency representative, Mr. Steven Huddleson, approved the preliminary action. (personal communication, October 21, 2015)
4. On October 15, 2015, the Permittee drafted the Notification to satisfy the one week written notification requirements of Permit Condition 32.

The Notification includes a Corrective Action Plan (Plan) addressing proposed actions to prevent future unauthorized discharges, a schedule to complete these actions, and a commitment to sample fluid in Storm Water Pond 1. The Plan suggests the facility has sufficient capacity in its pond system, including the Storm Water and particularly the Salt Storage Ponds, to adequately manage storm water at the facility. The Plan commits to only utilizing the Salt Storage Ponds when the Storm Water Ponds are at capacity. The Plan commits to ensuring sufficient pumps and piping are available to transfer fluids between these systems when necessary. NMED will anticipate being provided with the results of the sampling proposed on page 3 of the Notification.

NMED finds that the Permittee has appropriately conformed to DP-831. Furthermore, NMED approves the Corrective Action Plan. This approval does not relieve the Permittee of the responsibility to comply with any other applicable federal, state, and /or local laws or regulations. Also, this approval does not relieve the Permittee of any liability should associated actions result in actual pollution of ground or surface waters.

If you have any questions, please contact Steve Pullen of the Ground Water Pollution Prevention Section at 505-827-2962.

Sincerely,

Michelle Hunter, Chief
Ground Water Quality Bureau
MH:sp

cc (e-copies):

S. Huddleson, NMED-GWQB
G. Huey, NMED-GWQB
S. Pullen, NMED-GWQB
R. Maestas, NMED-HWB
T. Shrader, CBFO
W. Mouser, CBFO
A. Stone, CBFO
A. Ward, CBFO
P. Breidenbach, NWP
J. Blankenhorn, NWP
R. Chavez, RES
Susan Lucas-Kamat, NMED-DOE OB

files: Read
DP-831

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

GROUND WATER
OCT 19 2015
BUREAU

OCT 15 2015

Ms. Michelle Hunter, Bureau Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Notification of Discharge/Corrective Action Report/Plan, Discharge Permit 831

Dear Ms. Hunter:

The purpose of this letter is to inform the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) of Contingency Plan notification requirements as applicable to Discharge Permit 831 (DP-831) issued to the U.S. Department of Energy (DOE), Carlsbad Field Office (CBFO). The following items are being addressed per Permit Conditions 31 and 32, of the permit's Contingency Plan section.

Permit Condition 31

Initial actions to reestablish freeboard were implemented on October 8, 2015, which was temporarily successful.

This Contingency Plan addresses the excess above freeboard in Storm Water Ponds 1, 2, and 3 with the need to place this excess storm water into Salt Storage Ponds 1 and 3. It is anticipated that this can be completed Friday October 16, 2015.

As the current matter addresses storm water run-off only, the CBFO requests that no further corrective measures be implemented for this event. The other evaporation ponds are associated with the sewage treatment facility and salt water containment. These evaporation ponds are not experiencing issues with their freeboard capacity.

Permit Condition 32

This report confirms the CBFO call to Mr. Steven Huddleson on October 9, 2015, informing your office of the need to transfer storm water from Storm Water Ponds 1, 2, and 3 to maintain freeboard capacity. Storm water will be transferred to Salt Storage Ponds 1 and 3 to achieve the proper freeboard in Storm Water Ponds 1, 2, and 3. The Salt Storage Ponds have substantial freeboard capacity remaining after pumping water from the Storm Water Ponds into these ponds.

CBFO:EPD:GTB:MN:15-2241:UFC 5486.00

Contingency Plan Information

The following information (a-g) completes the one-week notification, required in Section 32 in the DP-831 Permit.

(a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility:

Person in charge of the facility:
Todd A. Shrader, Manager
4021 National Parks Highway
Carlsbad, New Mexico, 88220
PHN: (575) 234-7300

Owner of the facility:
U.S. Department of Energy

Operator of the facility:
Nuclear Waste Partnership, LLC

(b) Name and address of the facility:

U.S. Department of Energy
Waste Isolation Pilot Plant (WIPP)
26 miles southeast of Carlsbad, New Mexico off of State Highway 128
Carlsbad, NM 88220

(c) The date, time, location, and duration of the discharge:

Date: October 8, 2015
Time: N/A
Location: WIPP Facility (Latitude: 32 22.589, Longitude 103 47.746)
Duration: It is estimated that storm water pond capacity was reached on October 8, 2015.

(d) The source and cause of the discharge:

Source: Runoff from the WIPP facility occurring from extended high precipitation events beginning October 3, 2015.

Cause of discharge:

On October 3, 2015, significant rainfall events began. During this first series of precipitation events, October 3 through October 4, 2015, a total of 1.67 inches of precipitation was measured. Initially, the storm water ponds were able to contain the runoff from the WIPP facility without exceeding the one foot freeboard permit requirement. Then on October 6, 2015, additional rainfall events occurred totaling 1.89 inches. The CBFO then initiated the short-term corrective measures of pumping water from Storm Water Pond 2 into Storm Water Pond 3.

The CBFO then informed the GWQB of the less than one foot of freeboard and outflow of Storm Water Pond 1 on October 8, 2015.

(e) A description of the discharge, including chemical composition:

The outflow from Storm Water Pond 1 was storm water runoff from the WIPP facility. Historical chemical sampling and analysis from storm water runoff have shown no exceedances of the analyte limits. A sample will be collected consistent with Permit Condition 20 and the chemical composition will be noted in the next semi-annual report submitted to the GWQB.

(f) The estimated volume of the discharge:

There is no device for measuring the overflow of Storm Water Pond 1. Also, amounts of water outflow are conservative estimations. There is no evidence of erosion damage to pond berms or liner integrity. The estimated amount of outflow is as follows:

Storm Water Pond 1 – 100 gallons

(g) Any actions taken to mitigate immediate damage from this discharge:

On October 8, 2015, water was pumped from the Storm Water Ponds 1 and 2 into Storm Water Pond 3 which had sufficient spare volume to contain the water from the other ponds and not outflow. Water was pumped from Storm Water Pond 3 into Salt Storage Pond 3 to maintain a one foot freeboard on Storm Water Pond 3.

Corrective Action Plan

The following information (a-c) completes the 15-day Corrective Action Report/Plan required in Section 32 in the DP-831 Permit.

a) A description of proposed actions to prevent future unauthorized discharge.

Corrective measures include pumps and piping to transfer storm water from Storm Water Pond 3 to Salt Storage Pond 3. Salt Storage Pond 3 has the capacity of 22,881,320 gallons storage and currently has approximately 12,000,000 gallons in it. This leaves an approximate capacity of 11,000,000 gallons which is near the total capacity of all three storm water ponds combined. The amount of water to be pumped into Salt Storage Pond 3 will only be equal to the amount needed to maintain one foot of freeboard in Storm Water Ponds 1, 2, and 3. If additional rainfall occurs, more water will need to be transferred to Salt Storage Pond 3. If more storage capacity is needed, Salt Storage Pond 1 can be used.

b) A description of proposed actions to prevent future unauthorized discharges of this nature.

The pumping system includes a pump that transfers water from Storm Water Ponds 1 and 2 into Storm Water Pond 3. Water from Storm Water Pond 3 is then transferred by another pump into Salt Storage Pond 3. A one foot freeboard is maintained in all impoundments. The transfer of this storm water will be completed by October 16, 2015. After the significant storm events, inspections of all the permitted ponds were performed. These inspections found no evidence of erosion or damage to any of the ponds.

c) A schedule for completion of proposed actions.

To prevent the reoccurrence of the overflowing of the Storm Water Ponds, a system of piping from one pond to the other has been established. New water pumps will be fitted to be quickly installed so that storm water can be pumped into another pond before the water overtops the ponds.

Upon review of this matter, it is believed that this outflow of storm water runoff poses no threat to human health and environment. The corrective actions described are intended to meet all notification requirements of 20.6.2.1203 NMAC and DP-831 with no additional documentation transmittal to the GWQB required, if events remain unchanged. If additional information changes the path forward, the NMED will be notified. Results of this effort will be included in the next semi-annual report.

If you have any further questions regarding this matter or need additional information, please contact me at (575) 234-7488.

Sincerely,

George T. Basabilvazo

George T. Basabilvazo, Director
Environmental Protection Division

cc:

S. Huddleson, NMED	*ED
T. Shrader, CBFO	ED
W. Mouser, CBFO	ED
A. Stone, CBFO	ED
A. Ward, CBFO	ED
P. Breidenbach, NWP	ED
J. Blankenhorn, NWP	ED
R. Chavez, RES	ED
CBFO M&RC	

*ED denotes electronic distribution

CBFO:EPD:GTB:MN:15-2241:UFC 5486.00

DP-831 (ua)

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

OCT 0 2 2014

Mr. Jerry Schoeppner
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building
P.O. Box 5469
Santa Fe, New Mexico 87502-5469

Subject: Supplement to the Notification of Discharge/Corrective Action Report, Discharge Permit 831

Reference: DOE Memorandum CBFO:EPD:GTB:KE:14-2612:UFC 5486.00 from George T. Basabilvazo to John Hall, NMED, dated September 25, 2014, Subject: Notification of Discharge/Corrective Action Report, Discharge Permit 831

Dear Mr. Schoeppner:

The purpose of this letter is to supplement the Notification of Discharge/Corrective Action Report sent to Mr. John Hall of the New Mexico Environment Department, Ground Water Quality Bureau (GWQB) on September 25, 2014, with the estimates of volume outflow from Storm Water Ponds 1, 2 and 3. This information is being provided as stated in the referenced September 25, 2014 letter.

There is no device for measuring the outflow of Storm Water Ponds 1, 2, and 3; therefore, the volumes are conservative estimates. The outflow estimates for Storm Water Ponds 1, 2, and 3 come from calculations of 0.52 inches of precipitation on the applicable watershed runoff areas for each individual pond. These calculations assume that all rain that fell on the drainage area ran into the pond, and no precipitation was absorbed into the ground, had not puddled in other locations, or was not directly channeled to the pond. Storm water was also pumped from Storm Water Ponds 1 and 2 into Storm Water Pond 3 to relieve the freeboard burden in those ponds. It appears wave action was a contributor to outflow of Storm Water Ponds 1 and 2 after they were filled by the runoff from the rain. The estimated amount of outflow is as follows:

Storm Water Pond 1 – 5,650 gallons
Storm Water Pond 2 – 108,900 gallons
Storm Water Pond 3 – 395,000 gallons

On September 30, 2014, we received the email sent by Mr. Hall of the GWQB to Ms. Margaret Gee of the Carlsbad Field Office approving corrective actions proposed in the reference letter to begin pumping storm water from Storm Water Ponds 1, 2, and 3 and from Salt Storage Pond 1 into Salt Storage Pond 3. These corrective measures will mitigate the excess storm water.

If you have any further questions regarding this matter or need additional information, please contact me at (575) 234-7488.

Sincerely,

George T. Basabilvazo

George T. Basabilvazo, Director
Environmental Protection Division

cc:
T. Kliphuis, NMED *ED
J. Pruett, NMED ED
CBFO M&RC
*ED denotes electronic distribution

CBFO:EPD:GTB:MN:14-2625:UFC 5486.00

Sandoval, Diana, NMENV

From:	Pruett, Jennifer, NMENV
Sent:	Friday, October 03, 2014 2:31 PM
To:	Sandoval, Diana, NMENV
Subject:	FW: Supplement to the Notification of Discharge/Corrective Action Report, Discharge Permit 831
Attachments:	14-2625 Letter.pdf

This one is also un-assigned. Please ensure the letter and the email below get put in the file.
Thank you,
JJP

Jennifer J. Pruett
Manager, Pollution Prevention Section
Harold Runnels Bldg.
1190 St. Francis Dr.
P.O. Box 5469
Santa Fe, NM 87502-5469
505-827-0652

From: Michelle Navarrete [mailto:Michelle.Navarrete@cbfo.doe.gov]
Sent: Thursday, October 02, 2014 4:40 PM
To: Schoeppner, Jerry, NMENV
Cc: Kliphuis, Trais; NMENV; Pruett, Jennifer, NMENV
Subject: Supplement to the Notification of Discharge/Corrective Action Report, Discharge Permit 831

If you have any questions regarding this matter, please contact Mr. George T. Basabilvazo at (575) 234-7488.

Michelle Navarrete, Administrative Assistant
ATA Services
Contractor to the Department Of Energy Carlsbad Field Office
Environmental Protection Divison
P.O. Box 3090
Carlsbad, NM 88220
575-234-7191
michelle.navarrete@cbfo.doe.gov

NEW MEXICO
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Governor

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RYAN FLYNN
Secretary

BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL – RETURN RECEIPT REQUESTED

July 29, 2014

Jose Franco, Manager
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221

RE: Discharge Permit Renewal, DP-831, Waste Isolation Pilot Plant (WIPP)

Dear Mr. Franco:

The New Mexico Environment Department (NMED) issues the enclosed Discharge Permit Renewal, DP-831, to the Department of Energy (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

The Discharge Permit contains terms and conditions that shall be complied with by the permittee and are enforceable by NMED pursuant to Section 20.6.2.3104 NMAC, WQA, NMSA 1978 §74-6-5 and §74-6-10. Please be aware that this Discharge Permit may contain conditions that require the permittee to implement operational, monitoring or closure actions by a specified deadline. Such conditions are listed at the beginning of the operational, monitoring and closure plans of this Discharge Permit.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

Pursuant to Paragraph (4) of Subsection H of 20.6.2.3109 NMAC, the term of the Discharge Permit shall be five years from the effective date. The term of this Discharge Permit will end on July 29, 2019.

NMED requests that the permittee submit an application for renewal (or renewal and modification) at least 180 days prior to the date the Discharge Permit term ends.

An invoice for the Discharge Permit Fee of $12,650.00 is being sent under separate cover. Payment of the Discharge Permit Fee must be received by NMED within 30 days of the date the Discharge Permit is issued.

If you have any questions, please contact John Hall at (505) 827-1049. Thank you for your cooperation during this Discharge Permit review.

Sincerely,

Jerry Schoeppner, Chief
Ground Water Quality Bureau

JS:JH

Encs: Discharge Permit Renewal, DP-831
Ground Water Discharge Permit Conditions for Synthetically Lined Lagoons – Liner Material and Site Preparation, Revision 0.0, May 2007
Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions, Revision 1.1, March 2011

cc: Michael Kesler, District Manager, NMED District III (electronic copy)
NMED Carlsbad Field Office (electronic copy)
John Romero, Office of the State Engineer (electronic copy)
George Basabilvazo, Director of HSE, U.S. Department of Energy, P.O. Box 3090, Carlsbad, NM 88221 (permit/enclosures)

GROUND WATER DISCHARGE PERMIT RENEWAL
Waste Isolation Pilot Plant (WIPP), DP-831

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Discharge Permit Renewal (Discharge Permit), DP-831, to the U.S. Department of Energy (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the Waste Isolation Pilot Plant (WIPP) (facility) into ground and surface water, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses and. protect public health. In issuing this Discharge Permit, NMED has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been or will be met. Pursuant to Section 20.6.2.3104 NMAC, it is the responsibility of the permittee to comply with the terms and conditions of this Discharge Permit; failure may result in an enforcement action(s) by NMED (20.6.2.1220 NMAC).

The activities which produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics of the discharge are briefly described as follows:

Up to 23,000 gallons per day (gpd) of domestic wastewater is discharged to a synthetically lined impoundment system for disposal by evaporation. The system consists of seven synthetically-lined facultative sewage lagoons (Facultative Lagoon System) that include Settling Lagoons 1 and 2, Polishing Lagoons 1 and 2, and Effluent Lagoons A, B, and C. Industrial wastewater from two compressed air systems at the facility is also discharged to the Facultative Lagoon System. Brine, purge waters, and miscellaneous industrial non-hazardous wastewater are discharged to the Effluent Lagoons B and C of the Facultative Lagoon System. In addition, brine, purge waters, and miscellaneous industrial non-hazardous wastewater are discharged to a separate synthetically-lined impoundment for disposal by evaporation (Evaporation Pond H-19).

Salt and other subsurface materials mined during construction of the facility, as well as currently mined salt, are stored on the surface in three stockpiles. The stockpiles that are being used to store salt currently, or in the future, as it is mined out from the underground panels at the facility are Salt Cells 2 and 3. Up to 2,547,202 gpd of storm water runoff in contact with these salt stockpiles (based on a 24-hour, 25-year storm event - 3.9 inches) is collected in two double synthetically-lined storm water impoundments, each with a leak detection system (Salt Storage Ponds 2 and 3). The third salt stockpile (Salt Cell 1) is capped with a synthetic liner and earthen cover. Up to 1,677,633 gpd of storm water runoff in contact with this stockpile is collected in synthetically-lined diversion ditches and is diverted to a synthetically-lined impoundment (Salt Storage Pond 1).

Additional storm water runoff from the facility's paved areas and roofs is collected in three synthetically-lined impoundments (Storm Water Ponds 1, 2, and 3). This runoff is not in contact with the salt stockpiles at the facility.

The Site and Preliminary and Design Validation (SPDV) material pile was constructed as the shafts were excavated when construction first began at the WIPP site. The SPDV material pile was closed in the year 2000 with a cover consisting of a geosynthetic liner installed on 6 inches of bedding material and covered with a minimum of three feet of earthen material.

The discharge contains water contaminants which may be elevated above the standards of Section 20.6.2.3103 NMAC and/or the presence of toxic pollutants as defined in Subsection WW of 20.6.2.7 NMAC. The facility is located off of the Jal Highway, approximately 26 miles southeast of Carlsbad, in Sections 20, 28, and 29, Township 22 South, Range 31 East, Eddy County. Ground water most likely to be affected is at a depth of approximately 164 feet and has a total dissolved solids concentration of approximately 3,400 milligrams per liter.

The Discharge Permit sets forth separate requirements for the Facultative Lagoon System, the storage of storm water runoff in contact with salt stockpiles, and storm water runoff from the facility's paved and impermeable areas.

- Part A. Applicable to All Parts
- Part B. Applicable to the Facultative Lagoon System
- Part C. Applicable to the Evaporation Pond H-19 and Storm Water Impoundments Not in Contact with Salt Stockpiles (Storm Water Ponds 1, 2, and 3)
- Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2, and 3)

The original Discharge Permit was issued on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998, amended on January 24, 2000, renewed on April 29, 2003, modified on December 22, 2003, modified again on December 29, 2006, and renewed and modified on July 23, 2008. The application (i.e., discharge plan) consists of the materials submitted by the permittee dated May 10, 2013 and materials contained in the administrative record prior to issuance of this Discharge Permit. The discharge shall be managed in accordance with all conditions and requirements of this Discharge Permit.

Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to require a Discharge Permit Modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under this Discharge Permit are not protective of ground water quality, and that more stringent requirements to protect ground water quality may be required by NMED. The permittee may be required to implement abatement of water pollution and remediate ground water quality.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

The following acronyms and abbreviations may be used in this Discharge Permit:

Abbreviation	Explanation	Abbreviation	Explanation
CFR	Code of Federal Regulations	NO_3-N	nitrate-nitrogen
Cl	Chloride	TDS	total dissolved solids
EPA	United States Environmental Protection Agency	TKN	total Kjeldahl nitrogen
gpd	gallons per day	total nitrogen	= TKN + NO_3-N
mg/L	milligrams per liter	SO_4	Sulfate
mL	Milliliters	UPC	Uniform Plumbing Code
NMAC	New Mexico Administrative Code	WQA	New Mexico Water Quality Act
NMED	New Mexico Environment Department	WQCC	Water Quality Control Commission
NMSA	New Mexico Statutes Annotated	WWTF	Wastewater Treatment Facility

II. FINDINGS

In issuing this Discharge Permit, NMED finds:

1. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move directly or indirectly into ground water within the meaning of Section 20.6.2.3104 NMAC.

2. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move into ground water of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of TDS within the meaning of Subsection A of 20.6.2.3101 NMAC.

3. The discharge from the facility is not subject to any of the exemptions of Section 20.6.2.3105 NMAC.

III. AUTHORIZATION TO DISCHARGE

Pursuant to 20.6.2.3104 NMAC, it is the responsibility of the permittee to ensure that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein.

The permittee is authorized to discharge up to 23,000 gpd of domestic wastewater to a synthetically-lined facultative impoundment system for disposal by evaporation. The permittee is also authorized to discharge up to 4,224,835 gpd of runoff in contact with salt stockpiles to three synthetically-lined impoundments for disposal by evaporation. The Facultative Lagoon System is permitted to accept non-hazardous industrial wastewater from two compressed air systems at the facility. Up to 50,000 gpd of brine, purge waters, and miscellaneous non-hazardous process waters are permitted to be discharged into Evaporation Ponds B and C of the Facultative Lagoon System, up to the capacity of the ponds with one foot of freeboard. Up to 50,000 gpd of brine, purge waters, and miscellaneous non-hazardous process waters are permitted to be discharged into to the Evaporation Pond H-19, up to the capacity of the pond with one foot of freeboard. The permittee is also authorized to collect storm water runoff from the facility's paved areas and

roofs in Storm Water Ponds 1, 2, and 3. This runoff is not in contact with the salt stockpiles at the facility.

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

IV. CONDITIONS

NMED issues this Discharge Permit for the discharge of water contaminants subject to the following conditions:

OPERATIONAL PLAN

Part A. Applicable to All Parts

#	Terms and Conditions
1.	The permittee shall implement the following operational plan to ensure compliance with Title 20, Chapter 6, Parts 1 and 2 NMAC. [Subsection C of 20.6.2.3109 NMAC]
2.	The permittee shall operate in a manner such that standards and requirements of Sections 20.6.2.3101 and 20.6.2.3103 NMAC are not violated. [20.6.2.3101 NMAC, 20.6.2.3103 NMAC, Subsection C of 20.6.2.3109 NMAC]
3.	The permittee shall maintain the impoundment liner(s) in such a manner as to avoid conditions which could affect the structural integrity of the impoundment(s) and/or impoundment liner(s). Such conditions include or may be characterized by the following: • erosion damage; • animal burrows or other damage; • the presence of vegetation including aquatic plants, weeds, woody shrubs or trees growing within five feet of the top inside edge of a sub-grade impoundment, within five feet of the toe of the outside berm of an above-grade impoundment, or within the impoundment itself; • the presence of large debris or large quantities of debris in the impoundment; • evidence of seepage; and • evidence of berm subsidence. Vegetation growing around the impoundment shall be routinely controlled by mechanical removal in a manner that is protective of the impoundment liner. The permittee shall visually inspect the impoundment(s) and surrounding berms on a monthly basis to ensure proper maintenance. In the event that inspection reveals any evidence of damage that threatens the structural integrity of an impoundment berm or liner, or that may result in an unauthorized discharge, the permittee shall enact the

#	Terms and Conditions
	contingency plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
4.	The permittee shall preserve a minimum of one foot of freeboard between the liquid level in the all impoundments and the elevation of the top of the impoundment liners. In the event that the permittee determines that one foot of freeboard cannot be preserved in any impoundment, the permittee shall enact the contingency plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

Part B. Applicable to the Facultative Lagoon System

#	Terms and Conditions
5.	The permittee shall maintain fences around the Facultative Lagoon System to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. Fences shall be maintained throughout the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
6.	The permittee shall maintain signs indicating that the wastewater at the facility is not potable. Signs shall be posted at the Facultative Lagoon System's entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish remain visible and legible for the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
7.	The permittee shall utilize operators, certified by the State of New Mexico at the appropriate level, to operate the wastewater collection, treatment and disposal systems. The operations and maintenance of all or any part of the wastewater system shall be performed by, or under the direct supervision of, a certified operator. [Subsection C of 20.6.2.3109 NMAC, 20.7.4 NMAC]
8.	The permittee shall measure the thickness of the sludge blanket in each pond of the Facultative Lagoon System ***once within the effective term*** of this Discharge Permit, but before the end of 2018. When sludge accumulation exceeds 1/3 of the total depth of any pond, the permittee shall remove the sludge in a manner, which is protective of the pond liner. Removed solids shall be contained, transported, and disposed of in accordance with all local, state, and federal regulations. The permittee shall maintain solids blanket measurements and solids disposal manifests for solids transported from the facility for

#	Terms and Conditions
	off-site disposal. The permittee shall submit all measurements and manifests to NMED in the semi-annual monitoring report immediately following the solids thickness measurement. [20.6.2.3109 NMAC, 20.6.2.3107 NMAC]

Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2 and 3)

#	Terms and Conditions
9.	The permittee shall measure the thickness of the solids blanket in each impoundment ***once within the effective term*** of this Discharge Permit, but before the end of 2018. Removed solids shall be contained, transported, and disposed of in accordance with all local, state, and federal regulations. The permittee shall maintain solids blanket measurements and solids disposal manifests for solids transported from the facility for off-site disposal. The permittee shall submit all measurements and manifests to NMED in the semi-annual monitoring report immediately following the solids thickness measurement. [20.6.2.3109 NMAC, 20.6.2.3107 NMAC]
10.	The permittee shall inspect the leak detection systems for Salt Storage Ponds 2 and 3 on a monthly basis for the presence of liquid. The permittee shall keep a log of the inspection findings and repairs made. The inspection log, including a statement whether or not liquids were observed in the leak detection systems, shall be submitted to NMED in the semi-annual monitoring reports. [20.6.2.3107 NMAC]
11.	The permittee shall conduct regular maintenance of the earthen cover on the Salt Cell 1 and the SPDV material pile. Inspections shall be conducted monthly and after storm events of 2 inches or greater in a 24-hour period to evaluate potential erosion and vegetation success of the cover. In the event of significant erosion or failure of vegetative success, the permittee shall provide a plan and schedule for repair within 90 days of discovery. General observations and cover repairs shall be reported to NMED. [20.6.2.3109 NMAC]

MONITORING AND REPORTING

Part A. Applicable to All Parts

#	**Terms and Conditions**
12.	The permittee shall conduct the following monitoring, reporting, and other requirements listed below in accordance with the monitoring requirements of this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
13.	METHODOLOGY – Unless otherwise approved in writing by NMED, the permittee shall conduct sampling and analysis in accordance with the most recent edition of the following documents: a) American Public Health Association, Standard Methods for the Examination of Water and Wastewater (18th, 19th or current) b) U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Waste c) U.S. Geological Survey, Techniques for Water Resources Investigations of the U.S. Geological Survey d) American Society for Testing and Materials, Annual Book of ASTM Standards, Part 31. Water e) U.S. Geological Survey, et al., National Handbook of Recommended Methods for Water Data Acquisition f) Federal Register, latest methods published for monitoring pursuant to Resource Conservation and Recovery Act regulations g) Methods of Soil Analysis: Part 1. Physical and Mineralogical Methods; Part 2. Microbiological and Biochemical Properties; Part 3. Chemical Methods, American Society of Agronomy h) New Mexico Environment Department, Hazardous Waste Bureau Position Paper, *Use of Low-Flow and Other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring.* [Subsection B of 20.6.2.3107 NMAC]
14.	The permittee shall submit semi-annual monitoring reports to NMED for the most recently completed semi-annual period by the 1st of February and August each year. Semi-annual monitoring shall be performed during the following periods and submitted as follows: • January 1st through June 30th (first half) – **due by August 1st** • July 1st through December 31st (second half) – **due by February 1st** [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Sewage Lagoon System

#	Terms and Conditions
15.	The volume of domestic influent discharged to the Facultative Lagoon System shall be measured ***monthly*** using a totalizing flow meter on the influent line to the system or the totalizing meter that measures total domestic water usage. Volumes of other authorized discharges to the Facultative Lagoon System shall be calculated by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. Monthly meter readings, the units of measurement, monthly discharge volumes and other volumetric calculations for the previous 6-month period shall be submitted to NMED semi-annually in the monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
16.	The permittee shall collect a wastewater sample on a ***semi-annual*** basis (once every six months) from the influent to the Facultative Lagoon System. The grab sample shall be analyzed for TKN, NO_3-N, SO_4, TDS and Cl. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]

Part C. Applicable to the Evaporation Pond H-19 and Storm Water Impoundments Not in Contact with Salt Stockpiles (Storm Water Ponds 1, 2, and 3)

#.	Terms and Conditions
17.	The volume and origin of all wastewater discharged to the Evaporation Pond H-19 that is derived from miscellaneous non-hazardous sources shall be measured ***monthly*** and reported to NMED. Discharge volumes to the Evaporation Pond H-19 shall be calculated by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. Monthly discharge volumes and other volumetric calculations for the previous 6-month period shall be submitted to NMED semi-annually in the monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
18.	A sample shall be collected ***semi-annually*** from the Evaporation Pond H-19 and analyzed for SO_4, Cl, and TDS. Samples shall be collected ***annually*** after a significant storm event from each of the storm water ponds, Storm Water Ponds 1, 2, and 3 and analyzed for SO_4, Cl, and TDS. Samples shall be properly prepared, preserved, transported and

#	Terms and Conditions
	analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
19.	The water depth shall be measured ***monthly*** to the nearest tenth of a foot (0.1 ft) in the Storm Water Ponds 1, 2, and 3. The approximate volume of storm water shall be calculated and submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]

Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2 and 3)

#	Terms and Conditions
20.	A sample shall be collected ***annually*** after a significant storm event from each of the Salt Storage Cells 1, 2, and 3 and analyzed for SO_4, Cl, and TDS. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
21.	The water depth shall be measured monthly to the nearest tenth of a foot (0.1 ft) in the Salt Storage Ponds 1, 2, and 3. The approximate volume of storm water shall be calculated and submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]

GROUND WATER MONTIROING AND REPORTS

#	Terms and Conditions
22.	Depth to the water table shall be measured to the nearest hundredth of a foot (0.01 ft) ***quarterly*** in piezometers/monitoring wells: • PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-6, PZ-7, PZ-8, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13,

#	Terms and Conditions
	PZ-14, and PZ-15 • C-2505, C-2506, C-2507, C-2811, and WQSP-6A [Subsection A of 20.6.2.3107 NMAC]
23.	The permittee shall perform ***semi-annual*** ground water sampling in the following piezometers/monitoring wells and analyze the samples for temperature, pH, specific conductance, SO_4, TDS, and Cl: • Piezometers: PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, and PZ-13 • Monitoring Wells: C-2507, C-2811, and WQSP-6A Ground water sample collection, preservation, transport and analysis shall be performed according to the following procedure: a) Measure the depth-to-most-shallow ground water from the top of the well casing to the nearest hundredth of a foot. b) Purge three well volumes of water from the well prior to sample collection. c) Obtain samples from the well for analysis. d) Properly prepare, preserve and transport samples. e) Analyze samples in accordance with the methods authorized in this Discharge Permit. Depth-to-most-shallow ground water measurements, analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
24.	The permittee shall perform ***semi-annual*** ground water sampling from monitoring well WQSP-6A and analyzed for TKN and NO_3. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results shall be submitted to NMED in the semi-annual monitoring reports. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
25.	Hydrographs shall be submitted ***annually*** for all monitoring wells and piezometers covered under Condition 22 of this Discharge Permit. At a minimum, graphs shall include the previous five years of water level data, or for recently installed wells, all data since the well was installed. Data for several wells may be included on one graph.

#	Terms and Conditions
	[Subsection A of 20.6.2.3107 NMAC]
26.	A potentiometric map for facility area shall be submitted *annually*. The map shall incorporate the most recent water level data for all monitoring wells and piezometers installed in the shallow subsurface water (SSW). [Subsection A of 20.6.2.3107 NMAC]
27.	A single table in a paper and electronic format (EXCEL spreadsheet) of water level measurements and water quality data with only those constituents analyzed and water levels measured during a single event shown in columns. Tabulated field measurements to include temperature, pH, and electrical conductivity corrected to 25 degrees Celsius. Monitoring sites shall be shown in rows. The second column shall contain the date of the sampling event. Values exceeding standards shall be bolded. Any constituent not analyzed for a particular site shall be shown as "NA", any site not sampled shall be shown as "NS" with an associated reason, and any site not measured for water levels shall be shown as "NM" with an associated reason. [Subsection A of 20.6.2.3107 NMAC]
28.	A single table that includes all available ground water data to date shall be submitted annually.. For each monitoring well, the name of the well shall be entered in the far left column in a row by itself. Sampling events, beginning with the earliest event first, shall be entered in subsequent rows with the sampling date in the second column and the corresponding analytical data in columns further to the right. Each new sampling event shall be added as an additional row to the existing spreadsheet with the corresponding date of the sampling event noted in the second column next to the monitoring well name. [Subsection A of 20.6.2.3107 NMAC]

CONTINGENCY PLAN

#	Terms and Conditions
29.	In the event that ground water monitoring indicates that a ground water quality standard identified in Section 20.6.2.3103 NMAC is exceeded; the total nitrogen concentration in ground water is greater than 10 mg/L; or a toxic pollutant (defined in Subsection WW of 20.6.2.7 NMAC) is present in a ground water sample and in any subsequent ground water sample collected from a monitoring well required by this Discharge Permit, the permittee shall enact the following contingency plan: Within 60 days of the subsequent sample analysis date, the permittee shall propose measures to ensure that the exceedance of the standard or the presence of a toxic pollutant will be mitigated by submitting a corrective action plan to NMED for approval.

#	Terms and Conditions
	The corrective action plan shall include a description of the proposed actions to control the source and an associated completion schedule. The plan shall be enacted as approved by NMED. Once invoked (whether during the term of this Discharge Permit; or after the term of this Discharge Permit and prior to the completion of the Discharge Permit closure plan requirements), this condition shall apply until the permittee has fulfilled the requirements of this condition and ground water monitoring confirms for a minimum of two years of consecutive ground water sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded and toxic pollutants are not present in ground water. The permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC, should the corrective action plan not result in compliance with the standards and requirements set forth in Section 20.6.2.4103 NMAC within 180 days of confirmed ground water contamination. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]
30.	In the event that inspection findings reveal significant damage likely to affect the structural integrity of the lined impoundment(s) or its ability to contain contaminants, the permittee shall propose the repair or replacement of the impoundment liner(s) by submitting a corrective action plan to NMED for approval. The plan shall be submitted to NMED within 30 days after discovery by the permittee or following notification from NMED that significant liner damage is evident. The corrective action plan shall include a schedule for completion of corrective actions and the permittee shall initiate implementation of the plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
31.	In the event that a minimum of one foot of freeboard cannot be preserved in the impoundment(s), the permittee shall take actions authorized by this Discharge Permit and all applicable local, state, and federal regulations to restore the required freeboard. In the event that one foot of freeboard cannot be restored within a period of 72 hours following discovery, the permittee shall propose actions to be immediately implemented to restore one foot of freeboard by submitting a short-term corrective action plan to NMED for approval. Examples of short-term corrective actions include: removing excess wastewater from the impoundment through pumping and hauling; or reducing the volume of liquid/wastewater discharged to the impoundment. The plan shall include a schedule for completion of corrective actions and shall be submitted within 15 days following the date when the one foot of freeboard limit was initially discovered. The permittee shall initiate implementation of the plan following approval by NMED. In the event that the short-term corrective actions failed to restore one foot of freeboard,

#	Terms and Conditions
	the permittee shall propose permanent corrective actions in a long-term corrective action plan submitted to NMED within 90 days following failure of the short-term corrective action plan. Examples include: the installation of an additional storage impoundment, or a significant/permanent reduction in the volume of liquid/wastewater discharged to the impoundment. The plan shall include a schedule for completion of corrective actions and implementation of the plan shall be initiated following approval by NMED. [Subsection A of 20.6.2.3107 NMAC]
32.	In the event that a release (commonly known as a "spill") occurs that is not authorized under this Discharge Permit, the permittee shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in Section 20.6.2.1203 NMAC and summarized below. Within <u>24 hours</u> following discovery of the unauthorized discharge, the permittee shall verbally notify NMED and provide the following information: a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility. b) The name and address of the facility. c) The date, time, location, and duration of the unauthorized discharge. d) The source and cause of unauthorized discharge. e) A description of the unauthorized discharge, including its estimated chemical composition. f) The estimated volume of the unauthorized discharge. g) Any actions taken to mitigate immediate damage from the unauthorized discharge. Within <u>one week</u> following discovery of the unauthorized discharge, the permittee shall submit written notification to NMED with the information listed above and any pertinent updates. Within <u>15 days</u> following discovery of the unauthorized discharge, the permittee shall submit a corrective action report/plan to NMED describing any corrective actions taken and/or to be taken relative to the unauthorized discharge that includes the following: a) A description of proposed actions to mitigate damage from the unauthorized discharge. b) A description of proposed actions to prevent future unauthorized discharges of this nature. c) A schedule for completion of proposed actions. In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of Section 20.6.2.4103 NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to Paragraph (1) of Subsection A of 20.6.2.1203 NMAC, the permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000

#	Terms and Conditions
	through 20.6.2.4115 NMAC. Nothing in this condition shall be construed as relieving the permittee of the obligation to comply with all requirements of Section 20.6.2.1203 NMAC. [20.6.2.1203 NMAC]
33.	In the event that NMED or the permittee identifies any failures of the discharge plan or this Discharge Permit not specifically noted herein, NMED may require the permittee to submit a corrective action plan and a schedule for completion of corrective actions to address the failure(s). Additionally, NMED may require a Discharge Permit modification to achieve compliance with 20.6.2 NMAC. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]
34.	In the event of a pipeline break, pump failure, pond overflow or other system failure at the facility, discharged water shall be contained, pumped and transferred to area of the facility that impose minimal impacts to ground water quality. Failed components shall be repaired or replaced as soon as possible and no later than 72 hours from the time of failure. For good cause demonstrated, the permittee may request NMED approval of an extension of the schedule for the repair or replacement of a failed component. [20.6.2.3107A NMAC]

CLOSURE PLAN

Part A. Applicable to All Parts

#	Terms and Conditions
35.	The permittee shall close the facilities covered under this Discharge Permit in accordance with the closure plan in the March 4, 2005 discharge permit application, the closure plan in the WIPP Hazardous Waste Facility Permit (HWFP) dated November 1, 2012, and the WIPP Land Management Plan. [Subsection A of 20.6.2.3107 NMAC]
36.	The permittee shall continue ground water monitoring until the requirements of this condition have been met and ground water monitoring confirms for a minimum of two years of consecutive ground water sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded and toxic pollutants are not present in ground water. If monitoring results show that a ground water quality standard in Section 20.6.2.3103 NMAC is exceeded; the total nitrogen concentration in ground water is greater than 10

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	mg/L; or a toxic pollutant (defined in Subsection WW of 20.6.2.7 NMAC) is present in ground water, the permittee shall implement the contingency plan required by this Discharge Permit. Following notification from NMED that post-closure monitoring may cease, the permittee shall plug and abandon the monitoring well(s) in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Sewage Lagoon System

#	Terms and Conditions
37.	In the event the Facultative Lagoon System is proposed to be permanently closed, upon ceasing discharging, the permittee shall perform the following closure measures: Within <u>60 days</u> of ceasing discharging to the Facultative Lagoon System impoundments(s), the line leading to the impoundment shall be plugged so that a discharge can no longer occur. Within <u>60 days</u> of ceasing discharging to the Facultative Lagoon System (impoundments), wastewater shall be drained or evaporated from the impoundment and any other wastewater system components and it shall be disposed of in accordance with all local, state, and federal regulations. Within <u>90 days</u> of ceasing discharging to the Facultative Lagoon System impoundment(s), the permittee shall submit a sludge removal and disposal plan to NMED for approval. The permittee shall initiate implementation of the plan within 30 days following approval by NMED. The sludge removal and disposal plan shall include the following: a) The estimated volume and dry weight of sludge to be removed and disposed, including measurements and calculations. b) Analytical results for samples of the sludge taken from the impoundment for TKN, NO_3-N, percent total solids, hazardous constituents, and any other parameters tested (reported in mg/kg, dry weight basis). c) The method(s) of sludge *removal* from the impoundment(s). d) The method(s) of *disposal* for all of the sludge (and its contents) removed from the impoundment(s). The method(s) shall comply with all local, state and federal regulations, including 40 CFR Part 503. *Note: A proposal that includes the surface disposal of sludge may be subject to Ground Water Discharge Permitting requirements pursuant to 20.6.2.3104 NMAC that are separate from the*

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	requirements of this Discharge Permit. e) A schedule for completion of sludge removal and disposal not to exceed two years from the date discharge to the impoundment(s) ceased. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove all lines leading to and from the Facultative Lagoon System impoundment(s), or permanently plug and abandon them in place. b) Remove or demolish any other wastewater system components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liner(s). d) Fill the impoundment(s) with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [Subsection A of 20.6.2.3107 NMAC, 40 CFR Part 503]

Part C. Applicable to the Evaporation Pond H-19 and Storm Water Impoundments Not in Contact with Salt Stockpiles (Storm Water Ponds 1, 2, and 3)

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38.	Upon cessation of operation, the permittee shall close the Evaporation Pond H-19 and Storm Water Ponds 1, 2, and 3. Remaining liquids in each impoundment shall be removed and/or evaporated. All sludge shall be sampled to determine if hazardous constituents exist and managed and/or disposed of in accordance with applicable regulations. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove or plug all piping and other ancillary components b) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liner(s). d) Fill the impoundment(s) with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [20.6.2.3107A(11) NMAC]

Part D. Applicable to the Storm Water Runoff Impoundments in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, and 3) and Salt Stockpiles (Salt Cells 1, 2 and 3)

#	Terms and Conditions
39.	Upon cessation of operation, all mined salt at the facility shall be removed from the site. The permittee is permitted to use the mined salt as backfill in shafts and as interior fill material in berms and permanent markers after closure. All mined salt remaining after backfilling and after construction of surface structures shall be removed from the site. The permittee shall submit a plan and schedule for salt tailings removal to NMED for approval within 120 days prior to the facility closure. The WIPP Land Management Plan reflects the Land Withdrawal Act's requirements for disposition of the salt. The WIPP's Hazardous Waste Facility Permit also addresses closure activities that include closure of the salt storage areas in accordance with the provisions of the WIPP Land Management Plan. The salt storage area will be reclaimed in the manner described in these documents. [20.6.2.3107A(11) NMAC]
40.	Upon cessation of operation, the permittee shall close Salt Storage Ponds 1, 2, and 3. Remaining liquids in each impoundment shall be removed and/or evaporated. All sludge shall be sampled to determine if hazardous constituents exist and managed and/or disposed of in accordance with applicable regulations. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: f) Remove or plug all piping and other ancillary components g) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. h) Perforate or remove the impoundment liner(s). i) Fill the impoundment(s) with suitable fill. j) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [20.6.2.3107A(11) NMAC]

E. GENERAL TERMS AND CONDITIONS

#	Terms and Conditions
41.	RECORD KEEPING - The permittee shall maintain a written record of the following information: a) Information and data used to complete the application for this Discharge Permit. b) Records of any releases (commonly known as "spills") not authorized under this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC.

#	Terms and Conditions
	c) Records of the operation, maintenance, and repair of all facilities/equipment used to treat, store or dispose of wastewater. d) Facility record drawings (plans and specifications) showing the actual construction of the facility and bear the seal and signature of a licensed New Mexico professional engineer. e) Copies of monitoring reports completed and/or submitted to NMED pursuant to this Discharge Permit. f) The volume of wastewater or other wastes discharged pursuant to this Discharge Permit. g) Ground water quality and wastewater quality data collected pursuant to this Discharge Permit. h) Copies of construction records (well log) for all ground water monitoring wells required to be sampled pursuant to this Discharge Permit. i) Records of the maintenance, repair, replacement or calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit. j) Data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit. The following information shall be recorded and shall be made available to NMED upon request: i) The dates, location and times of sampling or field measurements; ii) The name and job title of the individuals who performed each sample collection or field measurement; iii) The sample analysis date of each sample; iv) The name and address of the laboratory, and the name of the signatory authority for the laboratory analysis; v) The analytical technique or method used to analyze each sample or collect each field measurement; vi) The results of each analysis or field measurement, including raw data; vii) The results of any split, spiked, duplicate or repeat sample; and viii) A copy of the laboratory analysis chain-of-custody as well as a description of the quality assurance and quality control procedures used. The written record shall be maintained by the permittee at a location accessible during a facility inspection by NMED for a period of at least five years from the date of application, report, collection or measurement and shall be made available to the department upon request. [Subsections A and D of 20.6.2.3107 NMAC]
42.	INSPECTION and ENTRY – The permittee shall allow inspection by NMED of the facility and its operations which are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC.

#	Terms and Conditions
	The permittee shall allow NMED to have access to and reproduce for their use any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge Permit and the WQCC regulations. Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED under the WQA, the WQCC Regulations, or any other local, state or federal regulations. [Subsection D of 20.6.2.3107 NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]
43.	DUTY to PROVIDE INFORMATION - The permittee shall, upon NMED's request, allow for NMED's inspection/duplication of records required by this Discharge Permit and/or furnish to NMED copies of such records. [Subsection D of 20.6.2.3107 NMAC]
44.	MODIFICATIONS and/or AMENDMENTS – In the event the permittee proposes a change to the facility or the facility's discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the facility, the permittee shall notify NMED prior to implementing such changes. The permittee shall obtain approval (which may require modification of this Discharge Permit) by NMED prior to implementing such changes. [Subsection C of 20.6.2.3107 NMAC, Subsections E and G of 20.6.2.3109 NMAC]
45.	PLANS and SPECIFICATIONS – In the event the permittee is proposing to construct a wastewater system or change a process unit of an existing system such that the quantity or quality of the discharge will change substantially from that authorized by this Discharge Permit, the permittee shall submit construction plans and specifications to NMED for the proposed system or process unit prior to the commencement of construction. In the event the permittee implements changes to the wastewater system authorized by this Discharge Permit which result in only a minor effect on the character of the discharge, the permittee shall report such changes (including the submission of record drawings, where applicable) as of January 1 and June 30 of each year to NMED. [Subsections A and C of 20.6.2.1202 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
46.	CIVIL PENALTIES - Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or facilities, or any refusal or failure to provide NMED with records or information, may

#	Terms and Conditions
	subject the permittee to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10(C) and 74-6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to $10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the permittee waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10 and 74-6-10.1]
47.	CRIMINAL PENALTIES – No person shall: 1) make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained under the WQA; 2) falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained under the WQA; or 3) fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation. Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental impact is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily injury to any other person is guilty of a second degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]
48.	COMPLIANCE with OTHER LAWS - Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of the obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders.

#	**Terms and Conditions**
	[NMSA 1978, § 74-6-5.L]
49.	RIGHT to APPEAL - The permittee may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC within thirty days of the receipt of postal notice of this Discharge Permit and shall include a statement of the issues to be raised and the relief sought. Unless a timely petition for review is made, the decision of NMED shall be final and not subject to judicial review. [20.6.2.3112 NMAC, NMSA 1978, § 74-6-5.O]
50.	TRANSFER of DISCHARGE PERMIT - Prior to the transfer of any ownership, control, or possession of this facility or any portion thereof, the permittee shall: 1) notify the proposed transferee in writing of the existence of this Discharge Permit; 2) include a copy of this Discharge Permit with the notice; and 3) deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee. Until both ownership and possession of the facility have been transferred to the transferee, the permittee shall continue to be responsible for any discharge from the facility. [20.6.2.3111 NMAC]
51.	PERMIT FEES - Payment of permit fees is due at the time of Discharge Permit approval. Permit fees shall be paid in a single payment or shall be paid in equal installments on a yearly basis over the term of the Discharge Permit. Single payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date. Initial installment payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date; subsequent installment payments shall be remitted to NMED no later than the anniversary of the Discharge Permit effective date. Permit fees are associated with <u>issuance</u> of this Discharge Permit. Nothing in this Discharge Permit shall be construed as relieving the permittee of the obligation to pay all permit fees assessed by NMED. A permittee that ceases discharging or does not commence discharging from the facility during the term of the Discharge Permit shall pay all permit fees assessed by NMED. An approved Discharge Permit shall be suspended or terminated if the facility fails to remit an installment payment by its due date. [Subsection F of 20.6.2.3114 NMAC, NMSA 1978, § 74-6-5.K]

V. PERMIT TERM & SIGNATURE

EFFECTIVE DATE: July 29, 2014
TERM ENDS: July 29, 2019

[Subsection H of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.I]

JERRY SCHOEPPNER
Chief, Ground Water Quality Bureau
New Mexico Environment Department

New Mexico Environment Department Ground Water Quality Bureau
Discharge Permit Summary

Facility Information

Facility Name	Waste Isolation Pilot Plant (WIPP)
Discharge Permit Number	DP-831
Legally Responsible Party	Jose Franco, Manager U.S. Department of Energy P.O. Box 3090 Carlsbad, NM 88221 (575) 234-7300

Treatment, Disposal and Site Information

Primary Waste Type	Domestic and Industrial
Facility Type	Federal Agency - U.S. Department of Energy

Evaporative Impoundment Locations

Domestic Wastewater

Type	Designation	Description & Comments
Settling Impoundment	Settling Lagoon 1	Formerly known as "Settling Pond 1A"; Primary treatment; Permitted 1 foot of freeboard.
Settling Impoundment	Settling Lagoon 2	Formerly known as "Settling Pond 2A"; Primary treatment; Permitted 1 foot of freeboard.
Polishing Impoundment	Polishing Lagoon 1	Formerly known as "Polishing Pond 1B"; Passive secondary treatment; Permitted 1 foot of freeboard.
Polishing Impoundment	Polishing Lagoon 2	Formerly known as "Polishing Pond 2B"; Passive secondary treatment; Permitted 1 foot of freeboard.
Evaporation Impoundment	Effluent Lagoon A	Formerly known as "Evaporation Pond A"; Effluent storage; Disposal by evaporation; Permitted 1 foot of freeboard.
Evaporation Impoundment	Effluent Lagoon B	Formerly known as "Evaporation Pond B"; Effluent storage; Disposal by evaporation; Permitted discharges are domestic waste, brine, purge waters, and miscellaneous industrial non-hazardous wastewater; Permitted 1 foot of freeboard.
Evaporation Impoundment	Effluent Lagoon C	Formerly known as "Evaporation Pond C"; Effluent Storage; Disposal by evaporation; Permitted discharges are domestic waste, brine, purge waters, and miscellaneous industrial non-hazardous wastewater; Permitted 1 foot of freeboard.

Storm Water Control

Type	Designation	Description & Comments
Storm Water Impoundment	Storm Water Pond 1	Formerly known as "Storm Water Intrusion Pond 1"; Receives clean non-contact storm water from paved areas, roofs, air conditioner condensate, and water from domestic water lines; Disposal by evaporation.

Storm Water Impoundment	Storm Water Pond 2	Formerly known as "Storm Water Intrusion Pond 2"; Receives clean non-contact storm after from the facilities paved areas, roofs, air conditioner condensate, and draining domestic water lines; Disposal by evaporation.
Storm Water Impoundment	Storm Water Pond 3	Formerly known as "Storm Water Intrusion Pond A"; Receives clean non-contact storm after from the facilities paved areas, roofs, air conditioner condensate, and draining domestic water lines; Disposal by evaporation.

Industrial Wastewater

Type	Designation	Description & Comments
Evaporation Impoundment	Evaporation Pond H-19	Permitted discharges are brine, purge waters, and miscellaneous industrial non-hazardous wastewater; 346, 085 gallons (with one foot of freeboard); Disposal by evaporation.
Evaporation Impoundment	Salt Storage Pond 1	Formerly known as "Salt Pile Evaporation Pond"; 1,677,633 gallons (with one foot freeboard); Disposal by evaporation
Evaporation Impoundment	Salt Storage Pond 2	Formerly known as "Salt Storage Extension Basin I"; Constructed using 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system;1,273,601 gallons (with one foot of freeboard); Disposal by evaporation.
Evaporation Impoundment	Salt Storage Pond 3	Formerly known as "Salt Storage Extension Basin II"; Constructed using 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system; 1,273,601 gallons (with one foot of freeboard); Disposal by evaporation.

Salt Storage Locations

Type	Designation	Description & Comments
Salt Pile	Salt Cell 1	Formerly known as "Salt Pile"; Inactive; Approximately 18.8 acres; graded to 2% slope covered with sand and 60 mil HDPE liner and with 2 ft. of native soil; Seeded; Run-off collects in to Salt Storage Pond 1.
Salt Pile	Salt Cell 2	Formerly known as "Salt Extension Cell A"; Active; 6.2 acres; Run-off area of 326,350 sq. ft.; Constructed using of six inch prepared subgrade, 60-mil HDPE liner, 200-mil drainage layer, eight oz. geotextile fabric covered with 2 ft. of native soil; Runoff collects in Storage Pond(s) 2 and/or 3.

Salt Pile	Salt Cell 3	Formerly known as "Salt Extension Cell B"; Active; 5.2 acres; run-off area of 272,850 sq. ft.; Constructed using of six inch prepared subgrade, 60-mil HDPE liner, 200-mil drainage layer, eight oz. geotextile fabric covered with 2 ft. of native soil; Runoff collects in Storage Pond(s) 2 and/or 3.
Salt Pile	Site Preliminary Design Validation Pile	Closed in 2000; Covered with a geosynthetic liner, 6 inches of bedding material, and three feet of soil; Seeded.

Flow Metering Locations

Type	Designation	Description & Comments
Totalizing Flow Meter	Ultrasonic Flow Meter	Located at the facility Pump House – water supply; Estimates domestic wastewater discharged to the facultative sewage impoundment system.
Primary Measurement Device	Time Recorder	Estimates miscellaneous wastewater discharged to Evaporation Pond H-19 and Facultative Lagoon System.

Ground Water Monitoring Locations

Type	Designation	Description & Comments
Monitoring Well	C-2505	Quarterly depth to water measurement.
Monitoring Well	C-2506	Quarterly depth to water measurement.
Monitoring Well	C-2507	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Monitoring Well	C-2811	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Monitoring Well	WQSP-6A	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO_4, Cl, TDS, TKN and NO_3.
Piezometer	PZ-4	Quarterly depth to water measurement.
Piezometer	PZ-5	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.

Piezometer	PZ-6	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-7	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-8	Quarterly depth to water measurement.
Piezometer	PZ-9	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-10	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-11	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-12	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-13	Quarterly depth to water measurement; Semi-annual collection of field parameters for temperature, pH, and specific conductance; Semi-annual monitoring for SO4, Cl, and TDS.
Piezometer	PZ-14	Quarterly depth to water measurement.
Piezometer	PZ-15	Quarterly depth to water measurement.

Depth-to-Ground Water 164 feet
Total Dissolved Solids (TDS) 3,400 mg/L

Permit Information

Application Received	May 10, 2013
Public Notice Published	May 31, 2014
Discharge Permit Issued	July 29, 2014
Discharge Permit Term Ends	July 29, 2019
Permitted Discharge Volume	Domestic – 23,000 gallons per day Industrial – 4,224,835 gallons per day

NMED Contact Information

Mailing Address	Ground Water Quality Bureau P.O. Box 5469 Santa Fe, New Mexico 87502-5469
GWQB Telephone Number	(505) 827-2900
NMED Lead Staff	John Hall
Lead Staff Telephone Number	(505) 827-1049
Lead Staff Email	john.hall@state.nm.us

Arthur, Sara, NMENV

From: Pruett, Jennifer, NMENV
Sent: Wednesday, October 01, 2014 10:08 AM
To: Arthur, Sara, NMENV
Subject: FW: Photos of stormwater ponds at WIPP
Attachments: Salt pile and E pond, looking N.JPG; Salt pile, closest pond, looking SW.JPG; Salt pile, E pond looking E at slumped salt.JPG; Salt pile, E pond looking east with salt in background.JPG; Salt pile, E pond, SW corner looking SE.JPG; Salt pile, N berm looking SW even further along road.JPG; Salt pile, N berm looking SW further along road.JPG; Salt pile, N berm looking SW.JPG; Salt pile, NW corer, unstable slope.JPG; Salt pile, spillway to closest pond, looking SW.JPG; Salt pile, surface (evap) texture.JPG; Salt pile, surface texture.JPG; Salt pile, SW corner looking N at lining between salt pile and pond 1.JPG; Salt pile, SW corner looking N at lining between salt pile and pond 2.JPG; Salt pile, SW corner looking N.JPG; Salt pile, SW corner looking SSE.JPG; Salt pile, SW corner.JPG; Salt pile, W end looking N.JPG; Salt pile, W pond looking W.JPG

Hi Orphan Person for the week,
Please print this email and the photos, and put them in the WIPP file (DP-831). We'll be talking later in the week about when to re-assign this, but I want to make sure these don't get lost. If you think it would be better to put the photos electronically in TEMPO or someplace else, I am open to suggestion. I'd like this to be as quick and easy for you as possible.
Thanks,
JJP

Jennifer J. Pruett
Manager, Pollution Prevention Section
Harold Runnels Bldg.
1190 St. Francis Dr.
P.O. Box 5469
Santa Fe, NM 87502-5469
505-827-0652

From: Schoeppner, Jerry, NMENV
Sent: Wednesday, October 01, 2014 9:57 AM
To: Pruett, Jennifer, NMENV
Subject: FW: Photos of stormwater ponds at WIPP

Jennifer:
I'm not sure who took over the WIPP DP from Missy.

Jerry

From: LucasKamat, Susan, NMENV
Sent: Tuesday, September 30, 2014 4:57 PM
To: Maestas, Ricardo, NMENV; Schoeppner, Jerry, NMENV
Cc: Kieling, John, NMENV; Johnson, Catrina, NMENV; Skibitski, Thomas, NMENV; Kliphuis, Trais, NMENV
Subject: RE: Photos of stormwater ponds at WIPP

Here you go, Ricardo (and Jerry).

All the photos were taken along the berm to the north of the salt pile and along the edges of the two (2) lagoons/ponds west of the salt pile. I don't know their official designations, so I called them E pond and W pond. The photo names include a description of where you ae in relation to the salt pile, berms and lagoons and what direction you are facing.

Ms. Catrina Johnson took these photos. She observed a fair amount of sand, salt and other material covering the lining around the salt pile and between the salt pile and the ponds. She observed that it looked like there was a large flow from the salt piles to the ponds.

Ms. Johnson observed that the pond immediately south of the parking lot and the two (2) ponds south of the Waste Handling Building did not have large volumes of water at this time, and they did not look like they had overflowed.

If you have any questions, please feel free to contact Ms. Johnson.

Susan

From: Maestas, Ricardo, NMENV
Sent: Tuesday, September 30, 2014 4:41 PM
To: LucasKamat, Susan, NMENV; Schoeppner, Jerry, NMENV
Cc: Kieling, John, NMENV; Skibitski, Thomas, NMENV; Kliphuis, Trais, NMENV
Subject: RE: Photos of stormwater ponds at WIPP

That would be much appreciated.
Thank you!

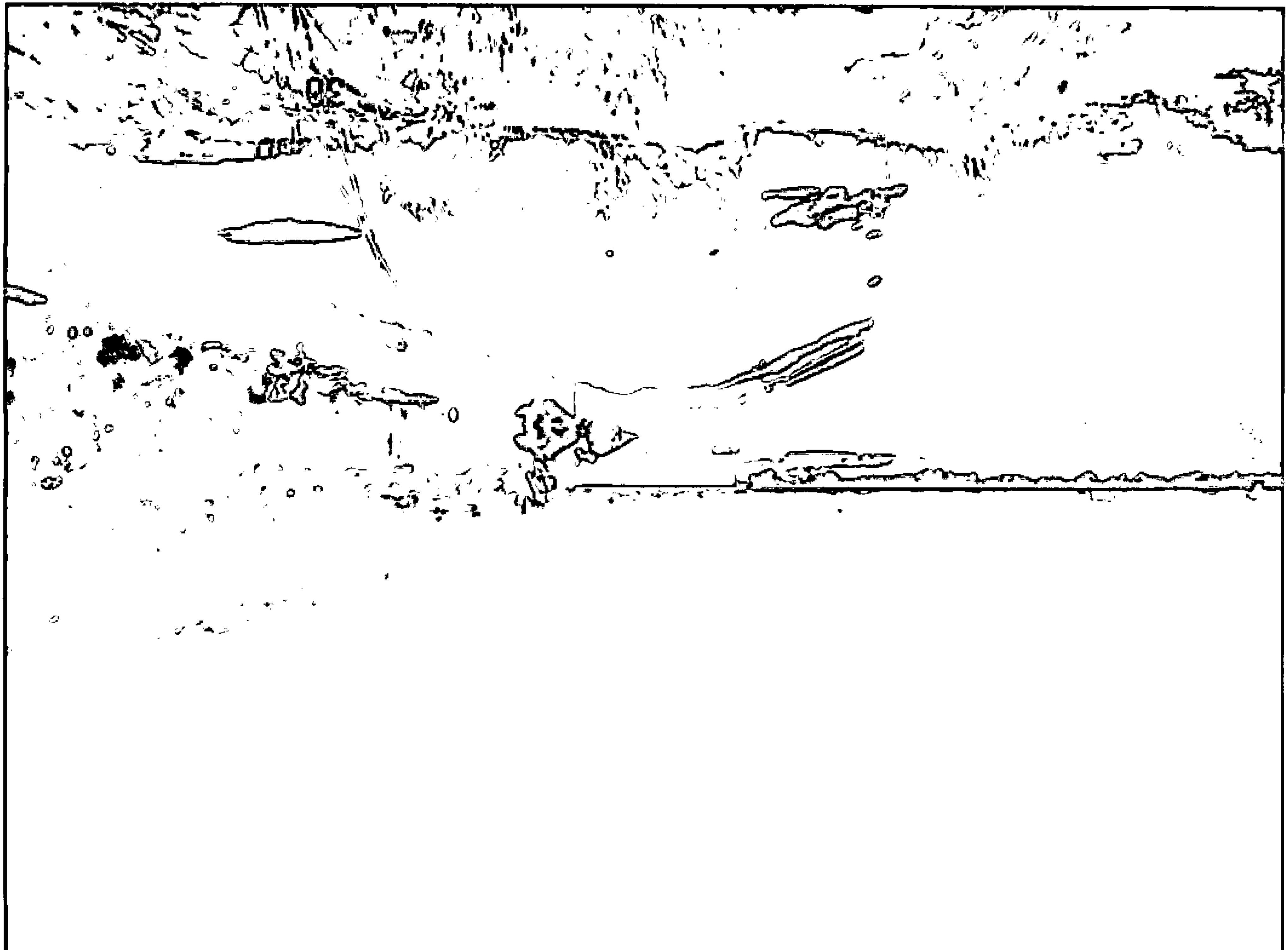
Ricardo

From: LucasKamat, Susan, NMENV
Sent: Tuesday, September 30, 2014 3:37 PM
To: Maestas, Ricardo, NMENV; Schoeppner, Jerry, NMENV
Cc: Kieling, John, NMENV; Skibitski, Thomas, NMENV; Kliphuis, Trais, NMENV
Subject: Photos of stormwater ponds at WIPP

NMED/DOE-OB staff were at WIPP today collecting the DPR canisters for the CY2014 Q-3 sampling event. We were able to take several photos of the evaporation, stormwater, water ponds/lagoons at the facility. I am downloading and organizing the photos.

Ricardo and Jerry, would you and/or staff like copies of the photos?

Susan A. Lucas Kamat, Staff Manager
Sandia and WIPP Oversight Sections, DOE Oversight Bureau
New Mexico Environment Department
PO Box 5400, MS 1396
Albuquerque, NM 87185-5400
Phone: (505) 845-5933
Fax: (505) 845-5853
Email: susan.lucaskamat@state.nm.us



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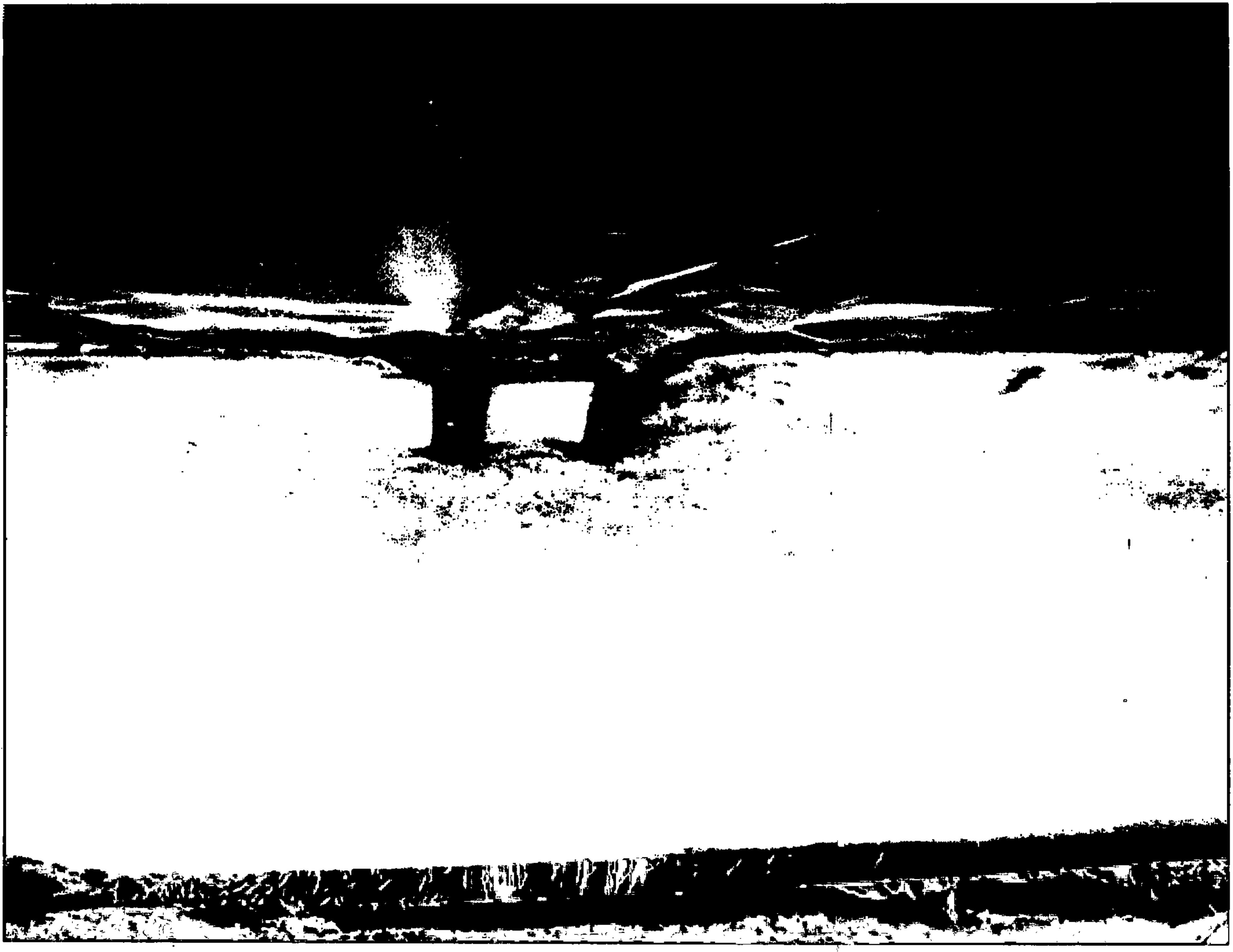
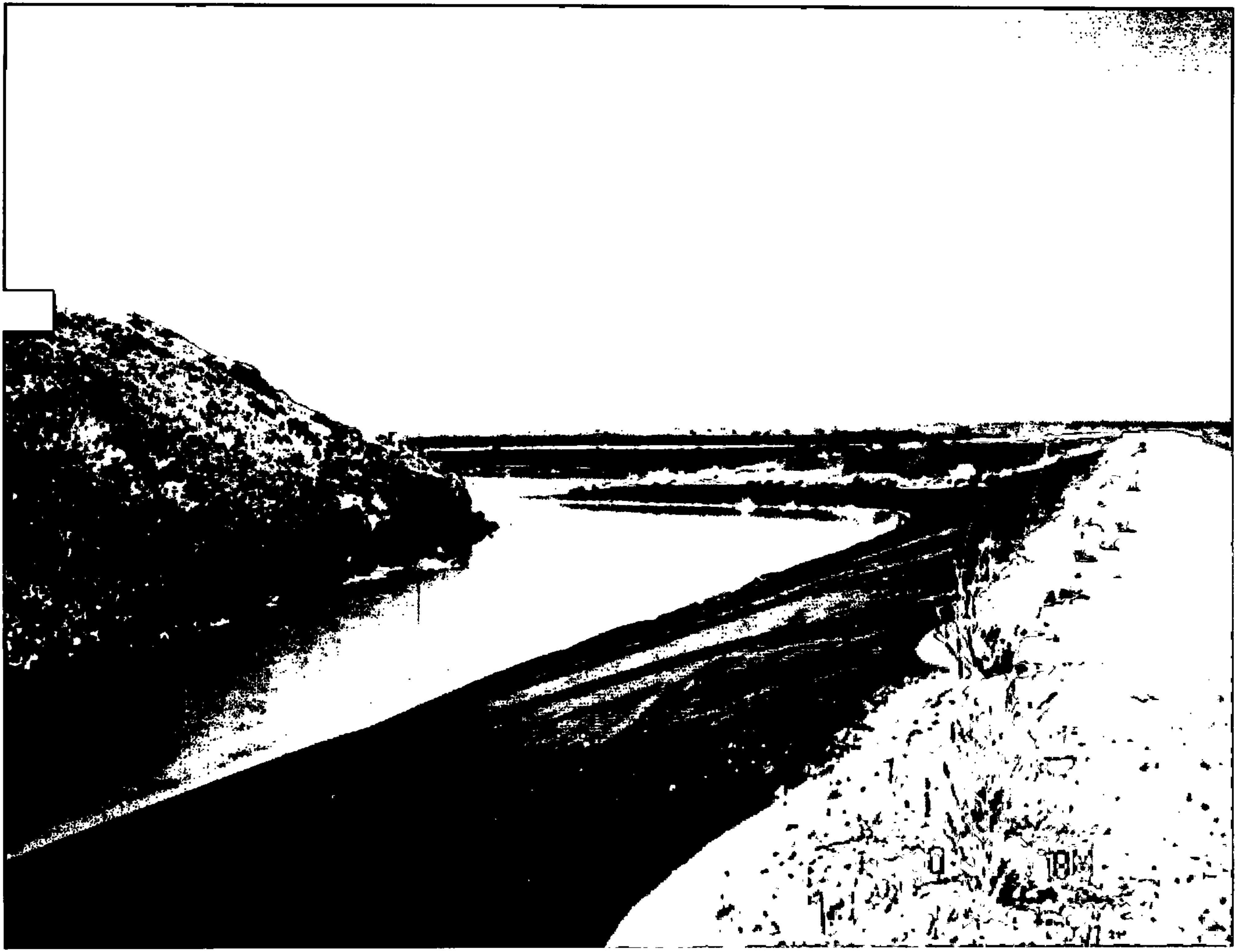
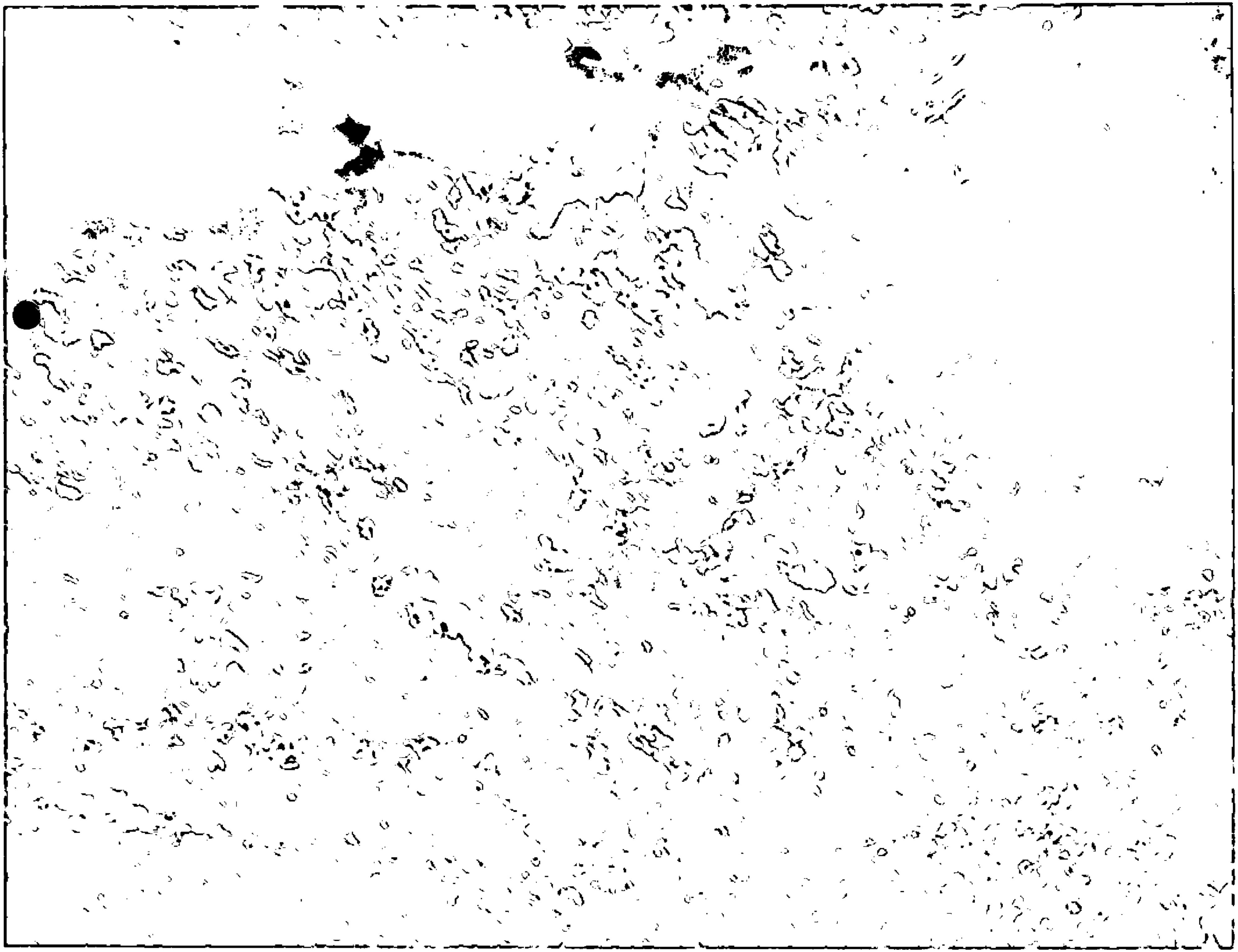
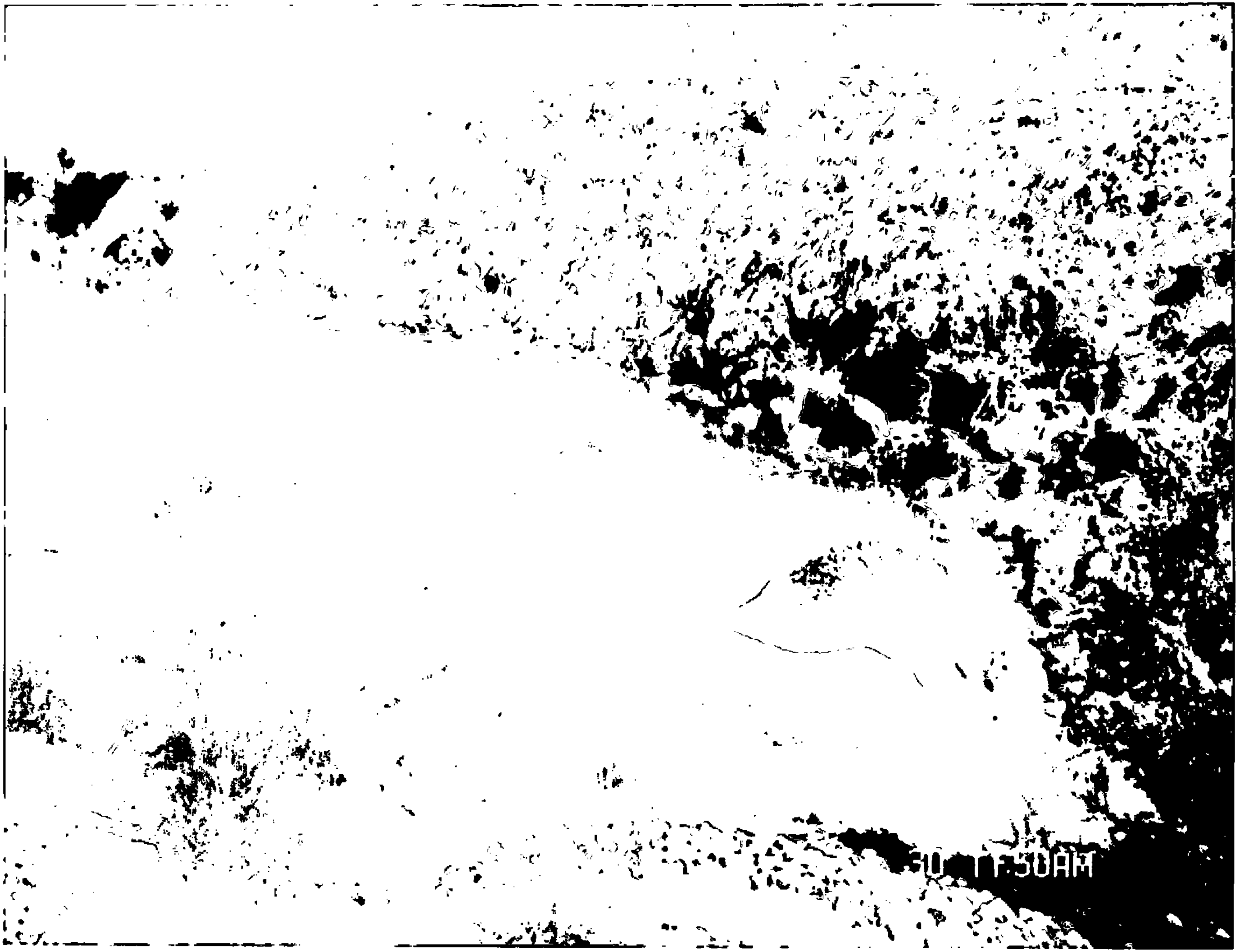





30 11:45AM





02991


30 11:46PM

From: Hall, John, NMENV
Sent: Tuesday, September 30, 2014 3:41 PM
To: 'Margaret Gee'
Cc: Kliphuis, Trais, NMENV; Schoeppner, Jerry, NMENV; Jose Franco; Dana Bryson; Casey Gadbury; Susan McCauslin; 'Bob McQuinn - NWP' (Bob.McQuinn2@wipp.ws); Blankenhorn, Jim - NWP (Jim.Blankenhorn@wipp.ws); Harris, Jennifer - NWP; Chavez, Rick - RES (Rick.Chavez@wipp.ws); George Basabilvazo; Pruett, Jennifer, NMENV
Subject: RE: Notification of Discharge/Corrective Action Report, Discharge Permit 831

Dear Ms. Gee and others,

I have reviewed the Notice of Discharge/Corrective Action Report submitted by the Department of Energy on September 25, 2014 regarding the exceedances of freeboard limits in Storm Water Ponds 1, 2, and 3 and Salt Storage Pond 1 and the outflow of excess storm water from Storm Water Ponds 1, 2, and 3.

NMED approves the corrective actions described in the September 25, 2014 Notice of Discharge/Corrective Action Report taken so far and further approves the proposed transfer of storm water from Storm Water Ponds 1, 2, and 3 and salt water from Salt Storage Pond 1 into Salt Storage Pond 3, which has sufficient extra capacity. Storm water and salt water will be transferred to return Storm Water Ponds 1, 2, and 3 and Salt Storage Pond 1 to proper freeboard conditions as required by Discharge Permit DP-831.

Thank you for your prompt attention to this matter and if you have any questions, please give myself or Jennifer Pruett (505-827-0652) a call.

Regards,

John Hall
Underground Injection Control Coordinator/Industrial Team leader
New Mexico Environment Department--Ground Water Quality Bureau
(505) 827-1049

From: Margaret Gee [mailto:margaret.gee@cbfo.doe.gov]
Sent: Thursday, September 25, 2014 5:26 PM
To: Hall, John, NMENV
Cc: Kliphuis, Trais, NMENV; Schoeppner, Jerry, NMENV; Jose Franco; Dana Bryson; Casey Gadbury; Susan McCauslin; 'Bob McQuinn - NWP' (Bob.McQuinn2@wipp.ws); Blankenhorn, Jim - NWP (Jim.Blankenhorn@wipp.ws); Harris, Jennifer - NWP; Chavez, Rick - RES (Rick.Chavez@wipp.ws); George Basabilvazo
Subject: Notification of Discharge/Corrective Action Report, Discharge Permit 831

Please see the attached correspondence. If you have any questions, please contact Mr. George T. Basabilvazo, Director, CBFO Environmental Protection Division, at (575) 234-7488.

K'Lee Ellis
Secretary, ATA Services
Contractor to the U.S. DOE – Carlsbad Field Office
PHN: (575)234-7340
Email: K'Lee.Ellis@cbfo.doe.gov

~This email sent on behalf of K'Lee Ellis~

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

SEP 25 2014

GROUND WATER
SEP 30 2014
BUREAU

Mr. John Hall
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Notification of Discharge/Corrective Action Report, Discharge Permit 831

Dear Mr. Hall:

The purpose of this letter is to inform the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) of Contingency Plan notification requirements as applicable to Discharge Permit 831 (DP-831) issued to the U.S. Department of Energy (DOE), Carlsbad Field Office (CBFO). The following items are being addressed per Permit Conditions 31 and 32, of the permit's Contingency Plan section.

Permit Condition 31

Initial actions to reestablish freeboard were implemented on September 16, 2014, but additional precipitation prevented this from being successful within 72 hours.

This Contingency Plan addresses the excess above freeboard in Storm Water Ponds 1, 2, 3, and Salt Storage Pond 1, with the need to place this excess storm water into Salt Storage Pond 3. It is anticipated that this can be completed within 45 days of activation of the pumping effort.

As the current matter addresses storm water run-off only, the CBFO requests that no permanent corrective measures be implemented. The weather pattern that brought significant precipitation to southeastern New Mexico is rare. The other evaporation ponds associated with the sewage treatment facility and total salt water containment is well below freeboard capacity.

Permit Condition 32

This report confirms the CBFO call to you (via subcontractor) on September 16, 2014, informing your office of the need to transfer storm water among Storm Water Ponds 1, 2, and 3 to maintain freeboard capacity. This call was a voicemail and response acknowledgment was provided via voicemail from you on September 16, 2014.

In addition, a follow-up call was placed to you on September 19, 2014, informing your office of further precipitation and that additional plans would need to be implemented to transfer storm water from Storm Water Ponds 1, 2, and 3 into Salt Storage Pond 3. With the outflow of excess water from Storm Water Ponds 1, 2, and 3, the call on September 19, 2014 completed the notice of a storm water spill. Additionally, it was noted on September 22, 2014, that Salt Storage Pond 1 was nearing the freeboard level, and water transfer from this pond is now necessary. As previously noted, transfer of water to Salt Storage Pond 3 should alleviate excess water above freeboard. Salt Storage Pond 3 has substantial freeboard capacity remaining, in spite of recent precipitation.

Contingency Plan Information

(a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility:

<u>Person in charge of the facility:</u>
Jose R. Franco, Manager
4021 National Parks Highway
Carlsbad, New Mexico, 88220
PHN: (575) 234-7300

<u>Owner of the facility:</u>
U.S. Department of Energy

<u>Operator of the facility:</u>
Nuclear Waste Partnership, LLC

(b) Name and address of the facility:

U.S. Department of Energy
Waste Isolation Pilot Plant (WIPP)
30 miles east of Carlsbad, New Mexico off of State Highway 128
Carlsbad, NM 88220

(c) The date, time, location, and duration of the discharge:

Date: September 18, 2014 to September 24, 2014
Time: N/A
Location: WIPP Facility (Latitude: 32 22.589, Longitude 103 47.746)
Duration: It is estimated that storm water pond capacity was reached on September 16, 2014.

(d) The source and cause of the discharge:

Source: Runoff from the WIPP facility occurring from extended high precipitation events beginning September 5, 2014.

Cause of discharge:

On September 5, 2014, high rainfall events began. During this first series of precipitation events, September 5-7, 2014, a total of 3.73 inches was measured. The storm water ponds were able to hold the runoff from the WIPP facility without exceeding the one-foot freeboard permit requirement. Then on September 11-13, 2014, additional rainfall events occurred totaling 2.68 inches. The CBFO then initiated the short-term corrective measures of pumping water from Storm Water Pond 2 into Storm Water Pond 3. The CBFO then informed the GWQB of the less than one foot of freeboard and outflow of ponds on September 19, 2014. From September 18-22, 2014, there was an additional

4.59 inches of precipitation that exceeded the holding capacity of the ponds. As the submittal of the report is occurring, additional precipitation is forecasted. Any additional precipitation will continue to exceed the holding capacity of Storm Water Ponds 1, 2, and 3.

(e) A description of the discharge, including chemical composition:

The outflow from all three Storm Water Ponds was storm water runoff from the WIPP facility and the employee parking lot. Historical chemical sampling and analysis from storm water runoff have shown no exceedances of the analyte limits. A sample will be collected consistent with Permit Condition 20 and the chemical composition will be noted in the next semi-annual report submitted to the GWQB.

(f) The estimated volume of the discharge:

There is no device for measuring the overflow of the ponds. The values noted are rough estimates from visual observation. Also, amounts of water outflow are conservative estimations. It appears wave action was a contributor to outflow. There is no evidence of erosion damage to pond berms or liner integrity. The estimated amount of outflow is as follows:

Storm Water Pond 1 – 500 gallons
Storm Water Pond 2 – 800 gallons
Storm Water Pond 3 – 12,000 gallons

(g) Any actions taken to mitigate immediate damage from this discharge:

On September 16 and 17, 2014, water was pumped from the Storm Water Ponds 1 and 2 into Storm Water Pond 3 which had sufficient spare volume to contain the water from the other ponds. Since that date, additional precipitation has caused Storm Water Ponds 1, 2, and 3 to outflow.

The information above (a-g) completes the one-week notification.

Corrective Action Plan

The following information completes the 15-day Corrective Action Report plan.

Proposed corrective measures are to configure a pump and piping to transfer storm water from Storm Water Pond 3 to Salt Storage Pond 3, upon the GWQB's approval of these corrective measures. Salt Storage Pond 3 has the capacity of 22,881,320 gallons storage and currently has approximately 1,900,000 gallons in it. This leaves an approximate capacity of 20,000,000 gallons which exceeds the total capacity of all three storm water ponds combined. The amount of water to be pumped into Salt Storage Pond 3 will only be equal to the amount needed to maintain one foot of freeboard in Storm Water Ponds 1, 2, and 3. If additional rainfall occurs, more water will need to be transferred to Salt Storage Pond 3.

The pumping system will include pumps that transfer water from Storm Water Ponds 1 and 2 into Storm Water Pond 3. Water from Storm Water Pond 3 will then be transferred by another pump into Salt Storage Pond 3. Water from Salt Storage Pond 1 will also be transferred to Salt Storage Pond 3 to achieve the needed freeboard. A one-foot freeboard will then be maintained in all impoundments. It is estimated that the transfer of this storm water can be completed within 45 days of pumping commencement, assuming no additional precipitation events occur. There is no evidence of erosion or damage to any of the ponds due to the outflow of water from the ponds. The total rainfall amount from the combined precipitation events is about 11.00 inches.

On September 24, 2014 from 8:30 to 10:30 p.m., an additional 0.50 inches of rain was received at the the WIPP facility. A verbal notice was provided to your voicemail on September 25, 2014. We are in the process of estimating the amount of overflow from Storm Water Ponds 1, 2 and 3 and will be providing a written notice to you next week. There has been no erosion damage to the ponds or liner integrity and the corrective measures to pump the excess water from these ponds to Salt Storage Pond 3 are still applicable.

Upon review of this matter, it is believed that this outflow of storm water runoff poses no threat to human health and environment. The corrective actions described are intended to meet all notification requirements of 20.6.2.1203 NMAC and DP-831 with no additional documentation transmittal to the GWQB required, if events remain unchanged. If additional information changes the path forward, the NMED will be notified. Results of this effort will be included in the next semi-annual report.

If you have any further questions regarding this matter or need additional information, please contact me at (575) 234-7488.

Sincerely,

George T. Basabilvazo

George T. Basabilvazo, Director
Environmental Protection Division

cc:

T. Kliphuis, NMED	*ED	R. McQuinn, NWP	ED
J. Schoeppner, NMED	ED	J. Blankenhorn, NWP	ED
J. Franco, CBFO	ED	J. Harris, NWP	ED
D. Bryson, CBFO	ED	R. Chavez, RES	ED
D.C. Gadbury, CBFO	ED	CBFO M&RC	
S. McCauslin, CBFO	ED		

*ED denotes electronic distribution

CBFO:EPD:GTB:KE:14-2612:UFC 5486.00

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

RYAN FLYNN
Cabinet Secretary Designate

BUTCH TONGATE
Deputy Secretary

TOM BLAINE, P.E.
Director

GROUND WATER

FEB 14 2014

BUREAU

February 14, 2014

SUBJECT: NOTICE OF PUBLIC COMMENT PERIOD AND OPPORTUNITY TO REQUEST A PUBLIC HEARING ON A DRAFT HAZARDOUS WASTE PERMIT FOR WASTE ISOLATION PILOT PLANT

Dear Interested Person:

Enclosed is a **Public Notice** regarding the draft Hazardous Waste Permit for Waste Isolation Pilot Plant (WIPP). The U.S. Department of Energy Carlsbad Field Office (**DOE**) owns and operates the Facility, and Nuclear Waste Partnership LLC (**NWP**) co-operates the Facility (collectively, the Applicants). WIPP is located north of Jal Highway (State Highway 128) in Eddy County, New Mexico, approximately 26 miles east of Carlsbad. WIPP is located at the following mailing addresses: DOE Carlsbad Field Office, P.O. Box 3090, Carlsbad, New Mexico 88221-3090; and Nuclear Waste Partnership LLC, P.O. Box 2078, Carlsbad, New Mexico 88221-2078. The Permittees' primary contact for this permitting action is: George Basabilvazo, Director, Office of Environment, Safety and Health, DOE Carlsbad Field Office, P.O. Box 3090, Carlsbad, New Mexico 88221-3090.

The enclosed Public Notice provides locations where the Administrative Record, including the Permit Modification Request, draft Permit, Fact Sheet, and supporting documentation, for this action can be reviewed, and provides procedures for submitting comments and requesting a public hearing. Comments and requests for public hearing must be received no later than **5:00 p.m. MDT on April 15, 2014.**

Any person seeking additional information regarding this notice may contact:

Trais Kliphuis, WIPP Project Manager
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

E-mail: trais.kliphuis@state.nm.us
Phone: (505) 476-6000
Fax: (505) 476-6060

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

RYAN FLYNN
Cabinet Secretary Designate

BUTCH TONGATE
Deputy Secretary

TOM BLAINE, P.E.
Division Director

PUBLIC NOTICE No. 14-01

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS WASTE BUREAU
SANTA FE, NEW MEXICO
FEBRUARY 14, 2014

NOTICE OF PUBLIC COMMENT PERIOD AND OPPORTUNITY TO REQUEST A PUBLIC HEARING ON A DRAFT HAZARDOUS WASTE PERMIT FOR THE WASTE ISOLATION PILOT PLANT
EPA ID NUMBER: NM4890139088-TSDF

The New Mexico Environment Department (**NMED**) is issuing for public comment a draft Hazardous Waste Facility Permit (**draft Permit**) for the Waste Isolation Pilot Plant (**WIPP**, or **the Facility**). The U.S. Department of Energy (**DOE**) and Nuclear Waste Partnership LLC (**NWP**), the Permittees, submitted a modification request to NMED on March 20, 2013. The request includes modifications to the panel closure, repository reconfiguration of Panels 9 and 10, and the volatile organic compounds (**VOC**) target analyte list and changes to the VOC monitoring program.

WIPP is currently permitted to manage, store, and dispose of hazardous waste, and to close hazardous waste disposal units, in accordance with the New Mexico Hazardous Waste Act (**HWA**) and its implementing regulations. NMED is charged with issuing a permit that will ensure that WIPP's hazardous waste operations are managed in a manner that is protective of human health and the environment.

WIPP is located north of Jal Highway (State Highway 128) in Eddy County, New Mexico, approximately 26 miles east of Carlsbad. WIPP is a hazardous waste facility currently operating under a Permit issued by NMED authorizing the management, storage, and disposal of transuranic (**TRU**) mixed waste at the Facility. Mixed waste is radioactive waste that is also a hazardous waste as defined by the HWA, and is thus subject to regulation by NMED. The DOE owns and operates the Facility, and NWP co-operates the Facility. These entities are collectively referred to as "Permittees" or "WIPP" in the draft Permit and this public notice.

WIPP is a facility authorized by Congress to dispose TRU radioactive waste materials generated by atomic energy defense activities. WIPP manages wastes that are regulated under the federal Resource Conservation and Recovery Act (**RCRA**), the New Mexico Hazardous Waste Act Chapter 74, Article 4 NMSA 1978 (**HWA**), and their implementing regulations. WIPP received a hazardous waste facility Permit from NMED in 1999 to dispose of TRU mixed waste containers 2,150 feet below ground in a mined geologic repository within the Salado Formation. The containers of waste must undergo complete waste characterization by the generator/storage sites in compliance with requirements of the Permit prior to disposal. WIPP is permitted to accept contact-handled TRU waste containers with a surface dose of less than 200 millirem per hour that may be handled directly. WIPP is also permitted to accept remote-handled TRU waste containers with a surface dose of 200 millirem or greater that must be handled either remotely or with sufficient shielding to reduce the effective dose.

WIPP may be contacted at the following mailing addresses: DOE Carlsbad Field Office, P.O. Box 3090, Carlsbad, New Mexico 88221-3090; and Nuclear Waste Partnership LLC, P.O. Box 2078, Carlsbad, New Mexico 88221-2078. The Permittees' primary contact for this permitting action is: George Basabilvazo, Director, Office of Environment, Safety and Health, DOE Carlsbad Field Office, P.O. Box 3090, Carlsbad, New Mexico 88221-3090.

The draft Permit is a proposed modification of the existing Permit. The Permittees submitted a modification request on March 20, 2013 following a public involvement process that included pre-submittal meetings with the public to obtain comment prior to submittal. Public meetings were held in Santa Fe and Albuquerque on April 16 and 18, 2013. On July 29, 2013, NMED determined the application to be administratively complete and that it constituted a timely and complete application under the regulations. On September 20, 2013 NMED issued a Technical Incompleteness Determination, requesting clarification and additional information. WIPP provided a response on October 31, 2013. The draft Permit is based on the submitted modification request and the information requested by NMED.

NMED also announces the availability of a Fact Sheet providing the basis for its proposed action on the Permit, and the significant factual, legal, and policy questions considered in preparing the draft Permit. The Fact Sheet explains the basis for Permit changes, including applicable statutory and regulatory support.

PUBLIC REVIEW OF THE DRAFT PERMIT

The Administrative Record for this proposed action consists of the Permit Modification Request, the draft Permit, this Public Notice, the Fact Sheet, and supporting documentation. The Administrative Record may be reviewed, with prior appointment, at the following locations during the public comment period.

NMED - Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone: (505) 476-6000
Monday – Friday: 8:00 a.m. to 5:00 p.m.
Contact: Pam Allen

NMED- DOE Oversight Bureau
406 N. Guadalupe, Suite C
Carlsbad, NM 88220
Phone: (575) 885-9023
Monday – Friday: 8:00 a.m. to 5:00 p.m.
Contact: Krissie Carrasco

A copy of the draft Permit, this Public Notice, the Fact Sheet, the modification request and an index of the Administrative Record is also available on NMED's website at: www.nmenv.state.nm.us/wipp/index.html. To obtain a copy of the Administrative Record or a portion thereof, please contact Ms. Pam Allen at (505) 476-6000 or at address given above. NMED will provide copies, or portions thereof, of the Administrative Record, including the draft Permit, at a cost to the requestor.

This public notice issued on **February 14, 2014**, announces the beginning of a 60-day comment period that will end at **5:00 p.m. MST, April 15, 2014**. Any person who wishes to comment on the draft Permit or request a public hearing should submit written or electronic mail (e-mail) comment(s) with the commenter's name and mailing address to the address below. Only comments and/or requests for public hearing received before **5:00 p.m. MST** on **April 15, 2014** will be considered.

Trais Kliphuis, WIPP Project Manager
Hazardous Waste Bureau - New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone: (505) 476-6000
Fax: (505) 476-6060
E-mail: trais.kliphuis@state.nm.us
Ref: WIPP Draft Permit

Written comments should include, to the extent practicable, all referenced factual materials. Documents in the Administrative Record need not be re-submitted if expressly referenced by the commenter. Requests for a public hearing shall provide: (1) a clear and concise factual statement of the nature and scope of the interest of the person requesting the hearing; (2) the name and address of all persons whom the requestor represents; (3) a statement of any objections to the draft Permit, including specific references to any conditions being modified; and (4) a statement of the issues which the commenter proposes to raise for consideration at the hearing. Written comment and requests for public hearing must be filed with Ms. Trais Kliphuis on or before **5:00**

p.m. MST, April 15, 2014. NMED will provide a thirty (30) day notice of a public hearing, if scheduled.

NMED must ensure that the final Permit is consistent with the New Mexico Hazardous Waste Management Regulations. All written comments submitted will be considered in formulating a final decision and may cause the draft Permit to be modified. NMED will respond in writing to all public comments. This response will specify which provisions, if any, of the draft Permit have been changed in the final decision and the reasons for the changes. All persons presenting written comments or who requested notification in writing will be notified of the decision by mail. These responses will also be posted on the NMED's website.

After consideration of all written public comments received and all data, views, and arguments presented at the public hearing, if one is held, NMED will issue, or modify and issue, the Permit. The Applicants shall be provided by mail a copy of any relevant modified documents and a detailed written statement of reasons for the modifications.

The Secretary of the Environment Department will make the final decision publicly available and shall notify the Applicants by certified mail. The Secretary's decision shall constitute a final agency decision and may be appealed as provided by the HWA (Chapter 74, Article 4 NMSA 1978).

ARRANGEMENTS FOR PERSONS WITH DISABILITIES

Persons having a disability and needing help in being a part of this hearing process, including TTY users, should contact J. C. Borrego at least 10 days before the event at the NMED Human Resources Bureau, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, New Mexico, 87502, telephone 505-827-0402.

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

RYAN FLYNN
Cabinet Secretary Designate

BUTCH TONGATE
Deputy Secretary

TOM BLAINE, P.E.
Director

14 de febrero de 2014

ASUNTO: AVISO DEL PERÍODO PARA PRESENTAR COMENTARIOS DEL PÚBLICO Y DE LA OPORTUNIDAD PARA SOLICITAR UNA AUDIENCIA PÚBLICA RELATIVA AL PROYECTO DE PERMISO PARA RESIDUOS PELIGROSOS PARA LA PLANTA PILOTO DE AISLAMIENTO DE RESIDUOS

Estimado/a interesado/a:

Adjunto encontrará un **Aviso Público** relativo al proyecto de Permiso para Residuos Peligrosos para la Planta Piloto de Aislamiento de Residuos (WIPP por su sigla en inglés). La Planta pertenece a la Oficina Local de Carlsbad del Departamento de Energía de los Estados Unidos **(DOE)** y es administrada por esa dependencia conjuntamente con Nuclear Waste Partnership LLC **(NWP)** (colectivamente, los Solicitantes). La Planta WIPP está ubicada al norte de la Carretera Jal (Carretera Estatal 128) en el condado de Eddy, Nuevo México, aproximadamente 26 millas al este de Carlsbad. La Planta WIPP tiene las siguientes direcciones postales: DOE Carlsbad Field Office, P.O. Box 3090, Carlsbad, New Mexico 88221-3090; y Nuclear Waste Partnership LLC, P.O. Box 2078, Carlsbad, New Mexico 88221-2078. Principal información de contacto con los Permisionarios para esta acción relativa a un permiso: George Basabilvazo, Director, Office of Environment, Safety and Health, DOE Carlsbad Field Office, P.O. Box 3090, Carlsbad, New Mexico 88221-3090.

El Aviso Público adjunto indica los lugares donde se puede revisar el Registro Administrativo para esta acción, incluso la Solicitud de Modificación del Permiso, el proyecto de Permiso, la Hoja de Datos y la documentación de apoyo, y proporciona los procedimientos a seguir para presentar comentarios y solicitar una audiencia pública. Los comentarios y las solicitudes de audiencia pública deben recibirse antes de las **5:00 de la tarde del 15 de abril de 2014**.

Aquellos que deseen más información sobre este aviso podrán comunicarse con:

Trais Kliphuis, WIPP Project Manager
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Correo electrónico: trais.kliphuis@state.nm.us
Teléfono: (505) 476-6000
Fax: (505) 476-6060

Atentamente,

John E. Kieling
Director
Oficina de Residuos Peligrosos

NEW MEXICO
ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

RYAN FLYNN
Cabinet Secretary Designate

BUTCH TONGATE
Deputy Secretary

TOM BLAINE, P.E.
Director

AVISO PÚBLICO NÚM. 14-01

DEPARTAMENTO DEL MEDIO AMBIENTE DE NUEVO MÉXICO
OFICINA DE RESIDUOS PELIGROSOS
SANTA FE, NUEVO MÉXICO
14 DE FEBRERO DE 2014

AVISO DEL PERÍODO PARA PRESENTAR COMENTARIOS DEL PÚBLICO Y DE LA OPORTUNIDAD PARA SOLICITAR UNA AUDIENCIA PÚBLICA RELATIVA AL PROYECTO DE PERMISO PARA RESIDUOS PELIGROSOS PARA LA PLANTA PILOTO DE AISLAMIENTO DE RESIDUOS NÚMERO DE IDENTIFICACIÓN EPA: NM4890139088-TSDF

El Departamento del Medio Ambiente de Nuevo México (**NMED**) hace público el Proyecto de Permiso de las Instalaciones para Residuos Peligrosos (**proyecto de Permiso**) para la Planta Piloto de Aislamiento de Residuos (**WIPP**, o **las Instalaciones**) con el propósito de recibir comentarios del público. El Departamento de Energía de los Estados Unidos (**DOE**) y Nuclear Waste Partnership LLC (**NWP**), los Permisionarios, presentaron ante NMED una solicitud de modificación el 20 de marzo de 2013. La solicitud incluye modificaciones para el cierre con paneles, la reconfiguración de los Paneles 9 y 10 del repositorio, y la lista de analitos meta de compuestos orgánicos volátiles (**VOC**) y cambios en el programa de monitoreo de VOC.

La Planta WIPP tiene actualmente permiso para manejar, almacenar y depositar residuos peligrosos y para cerrar unidades de depósito de residuos peligrosos, conforme a la Ley de Nuevo México para Residuos Peligrosos (**HWA**) y los reglamentos para su implementación. NMED tiene a su cargo emitir un permiso que garantice que las operaciones con residuos peligrosos de la Planta WIPP se realicen de manera que protejan la salud de los seres humanos y el medio ambiente.

La Planta WIPP está ubicada al norte de la Carretera Jal (Carretera Estatal 128) en el condado de Eddy, Nuevo México, aproximadamente 26 millas al este de Carlsbad. WIPP es una planta para residuos peligrosos que funciona actualmente bajo un Permiso emitido por NMED, que autoriza el manejo, el almacenamiento y el depósito de residuos transuránicos (**TRU**) mixtos en la Planta. Residuos mixtos son residuos radioactivos que también son residuos peligrosos según lo definido por la HWA y están, por lo tanto, sujetos a las normas de NMED. La Planta pertenece al DOE y es administrada por ese departamento conjuntamente con NWP. Esas entidades se denominan colectivamente "Permisionarios" o "WIPP" en el proyecto de Permiso y en este aviso público.

WIPP es una planta autorizada por el Congreso para depositar materiales residuales radioactivos TRU generados por actividades de defensa con energía atómica. WIPP se ocupa de la gestión de residuos regulados por la Ley Federal de Conservación y Recuperación de Recursos (**RCRA**), la Ley de Nuevo México para Residuos Peligrosos (**HWA**), Capítulo 74, Artículo 4 NMSA 1978, y los reglamentos para su implementación. WIPP recibió un Permiso de NMED para instalaciones de residuos peligrosos en 1999 para depósito de contenedores de residuos TRU mixtos a una profundidad de 2,150 pies por debajo de la superficie de la tierra, en un repositorio geológico minado ubicado dentro de la Formación Salado. Los contenedores de residuos deben someterse a la caracterización completa de residuos en las plantas generadoras/almacenadoras, conforme a los requisitos establecidos en el Permiso, antes de su depósito. La Planta WIPP está autorizada para aceptar contenedores de residuos TRU de manejo por contacto con una dosis superficial de menos de 200 milirem por hora que pueden manipularse de manera directa. La Planta WIPP también está autorizada para aceptar contenedores de residuos TRU de manejo remoto con una dosis superficial de 200 milirem o mayor, que deben manipularse remotamente o con suficiente protección para reducir la dosis efectiva.

Los interesados en comunicarse con la Planta WIPP podrán hacerlo a través de las siguientes direcciones postales: DOE Carlsbad Field Office, P.O. Box 3090, Carlsbad, New Mexico 88221-3090; y Nuclear Waste Partnership LLC, P.O. Box 2078, Carlsbad, New Mexico 88221-2078. Principal información de contacto con los Permisionarios para esta acción relativa a un permiso: George Basabilvazo, Director, Office of Environment, Safety and Health, DOE Carlsbad Field Office, P.O. Box 3090, Carlsbad, New Mexico 88221-3090.

El proyecto de Permiso es una modificación propuesta para el Permiso existente. Los Permisionarios presentaron una solicitud de modificación el 20 de marzo de 2013, luego de un proceso con participación del público, que incluyó reuniones con el público previas a la presentación de la solicitud, para recibir comentarios previos a la presentación. Las reuniones públicas se llevaron a cabo en Santa Fe y Albuquerque el 16 y el 18 de abril de 2013. El 29 de julio de 2013, NMED determinó que la solicitud estaba administrativamente completa y que constituía una solicitud presentada de manera oportuna y completa conforme a los reglamentos. El 20 de septiembre de 2013, NMED emitió una Determinación de Información Técnica Incompleta, y solicitó aclaraciones e información adicional. La Planta WIPP proporcionó una respuesta el 31 de octubre de 2013. El proyecto de Permiso se basa en la solicitud de modificación presentada y la información solicitada por NMED.

NMED también anuncia que dispone de una Hoja de Datos que proporciona el fundamento de la acción propuesta para el Permiso y las cuestiones importantes de carácter fáctico, legal y político que se consideraron al preparar el proyecto de Permiso. La Hoja de Datos explica el fundamento de los cambios para el Permiso, incluso las correspondientes bases jurídicas y reglamentarias.

REVISIÓN PÚBLICA DEL PROYECTO DE PERMISO

El Registro Administrativo para esta acción propuesta consta de la Solicitud de Modificación de Permiso, el proyecto de Permiso, este Aviso Público, la Hoja de Datos y la documentación de apoyo. Los interesados podrán revisar el Registro Administrativo, con cita previa, en las siguientes direcciones, durante el período establecido para comentarios del público.

NMED - Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Teléfono: (505) 476-6000
Lunes a viernes: 8:00 a.m. a 5:00 p.m.
Contacto: Pam Allen

NMED- DOE Oversight Bureau
406 N. Guadalupe, Suite C
Carlsbad, NM 88220
Teléfono: (575) 885-9023
Lunes a viernes: 8:00 a.m. a 5:00 p.m.
Contacto: Krissie Carrasco

También se dispone de la copia del proyecto de Permiso, este Aviso Público, la Hoja de Datos, la solicitud de modificación y un índice del Registro Administrativo en el sitio web de NMED: www.nmenv.state.nm.us/wipp/index.html. Quienes deseen una copia del Registro Administrativo, o de una porción del mismo, deberán comunicarse con la Srta. Pam Allen al (505) 476-6000 o en la dirección antes mencionada. NMED proporcionará copias del Registro Administrativo, o porciones del mismo, incluso del proyecto de Permiso, por una tarifa a quien lo solicite.

Este aviso público, emitido el **14 de febrero de 2014**, anuncia el inicio del período de 60 días para recibir comentarios, que finalizará a las **5 de la tarde del 15 de abril de 2014.** Quienes deseen comentar sobre el proyecto de Permiso o solicitar una audiencia pública deberán enviar sus comentarios escritos por correo o mediante un mensaje electrónico (e-mail) con el nombre y la dirección postal del autor de los comentarios a la dirección que aparece más abajo. Se considerarán solamente los comentarios y las solicitudes de audiencia pública que se reciban antes de las **5:00 de la tarde del 15 de abril de 2014.**

Trais Kliphuis, WIPP Project Manager
Hazardous Waste Bureau - New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Teléfono: (505) 476-6000
Fax: (505) 476-6060
Correo electrónico: trais.kliphuis@state.nm.us
Ref: WIPP Draft Permit

Los comentarios escritos deberán incluir, en la medida de lo posible, todos los materiales fácticos de referencia. No es necesario volver a presentar documentos del Registro Administrativo si el autor de los comentarios hace expresamente referencia a los mismos. Las solicitudes de Audiencia Pública deberán incluir: (1) una declaración fáctica clara y concisa de la naturaleza y alcance del interés de la persona que solicita la audiencia; (2) el nombre y la dirección de todas las personas a quienes representa el solicitante; (3) una declaración de todas las objeciones al proyecto de Permiso, incluso referencias específicas a cualquiera de las condiciones que se estén modificando; y (4) una declaración de los asuntos que el autor de los comentarios propone plantear para su consideración en la audiencia. Los comentarios escritos y las solicitudes de audiencia pública deben ser entregados a la Srta. Trais Kliphuis antes de las **5:00 de la tarde del 15 de abril de 2014**. NMED proporcionará un aviso de audiencia pública treinta (30) días antes de la audiencia, si fuera programada.

NMED debe garantizar que el Permiso final sea congruente con el Reglamento de Nuevo México para el Manejo de Residuos Peligrosos. Se considerarán todos los comentarios presentados por escrito para tomar la decisión final y esto podrá tener como resultado que el proyecto de Permiso sea modificado. NMED responderá por escrito a todos los comentarios recibidos del público. Esa respuesta especificará qué disposiciones, de haber alguna, del proyecto de Plan se han cambiado en la decisión final y los motivos para hacer esos cambios. Todos aquellos que presenten comentarios escritos o que hayan solicitado notificación por escrito serán notificados por correo sobre la decisión. Esas respuestas también serán publicadas en el sitio web de NMED.

Luego de considerar todos los comentarios escritos recibidos del público y todos los datos, puntos de vista y argumentos presentados en la audiencia pública, en caso de celebrarse, NMED emitirá, o modificará y emitirá, el Permiso. Los Solicitantes recibirán por correo una copia de todos los documentos pertinentes modificados y una declaración escrita detallada de los motivos de las modificaciones.

El Secretario del Departamento del Medio Ambiente pondrá a disposición del público la decisión final y notificará a los Solicitantes por correo certificado. La decisión del Secretario constituirá la decisión final del departamento y podrá apelarse conforme a la ley HWA (Capítulo 74, Artículo 4 NMSA 1978).

ADAPTACIONES PARA PERSONAS CON DISCAPACIDADES

Aquellas personas que tengan alguna discapacidad y necesiten ayuda para participar en el proceso de esta audiencia, incluso los usuarios de TTY, deberán comunicarse con J. C. Borrego por lo menos 10 días antes de la audiencia; dirección: NMED Human Resources Bureau, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, New Mexico, 87502, teléfono: 505-827-0402.

Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6306

Hasler
02/13/2014
US POSTAGE

FIRST-CLASS MAIL
$00.69º
ZIP 87505
011D11641177

Bill Olson
NMED/GWQB
P.O. Box 5469
Santa Fe, NM 87502

87502$5469 B015

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 Saint Francis Drive / PO Box 5469
Santa Fe, NM 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

Michelle Lujan Grisham
Governor

Howie C. Morales
Lieutenant Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

May 27, 2021

Michael Brown, Director
Office of Environmental Protection
U.S. Department of Energy, Carlsbad Field Office
P.O. Box 3090
Carlsbad, NM 88221

RE: Corrective Action Plan Approval, Waste Isolation Pilot Plant, DP-831

Dear Mr. Brown:

On April 16, 2021, the Ground Water Quality Bureau of the New Mexico Environment Department (NMED) received a Corrective Action Plan for the above referenced facility. The information submitted satisfies the requirements of Condition 30 of Discharge Permit Renewal, DP-831, dated July 29, 2014.

According to the submitted Corrective Action Plan, on a routine inspection of the salt cell liner on Salt Cell 2, the permittee discovered a tear in the liner due to high winds in the area. No release occurred.

The following describes the corrective actions the permittee has taken and proposes to take:
The permittee has placed sandbags on the affected area to prevent further damage from wind and continues to monitor the area during high winds. The permittee has begun the acquisition process to enable a subcontractor to repair the liner. Once the Department of Energy awards the service contract, the subcontractor will repair the liner.

The corrective actions proposed and taken are acceptable to NMED, and the Corrective Action Plan is satisfactory.

NMED may require additional corrective actions if additional information becomes available indicating that the corrective actions proposed or taken are inadequate and/or ground water contamination occurs as a result of the described discharge. The permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC, if the corrective action plan will not result in compliance with the standards and requirements set forth in Section 20.6.2.4103 NMAC within 180 days of confirmation of ground water contamination.

If you have any questions regarding these issues, please contact Avery Young at (505) 699-8564 or Jason Herman, Domestic Waste Team Leader of the Pollution Prevention Section, at (575) 649-3871.

Sincerely,

MOD for

Michelle Hunter, Chief
Ground Water Quality Bureau

MH:AY

cc: Jason Herman, Domestic Waste Team Leader
Michael Kesler, EHB District Manager, NMED District III
NMED Carlsbad Field Office

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

April 16, 2021

Ms. Avery Young
New Mexico Environment Department
Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: WIPP Discharge Permit (DP-831) Condition 30 Corrective Action Plan: Repair Salt Cell 2 Impoundment Liner

Dear Ms. Young:

The purpose of this letter is to inform the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) of a Corrective Action Plan (CAP) to repair a vertical tear in the Salt Cell 2 impoundment liner along the north berm (refer to Figures 1, 2, and 3 of the Enclosure). The CAP is required by Discharge Permit 831 (DP-831) Condition 30.

Permit Condition 30

This report confirms the Carlsbad Field Office (CBFO) call to Ms. Avery Young on March 31, 2021, informing the GWQB of the discovery of the Salt Cell 2 liner damage. No release has occurred. There is no imminent danger of a release to the environment because the tear location is at an elevated position and the current impoundment is dry.

Corrective Action Plan

1. Place sandbags around the affected area to prevent further damage from wind. This action step is complete.
2. Monitor the tear area during high winds. This action step is ongoing.
3. Initiate an Action Request (AR 2033530) to repair the liner. This action step is complete.
4. Initiate subcontractor services for liner repair. This step is in-progress.
5. Mobilize the subcontractor after awarding the service contract.
6. Repair the Salt Cell 2 impoundment liner.

If you have any further questions regarding this matter or need additional information, please contact me at (575) 706-0072.

Sincerely,

Michael Brown Digitally signed by Michael Brown Date: 2021.04.15 17:46:24 -06'00'

Michael R. Brown, Director
Office of Environmental Protection

Enclosure

cc: w/enclosure

S. Pullen, NMED	*ED
R. Strauch, NMED	ED
M. Hunter, NMED	ED
R. Maestas, NMED	ED
CBFO M&RC	

*ED denotes electronic distribution

CBFO:OEP:MRB:MC:21-0214:UFC 5486.00

Enclosure

Figures

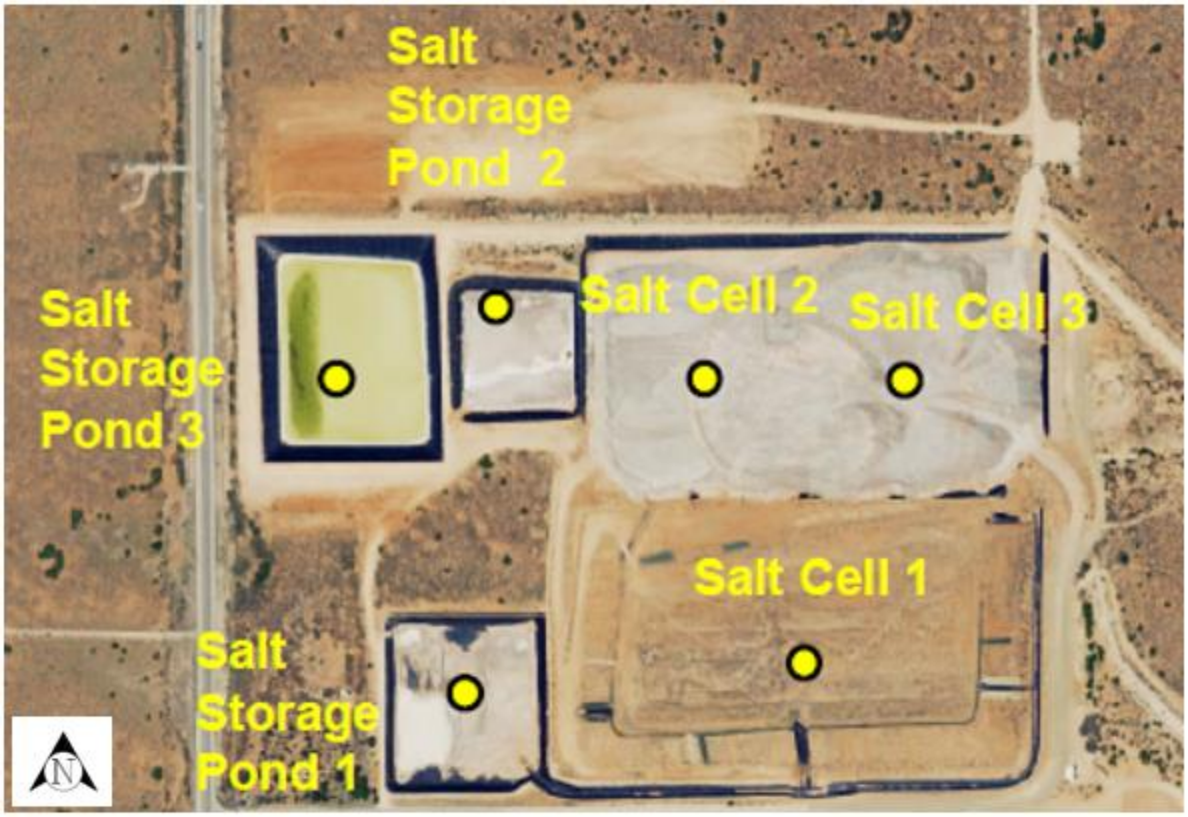


Figure 1 – WIPP Salt Storage Location

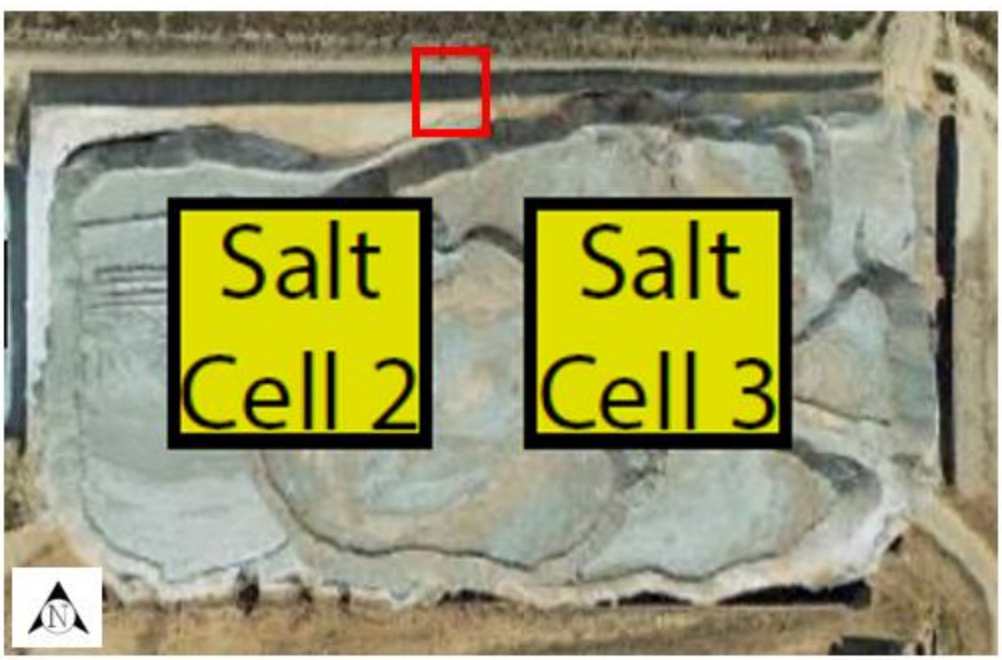
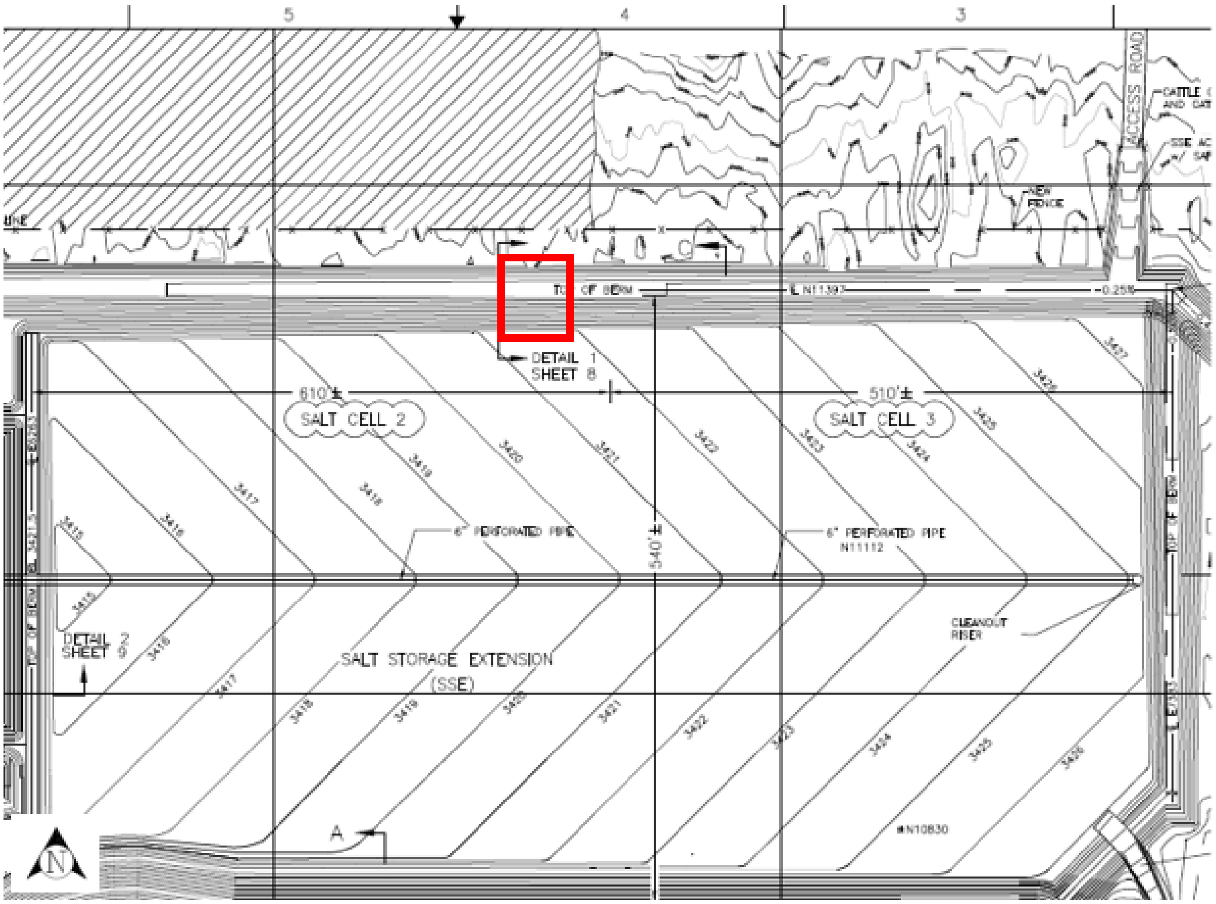


Figure 2 – Salt Cell Liner Tear Location



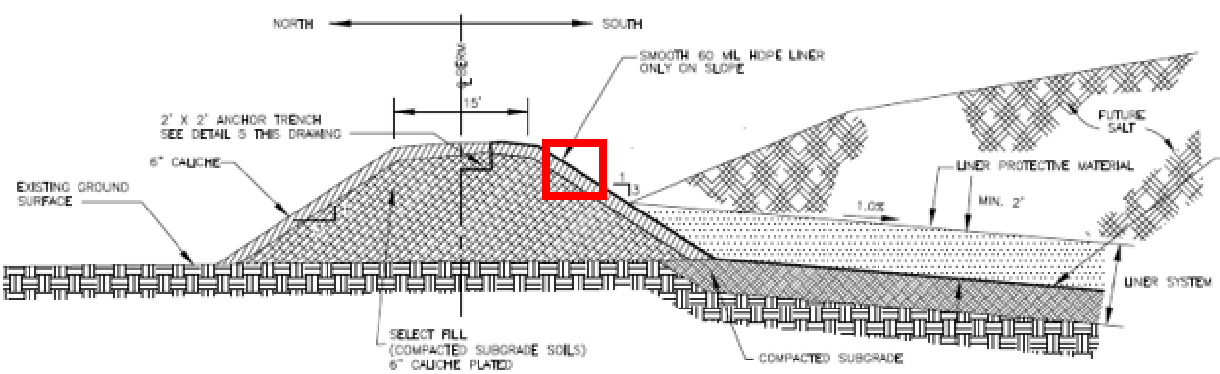


Figure 3 – Salt Cell Liner Tear Location

From:	Don Hancock
To:	Young, Avery, NMENV
Cc:	Roose, Rebecca, NMENV; Hunter, Michelle, NMENV; Sandoval, Melanie, NMENV; Stringer, Stephanie, NMENV; Pierard, Kevin, NMENV; Maestas, Ricardo, NMENV; Pullen, Steve, NMENV
Subject:	[EXT] Re: DP-831 Comments and Request for negotiations and hearing
Date:	Sunday, November 15, 2020 2:36:09 PM
Attachments:	sriccomm111520wattachment.pdf

Attached are SRIC's comments on draft permit DP-831 and the Public Notice of October 1, 2020.

Thank you for your careful consideration of, and response to, the attached comments. As noted, they are in addition to the SRIC comments of April 22, 2020.

SOUTHWEST RESEARCH AND INFORMATION CENTER
P.O. Box 4524 Albuquerque, NM 87196 505-262-1862 FAX: 505-262-1864 www.sric.org

November 15, 2020

Ground Water Quality Bureau
New Mexico Environment Department (NMED)
PO Box 5469
Santa Fe, NM 87502-5469 Via email: Avery.Young@state.nm.us

RE: WIPP Draft Discharge Permit (DP)-831

Dear Ms. Young:

Southwest Research and Information Center (SRIC) provides these comments on the September 24, 2020 draft Groundwater Discharge Permit, DP-831, Waste Isolation Pilot Plant, according to the Public Notice of October 1, 2020.

These comments, except as specifically noted, do not change any of SRIC's comments submitted on April 22, 2020 on the previous draft DP-831, dated March 2, 2020 and the undated Public Notice that set April 22, 2020 as the comment deadline. SRIC also is relying on the October 1, 2020 email to me from Avery Young that states: "The previous comments and requests for hearing will be combined with any we receive during this comment period. All comments will be addressed following the conclusion of the permitting action."

To reiterate, SRIC strongly opposes the inclusion in the permit of Salt Cell 5 and Salt Storage Pond 5, which are for a new shaft #5 and connecting drifts, which is an expansion of the WIPP facility that is strongly opposed by SRIC and many organizations and individuals, and has not been permitted by NMED. Salt Cell 5 and Salt Storage Pond 5 and its 1,292,499 gpd discharge volume should not be included in the renewed and modified permit.

Further, SRIC's re-affirms the request for negotiations and a public hearing on the draft permit, as provided in our April 22, 2020 comments.

Additional comments are the following:

1. <u>The current Public Notice and Fact Sheet are legally inadequate</u>
A. Neither the Public Notice of October 1, 2020, nor the Fact Sheet of September 2020 describe that the draft permit is revised and re-issued from the draft permit dated March 2, 2020. This is fundamental information that should be included in both documents. Absent that information,

NMED would apparently be in violation of Subsection F of 20.6.2.3108 NMAC that requires issuance of a draft permit or notice of intent to deny within 60 days of determining that the application is administratively complete.

B. Neither the Public Notice of October 1, 2020, nor the Fact Sheet of September 2020 describes that Salt Cell 5 and Salt Storage Pond 5 are required for the new shaft #5. That inadequacy is in violation of Subsection F(3) of 20.6.2.3108 NMAC that provides that the Public Notice shall include "a brief description of the activities that produce the discharge described in the application," and Subsection I(1) of 20.6.2.3108 NMAC that provides that the Fact Sheet and draft permit also shall provide that description. The failure to follow the regulations was pointed out in SRIC's April 22, 2020 comments at #3, so it is incomprehensible that the violation continues. The violation is especially puzzling since the draft permit was modified on page 3 of 43 to state: "Salt Cell 5 adds a new salt storage location, which will receive overburden and salt from the construction of Shaft 5 and its associated underground connecting drifts. Salt Storage Pond 5 will receive both the leachate and stormwater in contact with mined salt located in Salt Cell 5." The addition of the description that the new shaft produces the discharge in the draft permit does <u>not</u> remedy the violations of Subsection F(3) of 20.6.2.3108 NMAC and Subsection I(1) of 20.6.2.3108 NMAC. As SRIC discussed in the April 22, 2020 comments, from the Public Notice and Fact Sheet neither SRIC, nor any member of the public, would know from the Fact Sheet that the renewed and modified DP-831 relates to facilities required by the new shaft and connecting drifts.

SRIC notes that new Map 1 does show the approximate locations of Salt Cell 5 and Salt Storage Pond 5, as SRIC requested in its April 22, 2020 comments.

Nonetheless, the inadequate Public Notice and inadequate Fact Sheet must be remedied by re-issuing the Public Notice and Fact Sheet to comply with the regulations.

2. <u>Additional information since the SRIC April 22, 2020 comments</u>:
A. A Temporary Authorization (TA) for the new shaft was issued by Stephanie Stringer of NMED on April 24, 2020.[1] AR 200415.

B. SRIC strongly opposed the TA and appealed the TA decision to the New Mexico Court of Appeals on April 27, 2020. Case #: A-1-CA-38924.[2] AR 200421.

C. On June 11, 2020, the New Mexico Court of Appeals issued its Order Dismissing SRIC's Appeal because "we do not have jurisdiction over this case." ¶ 6.[3] AR 200605.5

D. On June 30, 2020, SRIC filed its Petition For A Writ Of Certiorari in the New Mexico Supreme Court. Case No. S-1-SC-38373.[4] AR 200636.

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[1] https://www.env.nm.gov/hazardous-waste/wp-content/uploads/sites/12/2016/05/WIPP-RPD-Approval-of-WIPP-Temporary-Authorization-Request-04-24-2020.pdf
[2] https://hwbdocuments.env.nm.gov/Waste%20Isolation%20Pilot%20Plant/200421.pdf
[3] https://hwbdocuments.env.nm.gov/Waste%20Isolation%20Pilot%20Plant/200605.5.pdf
[4] https://hwbdocuments.env.nm.gov/Waste%20Isolation%20Pilot%20Plant/200636.pdf

E. On September 17, 2020, the New Mexico Supreme Court issued its Order overturning the Court of Appeals Dismissal Order and ordered that the Court of Appeal "proceed in *Southwest Research v. NM Environment Department*, Ct. App. No. A-1-CA-38924, in accordance with the Rules of Appellate Procedure," thereby finding that the Court of Appeals does have jurisdiction.[5] AR 200918. Thus, the legality of the April 24, 2020 TA remains much in question.

F. On September 9, 2020, the WIPP permittees requested a reissuance of the TA for another 180 days.[6] AR 200907.

G. On September 11, 2020, SRIC submitted comments strongly objecting to re-issuing the TA.[7] AR 200908. Among many other things, the comments noted that, regarding the draft permit for the new shaft that was issued on June 12, 2020, Public Notice 20-03, "97 percent of those commenting object to the draft permit."

H. On September 29-30, 2020, Avery Young and Ricardo Maestas of NMED conducted an inspection of the new shaft construction.[8] AR 201011.

I. On October 24, 2020, the TA expired. As of this date, it has not been re-issued, and NMED has issued a verbal direction to the permittees "to suspend shaft construction by midnight October 24th an await NMED's response." Attachment 1.

Those events support SRIC's April 22, 2020 comments that the new shaft has not been permitted by NMED and that there is very significant public interest in the new shaft because it is part of the "Forever WIPP" expansion plans. Consequently, NMED cannot issue DP-831 that allows Salt Cell 5 and Salt Storage Pond 5 which are part of new shaft #5, which is prohibited by law. NMED cannot permit an illegal facility. Because of the significant public interest, NMED must hold negotiations and a public hearing, unless the requests for public hearing are withdrawn.

3. <u>Comments on changes to the draft permit.</u>
SRIC notes that there are a few changes in the September 24, 2020 draft permit, as compared with the March 2, 2020 draft permit. However, those changes are not readily apparent since there is no redline/strikeout version of the draft permit, nor does the Fact Sheet describe changes that were made to the March 2, 2020 draft permit. The omission of such changes is inappropriate, since it requires SRIC and other members of the public to spend significant time comparing the two documents. The federal Clean Water Act specifically requires public participation:

> Public participation in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan, or program established by the Administrator or any State under this chapter shall be provided for, encouraged, and assisted by the Administrator and the States.

33 U.S.C. § 1251(e).

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[5] https://hwbdocuments.env.nm.gov/Waste%20Isolation%20Pilot%20Plant/200918.pdf
[6] https://hwbdocuments.env.nm.gov/Waste%20Isolation%20Pilot%20Plant/200907.pdf
[7] https://hwbdocuments.env.nm.gov/Waste%20Isolation%20Pilot%20Plant/200908.pdf
[8] https://hwbdocuments.env.nm.gov/Waste%20Isolation%20Pilot%20Plant/201011.pdf

Since SRIC believes that yet another Public Notice and Fact Sheet are required to comply with the regulations, as stated in #1 above, SRIC requests that the new Public Notice and revised Fact Sheet briefly describe the changes from the previous draft permit, and any other changes if the draft permit is further revised. A redline/strikeout version of the draft permit should be provided.

SRIC notes that comment #6 in its April 22, 2020 letter was apparently noted and that the typo has been fixed in the new Discharge Permit Summary, page 2 of 5 5 – Salt Storage Pond 1 – capacity.

4. Additional condition requested.
Because Administrative Record (AR) documents regarding DP-831 are not available on the Ground Water Bureau website, nor on the WIPP website, SRIC and other members of the public have great difficulty in reviewing relevant documents in the AR. Therefore, in these comments SRIC has referenced Hazardous Waste Bureau WIPP AR documents. A method to alleviate that problem would be for DP-831 to include a condition, similar to WIPP Permit Part 1.14.1, that DOE is required to post such documents on the WIPP website. SRIC requests that such a condition be included in DP-831. Such documents should include, at a minimum, the permit, permit renewal application, permit modification requests, and required monitoring reports, such as the Semi-Annual Discharge Monitoring Reports, and Notices of Discharges. Such a condition would also be consistent with 33 U.S.C. § 1251(e), cited in #3 above.

Thank you very much for your careful consideration of, and your response to, these comments.

Sincerely,

Don Hancock

Don Hancock

cc: Rebecca Roose
Michelle Hunter
Steve Pullen
Melanie Sandoval
Stephanie Stringer
Kevin Pierard
Ricardo Maestas

Subject: RE: [EXT] WIPP Class 3 Permit Modification for New Shaft Negotiations and TA
From: "Maestas, Ricardo, NMENV" <Ricardo.Maestas@state.nm.us>
Date: 10/29/2020, 11:21 AM
To: Don Hancock <sricdon@earthlink.net>
CC: "McLean, Megan, NMENV" <Megan.McLean@state.nm.us>, "Pierard, Kevin, NMENV" <Kevin.Pierard@state.nm.us>, "Maestas, Ricardo, NMENV" <Ricardo.Maestas@state.nm.us>

Hello Don,

Again, thank you for your feedback on negotiations. We will get back to you on this topic.

With regard to the WIPP TA.
NMED is currently reviewing the Permittees' request to re-issue the Temporary Authorization. The Temporary Authorization expired on Saturday, October 24th. On Friday, October 23rd NMED verbally directed the Permittees to suspend shaft construction by midnight October 24th and await NMED's response.

Thank you.

Ricardo Maestas
WIPP Group Staff Manager
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Bldg 1
Santa Fe, New Mexico 87505
(505) 476-6050
ricardo.maestas@state.nm.us
www.env.nm.gov
twitter.com/NMEnvDep

From: Michelle Cook (CONTR)
To: Young, Avery, NMENV
Cc: Hunter, Michelle, NMENV; Maestas, Ricardo, NMENV; Pierard, Kevin, NMENV; Pullen, Steve, NMENV; DOE M&RC - WIPPNet
Subject: [EXT] Permittee Comments on the Draft Discharge Permit Renewal and Modification, DP 831, Waste Isolation Pilot Plant.
Date: Tuesday, November 10, 2020 11:32:09 AM
Attachments: image001.jpg
20-1501 Ltr.pdf
20-1501 Enclosure- Proposed Comments on Draft DP-831.pdf

Good Morning Ms. Young,

Please see the attached correspondence. If you have any questions regarding the attached letter and enclosure, please contact Mr. Mike Brown at (575) 706-0072 or Mike.Brown@cbfo.doe.gov

Thank you,

Michelle Cook
Administrative Assistant
Carlsbad Technical Assistance Contractor (North Wind – Portage)
Contractor to the Department of Energy
4021 National Parks Highway
Carlsbad, NM 88220
(575) 234-7154

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221

NOV 10 2020

Ms. Avery Young
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
Santa Fe, New Mexico 87502-5469

Subject: Permittee Comments on the Draft Discharge Permit Renewal and Modification, DP-831, Waste Isolation Pilot Plant.

Dear Ms. Young:

The purpose of this letter is to provide you with the enclosed comments on the September 24, 2020, Draft Discharge Permit Renewal and Modification, DP-831, Waste Isolation Pilot Plant.

If you have any questions, please contact Mr. Michael R. Brown at (575) 706-0072.

Sincerely,

Reinhard Knerr
Manager
Carlsbad Field Office

Enclosure

cc: w/enclosure

M. Hunter, NMED	*ED
R. Maestas, NMED	ED
K. Pierard, NMED	ED
S. Pullen, NMED	ED
CBFO M&RC	

*ED denotes electronic distribution

CBFO:OEP:MB:RS:20-1501:UFC 5486.00

Permittee Comments on Draft Discharge Permit Renewal and Modification, DP-831
Waste Isolation Pilot Plant

COMMENT 1 - Discharge Permit Summary, Domestic Wastewater Table: Update liner thicknesses in the summary table.

The liner thicknesses for Effluent Lagoon A, Effluent Lagoon B, and Effluent Lagoon C have been field verified as 60-mil high-density polyethylene (HDPE).

COMMENT 2 – Draft Discharge Permit Conditions #9, 13, 17, and 19: Delete the height requirement regarding fencing. The following is proposed replacement language.

> *The fences shall meet BLM standards for domestic livestock fences.~~consist of a minimum of six-foot chain link or field fencing and locking gates.~~*

The Bureau of Land Management (BLM) specifies standards for domestic livestock fences. Fencing is commonly used to control domestic livestock to achieve safety and vegetation management objectives. Fences are examples of structural improvements, which improve livestock grazing management, improve watershed conditions, and enhance wildlife habitats.

The following is proposed replacement language to the following conditions:

> Condition 9: *The Permittee shall maintain, throughout the term of this discharge permit, the Exclusive Use Area barbed wire fence that encompasses Storm Water Ponds 1, 2, and 3 to limit access by livestock. The fences shall meet BLM standards for domestic livestock fences.*

> Condition 13: *The Permittee shall maintain, throughout the term of this discharge permit, the Exclusive Use Area barbed wire fence that encompasses Brine Salt Storage Pond 4 to limit access by livestock. The fence shall meet BLM standards for domestic livestock fences.*

> Condition 17: *The Permittee shall maintain, throughout the term of this discharge permit, the barbed wire fence that encompasses Evaporation Pond H-19 to limit access by livestock. The fence shall meet BLM standards for domestic livestock fences and have a locking gate.*

> Condition 19: *The Permittee shall maintain, throughout the term of this discharge permit, the Exclusive Use Area barbed wire fence that encompasses Salt Storage Ponds 1, 2, and 3 to limit access by livestock. The fences shall meet BLM standards for domestic livestock fences.*

COMMENT 3 - Draft Discharge Permit Conditions #51, 52, 53, 54, and 55: Update the respective conditions in the Draft Permit to reflect work performed to date on the monitoring wells. A DOE status report letter (20-0296) was sent to the NMED Ground Water Quality Bureau in November 2020.

COMMENT 4 - Draft Discharge Permit Condition #51: Change “within 120 days of well completion” to “within 120 days following the effective date of this Discharge Permit (**by DATE**)”

COMMENT 5 - Draft Discharge Permit Condition #52: Change “within 120 days of well completion” to “within 120 days following the effective date of this Discharge Permit (**by DATE**)”

COMMENT 6 - Draft Discharge Permit Condition #53: Change “within 120 days of well completion” to “within 120 days following the effective date of this Discharge Permit (**by DATE**)”

COMMENT 7 - Draft Discharge Permit Condition #54 (third paragraph): Change “within 120 days of the installation of the monitoring wells” to “within 120 days following the effective date of this Discharge Permit (**by DATE**)”

COMMENT 8 - Draft Discharge Permit Condition #55: Change “within 120 days of the installation of the monitoring wells” to “within 120 days following the effective date of this Discharge Permit (**by DATE**)”

COMMENT 9 - Draft Discharge Permit Conditions #11 and 22: Update respective conditions in the Draft Permit to reflect work performed to date on the new impoundments. A DOE status report letter (20-0297) was sent to the NMED Ground Water Quality Bureau in November 2020.

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AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO

County of Bernalillo SS

Elise Rodriguez , the undersigned, on oath states that she is an authorized Representative of The Albuquerque Journal, and that this newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Session Laws of 1937, and that payment therefore has been made of assessed as court cost; that the notice, copy of which hereto attached, was published in said paper in the regular daily edition, for 1 time(s) on the following date(s):

10/01/2020

OFFICIAL SEAL
Susan Ramirez
NOTARY PUBLIC - STATE OF NEW MEXICO
My Commission Expires: 2/15/2023

Sworn and subscribed before me, a Notary Public in and for the County of Bernalillo and State of New Mexico this 1 day of October of 2020

PRICE $1,126.65

Statement to come at the end of month.

ACCOUNT NUMBER 1007595

PUBLIC NOTICE

October 1, 2020
Groundwater Discharge Permit Proposed for Approval
DP-831, Waste Isolation Pilot Plant
Public Comment Period Open Until November 15, 2020

The New Mexico Environment Department (NMED or department) Ground Water Quality Bureau (GWQB) provides notice that the following draft Groundwater Discharge Permit has been proposed for approval: The U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP or Facility) proposes to renew and modify the groundwater discharge permit (DP-831 or Permit) for the discharge of up to 9,586,995 gallons per day of industrial wastewater and stormwater to an impoundment and disposal system and up to 23,000 gallons per day of domestic wastewater to a treatment and disposal system. The draft Permit modification consists of the addition of one new salt cell and four new impoundments that will receive industrial wastewater and stormwater.

Applicant: U.S. Department of Energy's WIPP, Reinhard Knerr, Manager, Carlsbad Field Office, P.O. Box 3090, Carlsbad, NM 88221

Facility Description: The Facility is a mined geologic repository for the disposal of transuranic (TRU) waste. The underground repository at the Facility is located 2,150 feet below land surface in the bedded salt of the Salado Formation. The draft Permit addresses discharges that are not directly associated with the storage of TRU waste.

Discharge Locations: Discharge locations at the Facility potentially affecting groundwater include an impoundment system for domestic wastewater, three active salt cells, four lined impoundments for stormwater in contact with salt cells, three lined impoundments for stormwater not in contact with salt cells, and four lined impoundments for non-hazardous, non-radioactive, industrial wastewater.

Activities that Produce the Discharge: Discharges at this Facility include stormwater collected from the Facility grounds and from active and inactive salt cells which are directed to synthetically lined impoundments. Additionally, the Facility discharges industrial wastewater from various sources including brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous, non-radioactive wastewaters, to synthetically lined impoundments. The Facility discharges domestic wastewater to a synthetically lined impoundment system for treatment and disposal by evaporation. The Facility proposes to discharge brine produced from the operations of the to be constructed Salt Reduction System to two synthetically lined impoundments.

Facility Location: The Facility is located off Highway 128, approximately 26 miles southeast of Carlsbad, in Sections 20, 21, 28, and 29, Township 22S, Range 31E, Eddy County.

Potential Contaminants: Potential contaminants from these types of discharge include nitrogen compounds, dissolved solids, and chloride.

Groundwater Most Likely to be Affected by the Discharge: Groundwater most likely to be affected is at a depth of approximately 35 to 160 feet and had a pre-discharge total dissolved solids concentration of 3,400 milligrams per liter.

Public Involvement: NMED maintains a Facility-specific Public Involvement Plan (PIP) for each permitting action so that the department can plan for providing public participation opportunities and information that may be needed for the community to participate in a permitting process. The department's issuance of this public notice (Notice) is addressed in the PIP.

How to obtain more information: To learn more about this draft Permit and the permitting process, or to obtain a copy of the draft Permit, the associated Fact Sheet, which provides a brief summary of the basis for the draft Permit conditions and is available in both English and Spanish, or the associated PIP, please contact the NMED Permit Contact, Ms. Avery Young, by telephone at (505) 827-2909 or by email at **Avery.Young@state.nm.us**. NMED will provide, at no cost, documents either by email or US mail to any community member requesting a copy. Please specify how you would like the document(s) delivered. NMED maintains a facility-specific mailing list for persons wishing to receive notices for permitting actions associated with this Facility. When requesting documents, please specify if you would like to be added to this list.

The draft Permit, Fact Sheet, and PIP may be viewed online at **https://www.env.nm.gov/gwqb/dp-831/**. For a Spanish translation of the Fact Sheet, visit **https://www.env.nm.gov/gwqb/dp-831-es/**.

NMED has placed a hard copy of the draft Permit, the Fact Sheet, the Permit application, and the PIP at the following document repository locations: Eunice Public Library (1003 Avenue N, Eunice); Carlsbad Public Library (101 S. Halagueno St, Carlsbad). As of the date of NMED's issuance of this notice, both libraries are open to the public. In the event either library restricts public access during this public comment period due to the ongoing COVID-19 public health emergency, NMED asks community members to request documents as described above.

How to submit a comment or request a hearing: NMED is allowing 45 days after the date of publication of this Notice for anyone to submit written comments and/or a request for a public hearing regarding the draft Permit. Requests for a public hearing shall be in writing and shall set forth the reasons why a hearing should be held. Comments or a request for hearing regarding the draft Permit should be addressed to the GWQB, PO Box 5469, Santa Fe, NM 87502-5469, or emailed to the NMED Permit contact, Ms. Avery Young, at **Avery.Young@state.nm.us**, reference line "DP-831 Comments."

A hearing will be held if the New Mexico Secretary of Environment (Secretary) determines that there is substantial public interest. The Secretary will appoint a hearing officer and will ensure the hearing is held in the locally affected community. During the hearing process, members of the public may file technical testimony prior to the hearing and may provide verbal and written comments during the hearing itself. Once the hearing is complete, the hearing officer will provide the Secretary with a hearing report that includes a suggested determination. The Secretary will then issue a Final Order which will complete the Administrative Record (Record) for the permitting action. After the Record for a permitting action is complete and all required information is available, NMED will approve, approve with conditions, or disapprove the Permit based on the Record and/or Final Order from the Secretary.

How to request accommodations: If you are a non-English speaker, do not speak English well, or if you have a disability, you may contact Ms. Avery Young by telephone during normal business hours at (505) 827-2909 or by email at **Avery.Young@state.nm.us** to request assistance, translation services, an interpreter, or other reasonable accommodations in order to learn more about the Permit or the permitting process, or to participate in activities associated with the permitting process. Requested translation, interpretation services, and accommodations or services for persons with disabilities will be arranged. Telephone conversation assistance is available through Relay New Mexico at no charge for people who are deaf, hard of hearing, or have difficulty speaking on the phone, by calling 1-800-659-1779; TTY users: 1-800-659-8331; Spanish: 1-800-327-1857. Telephone interpretation assistance for persons that are a non-English speaker or do not speak English well is available at no charge when calling NMED.

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Parts 5 and 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this Notice or any of NMED's non-discrimination programs, policies or procedures, you may contact: Kristine Yurdin, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, **nd.coordinator@state.nm.us**. If you believe that you have been discriminated against with respect to a NMED program or activity, you may contact the Non-Discrimination Coordinator identified above or visit our website at **https://www.env.nm.gov/non-employee-discrimination-complaint-page/** to learn how and where to file a complaint of discrimination.

Journal: October 1, 2020

AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO

County of Bernalillo SS

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Elise Rodriguez , the undersigned, on oath states that she is an authorized Representative of The Albuquerque Journal, and that this newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Session Laws of 1937, and that payment therefore has been made of assessed as court cost; that the notice, copy of which hereto attached, was published in said paper in the regular daily edition, for 1 time(s) on the following date(s):

10/01/2020

OFFICIAL SEAL
Susan Ramirez
NOTARY PUBLIC - STATE OF NEW MEXICO
My Commission Expires: 2/15/2023

Sworn and subscribed before me, a Notary Public, in and for the County of Bernalillo and State of New Mexico this 1 day of October of 2020

PRICE $1,126.65

Statement to come at the end of month.

ACCOUNT NUMBER 1007595

NEW MEXICO ENVIRONMENT DEPARTMENT

AVISO PÚBLICO

1 de octubre de 2020
Permiso de Descarga de Aguas Subterráneas propuesto para su aprobación
DP-831, Planta Piloto de Aislamiento de Residuos
Período de comentarios públicos abierto hasta el 15 de noviembre de 2020

La Oficina de Calidad de Aguas Subterráneas (GWQB, por sus siglas en inglés) del Departamento de Medio Ambiente de Nuevo México (NMED, por sus siglas en inglés) avisa que el siguiente borrador de Permiso de Descarga de Aguas Subterráneas ha sido propuesto para su aprobación: La Planta Piloto de Aislamiento de Residuos (WIPP, por sus siglas en inglés) del Departamento de Energía de los Estados Unidos propone renovar y modificar el Permiso de Descarga (DP-831) para la descarga de hasta 9,586,995 galones por día de aguas residuales industriales y aguas pluviales a un sistema de embalse y eliminación y hasta 23,000 galones por día de aguas residuales domésticas a un sistema de tratamiento y eliminación. La modificación del borrador de Permiso consiste en la adición de una nueva celda de sal y cuatro nuevos embalses que recibirán aguas residuales industriales y aguas pluviales.

Solicitante: WIPP del Departamento de Energía de los Estados Unidos, Reinhard Knerr, gerente, oficina local en Carlsbad, P.O. Box 3090, Carlsbad, NM 88221

Descripción de la Instalación: La Instalación es un depósito geológico minado para la eliminación de residuos transuránicos (TRU). El depósito subterráneo está situado a 2,150 pies por debajo de la superficie del suelo en el lecho de sal de la Formación Salado. El borrador de Permiso aborda vertidos que no están directamente relacionados con el almacenamiento de los residuos TRU.

Ubicaciones de las descargas: Los lugares de descarga en la Instalación que pueden afectar las aguas subterráneas incluyen un sistema de embalse para las aguas residuales domésticas, tres celdas de sal activas, cuatro embalses revestidos para aguas pluviales en contacto con celdas de sal, tres embalses revestidos para aguas pluviales que no están en contacto con celdas de sal y cuatro embalses revestidos para aguas residuales industriales no peligrosas y no radioactivas.

Actividades que producen la descarga: Las descargas en esta Instalación incluyen aguas pluviales recogidas de los terrenos de la Instalación y de celdas de sal activas e inactivas que se dirigen a embalses revestidos sintéticamente. Además, las instalaciones descargan aguas residuales industriales de varias fuentes, entre ellas salmuera, aguas de purga de muestreo y de pozos de monitoreo en vías de desarrollo de la Instalación, y otras aguas residuales industriales no peligrosas y no radiactivas, a embalses revestidos de material sintético. La Instalación descarga aguas residuales domésticas a un sistema de embalse revestido de material sintético para su tratamiento y eliminación por evaporación. La Instalación propone descargar la salmuera producida por las operaciones del sistema de reducción de sal a dos embalses revestidos de material sintético.

Ubicación de la instalación: La Instalación se encuentra junto a la Highway 128, aproximadamente a 26 millas al sureste de Carlsbad, en las Secciones 20, 21, 28 y 29, Municipio 22S, Rango 31E, condado de Eddy.

Posibles contaminantes: Los posibles contaminantes de estos tipos de descarga incluyen compuestos de nitrógeno, sólidos disueltos y cloruro.

Agua subterránea con más probabilidad de ser afectada por la descarga: El agua subterránea que más probablemente se verá afectada se encuentra a una profundidad de aproximadamente 35 a 160 pies y tenía una concentración de sólidos disueltos totales antes del vertido de 3,400 miligramos por litro.

Participación pública: El NMED mantiene un Plan de Participación Pública (PIP) específico de la Instalación para cada acción de permisos, de manera que el departamento pueda planificar para proporcionar oportunidades de participación pública y la información que pueda ser necesaria para que la comunidad participe en un proceso de permisos. La emisión de este aviso público (Aviso) por parte del departamento se aborda en el PIP.

Cómo obtener más información: Para aprender más acerca de este borrador de Permiso y el proceso de permiso, o para obtener una copia del borrador de Permiso, la Hoja de Datos asociada, que proporciona un breve resumen de las bases de las condiciones del borrador de permiso y está disponible tanto en inglés como en español, o el PIP asociado, comuníquese con el contacto de permisos del NMED, la Sra. Avery Young, por teléfono al (505) 827-2909 o por correo electrónico en **Avery.Young@state.nm.us**. El NMED proveerá, sin costo alguno, documentos ya sea por correo electrónico o por correo postal de los Estados Unidos a cualquier miembro de la comunidad que solicite una copia. Haga el favor de especificar cómo desea que se le entreguen los documentos. El NMED mantiene una lista de correo específica de la Instalación para las personas que deseen recibir avisos de las acciones de permiso asociadas con esta Instalación. Cuando solicite documentos especifique si desea que se le agregue a esta lista.

El borrador de Permiso, la Hoja de Datos y el PIP pueden verse en línea en **https://www.env.nm.gov/gwqb/dp-831/**. Para obtener una traducción en español de la Hoja de Datos, visite **https://www.env.nm.gov/gwqb/dp-831-es/**.

El NMED ha colocado una copia impresa del borrador de Permiso, la Hoja de Datos, la solicitud del Permiso y el PIP en las siguientes ubicaciones de depósito de documentos: Biblioteca Pública de Eunice (1003 Avenida N, Eunice); Biblioteca Pública de Carlsbad (101 S. Halagueno St, Carlsbad). A partir de la fecha de emisión de este aviso por parte del NMED, ambas bibliotecas están abiertas al público. En caso de que alguna de las dos bibliotecas restrinja el acceso del público durante este período de comentarios públicos debido a la actual emergencia de salud pública de COVID-19, el NMED pide a los miembros de la comunidad que soliciten los documentos como se ha descrito anteriormente.

THENCE N. 09 deg. 11' W., 145.0 feet along the East ROW line of said private road to the Northwest corner of said tract, and the point of the beginning. Contains: 0.50 acres, more or less

ALSO KNOWN AS

IN THE MATTER OF THE ESTATE OF WINIFRED WILSON EDWARDS, Deceased.

NOTICE TO CREDITORS

NOTICE IS HEREBY GIVEN that the undersigned has been

IN THE MATTER OF THE ESTATE OF STEVEN MICHAEL SKELLY, DECEASED

NOTICE TO CREDITORS

NOTICE IS HEREBY GIVEN, by and through her attorney, Jason Marks, Esq., that

NG LIST IT

DISE? IN THE JOURN

23-4444

Carlsbad Current Argus.
PART OF THE USA TODAY NETWORK

Affidavit of Publication
Ad # 0004394848
This is not an invoice

RECEIVED
OCT 13 2020
Ground Water Quality Bureau

NMED / GROUND WATER QUALITY BUREAU
PO BOX 5469

SANTA FE, NM 87502-5469

I, a legal clerk of the **Carlsbad Current Argus**, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

10/01/2020

Kathleen Allen
Legal Clerk

Subscribed and sworn before me this October 1, 2020:

Pang Pappathopoulos
State of WI, County of Brown
NOTARY PUBLIC

10/23/2023
My commission expires

PANG PAPPATHOPOULOS
Notary Public
State of Wisconsin

Ad # 0004394848
PO #: 66700-0000035973
# of Affidavits 1

This is not an invoice

PUBLIC NOTICE
October 1, 2020
Groundwater Discharge Permit Proposed for Approval
DP-831, Waste Isolation Pilot Plant
Public Comment Period Open Until November 15, 2020

The New Mexico Environment Department (NMED or department) Ground Water Quality Bureau (GWQB) provides notice that the following draft Groundwater Discharge Permit has been proposed for approval: The U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP or Facility) proposes to renew and modify the groundwater discharge permit (DP-831 or Permit) for the discharge of up to 9,586,995 gallons per day of industrial wastewater and stormwater to an impoundment and disposal system and up to 23,000 gallons per day of domestic wastewater to a treatment and disposal system. The draft Permit modification consists of the addition of one new salt cell and four new impoundments that will receive industrial wastewater and stormwater.

Applicant: U.S. Department of Energy's WIPP, Reinhard Knerr, Manager, Carlsbad Field Office, P.O. Box 3090, Carlsbad, NM 88221

Facility Description: The Facility is a mined geologic repository for the disposal of transuranic (TRU) waste. The underground repository at the Facility is located 2,150 feet below land surface in the bedded salt of the Salado Formation. The draft Permit addresses discharges that are not directly associated with the storage of TRU waste.

Discharge Locations: Discharge locations at the Facility potentially affecting groundwater include an impoundment system for domestic wastewater, three active salt cells, four lined impoundments for stormwater in contact with salt cells, three lined impoundments for stormwater not in contact with salt cells, and four lined impoundments for non-hazardous, non-radioactive, industrial wastewater.

Activities that Produce the Discharge: Discharges at this Facility include stormwater collected from the Facility grounds and from active and inactive salt cells which are directed to synthetically lined impoundments. Additionally, the Facility discharges industrial wastewater from various sources including brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non--hazardous, non-radioactive wastewaters, to synthetically lined impoundments. The Facility discharges domestic wastewater to a synthetically lined impoundment system for treatment and disposal by evaporation. The Facility proposes to discharge brine produced from the operations of the to be constructed Salt Reduction System to two synthetically lined impoundments.

Facility Location: The Facility is located off Highway 128, approximately 26 miles southeast of Carlsbad, in Sections 20, 21, 28, and 29, Township 22S, Range 31E, Eddy County.

Potential Contaminants: Potential contaminants from these types of discharge include nitrogen compounds, dissolved solids, and chloride.

Groundwater Most Likely to be Affected by the Discharge: Groundwater most likely to be affected is at a depth of approximately 35 to 160 feet and had a pre-discharge total dissolved solids concentration of 3,400 milligrams per liter.

Public Involvement: NMED maintains a Facility-specific Public Involvement Plan (PIP) for each permitting action so that the department can plan for providing public participation opportunities and information that may be needed for the community to participate in a permitting process. The department's issuance of this public notice (Notice) is addressed in the PIP.

How to obtain more information: To learn more about this draft Permit and the permitting process, or to obtain a copy of the draft Permit, the associated Fact Sheet, which provides a brief summary of the basis for the draft Permit conditions and is available in both English and Spanish, or the associated PIP, please contact the NMED Permit Contact, Ms. Avery Young, by telephone at (505) 827-2909 or by email at Avery.Young@state.nm.us. NMED will provide, at no cost, documents either by email or US mail to any community member requesting a copy. Please specify how you would like the document(s) delivered. NMED maintains a facility-specific mailing list for persons wishing to receive notices for permitting actions associated with this Facility. When requesting documents, please specify if you would like to be added to this list.

The draft Permit, Fact Sheet, and PIP may be viewed online at https://www.env.nm.gov/gwqb/dp-831/. For a Spanish translation of the Fact Sheet, visit https://www.env.nm.gov/gwqb/dp-831-es/.

NMED has placed a hard copy of the draft Permit, the Fact Sheet, the Permit application, and the PIP at the following document repository locations: Eunice Public Library (1003 Avenue N, Eunice); Carlsbad Public Library (101 S. Halagueno St, Carlsbad). As of the date of NMED's issuance of this notice, both libraries are open to the public. In the event either library restricts public access during this public comment period due to the ongoing COVID-19 public health emergency, NMED asks community members to request documents as described above.

How to submit a comment or request a hearing: NMED is allowing 45 days after the date of publication of this

Notice for anyone to submit written comments and/or a request for a public hearing regarding the draft Permit. Requests for a public hearing shall be in writing and shall set forth the reasons why a hearing should be held. Comments or a request for hearing regarding the draft Permit should be addressed to the GWQB, PO Box 5469, Santa Fe, NM 87502-5469, or emailed to the NMED Permit contact, Ms. Avery Young, at Avery.Young@state.nm.us, reference line "DP-831 Comments."

A hearing will be held if the New Mexico Secretary of Environment (Secretary) determines that there is substantial public interest. The Secretary will appoint a hearing officer and will ensure the hearing is held in the locally affected community. During the hearing process, members of the public may file technical testimony prior to the hearing and may provide verbal and written comments during the hearing itself. Once the hearing is complete, the hearing officer will provide the Secretary with a hearing report that includes a suggested determination. The Secretary will then issue a Final Order which will complete the Administrative Record (Record) for the permitting action. After the Record for a permitting action is complete and all required information is available, NMED will approve, approve with conditions, or disapprove the Permit based on the Record and/or Final Order from the Secretary.

How to request accommodations: If you are a non-English speaker, do not speak English well, or if you have a disability, you may contact Ms. Avery Young by telephone during normal business hours at (505) 827-2909 or by email at Avery.Young@state.nm.us to request assistance, translation services, an interpreter, or other reasonable accommodations in order to learn more about the Permit or the permitting process, or to participate in activities associated with the permitting process. Requested translation, interpretation services, and accommodations or services for persons with disabilities will be arranged. Telephone conversation assistance is available through Relay New Mexico at no charge for people who are deaf, hard of hearing, or have difficulty speaking on the phone, by calling 1-800-659-1779; TTY users: 1-800-659-8331; Spanish: 1-800-327-1857. Telephone interpretation assistance for persons that are a non-English speaker or do not speak English well is available at no charge when calling NMED.

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Parts 5 and 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this Notice or any of NMED's non-discrimination programs, policies or procedures, you may contact: Kristine Yurdin, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. If you believe that you have been discriminated against with respect to a NMED program or activity, you may contact the Non-Discrimination Coordinator identified above or visit our website at https://www.env.nm.gov/non-employee-discrimination--complaint-page/ to learn how and where to file a complaint of discrimination.

AVISO PÚBLICO
1 de octubre de 2020
Permiso de Descarga de Aguas Subterráneas propuesto para su aprobación
DP-831, Planta Piloto de Aislamiento de Residuos
Período de comentarios públicos abierto hasta el 15 de noviembre de 2020

La Oficina de Calidad de Aguas Subterráneas (GWQB, por sus siglas en inglés) del Departamento de Medio Ambiente de Nuevo México (NMED, por sus siglas en inglés) avisa que el siguiente borrador de Permiso de Descarga de Aguas Subterráneas ha sido propuesto para su aprobación: La Planta Piloto de Aislamiento de Residuos (WIPP, por sus siglas en inglés) del Departamento de Energía de los Estados Unidos propone renovar y modificar el Permiso de Descarga (DP-831) para la descarga de hasta 9,586,995 galones por día de aguas residuales industriales y aguas pluviales a un sistema de embalse y eliminación y hasta 23,000 galones por día de aguas residuales domésticas a un sistema de tratamiento y eliminación. La modificación del borrador de Permiso consiste en la adición de una nueva celda de sal y cuatro nuevos embalses que recibirán aguas residuales industriales y aguas pluviales.

Solicitante: WIPP del Departamento de Energía de los Estados Unidos, Reinhard Knerr, gerente, oficina local en Carlsbad, P.O. Box 3090, Carlsbad, NM 88221

Descripción de la Instalación: La Instalación es un depósito geológico minado para la eliminación de residuos transuránicos (TRU). El depósito subterráneo está situado a 2,150 pies por debajo de la superficie del suelo en el lecho de sal de la Formación Salado. El borrador de Permiso aborda vertidos que no están directamente relacionados con el almacenamiento de los residuos TRU.

Ubicaciones de las descargas: Los lugares de descarga en la Instalación que pueden afectar las aguas subterráneas incluyen un sistema de embalse para las aguas residuales domésticas, tres celdas de sal activas, cuatro embalses revestidos para aguas pluviales en contacto con celdas de sal, tres embalses revestidos para aguas pluviales que no están en contacto con celdas de sal y cuatro embalses revestidos para aguas residuales industriales no peligrosas y no radioactivas.

Actividades que producen la descarga: Las descargas en esta Instalación incluyen aguas pluviales recogidas de los terrenos de la Instalación y de celdas de sal activas e inactivas que se dirigen a embalses revestidos sintéticamente. Además, las instalaciones descargan aguas residuales industriales de varias fuentes, entre ellas salmuera, aguas de purga de muestreo y de pozos de monitoreo en vías de desarrollo de la Instalación, y otras aguas residuales industriales no peligrosas y no radiactivas, a embalses revestidos de material sintético. La Instalación descarga aguas residuales domésticas a un sistema de embalse revestido de material sintético para su tratamiento y eliminación por evaporación. La Instalación propone descargar la salmuera producida por las operaciones del sistema de reducción de sal a dos embalses revestidos de material sintético.

Ubicación de la instalación: La Instalación se encuentra junto a la Highway 128, aproximadamente a 26 millas al sureste de Carlsbad, en las Secciones 20, 21, 28 y 29, Municipio 22S, Rango 31E, condado de Eddy.

Posibles contaminantes: Los posibles contaminantes de estos tipos de descarga incluyen compuestos de nitrógeno, sólidos disueltos y cloruro.

Agua subterránea con más probabilidad de ser afectada por la descarga: El agua subterránea que más probablemente se verá afectada se encuentra a una profundidad de aproximadamente 35 a 160 pies y tenía una concentración de sólidos disueltos totales antes del vertido de 3,400 miligramos por litro.

Participación pública: El NMED mantiene un Plan de Participación Pública (PIP) específico de la Instalación para cada acción de permisos, de manera que el departamento pueda planificar para proporcionar oportunidades de participación pública y la información que pueda ser necesaria para que la comunidad participe en un proceso de permisos. La emisión de este aviso público (Aviso) por parte del departamento se aborda en el PIP.

Cómo obtener más información: Para aprender más acerca de este borrador de Permiso y el proceso de permiso, o para obtener una copia del borrador de Permiso, la Hoja de Datos asociada, que proporciona un breve resumen de las bases de las condiciones del borrador de permiso y está disponible tanto en inglés como en español, o el PIP asociado, comuníquese con el contacto de permisos del NMED, la Sra. Avery Young, por teléfono al (505) 827-2909 o por correo electrónico en Avery.Young@state.nm.us. El NMED proveerá, sin costo alguno, documentos ya sea por correo electrónico o por correo postal de los Estados Unidos a cualquier miembro de la comunidad que solicite una copia. Haga el favor de especificar cómo desea que se le entreguen los documentos. El NMED mantiene una lista de correo específica de la Instalación para las personas que deseen recibir avisos de las acciones de permiso asociadas con esta Instalación. Cuando solicite documentos especifique si desea que se le agregue a esta lista.

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El NMED ha colocado una copia impresa del borrador de Permiso, la Hoja de Datos, la solicitud del Permiso y el PIP en las siguientes ubicaciones de depósito de documentos: Biblioteca Pública de Eunice (1003 Avenida N, Eunice); Biblioteca Pública de Carlsbad (101 S. Halagueno St, Carlsbad). A partir de la fecha de emisión de este aviso por parte del NMED, ambas bibliotecas están abiertas al público. En caso de que alguna de las dos bibliotecas restrinja el acceso del público durante este período de comentarios públicos debido a la actual emergencia de salud pública de COVID-19, el NMED pide a los miembros de la comunidad que soliciten los documentos como se ha descrito anteriormente.

Cómo presentar un comentario o solicitar una audiencia: NMED permite 45 días después de la fecha de publicación de este Aviso para que cualquier persona pueda presentar comentarios por escrito y/o una solicitud de audiencia pública con respecto al borrador de Permiso. Las solicitudes para una audiencia pública deberán hacerse por escrito y en ellas se expondrán las razones por las que debe celebrarse una audiencia. Los comentarios o una solicitud de audiencia con respecto al borrador de Permiso deben dirigirse a GWQB, P.O. Box 5469, Santa Fe, NM 87502-5469, o por correo electrónico al contacto de permisos de NMED, la Sra. Avery Young, en Avery.Young@state.nm.us, línea de referencia "DP-831 Comentarios".

Se celebrará una audiencia si el secretario de Medio Ambiente de Nuevo México (secretario) determina que hay un considerable interés por parte del público. El secretario nombrará un funcionario de audiencias y se asegurará de que la audiencia se lleve a cabo en la comunidad local afectada. Durante el proceso de la audiencia, los miembros del público podrán presentar testimonios técnicos antes de la audiencia y podrán hacer comentarios verbales y por escrito durante la propia audiencia. Una vez concluida la audiencia, el funcionario de audiencias entregará al secretario un informe de la audiencia que incluirá una determinación sugerida. A continuación, el secretario emitirá una Orden Final que completará el Registro Administrativo (Registro) para la acción de permiso. Después de que el Registro para la acción de permiso esté completo y toda la información requerida esté disponible, NMED aprobará, aprobará con condiciones, o denegará el Permiso basado en el Registro y/o la Orden Final del secretario.

Cómo solicitar acomodaciones: Si no habla inglés, no lo habla bien o si tiene alguna discapacidad, puede ponerse en contacto con la Sra. Avery Young por teléfono durante el horario normal de oficina al (505) 827-2909 o por correo electrónico en Avery.Young @state.nm.us para solicitar asistencia, servicios de traducción, un intérprete u otras acomodaciones razonables a fin de poder aprender más sobre el permiso o el proceso de permiso, o para participar en actividades relacionadas con el proceso de permiso. Se organizarán los servicios de traducción e interpretación solicitados, así como las acomodaciones o servicios para personas con discapacidades. Hay disponible asistencia para conversaciones telefónicas a través de Relay New Mexico sin costo alguno para las personas que están sordas, tienen problemas de audición o tienen dificultades para hablar por teléfono, llamando al 1-800-659-1779; los usuarios de

TTY: 1-800-659-8331; español: 1-800-327-1857. La asistencia para una interpretación telefónica para las personas que no hablan inglés o que no lo hablan bien está disponible sin costo alguno llamando al NMED.

NMED no discrimina por motivos de raza, color, origen nacional, discapacidad, edad o sexo en la administración de sus programas o actividades, según lo exigido por las leyes y los reglamentos correspondientes. NMED es responsable de la coordinación de los esfuerzos de cumplimiento y la recepción de consultas relativas a los requisitos de no discriminación implementados por 40 C.F.R. Partes 5 y 7, incluido el Título VI de la Ley de Derechos Civiles de 1964, según enmendada; Sección 504 de la Ley de Rehabilitación de 1973; la Ley de Discriminación por Edad de 1975, Título IX de las Enmiendas de Educación de 1972 y la Sección 13 de las Enmiendas a la Ley Federal de Control de Contaminación del Agua de 1972. Si usted tiene preguntas sobre este aviso o sobre cualquier programa, política o procedimiento de no discriminación de NMED, usted puede comunicarse con la Coordinadora de No Discriminación: Kristine Yurdin, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. Si usted piensa que ha sido discriminado/a con respecto a un programa o actividad de NMED, usted puede comunicarse con la Coordinadora de No Discriminación antes indicada o visitar nuestro sitio web en https://www.env.nm.gov/non-employee-discrimination-complaint-page/ para aprender cómo y dónde presentar una queja de discriminación.
#0004394848, Current Argus, Oct 1, 2020

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 Saint Francis Drive / PO Box 5469
Santa Fe, NM 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

Michelle Lujan Grisham
Governor

Howie C. Morales
Lieutenant Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

PUBLIC NOTICE

October 1, 2020
Groundwater Discharge Permit
Proposed for Approval
DP-831, Waste Isolation Pilot Plant
Public Comment Period Open Until November 15, 2020

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Applicant: U.S. Department of Energy's WIPP, Reinhard Knerr, Manager, Carlsbad Field Office, P.O. Box 3090, Carlsbad, NM 88221

Facility Description: The Facility is a mined geologic repository for the disposal of transuranic (TRU) waste. The underground repository at the Facility is located 2,150 feet below land surface in the bedded salt of the Salado Formation. The draft Permit addresses discharges that are not directly associated with the storage of TRU waste.

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Activities that Produce the Discharge: Discharges at this Facility include stormwater collected from the Facility grounds and from active and inactive salt cells which are directed to synthetically lined impoundments. Additionally, the Facility discharges industrial wastewater from various sources including brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous, non-radioactive wastewaters, to synthetically lined impoundments. The Facility discharges domestic wastewater to a synthetically lined impoundment system for treatment and disposal by evaporation. The Facility proposes to discharge brine produced from the operations of the to be constructed Salt Reduction System to two synthetically lined impoundments.

Facility Location: The Facility is located off Highway 128, approximately 26 miles southeast of Carlsbad, in Sections 20, 21, 28, and 29, Township 22S, Range 31E, Eddy County.

Potential Contaminants: Potential contaminants from these types of discharge include nitrogen compounds, dissolved solids, and chloride.

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A hearing will be held if the New Mexico Secretary of Environment (Secretary) determines that there is substantial public interest. The Secretary will appoint a hearing officer and will ensure the hearing is held in the locally affected community. During the hearing process, members of the public may file technical testimony prior to the hearing and may provide verbal and written comments during the hearing itself. Once the hearing is complete, the hearing officer will provide the Secretary with a hearing report that includes a suggested determination. The Secretary will then issue a Final Order which will complete the Administrative Record (Record) for the permitting action. After the Record for a permitting action is complete and all required information is available, NMED will approve, approve with conditions, or disapprove the Permit based on the Record and/or Final Order from the Secretary.

How to request accommodations: If you are a non-English speaker, do not speak English well, or if you have a disability, you may contact Ms. Avery Young by telephone during normal business hours at (505) 827-2909 or by email at Avery.Young@state.nm.us to request assistance, translation services, an interpreter, or other reasonable accommodations in order to learn more about the Permit or the permitting process, or to participate in activities associated with the permitting process. Requested translation, interpretation services, and accommodations or services for persons with disabilities will be arranged. Telephone conversation assistance is available through Relay New Mexico at no charge for people who are deaf, hard of hearing, or have difficulty speaking on the phone, by calling 1-800-659-1779; TTY users: 1-800-659-8331; Spanish: 1-800-327-1857. Telephone interpretation assistance for persons that are a non-English speaker or do not speak English well is available at no charge when calling NMED.

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Parts 5 and 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this Notice or any of NMED's non-discrimination programs, policies or procedures, you may contact: Kristine Yurdin, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. If you believe that you have been discriminated against with respect to a NMED program or activity, you may contact the Non-Discrimination Coordinator identified above or visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

DEPARTAMENTO DE MEDIO AMBIENTE DE NUEVO MÉXICO

Oficina de Calidad de Aguas Subterráneas

1190 Saint Francis Drive / PO Box 5469
Santa Fe, NM 87502-5469
Teléfono (505) 827-2900 Fax (505) 827-2965
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Michelle Lujan Grisham
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Secretario de Gabinete

Jennifer J. Pruett
Subsecretaria

AVISO PÚBLICO

1 de octubre de 2020
Permiso de Descarga de Aguas Subterráneas propuesto para su aprobación
DP-831, Planta Piloto de Aislamiento de Residuos
Período de comentarios públicos abierto hasta el 15 de noviembre de 2020

La Oficina de Calidad de Aguas Subterráneas (GWQB, por sus siglas en inglés) del Departamento de Medio Ambiente de Nuevo México (NMED, por sus siglas en inglés) avisa que el siguiente borrador de Permiso de Descarga de Aguas Subterráneas ha sido propuesto para su aprobación: La Planta Piloto de Aislamiento de Residuos (WIPP, por sus siglas en inglés) del Departamento de Energía de los Estados Unidos propone renovar y modificar el Permiso de Descarga (DP-831) para la descarga de hasta 9,586,995 galones por día de aguas residuales industriales y aguas pluviales a un sistema de embalse y eliminación y hasta 23,000 galones por día de aguas residuales domésticas a un sistema de tratamiento y eliminación. La modificación del borrador de Permiso consiste en la adición de una nueva celda de sal y cuatro nuevos embalses que recibirán aguas residuales industriales y aguas pluviales.

Solicitante: WIPP del Departamento de Energía de los Estados Unidos, Reinhard Knerr, gerente, oficina local en Carlsbad, P.O. Box 3090, Carlsbad, NM 88221

Descripción de la Instalación: La Instalación es un depósito geológico minado para la eliminación de residuos transuránicos (TRU). El depósito subterráneo está situado a 2,150 pies por debajo de la superficie del suelo en el lecho de sal de la Formación Salado. El borrador de Permiso aborda vertidos que no están directamente relacionados con el almacenamiento de los residuos TRU.

Ubicaciones de las descargas: Los lugares de descarga en la Instalación que pueden afectar las aguas subterráneas incluyen un sistema de embalse para las aguas residuales domésticas, tres celdas de sal activas, cuatro embalses revestidos para aguas pluviales en contacto con celdas de sal, tres embalses revestidos para aguas pluviales que no están en contacto con celdas de sal y cuatro embalses revestidos para aguas residuales industriales no peligrosas y no radioactivas.

Actividades que producen la descarga: Las descargas en esta Instalación incluyen aguas pluviales recogidas de los terrenos de la Instalación y de celdas de sal activas e inactivas que se dirigen a embalses revestidos sintéticamente. Además, las instalaciones descargan aguas residuales industriales de varias fuentes, entre ellas salmuera, aguas de purga de muestreo y de pozos de monitoreo en vías de desarrollo de la Instalación, y otras aguas residuales industriales no peligrosas y no radiactivas, a embalses revestidos de material sintético. La Instalación descarga aguas residuales domésticas a un sistema de embalse revestido de material sintético para su tratamiento y eliminación por evaporación. La Instalación propone descargar la salmuera producida por las operaciones del sistema de reducción de sal a dos embalses revestidos de material sintético.

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Ubicación de la instalación: La Instalación se encuentra junto a la Highway 128, aproximadamente a 26 millas al sureste de Carlsbad, en las Secciones 20, 21, 28 y 29, Municipio 22S, Rango 31E, condado de Eddy.

Posibles contaminantes: Los posibles contaminantes de estos tipos de descarga incluyen compuestos de nitrógeno, sólidos disueltos y cloruro.

Agua subterránea con más probabilidad de ser afectada por la descarga: El agua subterránea que más probablemente se verá afectada se encuentra a una profundidad de aproximadamente 35 a 160 pies y tenía una concentración de sólidos disueltos totales antes del vertido de 3,400 miligramos por litro.

Participación pública: El NMED mantiene un Plan de Participación Pública (PIP) específico de la Instalación para cada acción de permisos, de manera que el departamento pueda planificar para proporcionar oportunidades de participación pública y la información que pueda ser necesaria para que la comunidad participe en un proceso de permisos. La emisión de este aviso público (Aviso) por parte del departamento se aborda en el PIP.

Cómo obtener más información: Para aprender más acerca de este borrador de Permiso y el proceso de permiso, o para obtener una copia del borrador de Permiso, la Hoja de Datos asociada, que proporciona un breve resumen de las bases de las condiciones del borrador de permiso y está disponible tanto en inglés como en español, o el PIP asociado, comuníquese con el contacto de permisos del NMED, la Sra. Avery Young, por teléfono al (505) 827-2909 o por correo electrónico en Avery.Young@state.nm.us. El NMED proveerá, sin costo alguno, documentos ya sea por correo electrónico o por correo postal de los Estados Unidos a cualquier miembro de la comunidad que solicite una copia. Haga el favor de especificar cómo desea que se le entreguen los documentos. El NMED mantiene una lista de correo específica de la Instalación para las personas que deseen recibir avisos de las acciones de permiso asociadas con esta Instalación. Cuando solicite documentos especifique si desea que se le agregue a esta lista.

El borrador de Permiso, la Hoja de Datos y el PIP pueden verse en línea en https://www.env.nm.gov/gwqb/dp-831/. Para obtener una traducción en español de la Hoja de Datos, visite https://www.env.nm.gov/gwqb/dp-831-es/.

El NMED ha colocado una copia impresa del borrador de Permiso, la Hoja de Datos, la solicitud del Permiso y el PIP en las siguientes ubicaciones de depósito de documentos: Biblioteca Pública de Eunice (1003 Avenida N, Eunice); Biblioteca Pública de Carlsbad (101 S. Halagueno St, Carlsbad). A partir de la fecha de emisión de este aviso por parte del NMED, ambas bibliotecas están abiertas al público. En caso de que alguna de las dos bibliotecas restrinja el acceso del público durante este período de comentarios públicos debido a la actual emergencia de salud pública de COVID-19, el NMED pide a los miembros de la comunidad que soliciten los documentos como se ha descrito anteriormente.

Cómo presentar un comentario o solicitar una audiencia: NMED permite 45 días después de la fecha de publicación de este Aviso para que cualquier persona pueda presentar comentarios por escrito y/o una solicitud de audiencia pública con respecto al borrador de Permiso. Las solicitudes para una audiencia pública deberán hacerse por escrito y en ellas se expondrán las razones por las que debe celebrarse una audiencia. Los comentarios o una solicitud de audiencia con respecto al borrador de Permiso deben dirigirse a GWQB, P.O. Box 5469, Santa Fe, NM 87502-5469, o por correo electrónico al contacto de permisos de NMED, la Sra. Avery Young, en Avery.Young@state.nm.us, línea de referencia "DP-831 Comentarios".

Se celebrará una audiencia si el secretario de Medio Ambiente de Nuevo México (secretario) determina que hay un considerable interés por parte del público. El secretario nombrará un funcionario de audiencias y se asegurará de que la audiencia se lleve a cabo en la comunidad local afectada. Durante el proceso de la audiencia, los miembros del público podrán presentar testimonios técnicos antes de la audiencia y podrán hacer comentarios verbales y por escrito durante la propia audiencia. Una vez concluida la audiencia, el funcionario de audiencias entregará al secretario un informe de la audiencia que incluirá una determinación sugerida. A continuación, el secretario emitirá una Orden Final que completará el Registro Administrativo (Registro) para la acción de permiso. Después de que el Registro para la acción de permiso esté completo y toda la información requerida esté disponible, NMED aprobará, aprobará con condiciones, o denegará el Permiso basado en el Registro y/o la Orden Final del secretario.

Cómo solicitar acomodaciones: Si no habla inglés, no lo habla bien o si tiene alguna discapacidad, puede ponerse en contacto con la Sra. Avery Young por teléfono durante el horario normal de oficina al (505) 827-2909 o por correo electrónico en Avery.Young@state.nm.us para solicitar asistencia, servicios de traducción, un intérprete u otras acomodaciones razonables a fin de poder aprender más sobre el permiso o el proceso de permiso, o para participar en actividades relacionadas con el proceso de permiso. Se organizarán los servicios de traducción e interpretación solicitados, así como las acomodaciones o servicios para personas con discapacidades. Hay disponible asistencia para conversaciones telefónicas a través de *Relay New Mexico* sin costo alguno para las personas que están sordas, tienen problemas de audición o tienen dificultades para hablar por teléfono, llamando al 1-800-659-1779; los usuarios de TTY: 1-800-659-8331; español: 1-800-327-1857. La asistencia para una interpretación telefónica para las personas que no hablan inglés o que no lo hablan bien está disponible sin costo alguno llamando al NMED.

NMED no discrimina por motivos de raza, color, origen nacional, discapacidad, edad o sexo en la administración de sus programas o actividades, según lo exigido por las leyes y los reglamentos correspondientes. NMED es responsable de la coordinación de los esfuerzos de cumplimiento y la recepción de consultas relativas a los requisitos de no discriminación implementados por 40 C.F.R. Partes 5 y 7, incluido el Título VI de la Ley de Derechos Civiles de 1964, según enmendada; Sección 504 de la Ley de Rehabilitación de 1973; la Ley de Discriminación por Edad de 1975, Título IX de las Enmiendas de Educación de 1972 y la Sección 13 de las Enmiendas a la Ley Federal de Control de Contaminación del Agua de 1972. Si usted tiene preguntas sobre este aviso o sobre cualquier programa, política o procedimiento de no discriminación de NMED, usted puede comunicarse con la Coordinadora de No Discriminación: Kristine Yurdin, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. Si usted piensa que ha sido discriminado/a con respecto a un programa o actividad de NMED, usted puede comunicarse con la Coordinadora de No Discriminación antes indicada o visitar nuestro sitio web en https://www.env.nm.gov/non-employee-discrimination-complaint-page/ para aprender cómo y dónde presentar una queja de discriminación.

Michelle Lujan Grisham
Governor

Howie C. Morales
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

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Phone (505) 827-2900 Fax (505) 827-2965
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CERTIFIED MAIL – RETURN RECEIPT REQUESTED

September 24, 2020

Reinhard Knerr, Manager
U.S. Department of Energy, Carlsbad Field Office
P.O. Box 3090
Carlsbad, NM 88221

RE: Draft Discharge Permit Renewal and Modification, DP-831, Waste Isolation Pilot Plant

Dear Mr. Knerr:

The New Mexico Environment Department (NMED) hereby provides notice to the U.S. Department of Energy of the proposed approval of Ground Water Discharge Permit Renewal and Modification, DP-831, (copy enclosed), pursuant to Subsection H of 20.6.2.3108 NMAC. NMED will publish notice of the availability of the draft Discharge Permit in the near future for public review and comment and will forward a copy of that notice to you.

Prior to making a final ruling on the proposed Discharge Permit, NMED will allow 30 days from the date the public notice is published in the newspaper for any interested party, including the Discharge Permit applicant, i.e., yourself, to submit written comments and/or a request a public hearing. A hearing request shall set forth the reasons why a hearing is requested. NMED will hold a hearing in response to a timely hearing request if the NMED Secretary determines there is substantial public interest in the proposed Discharge Permit.

Please review the enclosed draft Discharge Permit carefully. Please be aware that this Discharge Permit may contain conditions that require the permittee to implement operational, monitoring or closure actions by a specified deadline.

NMED is taking all necessary precautions to reduce the spread of COVID-19. Given the current public health emergency, all monitoring and permit required activities must by conducted in accordance with the Governor's current Executive Orders and Public Health Orders. Please help to keep New Mexicans safe by visiting the New Mexico Department of Health's website to learn

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Reinhard Knerr, Manager
US Department of Energy
Carlsbad Field Office
PO Box 3090
Carlsbad, NM 88221

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how you can play a role in stopping the spread of COVID-19. That website is cv.nmhealth.org. If you believe the current COVID-19 restrictions impact your ability to safely complete one or more permit required tasks, please include this information with your submittals.

Please submit written comments or a request for hearing to my attention at the address above or via email to avery.young@state.nm.us. If NMED does not receive written comments or a request for hearing during the public comment period, the draft Discharge Permit will become final.

Thank you for your cooperation during the review process. Feel free to contact me with any questions at (505) 827-2909.

Sincerely,

Avery Young Digitally signed by Avery Young
Date: 2020.09.24 09:52:54 -06'00'

Avery Young
Environmental Scientist

Encl: Draft Discharge Permit Renewal and Modification, DP-831
Groundwater Discharge Permit DP-831 Fact Sheet

cc: Mike Brown, U.S. Department of Energy, mike.brown@wipp.ws
Rick Chavez, AECOM, rick.chavez@wipp.ws

Michelle Lujan Grisham
Governor

Howie C. Morales
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

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www.env.nm.gov

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

Draft: September 24, 2020

GROUND WATER QUALITY BUREAU
DISCHARGE PERMIT
Issued under 20.6.2 NMAC

Facility Name:	Waste Isolation Pilot Plant (WIPP)
Discharge Permit Number:	DP-831
Facility Location:	Highway 128, 26 miles southeast of Carlsbad Sections 20, 21, 28, and 29, Township 22S, Range 31E
County:	Eddy
Permittee:	U.S. Department of Energy
Mailing Address:	Reinhard Knerr, Manager U.S. Department of Energy, Carlsbad Field Office P.O. Box 3090 Carlsbad, NM 88221
Facility Contact:	Mike Proctor, Facility Operator
Telephone Number/Email:	(575) 234-8143/mike.proctor@wipp.ws
Permitting Action:	Renewal and Modification
Permit Issuance Date:	DATE
Permit Expiration Date:	DATE
NMED Permit Contact:	Avery Young
Telephone Number/Email:	(505) 827-2909/ avery.young@state.nm.us

MICHELLE HUNTER
Chief, Ground Water Quality Bureau
New Mexico Environment Department

Date

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Groundwater Discharge Permit Guidance for Synthetically Lined Lagoons – Liner Material and Site Preparation, Revision 0.0, May 2007
New Mexico Environment Department Ground Water Quality Bureau Monitoring Well Construction and Abandonment Guidelines, Revision 1.1, March 2011

GROUND WATER DISCHARGE PERMIT RENEWAL and MODIFICATION
Waste Isolation Pilot Plant (WIPP), DP-831

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this groundwater Discharge Permit Renewal and Modification (Discharge Permit or DP-831) to the U.S. Department of Energy (DOE or Permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the Waste Isolation Pilot Plant (WIPP or Facility) in order to protect groundwater and those segments of surface water gaining from groundwater inflow for present and potential future use as domestic and agricultural water supply and other uses, and to protect public health. It is NMED's determination in issuing this Discharge Permit that the Permittee has met the requirements of Subsection C of 20.6.2.3109 NMAC. The Permittee is responsible for complying with the terms and conditions of this Discharge Permit pursuant to Section 20.6.2.3104 NMAC; failure may result in an NMED enforcement action(s) (20.6.2.1220 NMAC).

Described below are the activities that produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics:

The Permittee discharges domestic wastewater to a synthetically lined impoundment system for treatment and disposal by evaporation at a rate of up to 23,000 gallons per day (gpd). The system consists of seven synthetically lined impoundments (Facultative Lagoon System) comprised of Settling Lagoons 1 and 2, Polishing Lagoons 1 and 2, and Effluent Lagoons A, B, and C.

The Permittee may discharge non-domestic wastewater at the Facility in the following ways:

- Effluent Lagoons B and C of the Facultative Lagoon System receive industrial wastewater at a volume of up to 27,000 gpd from the following sources: wastewater from compressed air systems, brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous, non-radioactive wastewaters. The Permittee is authorized to discharge these industrial wastewaters to the Facultative Lagoon System for evaporative disposal.

- Evaporation Pond H-19 receives industrial wastewater at a volume of up to 50,000 gpd from the following sources: brine, purge waters from sampling and developing Facility monitoring wells, condensate from the Exhaust Shaft fan ductwork on the surface, and water collected from the Waste Shaft Sump, Exhaust Shaft Interception Wells, and other observation boreholes in the underground. The Permittee is authorized to discharge these industrial wastewaters to Evaporation Pond H-19 for evaporative disposal.

- The to-be-constructed Salt Reduction System will produce and discharge brine at a volume of up to 2,210 gpd. The Salt Reduction System, which is located within the Safety Significant Confinement Ventilation System (SSCVS), will discharge brine to two double synthetically lined impoundments, each with a leak detection system (Brine Retention Ponds East and West, collectively Brine Ponds). The Facility will use one brine retention pond while the other brine retention pond is closed for evaporation and removal of precipitated salt in order to maintain at least two feet of freeboard. The Permittee will transfer any remaining brine in the closed Brine Pond to Brine Salt Storage Pond 4 for evaporative disposal.

- The Permittee will mine salt and other subsurface materials during construction of the Facility. The Permittee will store this mined salt, as well as already mined salt on the surface in four stockpiles (Salt Cells 1, 2, 3, and 5). Salt Storage Ponds 2 and 3 are two double synthetically lined impoundments, each with leak detection, that collect stormwater runoff that contacts Salt Cells 2 and 3. The total storage capacity of Salt Storage Ponds 2 and 3 is 21,737,254 gallons. Salt Storage Pond 5, a double synthetically lined stormwater impoundment with a leak detection system, will collect stormwater runoff in contact with Salt Cell 5. The storage capacity of Salt Storage Pond 5 will be 6,355,404 gallons. Salt Cell 1 no longer receives salt and is capped with synthetic material and an earthen cover. Salt Storage Pond 1, a synthetically lined impoundment, collects stormwater runoff in contact with this stockpile in synthetically lined diversion ditches directed to Salt Storage Pond 1. The storage capacity of Salt Storage Pond 1 is 3,301,634 gallons. With proper operation and maintenance, the storage capacity of each salt storage pond is sufficient to contain a 24-hour, 100-year (5.84-inch rainfall) storm event.

- Brine Salt Storage Pond 4, a double synthetically lined storm water impoundment with a leak detection system, collects stormwater runoff from the SSCVS area. The storage capacity of Brine Salt Storage Pond 4 is 8,668,722 gallons. With proper operation and maintenance, the capacity of the Brine Salt Storage Pond 4 is sufficient to contain a 24-hour, 100-year (5.84-inch rainfall) storm event.

- Storm Water Ponds 1, 2, and 3, three synthetically lined impoundments, collect additional stormwater runoff from the Facility's paved areas and roofs. This runoff is not in contact with the salt stockpiles or other waste materials at the Facility and the Permittee may use the impounded water for dust control, soil compaction, and other construction activities.

The Permittee stores salt and other subsurface materials mined during construction of the Facility, as well as currently mined salt, on the surface in four stockpiles (Salt Cells 1, 2, 3, and 5). The Permittee closed Salt Cell 1 with a 60-mil HDPE synthetic liner cover and two feet of native soil, as well as a 60-mil HDPE synthetically lined drainage system for stormwater runoff collection. Salt Cells 2 and 3 were constructed with six inches of prepared subgrade, a 60-mil HDPE liner, a

200-mil Geonet drainage layer, an eight-ounce geotextile fabric, and the fabric is then covered with two feet of screened native soil. Each salt cell is sloped toward the center, which contains a collection trench and pipe for conveyance of water to Salt Storage Ponds 2 and 3. Salt Cell 5 will be constructed with a 60-mil HDPE liner on the bottom with a protective layer of native soil on top to protect the liner. The Permittee will install a HDPE pipe to collect and transmit by gravity the leachate and stormwater runoff water from Salt Cell 5 to Salt Storage Pond 5.

The Permittee constructed the Site and Preliminary Design Validation (SPDV) material pile as the Permittee excavated the shafts when construction first began at the WIPP site. The Permittee closed the SPDV material pile in the year 2000 with a geosynthetic liner cover installed on 6 inches of bedding material and covered with a minimum of three feet of earthen material.

The Permit Modification consists of the addition of one new salt storage cell and four new impoundments: Salt Cell 5, Salt Storage Pond 5, Brine Salt Storage Pond 4, Brine Retention Pond East, and Brine Retention Pond West. Salt Cell 5 adds a new salt storage location, which will receive overburden and salt from the construction of Shaft 5 and its associated underground connecting drifts. Salt Storage Pond 5 will receive both the leachate and stormwater in contact with mined salt located in Salt Cell 5.

The Facility is located near the Jal Highway (NM-128), 26 miles southeast of Carlsbad, in Sections 20, 21, 28, and 29, Township 22S, Range 31E, Eddy County.

The WIPP Facility is a mined geologic repository for the disposal of transuranic (TRU) waste. The underground repository is located 2,150 feet below land surface in the bedded salt of the Salado Formation. The WIPP first accepted waste in March 1999. In addition to this groundwater Discharge Permit, the NMED Hazardous Waste Bureau under the New Mexico Hazardous Waste Act and New Mexico's Hazardous Waste Regulations regulates the WIPP.

The WIPP Facility is geologically situated in the southeast portion of New Mexico within the Delaware Basin, which is part of the larger Permian Basin. The geologic formations below the Facility that are pertinent to this Discharge Permit, from deepest to shallowest, include: the Salado Formation (851 to 2,150 below ground surface [bgs]), the Rustler Formation (546 to 851 bgs), the Dewey Lake Formation (54 to 564 bgs), and, in the northeastern portion of the Facility, the Santa Rosa Formation (34 to 54 bgs). The Salado Formation consists predominately of polyhalite, with some halite, carbonates, anhydrites, and clay seams. The Rustler Formation consists of carbonates, anhydrites, and halites. The Dewey Lake Formation consists almost entirely of mudstone, claystone, siltstone, and interbedded sandstone, and is frequently referred to as the Dewey Lake Redbeds Formation. Geologists use the terms upper, middle, and lower Dewey Lake to describe the stratigraphic position in the formation and characteristics that related to the occurrence of saturated conditions. The upper Dewey Lake consists of a thick, generally unsaturated section. The middle Dewey Lake occurs above a sulfate cementation change, which results in saturated conditions and a natural water table in limited areas. The lower Dewey Lake is below the sulfate cementation change and has low permeability. The Santa Rosa Formation consists of gray and red sandstone with lenses of shale and conglomerate.

The vadose zone consists, from shallowest to deepest, of Quaternary dune sand (0 to 7.5 bgs), Mescalero caliche (7.5 to 17 bgs), and the Gatuña Formation (17 to 34 bgs). Recharge rates through the native soils are extremely low and there is little recharge through the vadose zone to the Santa Rosa Formation.

A discharge at this Facility is most likely to affect groundwater at a depth of approximately 34 to 160 feet. Natural groundwater is located in the middle portion of the Dewey Lake Formation at a depth of approximately 160 feet and has an average total dissolved solids concentration of approximately 3,400 milligrams per liter. The WIPP discovered a perched water zone in the lower Santa Rosa and upper Dewey Lake Formations in 1995 and determined that the probable sources of this shallow groundwater were the unlined impoundments constructed to capture stormwater runoff at the Facility and runoff from the above-ground salt piles. This shallow groundwater is contaminated with total dissolved solids, sulfate (SO_4), and chloride. After the discovery of the anthropogenically created shallow groundwater (referred to as shallow groundwater), the Permittee lined all impoundments at the Facility and installed a network of monitoring wells. The shallow groundwater has a flow direction of north to south. Natural, non-anthropogenic, groundwater occurs in the Dewey Lake Formation (referred to as natural groundwater in the Dewey Lake Formation) south of the WIPP facility at a depth of 160 feet. The Dewey Lake Formation has a relatively low hydraulic conductivity.

The first laterally continuous water-bearing zone below the Facility is within an approximately 30-foot-thick section of the Culebra Member of the Rustler Formation. Water in the Culebra Member is usually present in fractures and is confined by overlaying anhydrite and underlying clay and anhydrite beds. A network of monitoring wells monitors the Culebra Member.

NMED issued the original Discharge Permit on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998 and on January 24, 2000, renewed on April 29, 2003, modified on December 22, 2003 and on December 29, 2006, renewed and modified on July 23, 2008, and last renewed on July 29, 2014. The application (i.e., discharge plan) consists of the materials submitted by the Permittee dated December 3, 2018 and materials contained in the administrative record prior to issuance of this Discharge Permit.

The Permittee shall manage the discharge in accordance with all conditions and requirements of this Discharge Permit.

NMED reserves the right to require a discharge permit modification in the event NMED determines that the Permittee is violating or may violate the requirements of 20.6.2 NMAC or are violating or may violate the standards of Section 20.6.2.3103 NMAC. NMED reserves this right pursuant to Section 20.6.2.3109 NMAC. An NMED requirement to modify the Discharge

Permit may result from a determination by NMED that structural controls and/or management practices approved under this Discharge Permit need to be more stringent to protect groundwater quality. NMED reserves the right to require the Permittee to implement abatement of water pollution and remediate groundwater quality.

NMED's issuance of this Discharge Permit does not relieve the Permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

This Discharge Permit may use the following acronyms and abbreviations.

Abbreviation	Explanation		Abbreviation	Explanation
BOD_5	biochemical oxygen demand (5-day)		NMED	New Mexico Environment Department
CFR	Code of Federal Regulations		NMSA	New Mexico Statutes Annotated
CFU	colony forming unit		NO_3-N	nitrate-nitrogen
Cl	chloride		NTU	nephelometric turbidity units
EPA	United States Environmental Protection Agency		QA/QC	Quality Assurance/Quality Control
gpd	gallons per day		TDS	total dissolved solids
HDPE	high-density polyethylene		TKN	total Kjeldahl nitrogen
LAA	land application area		total nitrogen	= TKN + NO_3-N
LADS	Land Application Data Sheet(s)		TRC	total residual chlorine
LDCRS	leak detection, collections, and recovery systems		TSS	total suspended solids
mg/L	milligrams per liter		WQA	New Mexico Water Quality Act
MPN	most probable number		WQCC	Water Quality Control Commission
NMAC	New Mexico Administrative Code		WWTF	Wastewater Treatment Facility
mL	milliliters			

II. FINDINGS

In issuing this Discharge Permit, NMED finds the following.

1. The Permittee is discharging effluent or leachate from the Facility so that such effluent or leachate may move into groundwater of the State of New Mexico that has an existing concentration of 10,000 mg/L or less of TDS, within the meaning of Subsection A of 20.6.2.3101 NMAC, without exceeding standards of 20.6.2.3103 NMAC for any water contaminant.

2. The Permittee is allowed to discharge effluent or leachate from the Facility directly or indirectly into groundwater pursuant to this Discharge Permit and Section 20.6.2.3104 NMAC.

3. The discharge from the Facility is not subject to any of the exemptions of Section 20.6.2.3105 NMAC including Subsection 20.6.2.3105.A which allows an exemption from obtaining a discharge permit if the discharge is composed of effluent or leachate which conforms to all the standards in Subsection A, B, and C of Section 20.6.2.3103 NMAC and has a total nitrogen concentration of 10 mg/L or less.

III. AUTHORIZATION TO DISCHARGE

The Permittee is responsible for ensuring that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein pursuant to 20.6.2.3104 NMAC.

This Discharge Permit authorizes the Permittee to discharge up to 23,000 gpd of domestic wastewater to a synthetically lined facultative lagoon system for disposal by evaporation. The Facultative Lagoon System is authorized to accept up to 27,000 gpd of non-hazardous, non-radioactive industrial wastewater from compressed air systems at the Facility, brine, purge waters from sampling and developing Facility wells, and miscellaneous industrial non-hazardous, non-radioactive wastewater for disposal by evaporation. This Discharge Permit authorizes the Permittee to discharge up to 50,000 gpd of brine, purge waters, condensate from the Exhaust Shaft fan ductwork on the surface, and water collected from the Waste Shaft Sump, Exhaust Shaft Interception Wells, and other observation boreholes in the underground into Evaporation Pond H-19. This Discharge Permit also authorizes the Permittee to discharge up to 2,210 gpd of brine from a 3,000-gallon holding tank to Brine Retention Ponds East and West for disposal by evaporation. In order to maintain at least two feet of freeboard, the Permittee is authorized to transfer the remaining brine in the Brine Ponds to Brine Salt Storage Pond 4.

This Discharge Permit authorizes the Permittee to stockpile mined salt in four salt cells: Salt Pile 1 is closed with a cover; Salt Cells 2, 3 and 5 have authorized footprints of 6.2 acres, 5.2 acres, and 5.1 acres, respectively. The Permittee is authorized to collect stormwater runoff from these salt cells in three double synthetically lined impoundments with leak detection systems (Salt Storage Pond 2, Salt Storage Pond 3, and Salt Storage Pond 5) and one synthetically lined impoundment with a drainage system (Salt Storage Pond 1) for disposal by evaporation. This Discharge Permit authorizes the Permittee to collect stormwater runoff from the Facility's paved areas and roofs in Storm Water Ponds 1, 2, and 3, as well as Brine Salt Storage Pond 4. This runoff is not in contact with the salt stockpiles at the Facility, and runoff from Storm Water Ponds 1, 2, and 3 may be used for dust control, soil compaction, and other construction activities.

This Discharge Permit sets forth requirements for the discharge and disposal of domestic and non-domestic wastewater. Conditions in the Operational Plan, the Monitoring and Reporting, and the Closure Plan sections are categorized as follows:

- **Part A. Generally Applicable to All Discharges;**
- **Part B. Applicable to the Facultative Lagoon System;**
- **Part C. Applicable to the Evaporation Pond H-19, Brine Retention Pond East, Brine Retention Pond West, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3;**
- **Part D. Applicable to the Impoundments Containing Stormwater Runoff in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, 3, and 5) and to Salt Stockpiles (Salt Cells 1, 2, 3, and 5); and**
- **Part E. Applicable to Ground Water Monitoring.**

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

IV. CONDITIONS

NMED issues this Discharge Permit for the discharge of water contaminants subject to the following conditions.

OPERATIONAL PLAN

Part A. Generally Applicable to All Discharges

#	Operating Conditions Applicable to All Discharges
1.	The Permittee shall implement the following operational plan to ensure compliance with Title 20, Chapter 6, Parts 2 and 4 NMAC. [Subsection C of 20.6.2.3109 NMAC]
2.	The Permittee shall operate the Facility in a manner such that it does not violate the standards and requirements of Sections 20.6.2.3101 and 20.6.2.3103 NMAC. [20.6.2.3101 NMAC, 20.6.2.3103 NMAC, Subsection C of 20.6.2.3109 NMAC]
3.	The Permittee shall maintain the impoundment liners as to avoid conditions that could affect the liner or the structural integrity of the impoundments. Characterization of such conditions may include the following: • erosion damage; • animal burrows or other damage; • the presence of vegetation including aquatic plants, weeds, woody shrubs or trees growing within five feet of the top inside edge of a sub-grade impoundment, within

#	Operating Conditions Applicable to All Discharges
	five feet of the toe of the outside berm of an above-grade impoundment, or within the impoundment itself; • the presence of large debris or large quantities of debris in the impoundment; • evidence of seepage; or • evidence of berm subsidence. The Permittee shall routinely control vegetation growing around the impoundments by mechanical removal that is protective of the impoundment liner. The Permittee shall visually inspect the impoundments and surrounding berms on a monthly basis to ensure proper maintenance. In the event that inspection reveals any evidence of damage that threatens the structural integrity of an impoundment berm or liner, or that may result in an unauthorized discharge, the Permittee shall implement the Contingency Plan set forth in this Discharge Permit. The Permittee shall create and maintain a log of all impoundment inspections that describes the findings and repairs, the date of the inspection, and the name of the person responsible for the inspection. The Permittee shall make the log available to NMED upon request. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
4.	The Permittee shall preserve a minimum of one foot of freeboard between the liquid level in all the impoundments and the elevation of the top of the impoundment liner, except Brine Salt Storage Pond 4, Salt Storage Pond 5, and Brine Retention Ponds East and West shall maintain two feet of freeboard. In the event that the Permittee determines that the specified freeboard cannot be preserved in the impoundments, the Permittee shall implement the Contingency Plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

Part B. Applicable to the Facultative Lagoon System

#	Facultative Lagoon System - Operational Actions with Implementation Deadlines
5.	Within three years following the effective date of this Discharge Permit (**by DATE**), the Permittee shall measure the thickness of the settled solids in two impoundments (Settling Lagoon 1 and Settling Lagoon 2) that are part of the Facultative Lagoon System.

#	Facultative Lagoon System - Operational Actions with Implementation Deadlines
	The Permittee shall report the results of the solids thickness measurements to NMED in the subsequent required periodic monitoring report. The Permittee shall measure the thickness of settled solids in each impoundment in accordance with the following procedure. a) The division of the total surface area of the treatment impoundment into nine equal sub-areas. b) One measurement (to the nearest half foot) using a settled solids measurement device (core sampler) per sub-area. c) Calculation of the average of the nine measurements. In the event that the measured settled solids exceed one-third of the maximum liquid depth in the impoundment, the Permittee shall implement the Contingency Plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

#	Facultative Lagoon System - Operating Conditions
6.	The Permittee shall maintain fences around the Facultative Lagoon System to restrict access by wildlife, livestock, or unauthorized persons. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. The Permittee shall maintain the fences to serve the stated purpose throughout the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
7.	The Permittee shall maintain signs indicating that the wastewater at the Facility is not potable. The Permittee shall post signs at the Facultative Lagoon System's entrance and other areas where there is potential for public contact with wastewater. The signs shall be printed in English and Spanish and shall remain visible and legible for the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
8.	The Permittee shall utilize operators of the domestic wastewater collection, treatment and disposal systems that are certified by the State of New Mexico at the appropriate level pursuant to 20.7.4 NMAC. A certified operator or a direct supervisee of a certified operator shall perform the operations and maintenance of all or any part of the wastewater system.

#	Facultative Lagoon System - Operating Conditions
	The Permittee shall notify the NMED within 24 hours if at any time the Permittee no longer has a certified operator maintaining the system. [Subsection C of 20.6.2.3109 NMAC, 20.7.4 NMAC]

Part C. Applicable to the Evaporation Pond H-19, Brine Retention Pond East, Brine Retention Pond West, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3

#	Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operational Actions with Implementation Deadlines
9.	Within 180 days following the effective date of this Discharge Permit (by DATE), the Permittee shall install fences around Storm Water Ponds 1, 2 and 3 to limit access by wildlife, livestock, or unauthorized persons. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. The Permittee shall maintain the fences to serve the stated purpose throughout the term of this Discharge Permit. Documentation of fence installation shall consist of a narrative statement describing the fences and gates with date-stamped photographs. The Permittee shall submit the documentation to NMED in the subsequent required periodic monitoring report. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
10.	Within two years following the effective date of this Discharge Permit (by DATE), the Permittee shall measure the thickness of the settled solids in Evaporation Pond H-19. The Permittee shall report the results of the solids thickness measurements to NMED in the subsequent required periodic monitoring report. The Permittee shall measure the thickness of settled solids in accordance with the following process. a) Measure the water level via the staff gauge located in the impoundment. b) Lower a sounding line to the top of the salt deposit and measure the length of the line from the top of the salt deposit to the water level. c) Subtract the depth to the salt deposit from the water level. In the event that the measured settled solids exceed one-third of the maximum liquid depth in the impoundment, the Permittee shall implement the Contingency Plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operational Actions with Implementation Deadlines**
11.	Prior to discharging to Brine Retention Pond East, Brine Retention Pond West, or Brine Salt Storage Pond 4, the Permittee shall complete construction of the Ponds in accordance with the final construction plans and specifications the Permittee submitted to NMED as part of the Discharge Permit application received on December 3, 2018. The Permittee shall notify NMED prior to the commencement of construction to allow NMED personnel to be onsite for inspection during construction. [Subsections A and C of 20.6.2.1202 NMAC, Subsection C of 20.6.2.3109 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
12.	Within 30 days of construction completion of Brine Retention Pond East, Brine Retention Pond West, and Brine Salt Storage Pond 4, the Permittee shall submit record drawings to NMED that bear the seal and signature of a licensed New Mexico professional engineer (pursuant to the New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority). [Subsections A and C of 20.6.2.1202 NMAC, Subsection C of 20.6.2.3109 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
13.	Prior to discharging to Brine Salt Storage Pond 4, the Permittee shall install fences around said impoundment to limit access by wildlife, livestock, or unauthorized persons. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. The Permittee shall maintain the fences to serve the stated purpose throughout the term of this Discharge Permit. Documentation of fence installation shall consist of a narrative statement describing the fences and gates with date-stamped photographs. The Permittee shall submit the documentation to NMED in the subsequent required periodic monitoring report. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
14.	Prior to discharging to Brine Salt Storage Pond 4, the Permittee shall post signs indicating that the wastewater in the impoundment is not potable. The Permittee shall post signs at the Facility entrance and other areas where there is potential for public contact with wastewater. Posted signs shall be in English and Spanish and shall remain visible and legible during the term of this Discharge Permit. Documentation of the sign installation shall consist of a date-stamped photograph. The Permittee shall submit the documentation to NMED in the subsequent required periodic monitoring report.

#	Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operational Actions with Implementation Deadlines
	[Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
15.	Prior to discharging to the proposed Brine Retention Pond East, the Brine Retention Pond West, or the Brine Salt Storage Pond 4, the Permittee shall submit written notification to NMED stating the date the discharge(s) is to commence. [Subsection C of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]

#	Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operating Conditions
16.	The Permittee shall construct, maintain and operate the leak detection, collection, and recovery systems (LDCRS) for Brine Salt Storage Pond 4 and Brine Retention Ponds East and West in a manner that will result in less than one foot of hydraulic head on the secondary liners in the impoundments. In the event that the Permittee cannot maintain less than one foot of hydraulic head on the secondary liners for Brine Salt Storage Pond 4 and Brine Retention Ponds East and West, the Permittee shall notify NMED within 48 hours of discovery and shall submit a Corrective Action Plan to NMED that evaluates the primary liner leakage rate, proposes options for reducing the leakage if optimal, or otherwise proposes a means to maintain less than one foot of hydraulic head on the secondary liner. The Permittee shall submit the plan to NMED for approval within 60 days after the discovery that the hydraulic head on the secondary liner has surpassed one foot. In the event that it becomes necessary to modify a LDCRS for an impoundment, the Permittee shall submit a report describing the proposed revised methodology for NMED approval. [20.6.2.3107 NMAC]
17.	The Permittee shall maintain fences around Evaporation Pond H-19 to limit access by wildlife, livestock, or unauthorized persons. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. The Permittee shall maintain the fences to serve the stated purpose throughout the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
18.	The Permittee shall maintain signs indicating that the wastewater in Evaporation Pond H-19 is not potable. The Permittee shall post signs at the impoundment entrance and other areas where there is potential for public contact with wastewater. The signs shall

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operating Conditions**
	be printed in English and Spanish and shall remain visible and legible for the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]

Part D. Applicable to the Impoundments Containing Stormwater Runoff in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, 3, and 5) and to Salt Stockpiles (Salt Cells 1, 2, 3, and 5)

#	**Salt Storage Ponds and Salt Stockpiles - Operational Actions with Implementation Deadlines**
19.	Within 90 days following the effective date of this Discharge Permit (**by DATE**), the Permittee shall install fences around Salt Storage Ponds 1, 2 and 3 to limit access by wildlife, livestock, or unauthorized persons. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. The Permittee shall maintain the fences to serve the stated purpose throughout the term of this Discharge Permit. Documentation of fence installation shall consist of a narrative statement describing the fences and gates and date-stamped photographs. The Permittee shall submit the documentation to NMED in the subsequent required periodic monitoring report. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
20.	Within 120 days following the effective date of this Discharge Permit (**by DATE**), the Permittee shall post signs indicating that the wastewater in Salt Storage Ponds 1, 2 and 3 is not potable. The Permittee shall post signs at the Facility entrance and other areas where there is potential for public contact with wastewater. Posted signs shall be in English and Spanish and shall remain visible and legible during the term of this Discharge Permit. Documentation of sign installation shall consist of date-stamped photographs. The Permittee shall submit the documentation to NMED in the subsequent required periodic monitoring report. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
21.	Within two years following the effective date of this Discharge Permit (**by DATE**), the Permittee shall measure the thickness of the settled solids in Salt Storage Pond 1, 2, and 3. The Permittee shall report the results of the solids thickness measurements to NMED in the subsequent required periodic monitoring report.

#	**Salt Storage Ponds and Salt Stockpiles - Operational Actions with Implementation Deadlines**
	The Permittee shall measure the thickness of settled solids in each Salt Storage Pond in accordance with the following procedure. a) Measure the water level via the staff gauge located in the impoundment. b) Lower a sounding line to the top of the salt deposit and measure the length of the line from the top of the salt deposit to the water level c) Subtraction of the depth to the salt deposit from the water level. In the event that the measured settled solids exceed one-third of the maximum liquid depth in the impoundment, the Permittee shall implement the Contingency Plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
22.	Prior to discharging to Salt Storage Pond 5 and prior to utilizing Salt Cell 5, the Permittee shall complete construction in accordance with the final construction plans and specifications the Permittee submitted to NMED as part of the Discharge Permit application received on December 3, 2018. The Permittee shall notify NMED prior to construction to allow NMED personnel to be onsite for inspection during construction. [Subsections A and C of 20.6.2.1202 NMAC, Subsection C of 20.6.2.3109 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
23.	Within 30 days of completing construction of Salt Storage Pond 5 and Salt Cell 5, the Permittee shall submit record final drawings to NMED that bear the seal and signature of a licensed New Mexico professional engineer (pursuant to the New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority). [Subsections A and C of 20.6.2.1202 NMAC, Subsection C of 20.6.2.3109 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
24.	Prior to discharging to Salt Storage Pond 5, the Permittee shall submit written notification to NMED stating the date the discharge is to commence. [Subsection C of 20.6.2.3107 NMAC]

#	**Salt Storage Ponds and Salt Stockpiles - Operating Conditions**
25.	The Permittee shall maintain and operate the leak detection, collection, and removal systems (LDCRS) for Salt Storage Ponds 2, 3 and 5 in a manner that will result in less than one foot of hydraulic head on the secondary liners in the ponds.

#	Salt Storage Ponds and Salt Stockpiles - Operating Conditions
	In the event that the Permittee cannot maintain less than one foot of hydraulic head on the secondary liners for Salt Storage Ponds 2, 3 and 5, the Permittee shall notify NMED within 48 hours of the discovery and shall submit a Corrective Action Plan to NMED which evaluates the primary liner leakage rate, proposes options for reducing the leakage if optimal, or otherwise proposes a means to maintain less than one foot of hydraulic head on the secondary liner. The Permittee shall submit the plan to NMED for approval within 60 days after the discovery that the hydraulic head on the secondary liner has surpassed one foot. In the event that it becomes necessary to modify a LDCRS for a pond, the Permittee shall submit a report describing the proposed revised methodology for NMED approval. [20.6.2.3107 NMAC]
26.	The Permittee shall conduct regular inspection of the earthen cover on Salt Cell 1 and the SPDV material pile. The Permittee shall conduct inspections monthly and after storm events of 2 inches or greater in a 24-hour period to evaluate the integrity of the covers, including erosional impact and vegetation success. The Permittee shall report general observations and minor cover repairs to NMED in the subsequent semi-annual report. In the event of significant erosion, such as the formation of gullies, rills, or areas where ponding is occurring, vegetative failure, or impending liner damage, the Permittee shall provide a plan and schedule for repair to NMED for approval within 90 days of discovery. [20.6.2.3107 NMAC]

MONITORING AND REPORTING

Part A. Generally Applicable to Monitoring

#	Monitoring and Reporting Conditions
27.	The Permittee shall conduct monitoring, reporting, and the other requirements listed below in accordance with the monitoring requirements of this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
28.	METHODOLOGY – Unless otherwise specified by this Discharge Permit, or approved in writing by NMED, the Permittee shall use sampling and analytical techniques that conform with the references listed in Subsection B of 20.6.2.3107 NMAC.

#	Monitoring and Reporting Conditions
	[Subsection B of 20.6.2.3107 NMAC]
29.	Semi-annual monitoring: The Permittee shall perform semi-annual monitoring during the following periods and shall submit reports to NMED by the following due dates: • January 1st through June 30th – **due by August 1st; and** • July 1st through December 31st – **due by February 1st.** [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
30.	The Permittee shall submit its "Waste Isolation Pilot Plant Annual Site Environmental Report" to NMED with the next semi-annual monitoring report following its publication. [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Lagoon System

#	Facultative Lagoon System - Monitoring and Reporting Conditions
31.	The Permittee shall estimate the monthly volume of domestic wastewater discharged to the Facultative Lagoon System by obtaining readings on a monthly basis from a totalizing flow meter that measures total domestic water usage. The Permittee shall submit the monthly meter readings and calculated monthly and average daily water usage volumes to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
32.	The Permittee shall measure the total monthly volume and record the origin of all industrial wastewater discharged to Effluent Lagoons B and C. The Permittee shall calculate discharge volumes to Effluent Lagoons B and C by a time/volume method or volumetric measurement of the transport container(s). The Permittee shall submit the monthly discharge volumes or other volumetric calculations and waste origins from each month to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
33.	All flow meters shall be capable of having their accuracy verified under working (i.e., real-time, in-the-field) conditions. The Permittee shall develop a field verification method for each flow meter and shall utilize that method to check the accuracy of each respective meter. The Permittee shall perform field calibrations upon the repair or replacement of a flow measurement device and, at a minimum, once within 90 days of the effective date of this Discharge Permit **(by DATE)**.

#	Facultative Lagoon System - Monitoring and Reporting Conditions
	The Permittee shall ensure each flow meter is calibrated to its manufacturer's recommended specification which shall be no less accurate than plus or minus 10 percent of actual flow, as measured under field conditions. Field calibrations shall be performed by an individual knowledgeable in flow measurement and in the installation/operation of the particular device in use. The Permittee shall prepare a flow meter calibration report for each flow measurement device calibration event. The flow meter calibration report shall include the following information. a) The location and meter identification. b) The method of flow meter field calibration employed. c) The measured accuracy of each flow meter prior to adjustment indicating the positive or negative offset as a percentage of actual flow as determined by an in-field calibration check. d) The measured accuracy of each flow meter following adjustment, if necessary, indicating the positive or negative offset as a percentage of actual flow of the meter. e) Any flow meter repairs made during the previous year or during field calibration. f) The name of the individual performing the calibration and the date of the calibration. The Permittee shall maintain flow meter calibration reports at a location accessible for review by NMED during Facility inspections. [Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]
34.	The Permittee shall collect a composite wastewater sample on a semi-annual basis (once every six months) from Effluent Lagoon A. The composite sample shall consist of a minimum of six equal aliquots collected at equal distances around the entire perimeter of the evaporative impoundment and thoroughly mixed. The Permittee shall analyze the composite sample for: • TKN; • NO_3-N; • TDS; • Cl; and • SO_4. The Permittee shall ensure samples are properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. The Permittee shall submit the laboratory analytical results, including the QA/QC summary and Chain of Custody, to NMED in the semi-annual monitoring reports.

#	Facultative Lagoon System - Monitoring and Reporting Conditions
	[Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
35.	In the event that the Permittee discharges any industrial wastewater to Effluent Lagoon B or C within a monitoring reporting period, the Permittee shall collect a composite wastewater sample from the impoundment(s) that received the industrial wastewater discharge. The composite sample(s) shall consist of a minimum of six equal aliquots collected at equal distances around the entire perimeter of the evaporative impoundment(s) and thoroughly mixed. The Permittee shall analyze the composite sample(s) for: • TDS; • Cl; and • SO_4. The Permittee shall ensure samples are properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. The Permittee shall submit the laboratory analytical results, including the QA/QC summary and Chain of Custody, to NMED in the semi-annual monitoring reports. NMED may require comprehensive laboratory analyses of the industrial wastewater discharged to Effluent Lagoons B and C prior to discharge when NMED determines that additional information is needed. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]

Part C. Applicable to the Evaporation Pond H-19, Brine Retention Pond East, Brine Retention Pond West, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3

#	Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions
36.	The Permittee shall measure the total monthly volume and record the origin of all wastewater discharged to Evaporation Pond H-19. The Permittee shall calculate discharge volumes to Evaporation Pond H-19 by a time/volume method or volumetric measurement of the transport container(s). The Permittee shall submit the monthly discharge volumes or other volumetric calculations and waste origins each month to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of.20.6.2.3109 NMAC]
37.	The Permittee shall measure the total monthly volume of brine received by Brine

#	Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions
	Retention Ponds East and West. The Permittee shall calculate discharge volumes to Brine Retention Ponds East and West by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. The Permittee shall submit the monthly discharge volumes and other volumetric calculations each month to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
38.	The Permittee shall measure the total weekly volume of liquid pumped from the leak detection sumps for Brine Salt Storage Pond 4 and Brine Retention Ponds East and West. The Permittee shall calculate the total volume of liquid pumped by a totalizing flow meter. The Permittee shall submit the weekly volumes to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
39.	The Permittee shall collect a composite wastewater sample annually after a storm event of two inches or greater in a 24-hour period from Storm Water Ponds 1, 2, and 3. The composite sample shall consist of a minimum of six equal aliquots collected at equal distances around the perimeter of the evaporative impoundments and thoroughly mixed. The Permittee shall analyze the composite sample for: • SO_4; • TDS; and • Cl. The Permittee shall ensure samples are properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. The Permittee shall submit laboratory analytical results, including the QA/QC summary and Chain of Custody, to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
40.	The Permittee shall collect a composite wastewater sample on a semi-annual basis (once every six months) from Evaporation Pond H-19 and from Brine Salt Storage Pond 4, once it becomes operational. The composite sample shall consist of a minimum of six equal aliquots collected at equal distances around the perimeter of the evaporative impoundment and thoroughly mixed. The Permittee shall analyze the composite sample for: • SO_4;

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions**
	• TDS; and • Cl. The Permittee shall ensure samples are properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. The Permittee shall submit laboratory analytical results, including the QA/QC summary and Chain of Custody, to NMED in the semi-annual monitoring reports. NMED may require comprehensive laboratory analyses of the industrial wastewater discharged to Evaporation Pond H-19 prior to discharge when NMED determines that additional information is needed. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
41.	During the first year following the effective date of the Discharge Permit (**by DATE**), the Permittee shall collect a grab sample (except as noted for pH) of wastewater from Evaporation Pond H-19 and analyze the sample for the following inorganic contaminants (dissolved fraction, except as noted): • aluminum (CAS 7429-90-5) • antimony (CAS 7440-36-0) • arsenic (CAS 7440-38-2) • barium (CAS 7440-39-3) • beryllium (CAS 7440-41-7) • boron (CAS 7440-42-8) • cadmium (CAS 7440-43-9) • chromium (CAS 7440-47-3) • cobalt (CAS 7440-48-4) • copper (CAS 7440-50-8) • cyanide CAS 57-12-5) • fluoride (CAS 16984-48-8) • iron (CAS 7439-89-6) • lead (CAS 7439-92-1) • manganese (CAS 7439-96-5) • molybdenum (CAS 7439-98-7) • total mercury (nonfiltered) (CAS 7439-97-6) • pH (instantaneous) • nickel (CAS 7440-02-0) • radioactivity: combined radium-226 & radium-228 (CAS 15262-20-1) • selenium (CAS 7782-49-2) • silver (CAS 7440-224) • sulfate (CAS 14808-79-8) • thallium (CAS 7440-28-0) • uranium (CAS 7440-61-1) • zinc (CAS 7440-66-6) The Permittee shall ensure the samples are properly collected, prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. The Permittee shall analyze the sample using analytical methods with reporting limits less than the corresponding numerical groundwater standards identified in 20.6.2.3103 NMAC.

<table>
<tr><th>#</th><th>Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions</th></tr>
<tr><td></td><td>The Permittee shall submit a summary of measured concentrations compared with the corresponding groundwater standards, a copy of the laboratory report, including the laboratory analytical results, QA/QC summary report and the Chain of Custody, to NMED in the next monitoring report.

[Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]</td></tr>
<tr><td>42.</td><td>During the first year following the effective date of the Discharge Permit (by DATE), the Permittee shall collect a grab sample of wastewater from Evaporation Pond H-19 and analyze the non-filtered sample for the following organic contaminants:

• atrazine (CAS 1912-24-9)
• benzene (CAS 71-43-2)
• benzo-a-pyrene (CAS 50-32-8)
• carbon tetrachloride (CAS 56-23-5)
• chloroform (CAS 67-66-3)
• 1,2-dichlorobenzene (CAS 95-50-1)
• 1,4-dichlorobenzene (CAS 106-46-7)
• 1,1-dichloroethane (CAS 75-34-3)
• 1,2-dichloroethane (EDC, CAS 107-06-2)
• 1,1-dichloroethene (1,1-DCE, CAS 75-35-4)
• cis-1,2-dichloroethene (CAS 156-59-2)
• trans-1,2-dichloroethene (CAS 156-60-5)
• 1,2-dichloropropane (PDC, CAS 78-87-5)
• ethylbenzene (CAS 100-41-4)
• ethylene dibromide (EDB, CAS 106-93-4)
• methylene chloride (CAS 75-09-2)
• <u>PAHs</u>: total naphthalene (CAS 91-20-3) plus monomethylnaphthalenes
• Phenols (CAS 108-95-2)
• polychlorinated biphenyls (PCBs, CAS 1336-36-3)
• pentachlorophenol (CAS 87-86-5)
• toluene (CAS 108-88-3)
• styrene (CAS 100-42-5)
• 1,1,2,2-tetrachloroethane (CAS 79-34-5)
• tetrachloroethene (PCE, CAS 127-18-4)
• 1,2,4-trichlorobenzene (CAS 120-82-1)
• 1,1,1-trichloroethane (1,1,1-TCA, CAS 71-55-6)
• 1,1,2-trichloroethane (CAS 79-00-5)
• trichloroethene (TCE, CAS 79-01-6)
• vinyl chloride (CAS 75-01-4)
• total xylenes (CAS 1330-20-7)

The Permittee shall ensure the sample is properly collected, prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. The Permittee shall analyze samples using analytical methods with reporting</td></tr>
</table>

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions**
	limits less than the corresponding numerical groundwater standards identified in 20.6.2.3103 NMAC. The Permittee shall submit a summary of measured concentrations compared with the corresponding groundwater standards and a copy of the laboratory report, including the laboratory analytical results, QA/QC summary, and the Chain of Custody, to NMED in the next monitoring report. [Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]
43.	The Permittee shall measure the water depth in Storm Water Ponds 1, 2, and 3 and Brine Salt Storage Pond 4 monthly to the nearest tenth of a foot (0.1 ft). The Permittee shall calculate and submit the approximate monthly volume of water to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC and Subsection H of 20.6.2.3109 NMAC]
44.	The Permittee shall collect at least one sample quarterly rotating between Brine Retention Pond East and Brine Retention Pond West of the liquid present and analyze the sample for every constituent listed in Subsection A of 20.6.2.3103 NMAC. The Permittee shall submit the laboratory analytical results, including the QA/QC summary and Chain of Custody, to NMED in the semi-annual monitoring reports. After four consecutive quarterly sampling events, the Permittee may request a reduction in the sampling frequency and/or analyte list set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
45.	The Permittee shall submit all analytical laboratory data from Brine Retention Ponds East and West submitted to the NMED Hazardous Waste Bureau to the Ground Water Quality Bureau. [Subsection A of 20.6.2.3107 NMAC]
46.	The Permittee shall submit a copy of all records of solids (salt) removal from the Brine Retention Basins East and West and the associated disposal documentation to NMED in the subsequent semi-annual monitoring report. [Subsection A of 20.6.2.3107 NMAC]

Part D. Applicable to the Impoundments Containing Stormwater Runoff in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, 3, and 5) and to Salt Stockpiles (Salt Cells 1, 2, 3, and 5)

#	Salt Storage Ponds and Salt Stockpiles - Monitoring and Reporting Conditions
47.	The Permittee shall collect a composite wastewater sample annually after a storm event of 2 inches or greater in a 24-hour period from Salt Storage Ponds 1, 2, 3, and 5. The composite sample shall consist of a minimum of six equal aliquots collected at equal distances around the perimeter of the evaporative impoundments and thoroughly mixed. The Permittee shall analyze the composite sample for: • SO_4; • TDS; and • Cl. The Permittee shall ensure the samples are properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. The Permittee shall submit the laboratory analytical results, including the QA/QC summary and Chain of Custody, to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
48.	The Permittee shall measure the water depth monthly to the nearest tenth of a foot (0.1 ft) in the Salt Storage Ponds 1, 2, 3, and 5. The Permittee shall calculate and submit the approximate volume of water to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
49.	The Permittee shall measure the total volume of liquid pumped from the leak detection sumps for Salt Storage Ponds 2 and 3 during every pumping event. The Permittee shall calculate the total volume of liquid pumped by a volumetric measurement of the container(s) filled. The Permittee shall submit the volumetric calculations for each pumping event to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
50.	The Permittee shall measure the weekly volume of liquid pumped from the leak detection sump for Salt Storage Pond 5. The Permittee shall calculate the total volume of liquid pumped by a totalizing flow meter. The Permittee shall submit the weekly volumes to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]

Part E. Groundwater Monitoring and Reporting

#	Groundwater Monitoring Actions with Implementation Deadlines
51.	Within 60 days following the effective date of this Discharge Permit (**by DATE**), the Permittee shall install the following new monitoring wells in accordance with the Monitoring Well Proposal submitted to NMED on February 18, 2020 and approved by NMED on February 20, 2020. • One monitoring well (PZ-17) located 20 to 50 feet hydrologically downgradient of the Facultative Lagoon System in the natural groundwater of the Dewey Lake Formation and intended to monitor the Facultative Lagoon System. • One monitoring well (PZ-19) located 20 to 50 feet hydrologically downgradient of Evaporation Pond H-19 in the natural groundwater of the Dewey Lake Formation and intended to monitor Evaporation Pond H-19. The Permittee shall complete the wells in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Guidelines*, Revision 1.1, March 2011 or alternative methods submitted for approval. The Permittee shall submit construction and lithologic logs to NMED within 120 days of well completion in a cumulative well report. [Subsection A of 20.6.2.3107 NMAC]
52.	Prior to discharging to Brine Salt Storage Pond 4, Salt Storage Pond 5, and Brine Retentions Ponds East and West, the Permittee shall install the following new monitoring wells in accordance to the Monitoring Well Proposal submitted to NMED on February 18, 2020 and approved by NMED on February 20, 2020. • One monitoring well (PZ-16) located 20 to 50 feet hydrologically downgradient of Brine Salt Storage Pond 4 in the shallow groundwater and intended to monitor Brine Salt Storage Pond 4. • One monitoring well (PZ-18) located 20 to 50 feet hydrologically downgradient of Salt Storage Pond 5 in the shallow groundwater and intended to monitor Salt Storage Pond 5. The Permittee shall complete the wells in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Guidelines*, Revision 1.1, March 2011 or alternative methods submitted for approval. The Permittee shall submit construction and lithologic logs to NMED within 120 days of well completion in a cumulative well report. [Subsection A of 20.6.2.3107 NMAC]
53.	Following the installation of the monitoring wells required by this Discharge Permit, the

#	Groundwater Monitoring Actions with Implementation Deadlines
	permittee shall sample groundwater in the wells and analyze the samples for temperature, pH, specific conductance (field measured); and for SO_4, TDS, and Cl. Groundwater sample collection, preservation, transport and analysis shall be performed according to the following procedure: a) The pump intake shall be placed in the following manner: fully submerged, within the screened interval, and at least two feet above the base of the screen. b) The drawdown will be minimized such that it will maintain depression of the water level, but not exceed one liter per minute. c) Allow field-measured temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, temperature, and specific conductance are within ± 10% of the last three consecutive readings. d) Obtain samples from the well for analysis. e) Properly prepare, preserve and transport samples. f) Analyze samples in accordance with the methods authorized in this Discharge Permit. The Permittee shall submit a well completion report to NMED within 120 days of well completion in a cumulative well report. A well completion report shall include; the Office of the State Engineer permit, depth-to-most-shallow groundwater measurements, groundwater laboratory analytical results, including the QA/QC summary report and Chain of Custody, and a Facility layout map showing the location and number of each well. [Subsection A of 20.6.2.3107 NMAC]
54.	Within 120 days following the effective date of this Discharge Permit (**by DATE**), the Permittee shall perform a geographical survey of all newly constructed groundwater monitoring wells approved by NMED for Discharge Permit monitoring purposes in the natural groundwater of the Dewey Lake Formation and in the shallow groundwater. The survey shall be tied or referenced to a U.S. Geological Survey (USGS) or other permanent benchmark. Survey data shall include northing, easting and elevation to the nearest hundredth of a foot and shall be in accordance with the "Minimum Standards for Surveying in New Mexico" (12.8.2 NMAC). The Permittee shall utilize the survey to establish an elevation at the top-of-casing, with a permanent marking indicating the point of elevation. The survey shall bear the seal and signature of a licensed New Mexico professional surveyor (pursuant to the New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority).

#	Groundwater Monitoring Actions with Implementation Deadlines
	Depth-to-most-shallow groundwater shall be measured to the nearest hundredth of a foot in all surveyed wells and referenced to mean sea level, and the data shall be used to develop a groundwater elevation contour map showing the location of all monitoring wells and the direction and gradient of groundwater flow at the Facility. The Permittee shall submit the data and groundwater elevation contour map to NMED within 120 days of the installation of the monitoring wells in a cumulative well report. [Subsection A of 20.6.2.3107 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
55.	The Permittee shall perform aquifer testing to determine the local hydraulic properties of the aquifer near the monitoring wells required by this Discharge Permit and that contain groundwater within 60 days of the complete installation of each new monitoring well. The purpose of the aquifer testing shall be to quantify the movement of groundwaters in the vicinity of each well or piezometer. The Permittee shall perform aquifer testing in wells in both the shallow groundwater and in the natural groundwater in the Dewey Lake Formation where groundwater is present. Aquifer testing shall estimate hydraulic conductivity, transmissivity, and storage coefficient and shall be performed utilizing procedures previously utilized at the Facility so as to produce comparable results. The Permittee shall submit the measured hydraulic properties for each monitoring well to NMED within 120 days of the installation of the monitoring wells in a cumulative well report. [Subsection A of 20.6.2.3107 NMAC]

#	Groundwater Monitoring Conditions
56.	The Permittee shall measure the depth to groundwater to the nearest hundredth of a foot (0.01 ft) quarterly in the following piezometers/monitoring wells: • PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-17, PZ-18, and PZ-19 • C-2505, C-2506, C-2507, C-2811, and WQSP-6A The Permittee shall submit depth-to-groundwater measurements to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]

#	Groundwater Monitoring Conditions
57.	Within the first year of the permit term, the Permittee shall perform sampling in the following groundwater piezometers/monitoring wells and analyze the samples for temperature, pH, specific conductance (field measured); Uranium and combined Radium-226 and Radium-228: • PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-17, PZ-18, and PZ-19 • C-2507, C-2811, and WQSP-6A Monitoring wells WQSP-6A, PZ-17, and PZ-19 are intended to monitor the natural groundwater of the Dewey Lake Formation, which occurs in the subsurface at the southern end of the Facility. All other monitoring wells are intended to monitor the shallow groundwater. The Permittee shall perform groundwater sample collection, preservation, transport and analysis according to the following low-flow sampling procedure: a) The pump intake shall be placed in the following manner: fully submerged, within the screened interval, and at least two feet above the base of the screen. b) The drawdown will be minimized such that it will maintain depression of the water level, but not exceed one liter per minute. c) Allow field-measured temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, temperature, and specific conductance are within ± 10% of the last three consecutive readings. d) Obtain samples from the well for analysis. e) Properly prepare, preserve and transport samples. f) Analyze samples in accordance with the methods authorized in this Discharge Permit. The Permittee shall submit analytical results, including the laboratory QA/QC summary report and Chain of Custody, and a Facility layout map showing the location and number of each well to NMED in the next semi-annual monitoring report following sampling. [Subsection A of 20.6.2.3107 NMAC]
58.	The Permittee shall perform semi-annual groundwater sampling in the following groundwater piezometers/monitoring wells and analyze the samples for temperature, pH, specific conductance (field measured); and for SO_4, TDS, and Cl: • PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-17, PZ-18, and PZ-19

#	Groundwater Monitoring Conditions
	• C-2507, C-2811, and WQSP-6A Monitoring wells WQSP-6A, PZ-17, and PZ-19 are intended to monitor the natural groundwater of the Dewey Lake Formation, which occurs in the subsurface at the southern end of the Facility. All other monitoring wells are intended to monitor the shallow groundwater. The Permittee shall perform groundwater sample collection, preservation, transport and analysis according to the following low-flow sampling procedure: a) The pump intake shall be placed in the following manner: fully submerged, within the screened interval, and at least two feet above the base of the screen. b) The drawdown will be minimized such that it will maintain depression of the water level, but not exceed one liter per minute. c) Allow field-measured temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, temperature, and specific conductance are within ± 10% of the last three consecutive readings. d) Obtain samples from the well for analysis. e) Properly prepare, preserve and transport samples. f) Analyze samples in accordance with the methods authorized in this Discharge Permit. The Permittee shall submit analytical results, including the laboratory QA/QC summary report and Chain of Custody, and a Facility layout map showing the location and number of each well to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
59.	The Permittee shall perform semi-annual groundwater sampling in the following monitoring wells and analyze the samples for TKN and NO_3-N. • PZ-17, located south of the Facultative Lagoon System and intended to be located hydrologically downgradient of the Facultative Lagoon System in the natural groundwater of the Dewey Lake Formation. The Permittee shall perform groundwater sample collection, preservation, transport and analysis according to the following low-flow sampling procedure: a) The pump intake shall be placed in the following manner: fully submerged, within the screened interval, and at least two feet above the base of the screen. b) The drawdown will be minimized such that it will maintain depression of the water

#	Groundwater Monitoring Conditions
	level, but not exceed one liter per minute. c) Allow field-measured temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, temperature, and specific conductance are within ± 10% of the last three consecutive readings. d) Obtain samples from the well for analysis. e) Properly prepare, preserve and transport samples. f) Analyze samples in accordance with the methods authorized in this Discharge Permit. The Permittee shall submit analytical results, including the laboratory QA/QC summary report and Chain of Custody, and a Facility layout map showing the location and number of each well to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
60.	The Permittee shall develop a groundwater elevation, i.e., potentiometric surface, contour map for the shallow groundwater and for the natural groundwater in the Dewey Lake Formation on a semi-annual basis. The Permittee shall use the top of casing elevation data from the monitoring well surveys and quarterly depth-to-groundwater measurements, referenced to mean sea level, obtained during the groundwater sampling required by this Discharge Permit. The groundwater elevation contour maps shall depict the groundwater flow direction based on the groundwater elevation contours. The Permittee shall estimate groundwater elevations between monitoring well locations using common interpolation methods. The Permittee shall use a contour interval appropriate to the data, but the interval shall, in no case, be greater than two feet. Groundwater elevation contour maps shall depict the groundwater flow direction, using arrows, based on the orientation of the groundwater elevation contours, and the location and identification of each monitoring well and contaminant source, e.g., surface impoundment. The Permittee shall submit groundwater elevation contour maps to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
61.	The Permittee shall submit a single table in a paper and electronic format (i.e., EXCEL spreadsheet) of water level measurements and water quality data with only those constituents analyzed and water levels measured during a single event shown in columns to NMED in the semi-annual monitoring reports. The table shall include the following tabulated field measurements: temperature, pH, and electrical conductivity corrected to

#	Groundwater Monitoring Conditions
	25 degrees Celsius. The monitoring sites shall be shown in rows on the table, and the second column shall contain the date of the sampling event. Values exceeding standards shall be bolded. Any constituent not analyzed for at a particular site shall be shown as "NA", any site not sampled shall be shown as "NS" with an associated reason, and any site not measured for water levels shall be shown as "NM" with an associated reason. [Subsection A of 20.6.2.3107 NMAC]
62.	The Permittee shall submit a single table that includes all available groundwater data to date annually to NMED in the semi-annual monitoring reports due February 1st. For each monitoring well, the name of the well shall be entered in the far-left column in a row by itself. Sampling events, beginning with the earliest event first, shall be entered in subsequent rows with the sampling date in the second column and the corresponding analytical data in columns further to the right. Each new sampling event shall be added as an additional row to the existing spreadsheet with the corresponding date of the sampling event noted in the second column next to the monitoring well name. [Subsection A of 20.6.2.3107 NMAC]

ADDITIONAL STUDIES REQUIRED

#	Terms and Conditions
63.	The Permittee's groundwater monitoring data and reports document that the shallow groundwater beneath the site is contaminated with TDS, chloride, and sulfate above the standards of 20.6.2.3103 NMAC. This data indicates that the contaminated groundwater is primarily anthropogenic, having resulted from leaking impoundments at the Facility, and has spread laterally since the installation of impoundment liners. Within six months following the effective date of this Discharge Permit (**by DATE**), the Permittee shall submit for NMED approval a site investigation workplan and implementation schedule. The purpose of the site investigation shall be to evaluate the efficacy of existing source controls, to determine the current lateral and vertical extent of the shallow contaminated groundwater, and to identify any potential impacts to the downgradient and naturally occurring groundwater in the Dewey Lake Formation. The site investigation may build upon the previous investigations completed by Daniel B. Stephens and Associates in 2003 and 2008. The Permittee shall implement the site

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	investigation upon NMED approval of the workplan and shall submit a completion report no later than two years following the effective date of this Discharge Permit (**by DATE**). NMED may require the Permittee to take corrective actions pursuant to 20.6.2.1203 NMAC or to abate water pollution consistent with the requirements and provisions of Section 20.6.2.4101, Section 20.6.2.4103, Subsections C and E of 20.6.2.4106, Section 20.6.2.4107, Section 20.6.2.4108 and Section 20.6.2.4112 NMAC. [20.6.2.3107 NMAC, 20.6.2.4103 NMAC]

CONTINGENCY PLAN

#	Terms and Conditions
64.	In the event that groundwater monitoring indicates that a groundwater quality standard identified in Section 20.6.2.3103 NMAC is newly exceeded in a monitoring well with no previous exceedances at the date of issuance of this Discharge Permit, the Permittee shall collect a confirmatory sample from the monitoring well within 15 days of receipt of the initial sampling results to confirm the initial sampling results. Within 90 days of confirmation of groundwater contamination, the Permittee shall submit to NMED a Corrective Action Plan (CAP) that proposes, at a minimum, source control measures and an implementation schedule. The Permittee shall implement the CAP as approved by NMED. Once invoked (whether during the term of this Discharge Permit, or after the term of this Discharge Permit and prior to the completion of the Discharge Permit closure plan requirements), this condition shall apply until the Permittee has fulfilled the requirements of this condition and groundwater monitoring confirms for a minimum of eight (8) consecutive quarterly samples that the standards of Section 20.6.2.3103 NMAC are not exceeded in groundwater. If the groundwater standard continues to be violated 180 days after the confirmation of groundwater contamination, NMED may require the Permittee to abate water pollution consistent with the requirements and provisions of Section 20.6.2.4101, Section 20.6.2.4103, Subsections C and E of 20.6.2.4106, Section 20.6.2.4107, Section 20.6.2.4108 and Section 20.6.2.4112 NMAC. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]

#	Terms and Conditions
65.	In the event that information available to NMED indicates that a groundwater monitoring well or piezometer is not constructed in a manner consistent with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Guidelines*, Revision 1.1, March 2011; contains insufficient water to effectively monitor groundwater quality; or is not completed in a manner that is protective of groundwater quality, the Permittee shall install a replacement well(s) within 120 days following notification from NMED. The Permittee shall survey the replacement monitoring well(s)/piezometer(s) within 150 days following notification from NMED. The Permittee shall install replacement wells at locations approved by NMED and completed in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. The Permittee shall submit construction and lithologic logs, survey data and a groundwater elevation contour map to NMED within 60 days following well completion. The Permittee shall properly plug and abandon the monitoring well requiring replacement upon completion of the replacement monitoring well. The Permittee shall complete the well plugging and abandonment and shall document the abandonment procedures in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011, and all applicable local, state, and federal regulations. The Permittee shall submit well abandonment documentation to NMED within 60 days of completion of well plugging activities. [Subsection A of 20.6.2.3107 NMAC]
66.	In the event that groundwater flow information obtained pursuant to this Discharge Permit indicates that a monitoring well/piezometer is not appropriately located, e.g., hydrologically downgradient of the discharge location it is intended to monitor, the Permittee shall install a replacement well within 180 days following notification from NMED. The Permittee shall survey the replacement monitoring well within 30 days following well installation. The Permittee shall install replacement wells at locations approved by NMED prior to installation and completed in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. The Permittee shall submit construction and lithologic logs, survey data and a groundwater elevation contour map within 120 days following well completion in a cumulative well report.

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	[Subsection A of 20.6.2.3107 NMAC]
67.	In the event that the site investigation required by this Discharge Permit or an inspection reveals significant damage has occurred or is likely to affect the structural integrity of an impoundment liner or its ability to contain contaminants, the Permittee shall propose to repair or the replacement of the impoundment liner by submitting a Corrective Action Plan (CAP) to NMED for approval. The Permittee shall ensure the CAP to NMED within 30 days after discovery of the damage or following notification from NMED that significant liner damage is evident. The Permittee shall ensure the CAP includes a schedule for completion of corrective actions and the Permittee shall initiate implementation of the CAP following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
68.	In the event that the required freeboard cannot be preserved in an impoundment, the Permittee shall take actions authorized by this Discharge Permit and all applicable local, state, and federal regulations to restore the required freeboard. In the event that the required freeboard cannot be restored within a period of 72 hours following discovery, the Permittee shall propose actions to be immediately implemented to restore of the required freeboard by submitting a short-term Corrective Action Plan (CAP) to NMED for approval. Examples of short-term corrective actions include the pumping and hauling of excess wastewater from the impoundment or reducing the volume of wastewater discharged to the impoundment. The Permittee shall ensure the CAP includes a schedule for completion of corrective actions and s is submitted within 15 days following the date when exceedance was discovered. The Permittee shall implement the CAP following approval by NMED. In the event that the short-term corrective actions failed to restore the required freeboard, the Permittee shall propose permanent corrective actions in a long-term CAP submitted to NMED within 90 days following failure of the short-term CAP. Examples include the installation of an additional storage impoundment or a significant/permanent reduction in the volume of wastewater discharged to the impoundment. The Permittee shall ensure the CAP includes a schedule for completion of corrective actions and that implementation of the CAP is initiated following NMED approval. [Subsection A of 20.6.2.3107 NMAC]
69.	In the event the average solids accumulation exceeds one-third of the maximum liquid depth in an impoundment, the Permittee shall submit a plan for NMED's approval for

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	the removal and disposal of the solids. The Permittee shall ensure that the solids removal and disposal plan is submitted to NMED within 120 days of the determination of excess solids. The Permittee shall ensure that the solids removal and disposal plan includes the following information: a) A method for removal of the solids to a depth of less than six inches throughout the treatment impoundment in a manner that is protective of the impoundment liner. b) A description of how the Permittee will contain, transport, and dispose of the solids in accordance with all local, state, and federal regulations, including 40 CFR Part 503. c) A schedule for completion of the solids removal and disposal project. The Permittee shall initiate implementation of the plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
70.	In the event that a release (commonly known as a "spill") occurs that is not authorized under this Discharge Permit, the Permittee shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in Section 20.6.2.1203 NMAC and summarized below. Within <u>24 hours</u> following discovery of the unauthorized discharge, the Permittee shall verbally notify NMED and provide the following information. a) The name, address, and telephone number of the person or persons in charge of the Facility, as well as of the owner and/or operator of the Facility. b) The name and address of the Facility. c) The date, time, location, and duration of the unauthorized discharge. d) The source and cause of unauthorized discharge. e) A description of the unauthorized discharge, including its estimated chemical composition. f) The estimated volume of the unauthorized discharge. g) Any actions taken to mitigate immediate damage from the unauthorized discharge. Within <u>one week</u> following discovery of the unauthorized discharge, the Permittee shall submit written notification to NMED with the information listed above and any pertinent updates. Within <u>15 days</u> following discovery of the unauthorized discharge, the Permittee shall submit a corrective action report/plan to NMED describing any corrective actions taken and/or to be taken relative to the unauthorized discharge that includes the following information. a) A description of proposed actions to mitigate damage from the unauthorized discharge.

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	b) A description of proposed actions to prevent future unauthorized discharges of this nature. c) A schedule for completion of proposed actions. In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of Section 20.6.2.4103 NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to Paragraph (1) of Subsection A of 20.6.2.1203 NMAC, the Permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC. The Permittee shall not construe anything in this condition as relieving them of the obligation to comply with all requirements of Section 20.6.2.1203 NMAC. [20.6.2.1203 NMAC]
71.	In the event that NMED or the Permittee identifies any failures of the discharge plan, i.e., the application, or this Discharge Permit not specifically noted herein, NMED may require the Permittee to submit a Corrective Action Plan and a schedule for completion of corrective actions to address the failure(s). Additionally, NMED may require a discharge permit modification to achieve compliance with 20.6.2 NMAC. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]

CLOSURE PLAN

Part A. Generally Applicable to All Discharges

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72.	The Permittee shall close the Facility covered under this Discharge Permit, either wholly or in part, in accordance with the closure plan in the March 10, 2005 Discharge Permit application. Where that closure plan references the closure plans in the WIPP Hazardous Waste Facility Permit and the WIPP Land Management Plan, the Permittee shall use the most up-to-date version of the plans. [Subsection A of 20.6.2.3107 NMAC]
73.	For the purpose of post-closure monitoring, after the Permittee completes closure of all authorized units , the Permittee shall continue groundwater monitoring until the monitoring data confirms for a minimum of eight (8) consecutive quarterly groundwater

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	sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded. Total dissolved solids and chloride shall meet pre-discharge conditions. If during post-closure monitoring results show that groundwater exceeds a standard in Section 20.6.2.3103 NMAC, the Permittee shall implement the contingency plan required by this Discharge Permit. Following notification from NMED that post-closure monitoring may cease, the Permittee shall plug and abandon all monitoring wells and piezometers in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Guidelines*, Revision 1.1, March 2011. [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Lagoon System

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74.	The Permittee shall perform the following closure measures in the event the Permittee proposes to permanently close the Facultative Lagoon System Within <u>60 days</u> of ceasing to discharge to the Facultative Lagoon System impoundments, the Permittee shall plug the line leading to the impoundments so that a discharge can no longer occur. Within <u>60 days</u> of ceasing to discharge to the Facultative Lagoon System impoundments, the Permittee shall evaporate or remove wastewater from the impoundments and any other wastewater system components and shall dispose of it in accordance with all local, state, and federal regulations. Within <u>90 days</u> of ceasing to discharge to the Facultative Lagoon System impoundments, the Permittee shall submit a sludge removal and disposal plan to NMED for approval. The Permittee shall implement the plan within 30 days following approval by NMED. The sludge removal and disposal plan shall include the following: a) The estimated volume and dry weight of sludge planned for removal and disposal, including measurements and calculations. b) Analytical results for samples of the sludge taken from the impoundment for TKN, NO_3-N, percent total solids, hazardous constituents, and any other parameters tested (reported in mg/kg, dry weight basis). c) The method(s) of sludge *removal* from the impoundments.

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	d) The method(s) of *disposal* for all of the sludge removed from the impoundments. The method(s) shall comply with all local, state and federal regulations, including 40 CFR Part 503. *Note: A proposal that includes the surface disposal of sludge may be subject to Ground-Water Discharge Permitting requirements pursuant to 20.6.2.3104 NMAC that are separate from the requirements of this Discharge Permit.* e) A schedule for completion of sludge removal and disposal not to exceed two years from the date discharge to the impoundments ceased. Within one year following completion of the sludge removal and disposal, the Permittee shall complete the following closure measures: a) Remove all lines leading to and from the Facultative Lagoon System impoundments, or permanently plug and abandon them in place. b) Remove or demolish any other wastewater system components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liners. d) Fill the impoundments with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [Subsection A of 20.6.2.3107 NMAC, 40 CFR Part 503]

Part C. Applicable to the Evaporation Pond H-19, Brine Retention Pond East, Brine Retention Pond West, Storm Water Ponds 1, 2, and 3, and Brine Salt Storage Pond 4

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75.	Upon cessation of operation, the Permittee shall close Evaporation Pond H-19 and Storm Water Ponds 1, 2, and 3. The Permittee shall evaporate or remove the remaining liquids in Storm Water Ponds and shall evaporate the remaining liquids in Evaporation Pond H-19. The Permittee shall sample all sludge to determine if it contains hazardous constituents and then manage and/or dispose of it in accordance with applicable regulations. Within one year following completion of the sludge removal and disposal, the Permittee shall complete the following closure measures: a) Remove or plug all piping and other ancillary components b) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liners.

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	d) Fill the impoundments with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [Subsection A of 20.6.2.3107 NMAC]

Part D. Applicable to the Impoundments Containing Stormwater Runoff in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, 3, and 5) and to Salt Stockpiles (Salt Cells 1, 2, 3, and 5)

#	Terms and Conditions
76.	Upon cessation of operation, the Permittee shall remove all mined salt from the Facility. The Permittee is permitted to use the mined salt as backfill in shafts and as interior fill material in berms and permanent markers after closure. The Permittee shall ensure removal from the site of all mined salt remaining after backfilling and after construction of surface structures. The Permittee shall submit a plan and schedule for salt removal to NMED for approval within 120 days prior to the Facility closure. The WIPP Land Management Plan reflects the Land Withdrawal Act's requirements for disposition of the salt. The WIPP's Hazardous Waste Facility Permit also addresses closure activities that include closure of the salt storage areas in accordance with the provisions of the WIPP Land Management Plan. The Permittee shall ensure that the salt storage area be reclaimed in the manner described in these documents. [Subsection A of 20.6.2.3107 NMAC]
77.	Upon cessation of operation, the Permittee shall close Salt Storage Ponds 1, 2, 3, and 5. The Permittee shall evaporate the remaining liquids in each impoundment. The Permittee shall sample all sludge to determine if it contains hazardous constituents and then manage and/or dispose of in accordance with applicable regulations. Within <u>one year</u> following completion of the sludge removal and disposal, the Permittee shall complete the following closure measures: a) Remove or plug all piping and other ancillary components. b) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liners. d) Fill the impoundments with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [Subsection A of 20.6.2.3107 NMAC]

GENERAL TERMS AND CONDITIONS

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78.	RECORD KEEPING - The Permittee shall maintain a written record of:
	• Information and data used to complete the application for this Discharge Permit;
	• Any releases (commonly known as "spills") not authorized under this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC;
	• The operation, maintenance, and repair of all facilities/equipment used to treat, store or dispose of wastewater;
	• Facility record drawings (plans and specifications) showing the actual construction of the Facility and bear the seal and signature of a licensed New Mexico professional engineer;
	• Copies of logs, inspection reports, and monitoring reports completed and/or submitted to NMED pursuant to this Discharge Permit;
	• The volume of wastewater or other wastes discharged pursuant to this Discharge Permit;
	• Groundwater quality and wastewater quality data collected pursuant to this Discharge Permit;
	• Copies of construction records (well log) for all sampled groundwater monitoring wells pursuant to this Discharge Permit;
	• The maintenance, repair, replacement or calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit; and
	• Data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit, including:
	  o the dates, location and times of sampling or field measurements;
	  o the name and job title of the individuals who performed each sample collection or field measurement;
	  o the sample analysis date of each sample
	  o the name and address of the laboratory, and the name of the signatory authority for the laboratory analysis;
	  o the analytical technique or method used to analyze each sample or collect each field measurement;
	  o the results of each analysis or field measurement, including raw data;
	  o the results of any split, spiked, duplicate or repeat sample; and
	  o a copy of the laboratory analysis chain-of-custody as well as a description of the quality assurance and quality control procedures used.
	
	The Permittee shall maintain the written record at a location accessible to NMED during a Facility inspection for the lifetime of the Discharge Permit. The Permittee shall make the record available to a NMED representative upon request.

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	[Subsections A and D of 20.6.2.3107 NMAC]
79.	INSPECTION and ENTRY – The Permittee shall allow NMED to inspect the Facility and its operations that are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which any maintained records required by this Discharge Permit, regulations of the federal government, or the WQCC are located. The Permittee shall allow NMED to have access to and reproduce for their use any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge Permit and the WQCC regulations. No person shall construe anything in this Discharge Permit as limiting in any way the inspection and entry authority of NMED under the WQA, the WQCC Regulations, or any other local, state or federal regulations. [Subsection D of 20.6.2.3107 NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]
80.	DUTY to PROVIDE INFORMATION - The Permittee shall, upon NMED's request, allow for NMED's inspection/duplication of records required by this Discharge Permit and/or furnish to NMED copies of such records. [Subsection D of 20.6.2.3107 NMAC]
81.	MODIFICATIONS and/or AMENDMENTS – In the event the Permittee proposes a change to the Facility or the Facility's discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the Facility, the Permittee shall notify NMED prior to implementing such changes. The Permittee shall obtain NMED's approval (which may require modification of this Discharge Permit) prior to implementing such changes. [Subsection C of 20.6.2.3107 NMAC, Subsections E and G of 20.6.2.3109 NMAC]
82.	PLANS and SPECIFICATIONS – In the event the Permittee proposes to construct a wastewater system or change a process unit of an existing system such that the quantity or quality of the discharge will change substantially from that authorized by this Discharge Permit, the Permittee shall submit construction plans and specifications of the

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	proposed system or process unit for NMED's approval prior to the commencement of construction. In the event the Permittee implements changes to the wastewater system authorized by this Discharge Permit that result in only a minor effect on the character of the discharge, the Permittee shall report such changes (including the submission of record drawings, where applicable) as of January 1 and June 30 of each year to NMED. [Subsections A and C of 20.6.2.1202 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
83.	CIVIL PENALTIES - Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or facilities, or any refusal or failure to provide NMED with records or information, may subject the Permittee to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10(C) and 74-6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to $10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the Permittee waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10 and 74-6-10.1]
84.	CRIMINAL PENALTIES – No person shall: • Make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained under the WQA; • Falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained under the WQA; or • Fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation. Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth-degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is

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	guilty of a third-degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental impact is guilty of a third-degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily injury to any other person is guilty of a second-degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]
85.	COMPLIANCE with OTHER LAWS - Nothing in this Discharge Permit shall be construed in any way as relieving the Permittee of the obligation to comply with any other applicable federal, state, and/or local laws, regulations, zoning requirements, nuisance ordinances, permits or orders. [NMSA 1978, § 74-6-5.L]
86.	RIGHT to APPEAL - The Permittee may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC within thirty days of the receipt of postal notice of this Discharge Permit and shall include a statement of the issues raised and the relief sought. Unless the Permittee files a timely petition for review, the decision of NMED shall be final and not subject to judicial review. [20.6.2.3112 NMAC, NMSA 1978, § 74-6-5.O]
87.	TRANSFER of DISCHARGE PERMIT - Prior to the transfer of any ownership, control, or possession of this Facility or any portion thereof, the Permittee shall: • Notify the proposed transferee in writing of the existence of this Discharge Permit; • Include a copy of this Discharge Permit with the notice; and • Deliver or send by certified mail to NMED a copy of the notification and proof the proposed transferee has received such notification. The Permittee shall continue responsibility e for any discharge from the Facility, until the Permittee transfers both ownership and possession of the Facility to the transferee. [20.6.2.3111 NMAC]
88.	PERMIT FEES – The Permittee shall be aware that the payment of permit fees is due at the time of Discharge Permit approval. The Permittee may pay the permit fees in a single

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	payment or they may pay the fee in equal installments on a yearly basis over the term of the Discharge Permit. The Permittee shall remit single payments to NMED no later than 30 days following the effective date of the Discharge Permit. The Permittee shall remit initial installment payments to NMED no later than 30 days following the effective date of the Discharge Permit; with subsequent installment payments remitted to NMED no later than the anniversary of the effective date of the Discharge Permit. Permit fees are associated with <u>issuance</u> of this Discharge Permit. No person shall construe anything in this Discharge Permit as relieving the Permittee of the obligation to pay all permit fees assessed by NMED. A Permittee that ceases discharging or does not commence discharging from the Facility during the term of the Discharge Permit shall pay all permit fees assessed by NMED. NMED shall suspend or terminate an approved Discharge Permit if the Permittee fails to remit an installment payment by its due date. [Subsection F of 20.6.2.3114 NMAC, NMSA 1978, § 74-6-5.K]

New Mexico Environment Department Ground Water Quality Bureau
Discharge Permit Summary

Facility Information

Facility Name — Waste Isolation Pilot Plant (WIPP)
Discharge Permit Number — DP-831

Legally Responsible Party — Reinhard Knerr, Manager
U.S. Department of Energy, Carlsbad Field Office
P.O. Box 3090
Carlsbad, NM 88221
(575) 234-7300

Treatment, Disposal and Site Information

Primary Waste Type — Domestic and Industrial
Facility Type — Federal Agency - U.S. Department of Energy

Evaporative Impoundment Locations

Domestic Wastewater

Type	Designation	Description & Comments
Settling Impoundment	Settling Lagoon 1	Primary treatment; 60-mil high-density polyethylene (HDPE) synthetically lined; permitted one foot of freeboard; capacity of 963,214 gallons.
Settling Impoundment	Settling Lagoon 2	Primary treatment; 60-mil HDPE synthetically lined; permitted one foot of freeboard; capacity of 963,214 gallons.
Polishing Impoundment	Polishing Lagoon 1	Passive secondary treatment; 60-mil HDPE synthetically lined; permitted one foot of freeboard; capacity of 414,901 gallons.
Polishing Impoundment	Polishing Lagoon 2	Passive secondary treatment; 60-mil HDPE synthetically lined; permitted one foot of freeboard; capacity of 141,901 gallons.
Evaporation Impoundment	Effluent Lagoon A	Effluent storage; 30-mil liner low-density polyethylene (LLDP) synthetically lined; disposal by evaporation; permitted one foot of freeboard; capacity of 566,610 gallons.
Evaporation Impoundment	Effluent Lagoon B	Effluent storage; 30-mil LLDP synthetically lined; disposal by evaporation; permitted discharges are domestic waste, brine, purge waters, and miscellaneous industrial non-hazardous wastewater; permitted one foot of freeboard; capacity of 846,257 gallons.
Evaporation Impoundment	Effluent Lagoon C	Effluent Storage; 30-mil HDPE synthetically lined; disposal by evaporation; permitted discharges are domestic waste, brine, purge waters, and miscellaneous industrial non-hazardous wastewater; permitted one foot of freeboard; capacity of 846,257 gallons.

Storm Water Control

Type	Designation	Description & Comments
Storm Water Impoundment	Storm Water Pond 1	Constructed using a 60-mil HDPE synthetic liner; receives clean non-contact storm water from paved areas, roofs, air conditioner condensate, and water from domestic water lines; disposal by evaporation; permitted one foot of freeboard; capacity of 626,076 gallons.
Storm Water Impoundment	Storm Water Pond 2	Constructed using a 60-mil HDPE synthetic liner; receives clean non-contact storm after from the facilities paved areas, roofs, air conditioner condensate, and draining domestic water lines; disposal by evaporation; permitted one foot of freeboard; capacity of 2,268,330 gallons.
Storm Water Impoundment	Storm Water Pond 3	Constructed using a 60-mil HDPE synthetic liner; receives clean non-contact storm after from the facilities paved areas, roofs, air conditioner condensate, and draining domestic water lines; disposal by evaporation; permitted one foot of freeboard; capacity of 7,211,967 gallons.

Non-Domestic Wastewater

Type	Designation	Description & Comments
Evaporation Impoundment	Evaporation Pond H-19	Constructed using a 36-mil Hypalon synthetic liner; permitted discharges are brine, purge waters, and miscellaneous industrial non-hazardous wastewater; disposal by evaporation; permitted one foot of freeboard; capacity of 346,085 gallons.
Evaporation Impoundment	Salt Storage Pond 1	Constructed using a 60-mil HDPE synthetic liner; disposal by evaporation; permitted one foot of freeboard; capacity of 3,301,634 gallons.
Evaporation Impoundment	Salt Storage Pond 2/3	Constructed using 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system; disposal by evaporation; permitted one foot of freeboard; capacity of 21,737,254 gallons
Evaporation Impoundment	Salt Storage Pond 5	To be constructed, 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system; disposal by evaporation; permitted two feet of freeboard; capacity of 6,355,404 gallons.

Evaporation Impoundment	Brine Salt Storage Pond 4	To be constructed, 60-mil HDPE geomembrane double liner with a leak detection system; permitted discharges are clean non-contact stormwater from the facilities paved areas, roofs, air conditioner condensate, draining domestic water lines, and brine from Brine Retention Ponds East and West; Disposal by evaporation; permitted one foot of freeboard; capacity of 8,668,722 gallons.
Retention Basin	Brine Retention Pond East	To be constructed, 60-mil HDPE geomembrane double liner with a leak detection system and an epoxy coated concrete bottom; disposal by evaporation; permitted two feet of freeboard; capacity of 46,094 gallons.
Retention Basin	Brine Retention Pond West	To be constructed, 60-mil HDPE geomembrane double liner with a leak detection system and an epoxy coated concrete bottom; disposal by evaporation; permitted two feet of freeboard; capacity of 46,094 gallons.
Holding tank	Brine Holding Tank	To be constructed, 3,000-gallon fiberglass reinforced plastic holding tank for brine prior to being discharged to either Brine Retention Pond East or West.

Salt Storage Locations

Type	Designation	Description & Comments
Salt Pile	Salt Cell 1	Inactive; approximately 18.8 acres; graded to 2% slope covered with sand and 60 mil HDPE liner and with two feet of native soil; seeded; run-off collects in Salt Storage Pond 1.
Salt Pile	Salt Cell 2	Active; 6.2 acres; run-off area of 326,350 sq. ft.; constructed using of six-inch prepared subgrade, 60-mil HDPE liner, 200-mil drainage layer, eight oz. geotextile fabric covered with two feet of native soil; runoff collects in Salt Storage Ponds 2 and/or 3.
Salt Pile	Salt Cell 3	Active; 5.2 acres; run-off area of 272,850 sq. ft.; constructed using of six-inch prepared subgrade, 60-mil HDPE liner, 200-mil drainage layer, eight oz. geotextile fabric covered with two feet of native soil; runoff collects in Salt Storage Ponds 2 and/or 3.
Salt Pile	Salt Cell 5	To be constructed; 5.09 acres; run-off area of 221,841 sq. ft.; 60-mil HDPE geomembrane liner with a protective native soil layer; runoff collects in Salt Storage Pond 5.
Salt Pile	Site and Preliminary Design Validation Pile	Closed in 2000; covered with a geosynthetic liner, six inches of bedding material, and three feet of soil; Seeded.

Flow Metering Locations

Type	Designation	Description & Comments
Totalizing Flow Meter	Ultrasonic Flow Meter	Located at the facility Pump House – water supply; estimates domestic wastewater discharged to the Facultative Lagoon system.
Primary Measurement Device		To be installed. Measures brine discharged to Brine Retention Ponds East and West from the New Filter Building.
Totalizing Flow Meters		To be installed. Four separate meters to measure the brine pumped from the leak detection sumps for Brine Salt Storage Pond 4, Brine Retention Ponds East and West, and Salt Storage Pond 5.

Ground Water Monitoring Locations

Type	Designation	Description & Comments
Monitoring Wells	C-2505, C-2506, PZ-2, PZ-3, PZ-4	Quarterly depth to water measurement; all wells drilled in the shallow groundwater.
Monitoring Wells	C-2507, C-2811, PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-18	Quarterly depth to water measurement; semi-annual collection of field parameters for temperature, pH, and specific conductance; semi-annual monitoring for SO4, Cl, TDS, Uranium, and combined Radium-226 and Radium-228; all wells drilled in the shallow groundwater.
Monitoring Well	PZ-17	Quarterly depth to water measurement; semi-annual collection of field parameters for temperature, pH, and specific conductance; semi-annual monitoring for SO_4, Cl, TDS, TKN and NO_3-N; well drilled in the shallowest, water bearing zone of the Dewey Lake Formation and intended to monitor the Facultative Lagoon System.
Monitoring Wells	PZ-19 and WQSP-6A	Quarterly depth to water measurement; semi-annual collection of field parameters for temperature, pH, and specific conductance; semi-annual monitoring for SO4, Cl, and TDS; both wells drilled in the shallowest, water bearing zone of the Dewey Lake Formation and PZ-17 is intended to monitor Evaporation Pond H-19.

Depth-to-Ground Water 34 feet
Total Dissolved Solids (TDS) 3,400 mg/L

Permit Information

Original Permit Issued	January 16, 1992
Permit Amended	August 28, 1995
Permit Renewal	July 3, 1997
Permit Amended	June 12, 1998
Permit Amended	January 24, 2000
Permit Renewal	April 29, 2003
Permit Modification	December 22, 2003
Permit Modification	December 29, 2006
Permit Renewal and Modification	July 23, 2008
Permit Renewal	July 29, 2014

Current Action	**Permit Renewal and Modification**
Application Received	December 3, 2018
Public Notice Published	[not yet published]
Permit Issued (Issuance Date)	[issuance date]
Permitted Discharge Volume	Domestic – 23,000 gallons per day Non-Domestic – 9,586,995 gallons per day

NMED Contact Information

Mailing Address	Ground Water Quality Bureau P.O. Box 5469 Santa Fe, New Mexico 87502-5469
GWQB Telephone Number	(505) 827-2900
NMED Lead Staff	Avery Young
Lead Staff Telephone Number	(505) 827-2909
Lead Staff Email	avery.young@state.nm.us

New Mexico Environment Department
Ground Water Quality Bureau
20.6.2.3103 STANDARDS FOR GROUNDWATER

This table lists the numeric ground water standards in 20.6.2.3103 NMAC, effective as of December 21, 2018. It does not list the "toxic pollutants" for which Subsection A of 20.6.2.3103 NMAC establishes a narrative standard. The list of "toxic pollutants" can be found in Subsection T of 20.6.2.7 NMAC. The standards with an asterisk (*) take effect on July 1, 2020 for past and current water discharges occurring as of July 1, 2017. For full details, please refer to the Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

Contaminant (Abbreviation) (CAS Number)	Standard
Numerical Standards (mg/l unless otherwise noted)	
Antimony (Sb) (CAS 7440-36-0)	0.006
Arsenic (As) (CAS 7440-38-2)	0.01*
Barium (Ba) (CAS 7440-39-3)	2.0
Beryllium (Be) (CAS 7440-41-7)	0.004
Cadmium (Cd) (CAS 7440-43-9)	0.005*
Chromium (Cr) (CAS 7440-47-3)	0.05
Cyanide (CN) (CAS 57-12-5)	0.2
Fluoride (F) (CAS 16984-48-8)	1.6
Lead (Pb) (CAS 7439-92-1)	0.015*
Total Mercury (Hg) (CAS 7439-97-6)	0.002
Nitrate (NO_3 as N) (CAS 14797-55-8)	10.0
Nitrite (NO_2 as N) (CAS 10102-44-0)	1.0
Selenium (Se) (CAS 7782-49-2)	0.05
Silver (Ag) (CAS 7440-224)	0.05
Thallium (Tl) (CAS 7440-28-0)	0.002
Uranium (U) (CAS 7440-61-1)	0.03
Radioactivity: Combined Radium-226 (CAS 13982-63-3) and Radium-228 (CAS 15262-20-1)	5 pCi/l*
Benzene (CAS 71-43-2)	0.005*
Polychlorinated biphenyls (PCB's) (CAS 1336-36-3)	0.0005*
Toluene (CAS 108-88-3)	1.0
Carbon Tetrachloride (CAS 56-23-5)	0.005*
1,2-dichloroethane (EDC) (CAS 107-06-2)	0.005*
1,1-dichloroethylene (1,1-DCE) (CAS 75-35-4)	0.007
tetrachloroethylene (PCE) (CAS 127-18-4)	0.005*
trichloroethylene (TCE) (CAS 79-01-6)	0.005*
ethylbenzene (CAS 100-41-4)	0.7*
total xylenes (CAS 1330-20-7)	0.62
methylene chloride (CAS 75-09-2)	0.005*
chloroform (CAS 67-66-3)	0.1
1,1-dichloroethane (CAS 75-34-3)	0.025
ethylene dibromide (EDB) (CAS 106-93-4)	0.00005*
1,1,1-trichloroethane (CAS 71-55-6)	0.2
1,1,2-trichloroethane (CAS 79-00-5)	0.005*
1,1,2,2-tetrachloroethane (CAS 79-34-5)	0.01
vinyl chloride (CAS 75-01-4)	0.002
PAHs: total naphthalene (CAS 91-20-3) plus monomethylnaphthalenes	0.03
benzo-a-pyrene (CAS 50-32-8)	0.0002*
cis-1,2-dichloroethene (CAS 156-59-2)	0.07
trans-1,2-dichloroethene (CAS 156-60-5)	0.1
1,2-dichloropropane (PDC) (CAS 78-87-5)	0.005

styrene (CAS 100-42-5)	0.1
1,2-dichlorobenzene (CAS 95-50-1)	0.6
1,4-dichlorobenzene (CAS 106-46-7)	0.075
1,2,4-trichlorobenzene (CAS 120-82-1)	0.07
pentachlorophenol (CAS 87-86-5)	0.001
atrazine (CAS 1912-24-9)	0.003
Other Standards for Domestic Water Supply	
Chloride (Cl) (CAS 16887-00-6)	250
Copper (Cu) (CAS 7440-50-80	1.0
Iron (Fe) (CAS 7439-89-6)	1.0
Manganese (Mn) (CAS 7439-96-5)	0.2
Phenols	0.005
Sulfate (SO_4) (CAS 14808-79-8)	600
Total Dissolved Solids (TDS)	1000
Zinc (Zn) (CAS 7440-66-6)	10
pH	6-9
Methyl tertiary-butyl ether (MTBE) (CAS 1634-04-4)	0.1
Standards for Irrigation Use	
Aluminum (Al) (CAS 7429-90-5)	5.0
Boron (B) (CAS 7440-42-8)	0.75
Cobalt (Co) (CAS 7440-48-4)	0.05
Molybdenum (Mo) (CAS 7439-98-7)	1.0
Nickel (Ni) (CAS 7440-02-0)	0.2

Groundwater Discharge Permit Guidance for Synthetically Lined Lagoons – Liner Material and Site Preparation

This guidance document represents minimum liner material and site preparation requirements for wastewater treatment, storage and evaporation lagoons. These requirements do not apply to lagoons storing hazardous wastes or high strength waste. The Ground Water Quality Bureau may impose additional requirements (e.g., double-lined lagoons with leak detection) for facilities discharging hazardous or high strength waste to lagoons through the development of specific Discharge Permit conditions for such facilities.

Liner Material Requirements:

1. The liner shall be chemically compatible with any material that will contact the liner.
2. The liner material shall be resistant to deterioration by sunlight if any portion of the liner will be exposed.
3. Synthetic liner material shall be of sufficient thickness to have adequate tensile strength and tear and puncture resistance. Under no circumstances shall a synthetic liner material less than 40 mils in thickness be accepted. Any liner material shall be certified by a licensed New Mexico professional engineer and approved by the New Mexico Environment Department (NMED) prior to its installation.

Lagoon Design and Site Preparation Requirements:

1. The system shall be certified by a licensed New Mexico professional engineer and approved by NMED prior to installation.
2. Inside slopes shall be a maximum of 3 (horizontal): 1 (vertical), and a minimum of 4 (horizontal); 1 (vertical).
3. Lagoon volume shall be designed to allow for a minimum of 24 inches of freeboard.
4. The liner shall be installed with sufficient liner material to accommodate shrinkage due to temperature changes. Folds in the liner are not acceptable.
5. To a depth of at least six inches below the liner, the sub-grade shall be free of sharp rocks, vegetation and stubble. In addition, liners shall be placed on a sub-grade of sand or fine soil. The surface in contact with the liner shall be smooth to allow for good contact between liner and sub-grade. The surface shall be dry during liner installation.
6. Sub-grade shall be compacted to a minimum of 90% of standard proctor density.
7. The minimum dike width shall be eight feet to allow vehicle traffic for maintenance.
8. The base of the pond shall be as uniform as possible and shall not vary more than three inches from the average finished elevation.
9. Synthetic liners shall be anchored in an anchor trench in the top of the berm. The trench shall be a minimum of 12 inches wide, 12 inches deep and shall be set back at least 24 inches from the inside edge of the berm.
10. If the lagoon is installed over areas of decomposing organic materials or shallow groundwater, a liner vent system shall be installed.
11. Any opening in the liner through which a pipe or other fixture protrudes shall be properly sealed. Liner penetrations shall be detailed in the construction plans and record drawings.
12. A synthetic liner shall not be installed in temperatures below freezing.
13. The liner shall be installed or supervised by an individual that has the necessary training and experience as required by the liner manufacturer.
14. All manufacturer's installation and field seaming guidelines shall be followed.
15. All synthetic liner seams shall be field tested by the installer and verification of the adequacy of the seams shall be submitted to NMED along with the record drawings.
16. Concrete slabs installed on top of the synthetic liner for operational purposes shall be completed in accordance with manufacturer and installer recommendations to ensure liner integrity.

NEW MEXICO ENVIRONMENT DEPARTMENT
GROUND WATER QUALITY BUREAU
MONITORING WELL CONSTRUCTION AND ABANDONMENT GUIDELINES

Purpose: These guidelines identify minimum construction and abandonment details for installation of water table monitoring wells under groundwater Discharge Permits issued by the NMED's Ground Water Quality Bureau (GWQB) and Abatement Plans approved by the GWQB. Proposed locations of monitoring wells required under Discharge Permits and Abatement Plans and requests to use alternate installation and/or construction methods for water table monitoring wells or other types of monitoring wells (e.g., deep monitoring wells for delineation of vertical extent of contaminants) must be submitted to the GWQB for approval prior to drilling and construction.

General Drilling Specifications:

1. All well drilling activities must be performed by an individual with a current and valid well driller license issued by the State of New Mexico in accordance with 19.27.4 NMAC. Use of drillers with environmental well drilling experience and expertise is highly recommended.
2. Drilling methods that allow for accurate determinations of water table locations must be employed. All drill bits, drill rods, and down-hole tools must be thoroughly cleaned immediately prior to the start of drilling. The borehole diameter must be drilled a minimum of 4 inches larger than the casing diameter to allow for the emplacement of sand and sealant.
3. After completion, the well should be allowed to stabilize for a minimum of 12 hours before development is initiated.
4. The well must be developed so that formation water flows freely through the screen and is not turbid, and all sediment and drilling disturbances are removed from the well.

Well Specifications (see attached monitoring well schematic):

5. Schedule 40 (or heavier) polyvinyl chloride (PVC) pipe, stainless steel pipe, carbon steel pipe, or pipe of an alternate appropriate material that has been approved for use by NMED must be used as casing. The casing must have an inside diameter not less than 2 inches. The casing material selected for use must be compatible with the anticipated chemistry of the groundwater and appropriate for the contaminants of interest at the facility. The casing material and thickness selected for use must have sufficient collapse strength to withstand the pressure exerted by grouts used as annular seals and thermal properties sufficient to withstand the heat generated by the hydration of cement-based grouts. Casing sections may be joined using welded, threaded, or mechanically locking joints; the method selected must provide sufficient joint strength for the specific well installation. The casing must extend from the top of the screen to at least one foot above ground surface. The top of the casing must be fitted with a removable cap, and the exposed casing must be protected by a locking steel well shroud. The shroud must be large enough in diameter to allow easy access for removal of the cap. Alternatively, monitoring wells may be completed below grade. In this case, the casing must extend from the top of the screen to 6 to 12 inches below the ground surface; the monitoring wells must be sealed with locking, expandable well plugs; a flush-mount, watertight well vault that is rated to withstand traffic loads must be emplaced around the wellhead; and the cover must be secured with at least one bolt. The vault cover must indicate that the wellhead of a monitoring well is contained within the vault.
6. A 20-foot section (maximum) of continuous-slot, machine slotted, or other manufactured PVC or stainless steel well screen or well screen of an alternate appropriate material that has been approved for use by NMED must be installed across the water table. Screens created by cutting slots into solid casing with saws or other tools must not be used. The screen material selected for use must be compatible with the anticipated chemistry of the ground water and appropriate for the contaminants of interest at the facility. Screen sections may be joined using welded, threaded, or mechanically

locking joints; the method selected must provide sufficient joint strength for the specific well installation and must not introduce constituents that may reasonably be considered contaminants of interest at the facility. A cap must be attached to the bottom of the well screen; sumps (i.e., casing attached to the bottom of a well screen) should not be installed. The bottom of the screen must be installed no more than 15 feet below the water table; the top of the well screen must be positioned not less than 5 feet above the water table. The well screen slots must be appropriately sized for the formation materials and should be selected to retain 90 percent of the filter pack. A slot size of 0.010 inches is generally adequate for most installations.

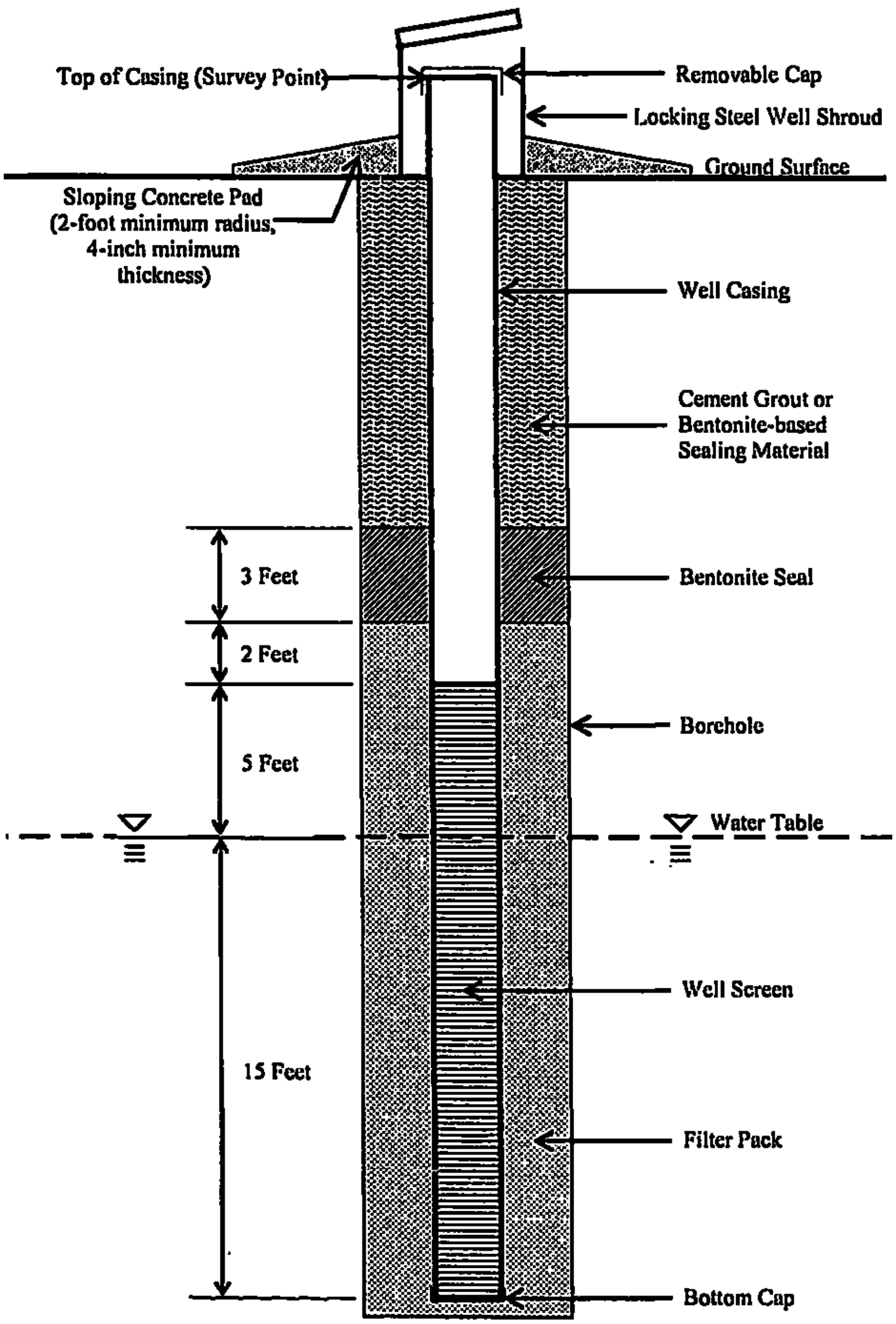
7. Casing and well screen must be centered in the borehole by placing centralizers near the top and bottom of the well screen.
8. A filter pack must be installed around the screen by filling the annular space from the bottom of the screen to 2 feet above the top of the screen with clean silica sand. The filter pack must be properly sized to prevent fine particles in the formation from entering the well; clean medium to coarse silica sand is generally adequate as filter pack material for 0.010-inch slotted well screen. For wells deeper than 30 feet, the sand must be emplaced by a tremmie pipe. The well should be surged or bailed to settle the filter pack and additional sand added, if necessary, before the bentonite seal is emplaced.
9. A bentonite seal must be constructed immediately above the filter pack by emplacing bentonite chips or pellets (3/8-inch in size or smaller) in a manner that prevents bridging of the chips/pellets in the annular space. The bentonite seal must be 3 feet in thickness and hydrated with clean water. Adequate time should be allowed for expansion of the bentonite seal before installation of the annular space seal.
10. The annular space above the bentonite seal must be sealed with cement grout or a bentonite-based sealing material acceptable to the State Engineer pursuant to 19.27.4 NMAC. A tremmie pipe must be used when placing sealing materials at depths greater than 20 feet below the ground surface. Annular space seals must extend from the top of the bentonite seal to the ground surface (for wells completed above grade) or to a level 3 to 6 inches below the top of casing (for wells completed below grade).
11. For monitoring wells finished above grade, a concrete pad (2-foot minimum radius, 4-inch minimum thickness) must be poured around the shroud and wellhead. The concrete and surrounding soil must be sloped to direct rainfall and runoff away from the wellhead. The installation of steel posts around the well shroud and wellhead is recommended for monitoring wells finished above grade to protect the wellhead from damage by vehicles or equipment. For monitoring wells finished below grade, a concrete pad (2-foot minimum radius, 4-inch minimum thickness) must be poured around the well vault and wellhead. The concrete and surrounding soil must be sloped to direct rainfall and runoff away from the well vault.

<u>**Abandonment**</u>:

12. Approval for abandonment of monitoring wells used for ground water monitoring in accordance with Discharge Permit and Abatement Plan requirements must be obtained from NMED prior to abandonment.
13. Well abandonment must be accomplished by removing the well casing and placing neat cement grout, bentonite-based plugging material, or other sealing material approved by the State Engineer for wells that encounter water pursuant to 19.27.4 NMAC from the bottom of the borehole to the ground surface using a tremmie pipe. If the casing cannot be removed, neat cement grout, bentonite-based plugging material, or other sealing material approved by the State Engineer must be placed in the well using a tremmie pipe from the bottom of the well to the ground surface.
14. After abandonment, written notification describing the well abandonment must be submitted to the NMED. Written notification of well abandonment must consist of a copy of the well plugging record submitted to the State Engineer in accordance with 19.27.4 NMAC, or alternate documentation containing the information to be provided in a well plugging record required by the State Engineer as specified in 19.27.4 NMAC.

Deviation from Monitoring Well Construction and Abandonment Requirements: Requests to construct water table monitoring wells or other types of monitoring wells for groundwater monitoring under groundwater Discharge Permits or Abatement Plans in a manner that deviates from the specified requirements must be submitted in writing to the GWQB. Each request must state the rationale for the proposed deviation from these requirements and provide detailed evidence supporting the request. The GWQB will approve or deny requests to deviate from these requirements in writing.

MONITORING WELL SCHEMATIC
(Not to Scale)



FACT SHEET
Groundwater Discharge Permit DP-831
September 2020

Facility Name:	Waste Isolation Pilot Plant
Facility Location:	Highway 128, 26 miles southeast of Carlsbad Carlsbad, NM Sections 20, 21, 28 and 29, Township 22S, Range 31E
County:	Eddy County
Applicant/Permittee:	Reinhard Knerr, Manager U.S. Department of Energy, Carlsbad Field Office P.O. Box 3090 Carlsbad, NM 88221
Proposed Permitting Action:	Discharge Permit Renewal and Modification
Regulatory Authority:	Water Quality Control Commission's Ground and Surface Water Protection Regulations, 20.6.2 NMAC
Issuing Agency:	Ground Water Quality Bureau of the New Mexico Environment Department
GWQB Contact:	Avery Young P.O. Box 5469, Santa Fe, NM 87502-5469 Phone: (505) 827-2909 Email: avery.young@state.nm.us

The New Mexico Environment Department (NMED) provides this Fact Sheet to inform the public regarding the Department's proposed permitting action at the Waste Isolation Pilot Plant (WIPP or Facility) to protect groundwater. Prior to issuing a permit, NMED is required by regulation to release a draft of the permit for public comment. NMED is also required to issue a Fact Sheet which serves two functions: 1) to facilitate public review of that draft permit; and 2) to provide a brief summary of the basis for draft permit conditions.

This Fact Sheet includes general information about WIPP, a description of the department's permitting process to protect groundwater, a description of the wastewater discharged from the Facility that could potentially impact groundwater, and a summary of the draft conditions in the groundwater discharge permit. NMED issues groundwater discharge permits in accordance with the State law, i.e., the New Mexico Water Quality Act, and State regulation, i.e., the Ground and Surface Water Protection Regulations.

Facility Background

The Facility is located near the Jal Highway (NM-128), 26 miles southeast of Carlsbad, in Sections 20, 21, 28, and 29, Township 22S, Range 31E, Eddy County. A map of the facility can be found in Attachment A.

The WIPP is a mined geologic repository for the disposal of U.S. Department of Energy (DOE or Permittee) mixed transuranic (MTRU) waste. MTRU waste is waste that has a hazardous component and radioactive elements heavier than uranium. DOE is obligated to manage MTRU waste in compliance with a Hazardous Waste Permit issued by NMED's Hazardous Waste Bureau (HWB) under the New Mexico Hazardous Waste Act and New Mexico's Hazardous Waste Regulations. New Mexico does not have the authority to regulate the radiological aspects of MTRU waste. The WIPP underground repository for MTRU waste is located 2,150 feet below land surface in the bedded salt of the Salado Formation. WIPP first began accepting MTRU waste in March 1999.

There are three basic structures associated with the Facility: surface structures, shafts and underground structures. The surface structures accommodate the personnel, equipment, and support services required for the receipt, preparation, and transfer of MTRU waste from the surface to the underground. Four vertical shafts connect the surface facility to the underground. The underground structures include the underground waste disposal areas, the shaft pillar area, interconnecting drifts, and other areas unrelated to waste management activities.

Regulatory Framework

The Ground and Surface Water Protection Regulations, 20.6.2 NMAC, establish the regulatory framework for controlling discharges onto or below the surface of the ground through the issuance of groundwater discharge permits. The purpose of the regulations pertaining to groundwater discharge permits, as stated in Section 20.6.2.3101 NMAC, is "to protect all ground water of the state of New Mexico which has an existing concentration of 10,000 mg/l or less of total dissolved solids, for present and potential future use as domestic and agricultural water supply, and to protect those segments of surface waters which are gaining because of ground water inflow, for uses designated" in the Standards for Interstate and Intrastate Surface Waters, 20.6.4 NMAC. (See the New Mexico Commission of Public Records website to view 20.6.2 and 20.6.4 NMAC: http://www.srca.nm.gov/chapter-6-water-quality/.) The regulations establish groundwater standards as identified in Section 20.6.2.3103 NMAC.

Persons proposing to discharge effluent or leachate in such a manner that it could move directly or indirectly into groundwater must obtain and comply with a discharge permit (20.6.2.3104

NMAC). In order to obtain a discharge permit, an applicant must submit an application (or "discharge plan" – 20.6.2.7 NMAC) proposing methods/techniques to be used or processes expected to naturally occur to ensure that the discharge of water contaminants does not result in the contamination of ground or surface water (20.6.2.3106 NMAC).

In reviewing and approving an application, NMED must ensure that the discharge plan will not result in a hazard to public health, undue risk to property, exceedance of the groundwater standards at any place of withdrawal of water for present or reasonably foreseeable future use, or violation of a stream standard (Subsections C and H of 20.6.3109 NMAC). "Hazard to public health" is defined in Section 20.6.2.7 NMAC and pertains to the exceedance of the groundwater standards in a drinking water supply.

Subsection B of 20.6.2.3109 NMAC directs the NMED Secretary to "approve, approve with conditions, or deny" a discharge permit application, after the administrative record is complete and all required information is available. This regulation authorizing permit approval "with conditions" provides the fundamental authority for including conditions in discharge permits.

Discharge Permit

NMED's Ground Water Quality Bureau (GWQB) is responsible for the issuance of the groundwater discharge permit (Discharge Permit of DP-831) to control discharges from the Facility for the protection of groundwater for present and potential future use as domestic and agricultural water supply. The draft Discharge Permit does not address the management of MTRU waste but instead addresses non-hazardous, non-radiological wastes generated primarily at the surface at WIPP in addition to mined salt disposed of at the surface.

Categories of wastes types addressed in the draft Discharge Permit include domestic waste, industrial wastewaters, salt brine, stormwater runoff, and salt. Domestic wastewater, i.e., human waste, is discharged to an impoundment system for treatment and disposal by evaporation. Industrial wastewater such as compressed air system generated waters, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous, non-radioactive wastewaters is discharged to an impoundment system for disposal by evaporation. Salt brine produced from stormwater runoff from salt storage piles and other Facility processes is discharged to an impoundment system for disposal by evaporation. Salt mined at the Facility is stored at the surface in four stockpiles or salt cells. A portion of these stockpiles are closed and covered. The salt stockpiles have lined stormwater collection and drainage systems which convey the water to impoundments or ponds for evaporation.

Discharge Permit History

The original WIPP groundwater Discharge Permit (DP-831) was issued by NMED on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998 and on

January 24, 2000, renewed on April 29, 2003, modified on December 22, 2003 and on December 29, 2006, renewed and modified on July 23, 2008, and last renewed on July 29, 2014. The application (i.e., discharge plan) consists of the materials submitted by the Permittee dated December 3, 2018 and materials contained in the administrative record prior to issuance of this draft Discharge Permit and draft Fact Sheet.

The draft Discharge Permit addresses the renewal and modification of associated permit conditions. The permit modification consists of the addition of one new salt storage cell and four new liquid impoundments: Salt Cell 5, Salt Storage Pond 5, Brine Salt Storage Pone 4, Brine Retention Pond East, and Brine Retention Pond West. Additional changes made to the Discharge Permit issued on July 29, 2014 are described below.

Hydrogeology

The Facility is geologically situated in the southeast portion of New Mexico within the Delaware Basin, which is part of the larger Permian Basin. The geologic formations below the facility that are pertinent to this Discharge Permit, from deepest to shallowest, include: the Salado Formation (851 to 2,150 below ground surface [bgs]), the Rustler Formation (546 to 851 bgs), the Dewey Lake Formation (54 to 564 bgs), and, in the northeastern portion of the facility, the Santa Rosa Formation (34 to 54 bgs). The Salado Formation consists predominately of polyhalite, with some halite, carbonates, anhydrites, and clay seams. The Rustler Formation consists of carbonates, anhydrites, and halites. The Dewey Lake Formation consists almost entirely of mudstone, claystone, siltstone, and interbedded sandstone, and is frequently referred to as the Dewey Lake Redbeds Formation. The terms upper, middle, and lower Dewey Lake are used to describe the stratigraphic position in the formation and characteristics that related to the occurrence of saturated conditions. The upper Dewey Lake consists of a think, generally unsaturated section. The middle Dewey Lake occurs above a sulfate cementation change, which results in saturated conditions and a natural water table in limited areas. The lower Dewey Lake is below the sulfate cementation change and has low permeability. The Santa Rosa Formation consists of gray and red sandstone with lenses of shale and conglomerate.

The vadose zone, i.e., the area above the water table, consists of Quaternary dune sand (0 to 7.5 bgs), Mescalero caliche (7.5 to 17 bgs), and the Gatuña Formation (17 to 34 bgs). Recharge rates through the native soils are extremely low and there is little recharge through the vadose zone to the Santa Rosa Formation.

Groundwater below the Facility most likely to be affected by a discharge from the facility is at a depth of approximately 34 to 160 feet. The WIPP discovered a perched water zone in the lower Santa Rosa and upper Dewey Lake Formations in 1995 and determined that the probable sources of this shallow groundwater were the unlined impoundments constructed to capture stormwater runoff at the Facility and runoff from the above-ground salt piles. This shallow groundwater is contaminated with total dissolved solids, sulfate, and chloride. After the discovery of the human caused shallow groundwater, all impoundments at the facility were lined and a network of monitoring wells was installed. The shallow groundwater has a flow direction of north to south. Natural, non-human caused, groundwater occurs in the middle portion of the Dewey Lake Formation south of the WIPP facility at a depth of 160 feet. The Dewey Lake Formation has a relatively low hydraulic conductivity and the groundwater in the Formation has an average total dissolved solids concentration of approximately 3,400 milligrams per liter.

The first laterally continuous water-bearing zone below the Facility is within an approximately 30-foot-thick section of the Culebra Member of the Rustler Formation. Water in the Culebra Member is usually present in fractures and is confined by overlaying anhydrite and underlying clay and anhydrite beds. The Culebra Member is monitored through a network of monitoring wells.

Description of the Proposed Discharge

The activities that produce the discharge and the quantity, quality, and flow characteristics of the proposed discharges at the WIPP are briefly described as follows:

The source and disposition locations of proposed discharges at WIPP include the following: domestic wastewater to a facultative (treatment) lagoon system; industrial, non-hazardous, non-radioactive wastewater to evaporative impoundments; stormwater emanating generally from the Facility to evaporative impoundments, and stormwater emanating from the salt piles to evaporative impoundments.

Up to 23,000 gallons per day (gpd) of domestic wastewater may be discharged to seven synthetically lined impoundments (Facultative Lagoon System) comprised of Settling Lagoons 1 and 2, Polishing Lagoons 1 and 2, and Effluent Lagoons A, B, and C for disposal by evaporation and removal of precipitated domestic waste solids.

Non-domestic wastewater may be discharged at the Facility in the following ways:

- Up to 27,000 gpd of industrial wastewaters from the following sources: wastewater from compressed air systems, brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous, non-radioactive wastewaters. These industrial wastewaters are discharged to the Effluent Lagoons B and C of the Facultative Lagoon System for disposal by evaporation.

- Up to 50,000 gpd of industrial wastewaters from the following sources: brine, purge waters from sampling and developing Facility monitoring wells, condensate from the Exhaust Shaft fan ductwork on the surface, and water collected from the Waste Shaft Sump, Exhaust Shaft Interception Wells, and other observation boreholes in the underground. These industrial wastewaters are discharged to a separate synthetically lined impoundment for disposal by evaporation (Evaporation Pond H-19).

- Up to 2,210 gpd of brine produced from the operation of the to be constructed Salt Reduction System within the Safety Significant Confinement Ventilation System (SSCVS) will be discharged to two double synthetically lined impoundments, each with a leak detection system (Brine Retention Ponds East and West, collectively Brine Ponds). One brine retention pond will be in service while the other brine retention pond is closed for evaporation and removal of precipitated salt in order to maintain at least two feet of freeboard. Any remaining brine in the closed Brine Pond will be transferred to Brine Salt Storage Pond 4 for disposal by evaporation.

- Salt and other subsurface materials mined during construction of the Facility, as well as currently mined salt, are stored at the surface in four stockpiles. The stockpiles currently storing salt, or that will be used in the future as salt is mined from the Facility's underground panels, are referred to as Salt Cells 2, 3, and 5. Stormwater runoff in contact with Salt Cells 2 and 3 is collected in two double synthetically-lined stormwater impoundments, each with a leak detection system (Salt Storage Ponds 2 and 3). The total storage capacity of Salt Storage Ponds 2 and 3 is 21,737,254 gallons. Stormwater runoff in contact with Salt Cell 5 will be collected in a double synthetically-lined stormwater impoundment with a leak detection system (Salt Storage Pond 5). The storage capacity of Salt Storage Pond 5 will be 6,355,404 gallons. Salt Cell 1 no longer receives salt and is capped with synthetic material and an earthen cover. Stormwater runoff in contact with this stockpile is collected in synthetically-lined diversion ditches directed to a synthetically-lined impoundment (Salt Storage Pond 1). The storage capacity of Salt Storage Pond 1 is 3,301,634 gallons. The storage capacity of each salt storage pond is more than sufficient to contain a 24-hour, 100-year (5.84-inch rainfall) storm event.

- Stormwater runoff from the SSCVS area is collected in a double synthetically-lined stormwater impoundment with a leak detection system (Brine Salt Storage Pond 4). The storage capacity of Brine Salt Storage Pond 4 is 8,668,722 gallons. The capacity of the Brine Salt Storage Pond 4 is more than sufficient to contain a 24-hour, 100-year (5.84-inch rainfall) storm event.

- Additional stormwater runoff from the Facility's paved areas and roofs is collected in three synthetically-lined impoundments (Storm Water Ponds 1, 2, and 3). This runoff does not contact the salt stockpiles or other waste materials at the Facility and may be used by the permittee for dust control, soil compaction, and other construction activities.

Basis for Draft Permit Conditions

The conditions in this Draft Permit are organized into the following Sections: Operational Plan, Monitoring and Reporting, Additional Studies Required, Contingency, Closure, and General Requirements. The Draft Permit conditions conform to the requirements of the regulations and are generally consistent with similar conditions in other groundwater discharge permits issued by the Department.

1. Operational Plan Conditions (pages 6-14 in the Draft Permit)

Conditions in this Section require the permittee to properly operate and maintain the disposal systems, to restrict access to the systems via fencing so that unauthorized persons cannot damage a system or be exposed to unsafe conditions, and to post appropriate cautionary signs.

This Section contains operating conditions typically required for discharge systems composed of lined treatment impoundments for domestic wastewater and lined evaporative impoundments for industrial wastewater and stormwater. These conditions include requirements to appropriately maintain the synthetic impoundment liners, to maintain a specific freeboard within impoundments to prevent overtopping, to measure the thickness of settled solids within impoundments and to remove those solids in accordance with all local, state, and federal regulations if storage capacity is diminished to a specific limit. Proper operation and maintenance of the discharge system is critical for the Discharge Permit to achieve the performance criteria established in Subsection C of 20.6.2.3109 NMAC.

This Section requires the Permittee to monitor impoundment leak detection systems associated with specific salt storage ponds and the proposed impoundments. This requirement in-part addresses the requirement that a discharge plan include procedures for detecting a failure of the discharge system as specified in 20.6.2.3107 NMAC. The Permittee must construct, maintain, and operate impoundment leak detection, collection, and recovery systems (LDCRS) in a manner that will result in less than one foot of hydraulic head on the secondary liner. If this impoundment leakage limit cannot be maintained, the Permittee is obligated to submit a corrective action plan to NMED for approval.

This Section also requires the Permittee to conduct regular inspection of the earthen covers on Salt Cell 1 and the Site and Preliminary Design Validation (SPDV) Material Pile. The Permittee is required to inspect the earthen covers monthly and after storm events of 2 inches or greater in a 24-hour period to evaluate the covers, including erosional impact and vegetative success. Both piles consist of salt excavated during the construction of the Facility. Both piles are no longer active, i.e., they no longer receive mined salt; therefore, they have been covered in order to prevent stormwater infiltration and destabilization of the piles.

The Draft Permit does not contain discharge quality limitations because all discharges are contained in evaporative disposal systems.

2. Monitoring and Reporting Conditions (pages 15 – 27 in the Draft Permit)

Conditions in this Section require the Permittee to monitor and report on various aspects of the discharge system and groundwater to demonstrate that operations are compliant with the Discharge Permit and that the Discharge Permit is achieving the expected results. Monitoring and reporting requirements are authorized by Subsection A of 20.6.2.3107 NMAC. A discharge permit may not be approved without provisions for flow measurement and sampling, pursuant to Subsection H of 20.6.2.3109 NMAC.

The facility subsections require monitoring of the quantity and quality of the discharges, specifically, the discharge volumes to the impoundments, the chemical characterization of the impounded fluids, and the volume of liquid pumped from the leak detection systems.

This Section requires semi-annual sampling of Effluent Lagoon A of the Facultative Lagoon System for total Kjeldahl nitrogen, nitrate as nitrogen, total dissolved solids, chloride, and sulfate. If industrial wastewater is discharged into Effluent Lagoon B or C during a semi-annual period, the Permittee is required to sample the impoundments for total dissolved solids, chloride and sulfate. In addition, NMED may require comprehensive laboratory analysis of the industrial wastewater prior to it being discharged when NMED determines additional information is required.

This Section requires the Permittee once during the Discharge Permit term to evaluate the industrial wastewater in Evaporation Pond H-19 for constituent listed in 20.6.2.3103 NMAC. This comprehensive analysis pertains to the industrial waste discharges having varied origins, including brine, purge waters from sampling and developing monitoring wells, water collected from the Waste Shaft Sump, Exhaust Shaft Interception Wells, other observation boreholes in the underground, and condensate from the Exhaust Shaft fan ductwork on the surface. On an annual basis, the Permittee is required to sample Storm Water Ponds 1, 2, and 3 for sulfate, total dissolved solids, and chloride. The Permittee is required to sample the industrial wastewater in Brine Retention Ponds East and West quarterly and analyze the sample for every constituent listed in Subsection A of 20.6.2.3103 NMAC. After four consecutive quarterly sampling events, the Permittee may request to reduce the sampling frequency and/or the analyte list.

The Permittee is required to sample Salt Storage Ponds 1, 2, 3 and 5 on an annual basis and analyze the sample for sulfate, total dissolved solids, and chloride.

The Groundwater Monitoring and Reporting subsection requires monitoring groundwater downgradient of the following potential contaminant sources: impoundments containing stormwater runoff in contact with salt piles, the domestic wastewater impoundment system, capped salt piles, uncapped salt piles, and impoundments containing industrial discharges. This Section requires groundwater monitoring of two perched water zones, the shallow human caused groundwater measured at approximately 35 to 80 feet below ground surface in fifteen monitoring wells and the shallowest natural water-bearing zone in the Dewey Lake Formation measured at approximately 160 feet below ground surface in three monitoring wells. A map depicting monitoring well locations can be found in Attachment B.

The Permittee is required on a semi-annual basis to sample for total dissolved solids, chloride, and sulfate in eighteen groundwater monitoring wells designated to monitor salt piles, impoundments containing stormwater runoff in contact with salt piles, and the domestic wastewater system. The Permittee is required to sample on a semi-annual basis for nitrate as nitrogen and total Kjeldahl nitrogen in one groundwater monitoring well designated to monitor the domestic wastewater impoundment system. The Permittee is required to sample for uranium and combined radium-226 and radium-228 once within the first year of the permit term in eighteen groundwater monitoring wells designated to monitor all domestic and non-domestic discharge locations at the Facility. The sampling requirements for uranium and radium-226/radium-228 are included because these constituents are the only radioactive constituents for which New Mexico has groundwater protection standards. Historical analysis for 12 years at the Facility for other radioactive constituents showed results at concentrations at background levels or below counting limits. Radionuclides continue to be monitored in the Annual Site Environmental Report prepared by the WIPP.

Monitoring wells WQSP-6A, PZ-17, and PZ-19 are intended to monitor the shallowest natural water-bearing zone in the Dewey Lake Formation, which occurs in the subsurface at the southern end of the Facility. All other monitoring wells are intended to monitor the shallow human caused groundwater.

This subsection requires the installation of four new groundwater monitoring wells to monitor groundwater associated with newly authorized impoundments, to replace an improperly located well, and to monitor previously unmonitored locations. One monitoring well is required to be installed downgradient of the Facultative Lagoon System to replace an improperly located well. One monitoring well is required to be installed downgradient of Evaporation Pond H-19 because the impoundment is comprised of a single, 40-mil synthetic liner; therefore, a monitoring well is required downgradient to monitor the integrity of the liner. One monitoring well is required to be installed downgradient of the proposed Brine Salt Storage Pond 4 to monitor that impoundment system. One well is required to be installed downgradient of the proposed Salt Storage Pond 5 in order to monitor that impoundment system.

This Section requires the submittal of semi-annual monitoring reports that include the following: the chemical analytical results of domestic effluent and non-domestic wastewater; discharge volumes; record of solids (salt) removal and disposal; leak detection system measurements; the submittal of DOE's "Waste Isolation Pilot Plant Annual Site Environmental Report"; groundwater characterization data; groundwater depth measurements; and groundwater elevation contour maps.

3. Additional Studies Required (pages 27 - 28 in the Draft Permit)

This Section requires the Permittee to submit for NMED approval a workplan to investigate the shallow groundwater beneath the site, which contains concentrations of total dissolved solids, chloride, and sulfate above the standards of 20.6.2.3103 NMAC. Contingency Condition 26 of WIPP's previous Discharge Permit dated July 29, 2014 requires a response to exceedances to the standards of 20.6.2.3103 NAMC. Facility records identify the probable source of this groundwater as unlined stormwater impoundments from the time of initial construction of the Facility to the time the impoundments were lined in 2005. The purpose of the site investigation is to determine the efficacy of existing source controls, to determine the current lateral and vertical extent of this contaminated shallow groundwater, and to identify any potential impacts to the downgradient and naturally occurring downgradient groundwater in the Dewey Lake Formation. The site investigation may build upon the previous investigations completed by Daniel B. Stephens and Associates in 2003 and 2008.

This requirement is consistent with Section 20.6.2.3107 NMAC, which allows the Secretary to require a system of monitoring and reporting to verify that the permit is achieving the expected results and to require reporting of other information. The site investigation will provide additional information necessary to prevent further contamination and to determine whether to require corrective action or abatement.

4. Contingency Plan Conditions (pages 28 -31 in the Draft Permit)

This Section requires the Permittee implement specified actions, or to propose corrective actions for NMED's approval, in the case of failure of any aspect of the discharge system. The conditions, which reflect standard language used in other industrial discharge permits, address the exceedance of groundwater standards, damage to impoundment liners, lack of required freeboard in impoundments, and monitoring well deficiencies (e.g., improper construction, improper location for monitoring the intended source, insufficient water for sampling). If any of the conditions listed occur, the Permittee is required to submit a Corrective Action Plan resolving the issue to NMED for approval. Contingency plans are authorized by Subsection A(10) of 20.6.2.3107 NMAC. The Permittee is required to report and address unauthorized discharges in accordance with 20.6.2.1203 NMAC.

5. Closure Conditions (pages 32 – 35 in the Draft Permit)

This Section prescribes measures and timeframes for closing part, or all, of the Facility so that discharges can no longer occur and so that the exceedance of groundwater standards does not occur after the cessation of the operation. NMED understands that the Permittee does not plan to close the Facility during the term of this Discharge Permit, however general closure conditions are always included in discharge permits. Closure requirements are authorized by Subsection A(11) of 20.6.2.3107 NMAC, which also stipulates that closure requirements survive the termination or expiration of the Discharge Permit.

Groundwater monitoring is required after a discharge ceases and all means of transferring liquid to a discharge impoundment are sealed. This period after "closure" is commonly referred to as "post-closure" and generally continues until a minimum of eight consecutive quarters of groundwater sampling and analysis confirm no exceedance of standards. This two-year period allows for the potential movement of contaminants through the vadose zone and is consistent with the time period established in remediation programs for demonstrating that remediation is complete, e.g., 20.6.2.4103 NMAC (abatement plans) and 20.5.119.1929 NMAC (petroleum storage tank systems).

This Section includes a condition for properly closing the Facility in accordance with the WIPP Land Withdrawal Act, WIPP's Hazardous Waste Facility Permit (NM4890139088-TSDF), and the WIPP Land Management Plan's requirements for disposition of salt. In particular, the condition requires removal of all salt stockpiles from the land surface at the Facility so that the salt does not remain as a potential source of a contaminant discharge to groundwater.

6. General Terms and Conditions (pages 35 – 39 in the Draft Permit)

This Section's general terms and conditions are standard conditions in all discharge permits.

The Permittee is required to maintain certain records and provide them if requested to NMED, as authorized by Subsections A and D of 20.6.2.3107 NMAC. The Permittee is required to notify NMED of proposed changes to the volume, location, or character of the discharge, as this may require a "discharge permit modification" as defined in Subsection D of 20.6.2.7 NMAC and is consistent with the notification requirement in Subsection C of 20.6.2.3107 NMAC.

This Section identifies the Permittee's obligations, pursuant to the Ground and Surface Water Protection Regulations, regarding the transfer of the discharge permit, permit fees, and submittal of construction plans and specifications. The Section also cites New Mexico Water Quality Act provisions allowing for inspections, civil and criminal penalties, and the duty to comply with other laws.

Comment Period / Request for Hearing

NMED will allow at least thirty days during which time the public or the Facility may submit written comments and request a public hearing regarding the draft Discharge Permit. NMED will allow for these activities after publishing notice of the availability of this draft Permit and Fact Sheet. Requests for public hearing shall be in writing and shall set forth the reasons why a hearing should be held. A hearing will be held if the NMED Secretary determines that there is substantial public interest. To obtain a copy of the Draft Permit, to submit a comment, or to request a hearing on this matter, contact the GWQB Contact listed at the beginning of this Fact Sheet.

From: Young, Avery, NMENV
Sent: Tuesday, June 16, 2020 2:25 PM
To: Vajda, Josh - RES
Subject: RE: WIPP Facultative Lagoon System Design Drawing - 1987

Great, thank you very much!

Avery Young, Environmental Scientist
New Mexico Environment Department
Ground Water Quality Bureau
1190 Saint Francis Dr, Santa Fe, NM 87505
505-827-2909
https://www.env.nm.gov/gwqb/
Avery.Young@state.nm.us

From: Vajda, Josh - RES <Josh.Vajda@wipp.ws>
Sent: Tuesday, June 16, 2020 2:22 PM
To: Young, Avery, NMENV <Avery.Young@state.nm.us>
Subject: [EXT] RE: WIPP Facultative Lagoon System Design Drawing - 1987

Effluent Lagoons B&C are attached.

From: Young, Avery, NMENV <Avery.Young@state.nm.us>
Sent: Tuesday, June 16, 2020 2:14 PM
To: Vajda, Josh - RES <Josh.Vajda@wipp.ws>
Subject: [EXTERNAL] RE: WIPP Facultative Lagoon System Design Drawing - 1987

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Thank you very much. I don't see the design for Effluent Lagoons B and C attached. Do you have a copy of that?

Avery Young, Environmental Scientist
New Mexico Environment Department
Ground Water Quality Bureau
1190 Saint Francis Dr, Santa Fe, NM 87505
505-827-2909
https://www.env.nm.gov/gwqb/
Avery.Young@state.nm.us

From: Vajda, Josh - RES <Josh.Vajda@wipp.ws>
Sent: Tuesday, June 16, 2020 1:57 PM

To: Young, Avery, NMENV <Avery.Young@state.nm.us>
Subject: [EXT] RE: WIPP Facultative Lagoon System Design Drawing - 1987

Avery,

I have attached the drawings that you have requested. Let me know if you need further drawings and I will do my best to accommodate the request.

Joshua Vajda
WIPP-RES
(575) 234-3214

From: Young, Avery, NMENV <Avery.Young@state.nm.us>
Sent: Monday, June 08, 2020 12:38 PM
To: Vajda, Josh - RES <Josh.Vajda@wipp.ws>
Subject: [EXTERNAL] RE: WIPP Facultative Lagoon System Design Drawing - 1987

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Also, if it's easy enough, can you send the original designs for H-19, Salt Storage Ponds 1, 2, 3, and Stormwater Ponds 1,2, 3? I think I have them in the office, but I'm not sure when I can go in to access them.

Thanks!

Avery Young, Environmental Scientist
New Mexico Environment Department
Ground Water Quality Bureau
1190 Saint Francis Dr, Santa Fe, NM 87505
505-827-2909
https://www.env.nm.gov/gwqb/
Avery.Young@state.nm.us

From: Young, Avery, NMENV
Sent: Monday, June 8, 2020 12:22 PM
To: Vajda, Josh - RES <Josh.Vajda@wipp.ws>
Subject: RE: WIPP Facultative Lagoon System Design Drawing - 1987

Hey Josh,

Is it possible for you to send drawings showing the design for Effluent Lagoons B and C?

Thank you!

Avery Young, Environmental Scientist
New Mexico Environment Department
Ground Water Quality Bureau

1190 Saint Francis Dr, Santa Fe, NM 87505
505-827-2909
https://www.env.nm.gov/gwqb/
Avery.Young@state.nm.us

From: Vajda, Josh - RES <Josh.Vajda@wipp.ws>
Sent: Tuesday, May 19, 2020 11:22 AM
To: Young, Avery, NMENV <Avery.Young@state.nm.us>
Subject: [EXT] RE: WIPP Facultative Lagoon System Design Drawing - 1987

Avery,

We assumed that the impoundment was originally designed for 2 feet because "older" DP-831 Permits had us maintain 2 feet.
As the original drawing shows, 1 foot was the actual freeboard design.
At some point in the WIPP history, we changed it from 2 feet to 1 foot, which aligns with the original design criteria of the impoundment.

Joshua Vajda
WIPP-RES
(575) 234-3214

From: Young, Avery, NMENV <Avery.Young@state.nm.us>
Sent: Monday, May 18, 2020 12:09 PM
To: Vajda, Josh - RES <Josh.Vajda@wipp.ws>
Subject: [EXTERNAL] RE: WIPP Facultative Lagoon System Design Drawing - 1987

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Hi Josh,

I did receive it. Sorry, I thought I'd responded.

I guess I'm just a little confused because during our call Stewart mentioned that it was designed for 2 feet of freeboard. If that is not the case, where did he get that from? Can you please clarify.

Thank you,

Avery Young, Environmental Scientist
New Mexico Environment Department
Ground Water Quality Bureau
1190 Saint Francis Dr, Santa Fe, NM 87505
505-827-2909
https://www.env.nm.gov/gwqb/
Avery.Young@state.nm.us

From: Vajda, Josh - RES <Josh.Vajda@wipp.ws>
Sent: Monday, May 18, 2020 11:25 AM
To: Young, Avery, NMENV <Avery.Young@state.nm.us>
Subject: [EXT] FW: WIPP Facultative Lagoon System Design Drawing - 1987

Avery,

We sent an email with an attachment (2MB) last week regarding our Facultative Lagoon System. I am just checking to ensure that you received it.

Joshua Vajda
WIPP-RES
(575) 234-3214

From: Vajda, Josh - RES
Sent: Tuesday, May 12, 2020 2:34 PM
To: 'Young, Avery, NMENV' <Avery.Young@state.nm.us>
Cc: Chavez, Rick - RES <Rick.Chavez@wipp.ws>; Jones, Stewart - RES <Stewart.Jones@wipp.ws>; Jaco, Bill - RES <bill.jaco@wipp.ws>; Brown, Michael (Mike) - FedNet <mike.brown@cbfo.doe.gov>
Subject: WIPP Facultative Lagoon System Design Drawing - 1987

Avery,

As requested, we have attached the as-built Facultative Lagoon System Design drawing from 1987. The Section A cutaway in the bottom half of the drawing shows the 1 foot freeboard in the original design. The "Maximum Depth" is labeled at elevation 3384 and the "Top of Berm" is labeled at elevation 3385. The freeboard is consistent with Drawing number 25-C-004-W provided in the application. Let us know if you have any questions.

Joshua Vajda
WIPP-RES
(575) 234-3214

Young, Avery, NMENV

From: Salness, Rick - RES <richard.salness@wipp.ws>
Sent: Monday, June 29, 2020 8:25 AM
To: Young, Avery, NMENV
Subject: [EXT] RE: Drilling

You too. Will start on deep 19 corehole today.

Rick Salness, P.G.
Manager, Environmental Monitoring and Hydrology
Nuclear Waste Partnership, LLC - Regulatory Environmental Services Contractor for the U.S. Department of Energy
richard.salness@wipp.ws
(575)234-8966

"A leader is best when people barely know he exists, when his work is done, his aim fulfilled, they will say we did it ourselves" – Lao Tzu

---

From: Young, Avery, NMENV <Avery.Young@state.nm.us>
Sent: Monday, June 29, 2020 8:23 AM
To: Salness, Rick - RES <richard.salness@wipp.ws>
Subject: [EXTERNAL] RE: Drilling


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Ok, thank you. Have a great day!

Avery Young, Environmental Scientist
New Mexico Environment Department
Ground Water Quality Bureau
1190 Saint Francis Dr, Santa Fe, NM 87505
505-827-2909
https://www.env.nm.gov/gwqb/
Avery.Young@state.nm.us

From: Salness, Rick - RES <richard.salness@wipp.ws>
Sent: Monday, June 29, 2020 8:23 AM
To: Young, Avery, NMENV <Avery.Young@state.nm.us>
Subject: [EXT] RE: Drilling

No water at both of them.

Rick Salness, P.G.
Manager, Environmental Monitoring and Hydrology
Nuclear Waste Partnership, LLC - Regulatory Environmental Services Contractor for the U.S. Department of Energy
richard.salness@wipp.ws
(575)234-8966

"A leader is best when people barely know he exists, when his work is done, his aim fulfilled, they will say we did it ourselves" – Lao Tzu

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From: Young, Avery, NMENV <Avery.Young@state.nm.us>
Sent: Monday, June 29, 2020 8:19 AM
To: Salness, Rick - RES <richard.salness@wipp.ws>
Subject: [EXTERNAL] RE: Drilling

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Awesome. Have you encountered water at the one south of Pond 5?

Avery Young, Environmental Scientist
New Mexico Environment Department
Ground Water Quality Bureau
1190 Saint Francis Dr, Santa Fe, NM 87505
505-827-2909
https://www.env.nm.gov/gwqb/
Avery.Young@state.nm.us

From: Salness, Rick - RES <richard.salness@wipp.ws>
Sent: Monday, June 29, 2020 8:14 AM
To: Young, Avery, NMENV <Avery.Young@state.nm.us>
Subject: [EXT] RE: Drilling

16 and 18. Ones south of Pond 4 and Pond 5.

Rick Salness, P.G.
Manager, Environmental Monitoring and Hydrology
Nuclear Waste Partnership, LLC - Regulatory Environmental Services Contractor for the U.S. Department of Energy
richard.salness@wipp.ws
(575)234-8966

"A leader is best when people barely know he exists, when his work is done, his aim fulfilled, they will say we did it ourselves" – Lao Tzu

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From: Young, Avery, NMENV <Avery.Young@state.nm.us>
Sent: Monday, June 29, 2020 8:13 AM
To: Salness, Rick - RES <richard.salness@wipp.ws>
Subject: [EXTERNAL] RE: Drilling

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Great. Thank you for the update. Which two wells will you have drilled?

Avery Young, Environmental Scientist
New Mexico Environment Department
Ground Water Quality Bureau
1190 Saint Francis Dr, Santa Fe, NM 87505
505-827-2909
https://www.env.nm.gov/gwqb/
Avery.Young@state.nm.us

From: Salness, Rick - RES <richard.salness@wipp.ws>
Sent: Monday, June 29, 2020 7:09 AM
To: Young, Avery, NMENV <Avery.Young@state.nm.us>
Subject: [EXT] Drilling

I just wanted to let you know we started drilling on the 22nd and will have two well completed by the end of today.

Rick Salness, P.G.
Manager, Environmental Monitoring and Hydrology
Nuclear Waste Partnership, LLC - Regulatory Environmental Services Contractor for the U.S. Department of Energy
richard.salness@wipp.ws
(575)234-8966

"A leader is best when people barely know he exists, when his work is done, his aim fulfilled, they will say we did it ourselves" – Lao Tzu

From:	Deborah Reade
To:	Young, Avery, NMENV
Cc:	Joni Arends; CARD; dave mccoy; Scott Kovac; Don Hancock; Rose Gardner
Subject:	[EXT] Public Comment on DP-831, Draft Discharge Permit for WIPP
Date:	Wednesday, April 22, 2020 11:21:10 PM
Attachments:	DP-831comments_Reade.pdf

Dear Ms Avery,

Attached, please find my comments on DP-831, the WIPP Draft Discharge Permit. Please let me know if you have any difficulties opening or reading the file. And please add my comments to the Administrative Record for DP-831.

Best wishes,
Deborah Reade

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117 Duran Street
Santa Fe NM 87501-1817
Phone/fax 505-986-9284
Reade@nets.com

April 22, 2020

By email to: Avery.Young@state.nm.us

Ms Avery Young, Permit Contact
Ground Water Quality Bureau
New Mexico Environment Department
Santa Fe, New Mexico

Re: Public Comments and Request for Public Hearing for the
Draft Discharge Permit DP-831, 3/2/2020 for WIPP

Dear Ms Young:

First, I am requesting that the comment period be postponed until the Corona Virus emergency has ended. When the state is still "peaking" and people throughout the state have lost their jobs, are scrambling to feed their families, find medical insurance, pay rent, **and are worried about their very lives,** it is impossible for the public—even directly-affected community members—to concentrate adequately on a discharge permit renewal.

If this is not enough to convince NMED to extend this process, perhaps more procedurally important, is that it has been impossible during this emergency, to study the Administrative Record for DP-831. A question about publication dates arose in my review of the public notice but there is no way to check that date, as the Record and even any Index of the Record are not online. Hardcopy can't be safely viewed at NMED's offices or anywhere else. In fact, the Record has been inaccessible to the public during two thirds of the comment period, since the Governor's March 23rd order.

In addition, hardcopy versions of the Draft Permit, the Fact Sheet and the PIP which were put in two public libraries and the local field office repositories were also inaccessible to the directly affected community because of closures during two thirds of the comment period. This included most of the information available for Low English Proficiency (LEP) Spanish speakers—the Fact Sheet. Though these documents are available online, NMED is well aware of the difficulties the local community in southeastern New Mexico has with online access because of lack of computer access, lack of proficiency going online and difficulties with connection in this area. This particularly affects the LEP community.

Also, were full translation and interpretation services available for LEP Spanish speakers during this same period? It doesn't appear so. Certainly, NMED still has no Spanish option on its phone service; even the non-discrimination coordinator's message is only in English and now has been abbreviated simply to "New Mexico Environment Department." If you go to the non-employee complaint page on NMED's website, the Spanish version is hidden. The English version fills the page and there is no link visible or indication to scroll down for Spanish. All of this combines to continue the difficulty LEP Spanish speakers have in participating and rises to the level of discriminatory action as these members of the public cannot access even the minimal materials translated for them, nor can they find out how to complain about this. No wonder NMED considers the potential for LEP contact with the permitting process to be only "occasional."

For these reasons alone, the comment period must be postponed or extended until the Record and hardcopy documents are safely available for review. At this point it is impossible to say when safe review of hardcopy documents either at NMED or near the facility will be available. Since many potentially affected people cannot access online documents, posting the documents online, as NMED has done, is unfortunately not sufficient. Posting the Administrative Record and the Index online might solve the problem of their inaccessibility, however, as anyone who would be researching on that level is probably able to use online resources. When critical and vital documents are not available for most of the comment period, the public participation process is defective and must be redone.

My comments will cover:

1. the DP-831 PIP
2. the latest PN-2
3, the Fact Sheet/Permit Summary

I am requesting:

1. a revision of Permit to eliminate the inclusion of Salt Cell 5 and Salt Storage Pond 5
2. a revision of the Fact Sheet whether or not the Draft Permit is revised
3. an extension or postponement of the comment period with an improved new PN-2 published after the Fact Sheet has been revised.
4. and even if none of these requests is approved, I request a public hearing. WIPP is an important and controversial facility in whose activities there is widespread interest throughout the state. Therefore, a hearing on this discharge permit must be held.

Public Involvement Plan (PIP) for DP-831
As with virtually all of NMED's PIPs, this PIP has certain glaring deficiencies—one of the largest being that PIPs are never translated into Spanish or any language other than English. I will describe the usual deficiencies at the end of this section as these deficiencies repeat in PIP after PIP with monotonous regularity. First I will describe problems that are unique to this particular PIP.

1. NMED relies too heavily and only on EJSCREEN as they do in all PIPs. What is particularly bad about this PIP is that NMED has arbitrarily chosen only a 30 mile radius for their EJSCREEN. We had hoped, after the URENCO discharge permit EJSCREEN radius was extended to 50 miles that other PIPs would follow. 50 miles is standard for EIS demographic investigations and was the radius used in the WIPP RCRA permit Volume Mod PIP. NMED has provided no justification for picking a 30 mile radius or for limiting the radius to 30 mile in one WIPP permit after using a 50 mile radius in another permit.

If NMED had extended to 50 miles they would have found that there was a majority of minority people in the area (55%). In addition, the people who speak a language other than English at home increases from 25 to 35%, and significantly, those who don't speak English well *doubles* from 5 to 10%. NMED said there were fewer linguistically isolated households than the state average within 30 miles, but that does not appear to be true if you go out to 50 miles.

NMED has no criteria on which to base choosing an EJSCREEN radius and should always pick the most conservative radius (in this case the largest and most commonly used). NMED needs to develop some kind of criteria as this decision should not be left to someone's best guess.

2. There are several other problems with the DP-1481 PIP starting with the lack of information for the general public on how to appeal or revise the PIP. In fact, there is no formal process at all to allow the public to respond when problems are found in the PIP. The public has no clear path to request corrections, make suggestions, or provide community-based, local input. Thus problems continue and the PIPs, including this one, having little or no public involvement of any kind in their creation, are of only limited use.

3. And, of course, the PIP is not translated into Spanish. How can members of the affected community who are LEP even have any idea what the PIP is about, let alone try to gauge its adequacy or make suggestions to improve it? Just finding the PIP online would be almost impossible if you are LEP, as the PIP website is also completely in English as are almost all Ground Water Quality Bureau (GWQB) pages and most of the rest of NMED's website. Nothing about accessing information at NMED is user-friendly if you are LEP.

The PIP acknowledges that the affected community has a significant percentage of persons with low English proficiency and thus allows for translation of some notices and announcements. It also requires all public notices to include information that interpretation is available and that translation can be arranged. However, the PIP limits the amount of language assistance that is provided to what is possible within the Bureau's "budget and time limitations." These limitations have resulted in a completely inadequate amount of translation so that it is impossible for LEP Spanish speakers to inform themselves enough to provide comments, make their needs known and to participate on a equal level with English speakers.

Interestingly, NMED never says they can only work with applicants or permittees as their "budget and time limitations allow." Instead, NMED provides thousands of dollars of their employees' work time and provides other resources to help applicants and Permittees. There are usually only pennies on the dollar left for NMED to assist the LEP public. The pitiful amount of translation of information recommended by this PIP is said to be all that NMED can afford. A note is made "[f]ees collected from the permittees...are not sufficient to cover [even] these costs." Yet NMED had a chance to raise those fees and chose not to. The public, and especially the LEP public, should not have to suffer without adequate information because of the Bureau's poor planning and poor budgeting.

NMED made a commitment in the Resolution Agreement to "ensure that all 'vital' information related to the ...permit process is accessible to LEP persons in a language they can understand." and that "...vital information...that is available to the public in English, whether in written form or orally, will, at a minimum, be available to the non-English speaking public through a qualified interpreter or through translation depending on the circumstances." Yet, again, NMED has not translated the permit, nor have they created and translated an adequate Fact Sheet containing a summary of all vital information in the draft permit and all other vital information. (More on the Fact Sheet is described below.) This is presumably because of NMED's time and budget constraints. However, the permitting process should not go forward until all vital information available to English speakers has been translated directly or adequately summarized and translated for LEP

Spanish speakers. Again, it is not okay to short circuit the public process while proceeding full speed ahead for the permittees.

3. The PIP overly relies on using only EJSCREEN and information in the ACS report to provide information on the affected community's needs, concerns, history, and demographics. This is despite the warnings in EPA's EJSCREEN Fact Sheet not to use EJSCREEN "as the sole basis for...decision-making or making a determination regarding the existence or absence of EJ concerns." It also says that EJSCREEN should be supplemented with "...additional information and local knowledge..." But NMED appears to have no interest in using local knowledge as they have made no effort to identify stakeholders in the affected community nor any effort to create partnerships with most private and public entities or to share information with affected communities, with environmental and environmental justice organizations, religious institutions, public administration, environmental, law and health departments at colleges and universities and relevant community service organizations.

What is critically important is that because of the lack of local knowledge, this PIP, like all NMED's PIPs, covers almost none of the community's concerns or needs or their history. The only concerns mentioned are language and disability needs—and even attention to those is minimal. All other concerns of the community are completely ignored though NMED has been told of them over and over again in comments, letters, during hearings, in complaints, in negotiations, etc. for years. NMED knows of the high cancer death rate and low life expectancies in southeastern New Mexico, the enormous level of pollution, the multiplicity of polluting facilities both permitted and unpermitted, the lack of access to medical care, the low income, high numbers of LEP persons, the rural nature of the area, and other social concerns of area residents. Yet again, NMED has chosen to ignore all of these, both in the PIP and in the formation of the draft permit. Not a word on any of this history or on any of these needs and concerns is anywhere in the PIP, public notice or permit. This is a significant deficiency.

Public Notice

This public notice has no publication date on it as with most of NMED's documents. It does state that the 45 day comment period ends on April 22, 2020 so counting back the publication date would be 3/8/20. This is also the online date given. However, downloading the Fact Sheet and the Public Notice from the website shows a date of 3/11/20 in the title of both documents. It's thus unclear when this public notice was actually published in the required newspapers or in other ways. It has been impossible for most of the comment period to check this date as the Record is inaccessible.

The **Discharge Locations** section of this notice is inadequate. Though the locations are described by type, they are not described by location in relation to the rest of the facility. In fact, it is even unclear if all these systems, cells and impoundments are above or below ground.

The **Activities that produce the discharge** section is also inadequate. It is unclear what "salt cells" are and too vague about what "other miscellaneous industrial non-hazardous wastewaters" are.

Potential Contaminants are listed only as nitrogen compounds, dissolved solids and chloride. It is not mentioned that any radioactive materials could be contaminants though they are monitored under this draft permit. Since the entire WIPP facility is devoted to radioactive waste, even if NMED can't regulate all the radioactive materials present, it should still tell the public what could be in the discharges. More could be present than NMED can monitor and that all should have been included here. In addition, the Fact Sheet refers to one-time monitoring of "a comprehensive list of chemical constituents," none of which are mentioned here. This section is deficient.

Accessing documents is confusing as one document is described as a "Fact Sheet" online but is described in the repositories in Eddy County as "the permit summary." NMED employees and this commenter have some experience to understand that this is only one document, but that isn't true of the general or LEP public. They have no idea whether these are two different documents or the same document so this is completely confusing for those with little knowledge of how to participate. And because LEP individuals have no access to the permit itself or to the administrative record, it is important to include extra information and clarifications that we just intuitively understand. It's difficult to imagine not knowing what we know, but it's necessary. NMED says they want to increase public participation but confusion like two different document names helps to lower public involvement.

The public notice tries to describe how the public can participate in a hearing and the procedures to be followed by the Secretary in making a final determination about the Draft Permit. However, the notice states that "members of the public may file *technical testimony* prior to the hearing and may provide verbal and written comments during the hearing itself." The statement about technical testimony is incorrect (though the second part of the statement is fine). Technical testimony can only be presented at the hearing itself though people can file a "statement of intent to present technical testimony" before the hearing. In the pre-hearing period, the public may "provide a general written statement concerning the Draft Permit, Application or Petition ..." [20.1.4.300B(2) NMAC] This is how it should have been described in the public notice—as general written statements, not technical testimony. Providing incorrect information on how to participate, again, only helps to lower public involvement and makes this section of the public notice deficient.

At the end of the paragraph the public notice also states that "NMED will approve, approve with conditions or disapprove the Permit based on the Administrative Record *and/or Final Order* from the NMED Cabinet secretary." Again, this is incorrect and confusing. The decision is not based in any way on the "Final Order from the ... secretary." The Final Order *is* the decision. A decision cannot be based on itself! The decision is made by the Secretary *based only on information in the Administrative Record*. NMED has stated this clearly in other documents and this should be cleared up in any future public notices. Wording this required statement in this way is confusing and incorrect and also makes this section of the notice deficient.

Finally, the public notice says that "Requested translation, interpretation services and accommodations or services for persons with disabilities will be arranged *to the extent possible.*" In fact, NMED must meet certain minimal translation, interpretation and accommodation requirements—period. Not to do so is discriminatory. If NMED cannot meet these minimum requirements so that the process is not discriminatory, NMED must stop the process until it can run a non-discriminatory public participation process.

Fact Sheet
Unfortunately, this Fact Sheet is deficient throughout and needs to be completely re-written. It is not an adequate summary of the Permit. I read it without reading the permit as an LEP Spanish speaker would do and I gained very little understanding of the draft permit, the geology and hydrology of the area and the demographics, history, needs and concerns of the potentially affected communities near WIPP. If the vital document of the permit is not translated in its entirety and this is all people have to explain the discharge permit, everything must be spelled out in much more detail. This Fact Sheet simply states that a certain section puts in the requirements for how something is to be done and leaves it at that. There is usually no description about how specifically those requirements have been met in the particular section.

Because NMED has allowed other permits to be approved with extensive deficiencies, it is critical that all members of the public can know exactly how regulatory requirements are to be met. This summary provides little detailed information. I recommend that NMED use the second URENCO fact sheet as a guide, supplemented by CCNS's comments. That is the best fact sheet prepared in many years, though even that needed to be tweaked so the LEP public had adequate information. Specific comments follow.

1. The first paragraph says the fact sheet is required by Subsection I of 20.6.2.3108 NMAC but this requirements does not appear to be part of that Subsection. Please clarify where NMED found this requirement and what the specific language of the requirement is.

2. **General Facility Information**
The description of the very complex geology and hydrology at WIPP is too thin, though the description of the human caused contaminated shallow groundwater is quite interesting. However, when writing for the general public, a description other than "anthropogenically created" should be used as that is very user un-friendly! It almost seems to hide the fact that WIPP created this contaminated water and is now a hazardous waste generator. This is important to understand since this contaminated water appears to be the result of the failure of a previous version of this discharge permit. This should lead people to look more closely to see if the provisions of this version of the permit are now adequate.

Also, a reference is made later to water percolating through the "vadose zone" but this zone is not described here, which it should be. The laterally continuous water-bearing zone in the Culebra has no depth described. Other geologic formations are described with thicknesses but require a calculation to figure where they start and end except for the Salado Formation. Calculations shouldn't be necessary here and this critically important section needs to be fleshed out much more.

3, **Description of the Proposed Discharge**
This section is again, deficient. Typos make it more confusing. Industrial wastewater is described as non-hazardous. Is it also non-radioactive? This needs to be clarified. Where evaporites go after treatment is also not described. It is totally insufficient to describe "*other miscellaneous* industrial non-hazardous wastewaters" and leave it at that. You must list every source for all waters. Stating the 100-year storm capacities for various impoundments etc. is a nice touch, however. Remember, LEP persons only know what is written in this Fact Sheet and the Public Notices.

4. **Operational Plan and Monitoring and Reporting conditions**
Both of these sections are so deficient that it is impossible to list everything. Again—get specific. It is totally unclear how many monitoring wells there are, (except for 4 that are very nicely described) or where they are, how deep each of them is, whether any are in the vadose zone, whether proper vadose zone monitoring is taking place, and mostly what contaminants are being monitored. The one-time monitoring states they are looking for a "comprehensive list of chemical constituents" but what are they? Certain NMED-regulated radioactive constituents are listed but could other radioactive constituents possibly be in the discharge as well? This needs to be clarified. The summary of the semi-annual monitoring reports is very well done.

5. **Additional Studies**
This is also well done and provides a good explanation of why a new workplan is required.

6. **Contingency Plan**
This is a critical part of the permit but basically says nothing. "Standard language" has been totally insufficient in previous permits so a detailed description here is necessary. It is impossible for the LEP public who have no access to the permit to know if the language here is adequate. In fact, I would say that this entire section should be copied and translated word for word from the permit. Anything else does not provide the same amount of vital information to LEP persons as is available to English speakers who can read the permit. Again, because of NMED's previous bad language in this section of another permit, they must go the distance to prove that this part of the permit is adequate.

7. **Closure Conditions.**
Again, there is not enough detailed information here. However, the statement that closure requirements survive the discharge permit is good to know. This is the first time the vadose zone is mentioned in the Fact Sheet and there should be more information on this. It is stated that there is a condition for properly closing the Facility in accordance with the WIPP Land Withdrawal Act and other rules and regulations, but the full condition needs to be described. It is unclear if the condition truly meets these laws' requirements. Particularly since the Land Withdrawal Act includes timelines and volume limitations, it is unclear if the permit truly is in compliance with the Act.

6. **General Terms and Conditions**
Again, more detail is required—though perhaps not as much detail as is needed in previous sections. In particular, the requirement to comply with other laws etc. should be quoted in its entirety.

Permit Problems
The modification including Salt Cell 5 and Salt Storage Pond 5 is premature. These items have not been approved yet and hopefully will never be approved. To permit discharge from these areas when they don't exist is not the correct way of doing things. If they are approved, then modify the permit. NMED appears to be trying to do an end run around the public by approving Salt Cell 5 here in a discharge permit when it should be part of a RCRA permit.

Conclusion
There are many problems with the PIP, Public Notice, Fact Sheet and the Draft Permit itself. These all need to be corrected and a new comment period and public notice, fact sheet etc. issued. Because of the virus and the current emergency, the lack of access to critical and vital documents, and combined with these multiple deficiencies, NMED should be in no hurry to push forward with this permit. This is the perfect time to correct all these problems so that when the emergency is lifted and the public can give their full attention to the permit process, NMED will be ready with excellent documents and information for the public process.

If NMED, however, chooses to go ahead with what would be a discriminatory process as well as a process that does not even meet the mimum requirements for the general public, I request that there be a public hearing on this version of the permit.

Sincerely,
Deborah Reade
117 Duran Street
Santa Fe, NM 87501
reade@nets.com

From:	Joni Arends
To:	Young, Avery, NMENV
Cc:	Roose, Rebecca, NMENV; Hunter, Michelle, NMENV; Pullen, Steve, NMENV; Sandoval, Melanie, NMENV; Stringer, Stephanie, NMENV; Pierard, Kevin, NMENV; Maestas, Ricardo, NMENV
Subject:	[EXT] CCNS Public Comments about draft DP-831 for WIPP
Date:	Wednesday, April 22, 2020 10:24:08 PM

April 22, 2020

By email to: Avery.Young@state.nm.us

Ms. Avery Young, Permit Contact
Ground Water Quality Bureau
New Mexico Environment Department
Santa Fe, NM

Re: Public Comments and Request for Public Hearing
Draft March 2, 2020 DP-831 for the Waste Isolation Pilot Plant (WIPP)
Opposition to Inclusion of Salt Cell 5 and Salt Storage Pond 5 in DP-831

Dear Ms. Young:

Concerned Citizens for Nuclear Safety (CCNS) is a Santa Fe-based non-governmental organization that formed in 1988 to address community concerns about the proposed transportation of radioactive and hazardous wastes from Los Alamos National Laboratory (LANL) to the unopened Waste Isolation Pilot Plant (WIPP) through Santa Fe on St. Francis Drive. Our mission is to *protect all living beings and the environment from the effects of radioactive and other hazardous materials now and in the future.*

CCNS opposes the inclusion of Salt Cell 5 and Salt Storage Pond 5 in the draft DP-831 for WIPP. Those two proposed facilities are essential for the new shaft and associated drifts, which are part of the "Forever WIPP" expansion, which CCNS strongly opposes. CCNS questions why they are included in the draft DP-831 when the New Mexico Environment Department (NMED) has not allowed construction of the proposed shaft and associated drifts. In fact, a temporary authorization request is pending decision before the NMED Hazardous Waste Bureau (HWB). Further, in both cases, such permitting can only happen after public comments, negotiations, and a public hearing, which have not occurred.

NMED must delete all reference to proposed Salt Cell 5 and proposed Salt Storage Pond 5 in the draft permit. It is unnecessary to include these facilities in draft DP-831. DOE is attempting a slight-of-hand to permit the proposed facilities without the HWB making a decision.

CCNS requests negotiations and a public hearing on the draft permit for the reasons detailed below about the draft Permit and Public Involvement Plan (PIP).

CCNS and many other non-governmental organizations and individuals oppose "Forever WIPP," and there is substantial public interest in the proposed WIPP expansion, including the new shaft, associated drifts, and the addition of proposed

Salt Cell 5 and Salt Storage Pond 5 that will receive industrial wastewater and stormwater. Please see the hundreds of 8 ½ by 5 ½ inch postcards submitted to the NMED HWB opposing the "WIPP Forever" Plans.

CCNS requests that NMED delete Salt Cell 5 and Salt Storage Pond 5 and its capacity of 1,292,499 gallons per day discharge volume from the draft permit.

Comments about the Public Involvement Plan (PIP), Template Version 2018-10-16, dated February 12, 2019.

1. *Inconsistent availability of documents.* Table of Public Involvement Activities on PIP page 3 does not include two of the document repository locations in Eddy County described in the Fact Sheet. They are the Eunice Public Library and Carlsbad Public Library.

Further, the Table of Mandated Public Involvement Activities on PIP page 8 does not list under Public Notice (PN-2) that the PIP will also be available, along with the draft permit and fact sheet.

2. *PIP does not include the NMED Spanish phone number: 1-800-327-1857 for Relay New Mexico found in the Fact Sheet and PN-2.* Under the PIP Non-English Language Speaker Assistance the Spanish phone number is not provided.

3. *NMED does not provide justification for using a 30-mile radius for the EJSCREEN analysis for this proposed permit.* NMED uses a 50-mile radius for the EJSCREEN for the its Hazardous Waste Permit for WIPP, which is up for renewal in 2020. What is NMED's justification for reducing the radius used?

4. *Occasional contact with LEP persons.* Following EJSCREEN analysis, NMED states, "[T]he Bureau considers the potential for Limited English Proficiency (LEP) contact with the permitting process to be 'occasional.'"

Conclusion. Given the reduced EJSCREEN radius, the omission of the Spanish phone number in the PIP, and the inconsistencies between the PIP and Fact Sheet about where the document repositories are located, of course, NMED would come to the conclusion that the potential for LEP contact is "occasional." CCNS urges NMED to correct these errors and re-issue the PIP, the PN-2, and Fact Sheet to fulfill its obligations under NMED's *Public Participation Policy 07-13.*

General Comments about the draft DP-831.

<!--[if !supportLists]-->1. <!--[endif]-->Delete all references to [proposed] Salt Cell 5 to [proposed] Salt Storage Pond 5 in the Table of Contents. P. 2.

<!--[if !supportLists]-->2. <!--[endif]-->Delete all references to [proposed] Salt Cell 5 and [proposed] Salt Storage Pond 5 in first bulleted paragraph and

last full paragraph at the bottom of p. 2 of 38.

<!--[if !supportLists]-->3. <!--[endif]-->Is the HDPE pipe proposed for installation "to collect and transmit by gravity the leachate and stormwater runoff from [proposed] Salt Cell 5 to [proposed] Salt Storage Pond 5" double-lined? P. 2 of 38.

<!--[if !supportLists]-->4. <!--[endif]-->Page 3 of 38: delete reference to proposed Salt Cell 5 and proposed Salt Storage Pond 5 in the first paragraph (bolded), as well as in bolded language on p. 6 of 38.

<!--[if !supportLists]-->5. <!--[endif]-->Add the following acronyms to the table on p. 4: LLDP, HDPE, and leak detection, collections, and recovery systems (LDCRS).

<!--[if !supportLists]-->6. <!--[endif]-->Section III. Authorization to Discharge includes reference to proposed Salt Cell 5 and proposed Salt Storage Pond 5, which must be deleted. P. 5 of 38.

<!--[if !supportLists]-->7. <!--[endif]-->The draft permit does not require calibration of monitoring equipment and flow measurement devices within a certain range of measurement, e.g., +/- 1%.

<!--[if !supportLists]-->8. <!--[endif]-->Add a Condition requiring DP-831 documents be posted to the WIPP Electronic Public Reading Room, such as the semi-annual monitoring reports (Condition 29) and groundwater monitoring data and reports (Condition 62).

Operational Plan Comments

<!--[if !supportLists]-->9. <!--[endif]-->Part A, # 3 must include requirements to meet the manufacturer's specifications for inspections and maintenance for the impoundment liners. p. 6 of 38.

<!--[if !supportLists]-->10. <!--[endif]-->Part A, # 4 – The *Groundwater Discharge Permit Guidance for Synthetically Lined Lagoons – Liner Material and Site Preparation* at No. 3, under Lagoon Design and Site Preparation Requirements, "Lagoon volume shall be designed to allow for a minimum of [two feet] 24 inches of freeboard." What is the justification for requiring one foot of freeboard throughout most of the permit? One foot of freeboard does not comply with NMED Guidance and Requirements.

<!--[if !supportLists]-->11. <!--[endif]-->Part B, # 5 – should the time period in the first sentence be revised from "three years" to "two years"? Three years conflict with the later requirement to submit the solids removal and

disposal plan to NMED for approval "within two years and two months following the effective date of this Discharge Permit…." Further, such as change would be consistent with Condition # 15. P. 10 of 38.

<!--[if !supportLists]-->12. <!--[endif]-->P. 11 of 38: Delete proposed Salt Storage Pond 5 and proposed Salt Cell 5 from the Part D title, as well as on p. 20 of 38, and p. 33 of 38.

<!--[if !supportLists]-->13. <!--[endif]-->Part D, # 19 – delete this Condition, which references the proposed Salt Storage Pond 5.

<!--[if !supportLists]-->14. <!--[endif]-->Part D, # 20 – delete this Condition, which references the proposed Salt Storage Pond 5 and proposed Salt Cell 5.

<!--[if !supportLists]-->15. <!--[endif]-->Part D, # 21 – delete this Condition, which references the proposed Salt Storage Pond 5 and proposed Salt Cell 5.

<!--[if !supportLists]-->16. <!--[endif]-->Part D, # 25 – delete reference to the proposed Salt Storage Pond 5.

Monitoring and Reporting Comments

<!--[if !supportLists]-->17. <!--[endif]-->Part D, # 46 – delete reference to proposed Salt Storage Pond 5.

<!--[if !supportLists]-->18. <!--[endif]-->Part D, # 47 – delete reference to proposed Salt Storage Pond 5.

<!--[if !supportLists]-->19. <!--[endif]-->Part D, # 49 – delete this Condition, which references Salt Storage Pond 5.

<!--[if !supportLists]-->20. <!--[endif]-->Part D, # 51 – delete reference to the proposed Salt Storage Pond 5.

Closure Plan Comments

<!--[if !supportLists]-->21. <!--[endif]-->Part D, # 75 – delete reference to proposed Salt Storage Pond 5.

Comments about Discharge Permit Summary.

The *Groundwater Discharge Permit Guidance for Synthetically Lined Lagoons – Liner Material and Site Preparation* requires at No. 3, under Liner Material Requirements, "Under no circumstance shall a synthetic liner material less than 40 mils in thickness be accepted."

Nevertheless, for the Domestic Wastewater description and comments, Effluent Lagoon A, B, and C are lined with 30-mil LLDP synthetic liner.

Under the Non-Domestic Wastewater description and comment, the Evaporation Pond H-19 uses a 36-mil Hypalon synthetic liner.

It is unclear why relaxed requirements are allowed.

The *Guidance* at No. 3, under Lagoon Design and Site Preparation Requirements, "Lagoon volume shall be designed to allow for a minimum of [two feet] 24 inches of freeboard."

Nevertheless, for the Domestic Wastewater description and comments, none of the impoundments are required to meet a minimum of two feet of freeboard. Each of the seven permitted lagoons only requires one foot of freeboard.

Under Storm Water Control heading, all three Storm Water Ponds require one foot of freeboard.

Under the Non-Domestic Wastewater heading, the Evaporation Pond H-19, Salt Storage Pond 1, and Salt Storage Pond 2/3, require one foot of freeboard. The Brine Salt Storage Pond 4 (to be constructed) requires one foot of freeboard.

It remains unclear why the relaxed requirements are allowed.

Thank you for your careful consideration of CCNS's comments. Please contact me with any questions or comments.

Sincerely,

Joni Arends, CCNS Co-founder and Executive Director

cc: Rebecca Roose
Michelle Hunter
Steve Pullen
Melanie Sandoval
Stephanie Stringer
Kevin Pierard
Ricardo Maestas

--
Joni Arends, Executive Director
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505 986-1973
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From:	Scott Kovac
To:	Young, Avery, NMENV
Cc:	Jay Coghlan
Subject:	[EXT] NWNM Comments on WIPP draft DP-831
Date:	Wednesday, April 22, 2020 1:42:23 PM
Attachments:	NWNM WIPP DP-831 Comments 4-22-20.pdf

Ms. Young,
Attached are our comments on the Waste Isolation Pilot Plant Draft Groundwater Discharge Permit DP-831 Renewal and Modification.

Please respond as to the receipt and readability of these comments.

Thank you for this opportunity,
Scott

--
Scott Kovac
Nuclear Watch New Mexico
903 W. Alameda #325
Santa Fe, NM 87501
www.nukewatch.org

-->

nuclear watch new mexico

April 22, 2020

Avery Young
New Mexico Environment Department
Ground Water Quality Bureau
P.O. Box 5469
Santa Fe, NM 87502-5469

Via e-mail to: avery.young@state.nm.us

RE: Waste Isolation Pilot Plant Draft Groundwater Discharge Permit DP-831 Renewal and Modification

Dear Ms. Young:

Thank you for this opportunity to provide comments on the Waste Isolation Pilot Plant Draft Groundwater Discharge Permit DP-831 Renewal and Modification. Through comprehensive research, public education, and effective citizen action, Nuclear Watch New Mexico seeks to promote safety and environmental protection at regional nuclear facilities; mission diversification away from nuclear weapons programs; greater accountability and cleanup in the nation-wide nuclear weapons complex; and consistent U.S. leadership toward a world free of nuclear weapons.

Nuclear Watch New Mexico opposes the inclusion of Salt Cell 5 and Salt Storage Pond 5 in DP-831. Those facilities are essential for the new shaft and associated drifts, which are part of the "Forever WIPP" expansion, which our organization strongly opposes.

Further, we object to including facilities essential for the new shaft, when construction of the shaft has not been permitted by the NMED that can only happen after public comments, negotiations, and a hearing, which have not occurred.

Nuclear Watch New Mexico and many other groups oppose "Forever WIPP," and there is substantial public interest against WIPP expansion, including the new shaft and related drifts.

We request negotiations and a hearing on the draft permit.

Nuclear Watch New Mexico
903 W. Alameda #325, Santa Fe, NM 87501 • Voice and fax: 505.989.7342
info@nukewatch.org • www.nukewatch.org • http://www.nukewatch.org/watchblog/

Salt Cell 5 and Salt Storage Pond 5 and its discharge capacity of 1,292,499 gallons per day discharge volume should be deleted from the renewed permit as prejudicial actions biased towards an expansion of WIPP that have yet to be debated and approved.

If Salt Cell 5 and Salt Storage Pond 5 prematurely remain in the permit, the fact that the salt put in each of these is to be mined from an unapproved new shaft (Shaft 5) and unapproved new drifts must be included in this permit. And the fact that Shaft 5 may not be approved for construction must be included in this permit.

Nuclear Watch New Mexico strongly believes that there is not adequate NEPA analysis to support the construction and operation of the new shaft, Salt Cell 5, and Salt Storage Pond 5. We also believe that NMED should not permit facilities that do not have adequate, required NEPA documentation.

Again, thank you for this opportunity to comment.

Sincerely,

Jay Coghlan
Executive Director

Scott Kovac
Research and Operations Director

From:	Don Hancock
To:	Young, Avery, NMENV
Cc:	Roose, Rebecca, NMENV; Hunter, Michelle, NMENV; Sandoval, Melanie, NMENV; Stringer, Stephanie, NMENV; Pierard, Kevin, NMENV; Maestas, Ricardo, NMENV; Pullen, Steve, NMENV
Subject:	[EXT] DP-831 Comments and Request for negotiations and hearing
Date:	Wednesday, April 22, 2020 12:09:49 PM
Attachments:	sriccomm042220.pdf

Avery,

Thank you for your assistance and for the careful consideration of, and response to, the attached comments.

SOUTHWEST RESEARCH AND INFORMATION CENTER
P.O. Box 4524 Albuquerque, NM 87196 505-262-1862 FAX: 505-262-1864 www.sric.org

April 22, 2020

Ground Water Quality Bureau
New Mexico Environment Department (NMED)
PO Box 5469
Santa Fe, NM 87502-5469 Via email: Avery.Young@state.nm.us

RE: WIPP Draft Discharge Permit (DP)-831

Dear Ms. Young:

Southwest Research and Information Center (SRIC) is a non-profit organization based in Albuquerque, New Mexico that focuses on public education and involvement and public health and environmental justice. SRIC has been involved in Waste Isolation Pilot Plant (WIPP) Hazardous Waste Act (HWA) permitting activities for more than 20 years, as well as numerous other activities related to WIPP, public health, and the environment.

SRIC provides these comments on the Groundwater Discharge Permit, DP-831, Waste Isolation Pilot Plant, according to the Public Notice.

SRIC does not object to a renewal of the existing permit or for modifying the permit to add Brine Salt Storage Pond 4, Brine Retention Pond East, and Brine Retention Pond West. However, SRIC strongly opposes the inclusion in the permit of Salt Cell 5 and Salt Storage Pond 5, which are for a new shaft #5 and connecting drifts, which is an expansion of the WIPP facility that is strongly opposed by SRIC and many organizations and individuals, and has not been permitted to be constructed by NMED. Salt Cell 5 and Salt Storage Pond 5 and its 1,292,499 gpd discharge volume should not be included in the renewed and modified permit.

SRIC also requests negotiations and a public hearing regarding the draft permit.

Following are SRIC's more detailed comments.

1. <u>The new shaft has not been permitted for construction by NMED</u>.
On December 22, 2017, the Department of Energy (DOE) and co-permittee Nuclear Waste Partnership (NWP) submitted a Request for Determination of Class to the NMED Hazardous Waste Bureau (HWB) for a new shaft and connecting drifts.[1] SRIC and others submitted

[1]https://wipp.energy.gov/library/Information_Repository_A/Permit_Modification_Class_Determination_Requests_NMED_Responses/17-1091_Redacted_Enclosure.pdf

comments that the request must be considered as a Class 3 modification.[2] On August 15, 2019, DOE withdrew the 2017 request and submitted a Class 3 modification request for the new shaft and connecting drifts.[3] On January 16, 2020, DOE submitted a request for Temporary Authorization (TA) to begin construction of the new shaft.[4] As of this date, NMED has provided a Technical Incompleteness Determination on the Class 3 modification, but has not taken final action on either the TA or Class 3 request.

Thus, it is uncontested that construction of the new shaft cannot begin because there is no TA or approved modification. Consequently, there can be no discharge, and DOE cannot state that it intends to use Salt Cell 5 and Salt Storage Pond 5 when it does not have the required HWA permit to construct the new shaft and associated drifts. Additionally, NMED should not approve a discharge permit with facilities that are only needed for the new shaft and connecting drifts, while at the same time not permitting construction of the new shaft and connecting drifts.

2. <u>There is very significant public interest in the new shaft because it is part of the "Forever WIPP" expansion plans</u>.
There have been extensive comments from several organizations, including SRIC, and dozens (and perhaps more) of individuals opposing WIPP expansion and the new shaft and connecting drifts that have been submitted to Ricardo Maestas of the NMED HWB. The significant public interest is because the new shaft and connecting drifts are part of a DOE plan to substantially expand WIPP, including its physical facilities outside the long-established surface and underground footprint, its operating lifetime for waste disposal from 25 years to 80 years or longer, and the types and amounts of waste allowed.

Limits for WIPP were initially established by the Consultation and Cooperation (C&C) Agreement signed by the Governor of New Mexico and Secretary of Energy on July 1, 1981. The C&C Agreement has been modified, and it includes limits and requirements for WIPP. The WIPP Land Withdrawal Act (LWA, Public Law 102-579) also provides numerous limits and requirements for WIPP. The law also states that the C&C Agreement remains in full force and effect. Section 21. However, DOE has recently taken actions to exceed some of those limits and has released documents that describe some expansion plans. Among other documents, the DOE Carlsbad Field Office *Draft 2019-2024 Strategic Plan* declares the objective of operating WIPP through 2050 to emplace, not the up to 6.2 million cubic feet of defense transuranic (TRU) waste allowed by the C&C Agreement and LWA, but the entire "existing defense TRU waste inventory."[5] DOE's December 2019 *Final Supplement Analysis of the Complex Transformation Supplemental Programmatic Environmental Impact Statement* states that waste will be disposed at WIPP until sometime after 2080.[6] There is very significant public interest and opposition to those plans, including the new shaft and connecting drifts.

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[2] http://sric.org/nuclear/docs/030819_SRIC_Shaft-Determination-letter-w-attach.pdf
[3] https://wipp.energy.gov/Library/Information_Repository_A/Class_3_Permit_Modifications/19-0241_Letter_Redacted.pdf
[4] https://wipp.energy.gov/Library/Information_Repository_A/Extensions_of_Time/20-0201_Letter_Redacted.pdf
[5] https://wipp.energy.gov/pdfs/DOE-CBFO-19-3605_CBFO%20Strategic%20Plan%202019-2023-Rev%200-DRAFT%20A.pdf, at 1.
[6] https://www.energy.gov/sites/prod/files/2020/01/f70/final-supplement-analysis-eis-0236-s4-sa-02-complex-transformation-12-2019.pdf, at 65.

3. <u>The Public Notice, Fact Sheet, and draft Permit are deficient because they do not state that the Salt Cell 5 and Salt Storage Pond 5 are part of the facilities needed for the new shaft.</u>
Subsection F(3) of 20.6.2.3108 NMAC provides that the Public Notice shall include "a brief description of the activities that produce the discharge described in the application." Subsection I(1) of 20.6.2.3108 NMAC provides that the Fact Sheet and draft permit also shall provide that description.

The Public Notice includes no mention of the new shaft, even in the "Activities that Produce the Discharge," which only includes the "to be constructed Salt Reduction System," which does not include the new shaft. Thus, neither SRIC, nor any member of the public, would know from the notice that the renewed and modified permit relates to facilities required by the new shaft and connecting drifts. The Fact Sheet does not mention the new shaft. The Fact Sheet does mention the Salt Cell 5 and the Salt Storage Pond 5. Regarding "Description of the Proposed Discharge," the Fact Sheet states: "The stockpiles currently storing salt, or that will be used in the future as salt is mined from the Facility's underground panels, are referred to as Salt Cells 2, 3, and 5." Since there is current mining of Panel 8 and perhaps future mining of Panel 10, that description does not imply that the new shaft and connecting drifts are a source for the new Cell 5. Neither SRIC, nor any member of the public, would know from the Fact Sheet that the renewed and modified permit relates to facilities required by the new shaft and connecting drifts. The draft permit does not mention the new shaft and connecting drifts. The draft Permit does include the language about Salt Cells 2, 3, and 5 contained in the Fact Sheet and mentions the capacity of Salt Storage Pond 5. The draft permit does not even include a map that shows the locations of the new Salt Cell 5 and the Salt Storage Ponds 4 and 5 and the Brine Retention Ponds East and West, which would show that the new cell and Pond 5 are near the new shaft. Neither SRIC, nor any member of the public, would know from the draft permit that the renewed and modified permit relates to facilities required by the new shaft and connecting drifts.

Thus, the Public Notice, Fact Sheet, and draft Permit are all legally deficient in not adequately describing the activities that produce the discharge and that Salt Cell 5 and Storage Pond 5 are for the new shaft and connecting drifts. They also do not provide even location information and map from the application from which that required description could be determined.

4. <u>The Permit application clearly states that Salt Cell 5 and Salt Storage Pond 5 are for the new shaft and connecting drifts</u>.
The permit application states:

> "Salt Cell 5 adds a new salt storage location (Latitude: 32 22 21.02, Longitude: 103 48 7.44), which will receive overburden and salt from the construction of Shaft 5 and its associated underground connecting drifts.
> Salt Storage Pond 5 (Latitude: 32 22 20.25, Longitude: 103 48 13.22) will receive both the leachate and storm water in contact with mined salt located in Salt Cell 5. Salt Storage Pond 5 will increase the quantity of the current industrial wastewater maximum permitted discharge volume by 1,292,499 gallons per day (gpd), which is based on the total inflow from a 24-hour, 100-year rainfall event (5.84 inches)."
> at 3.

The permit application also states:

> "Industrial Wastewater - Salt Cell 5 and Salt Storage Pond 5 (Modification - New Shaft). Salt Cell 5 will be designed to contain 5,224,000 cubic feet of loose salt materials from the construction of Shaft 5 and the associated drifts." at 12.

The permit application also has similar information that Salt Cell 5 and Salt Storage Pond 5 are for the new shaft and connecting drifts on pages 21 and 26. So there is no question about their purpose, based on the application. Thus, not including the required description in the Public Notice, Fact Sheet, and draft Permit does not even adequately convey what is in the application.

The application also includes APPENDIX C - Shaft # 5 Pond Drawings. However, each of the drawings is titled for "WIPP Exhaust Shaft." However, the new shaft is <u>not</u> an exhaust shaft, so that is obsolete and inaccurate information.

5. <u>There is no adequate NEPA analysis for the Salt Cell 5 and Salt Storage Pond 5</u>
The DOE must comply with the National Environmental Policy Act (NEPA). The NEPA analysis of the new shaft is the *Supplement Analysis for the New Permanent Ventilation System* (DOE/EIS-0026-SA-11), November 2017.[7]

That document makes <u>no</u> mention of Salt Cell 5 or Salt Storage Pond 5. The document has two brief mentions of "construction and operation of lined evaporation ponds." (at 20). But the SA has no description of the size of the two facilities, no location description or map showing the facilities, and no analysis of the impacts. The document does mention DP-831, but does not state that the discharge permit would need to be modified to accommodate the new facilities.

Thus, SRIC strongly believes that there is no adequate NEPA analysis to support the construction and operation of the new shaft, Salt Cell 5, and Salt Storage Pond 5. SRIC also believes that NMED should not permit facilities that do not have adequate, required NEPA documentation.

6. <u>Correct typographical error</u>
Discharge Permit Summary, page 2 of 5 – Salt Storage Pond 1 – capacity is missing a comma and should be 3,301,634 gallons.

<u>Request for negotiations and hearing</u>
SRIC requests a hearing on the draft permit based on these comments. There is very significant public interest in the new shaft, both because it is a major expansion of the WIPP facility and because there are many organizations and individuals that have expressed interest regarding the new shaft and associated drifts. SRIC requests negotiations with NMED, DOE, and any other parties to resolve or narrow the issues before the hearing. Such negotiations might result in a withdrawal of the hearing request. In the event that Salt Cell 5 and Salt Storage Pond 5 are deleted from the permit, SRIC would withdraw its request for a hearing.

[7] https://wipp.energy.gov/library/seis/DOE-EIS-0026-SA-11_Nov_2017.pdf

On April 21, I discussed by phone with Mike Brown of DOE and Rick Chavez of NWP whether DOE would agree to delete Salt Cell 5 and Salt Storage Pond 5 from the current application. They said that it was discussed, but that they were unwilling to make that change at this time.

Thank you very much for your careful consideration of, and your response to, these comments.

Sincerely,

Don Hancock

cc: Rebecca Roose
Michelle Hunter
Steve Pullen
Melanie Sandoval
Stephanie Stringer
Kevin Pierard
Ricardo Maestas

From:	dave mccoy
To:	Young, Avery, NMENV
Cc:	Hunter, Michelle, NMENV
Subject:	[EXT] Discharge Permit-831 Request for Public Hearing
Date:	Tuesday, April 21, 2020 9:55:12 AM

Memorandum
April 21, 2020
New Mexico Environment Department
Mr. Avery Young
Groundwater Quality Bureau
Santa Fe, NM

Re: DP-831 Waste Isolation Pilot Plant (WIPP)
Sent by email to: Avery.Young@state.nm.us

Dear Mr. Young,

Citizen Action New Mexico (CANM) is a non-governmental organization (NGO) that participates in information gathering about radioactive and hazardous waste disposal and its permitting throughout the State of New Mexico. As an NGO, CANM has advocated for and pursued efforts to cleanup and monitor military and weapons facilities of the federal government in New Mexico. CANM has participated in numerous public hearings and matters regarding permitting at facilities such as WIPP, Sandia National Laboratories, Los Alamos, Los Alamos National Laboratory and Kirtland Air Force Base.

CANM requests that the NMED provide a public hearing and negotiations for DP-831 since the operation of WIPP is of concern to our organization and the public interest (both in-state and national) with respect to water and any expansion of existing operations that could result in accommodation of more nuclear weapons production and a concomitant greater disposal of radioactive and hazardous waste than allowed under the current permit.

CANM objects to the approval of DP-831 that would further the relationship of Salt Cell 5 and Salt Storage Pond 5 to the development of an additional shaft for nuclear weapons waste. CANM is strongly opposed to the continued production of nuclear weapons and the nuclear and toxic waste stream generated that would be facilitated by DP-831. DP-831 puts the cart before the horse in assisting a backdoor approval for a new shaft and facility to receive additional nuclear waste that has not yet been permitted for construction. The addition of a new shaft for more nuclear waste would result in WIPP operations well beyond the expiration of its current permit in 2024.

Any proposal for what would result in WIPP expansion or permitting of any further operations need to be reviewed in full perspective given public endangerment from WIPP's failed safety operations resulting in fire, explosion and worker exposures that caused a $2,000,000,000 cost to the taxpayer along with years of delay. While the discharge permit for storm water may seem disconnected to the poor operation of WIPP, CANM believes that the totality of the circumstances in relation to waste operations and expansion of nuclear weapons production must be considered before DP-831 is approved. There is also the matter of the upcoming expiration of the LANL RCRA hazardous waste permit.

Please delete Salt Cell 5 and Salt Storage Pond 5 and its discharge capacity of 1,292,499 gallons per day discharge volume from the permit.

Respectfully,

Dave McCoy, Executive Director
Citizen Action New Mexico
dave@radfreenm.org

From: Janet
To: Young, Avery, NMENV
Subject: [EXT] DP-831(WIPP)
Date: Monday, April 20, 2020 8:57:46 PM

RE: DP-831 (WIPP)

This organization opposes the inclusion of Salt Cell 5 and Salt Storage Pond 5 in DP-831. Those facilities are essential for the new shaft and associated drifts, which are part of the "Forever WIPP" expansion, which this organization strongly opposes. Further, we object to including facilities essential for the new shaft, when construction of the shaft has not been permitted by the NMED that can only happen after public comments, negotiations, and a hearing, which have not occurred.

This organization and many others oppose "Forever WIPP," and there is substantial public interest in WIPP expansion, including the new shaft and associated drifts.

This organization requests negotiations and a hearing on the draft permit.

Please delete Salt Cell 5 and Salt Storage Pond 5 and its discharge capacity of 1,292,499 gallons per day discharge volume from the permit.

Sincerely,

Janet Greenwald
Citizens for Alternatives to Radioactve Dumping (CARD)
Box 485, Dixon, NM 87527

From:	Michelle Cook (CONTR)
To:	Young, Avery, NMENV
Cc:	Hunter, Michelle, NMENV; Maestas, Ricardo, NMENV; Pierard, Kevin, NMENV; Pullen, Steve, NMENV; DOE M&RC - WIPPNet
Subject:	[EXT] Permittee Comments on the Draft Discharge Permit Renewal and Modification, DP 831, Waste Isolation Pilot Plant.
Date:	Thursday, April 16, 2020 12:59:03 PM
Attachments:	image001.jpg 20-0228 Enlosure.pdf 20-0228 Letter.pdf

Good Afternoon Ms. Young,

Please see the attached correspondence. If you have any questions regarding the attached letter and enclosure, please contact Mr. Mike Brown at (575) 234-7476 or Mike.Brown@cbfo.doe.gov

Thank you,

Michelle Cook

Administrative Assistant

Carlsbad Technical Assistance Contractor (North Wind – Portage)

Contractor to the Department of Energy

4021 National Parks Highway

Carlsbad, NM 88220

(575) 234-7154

Department of Energy
Carlsbad Field Office
P. O. Box 3090
Carlsbad, New Mexico 88221
April 16, 2020

Ms. Avery Young
Ground Water Quality Bureau
New Mexico Environment Department
P.O. Box 5469
Santa Fe, New Mexico 87502-5469

Subject: Permittee Comments on the Draft Discharge Permit Renewal and Modification, DP-831, Waste Isolation Pilot Plant.

Dear Ms. Young:

The purpose of this letter is to provide you with the enclosed comments on the March 2, 2020, Draft Discharge Permit Renewal and Modification, DP-831, Waste Isolation Pilot Plant.

If you have any questions, please contact Mr. Mike Brown at (575) 234-7476.

Sincerely,

Gregory Sosson
Acting Manager
Carlsbad Field Office

Enclosure

cc: w/enclosure
M. Hunter, NMED *ED
R. Maestas, NMED ED
K. Pierard, NMED ED
S. Pullen, NMED ED
CBFO M&RC
*ED denotes electronic distribution

CBFO:OEP:MRB:MC:20-0228:UFC 5487.00

Permittee Comments on Draft Discharge Permit Renewal and Modification, DP-831

Waste Isolation Pilot Plant

COMMENT 1 - Discharge Permit Summary, Non-Domestic Waste Water

The freeboard information for Salt Storage Pond 5 in the *Discharge Permit Summary, Non-Domestic Waste Water* table attached at the end of the draft permit is inconsistent with draft permit Condition #4 shown below.

> *The permittee shall preserve a minimum of one foot of freeboard between the liquid level in all the impoundments and the elevation of the top of the impoundment liner, except the Brine Retention Ponds East and West shall maintain two feet of freeboard. In the event that the permittee determines that the specified freeboard cannot be preserved in the impoundments, the permittee shall enact the contingency plan set forth in this Discharge Permit.*

The *Description and Comments* for the Salt Storage Pond 5 in the *Non-Domestic Wastewater* table states that this impoundment is "…permitted two feet of freeboard…" This is inconsistent with permit Condition 4 (shown above) which requires one foot of freeboard. Please revise the entry to make the Discharge Permit Summary table and permit Condition 4 consistent by changing "…permitted two feet of freeboard…" to "…permitted one foot of freeboard..." so that the description reads as shown in the redline strike out text below:

> *To be constructed, 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system; disposal by evaporation; permitted one foot ~~two feet~~ of freeboard; capacity of 6,355,404 gallons.*

COMMENT 2 – Draft Discharge Permit Condition #54: Recommend changing the word "measure" to "estimate" in reference to hydraulic conductivity in Condition #54 as shown in the redline strikeout text below. Aquifer parameters estimates are not obtained through measurement, but calculated based on hydraulic data obtained through the aquifer testing.

> *The permittee shall perform aquifer testing to determine the local hydraulic properties of the aquifer near the monitoring wells required by this Discharge Permit and that contain groundwater within 60 days of the complete installation of each new monitoring well. The purpose of the aquifer testing shall be to quantify the movement of groundwaters in the vicinity of each well or piezometer. Aquifer testing shall be performed in wells in both the shallow groundwater and in the natural groundwater in the Dewey Lake Formation where groundwater is present. Aquifer testing shall estimate ~~measure~~ hydraulic conductivity, transmissivity, and storage coefficient and shall be performed utilizing procedures previously utilized at the facility so as to produce comparable results.*
>
> *The estimated ~~measured~~ hydraulic properties for each monitoring well shall be submitted to NMED within 120 days of the installation of the monitoring wells in a cumulative well report.*

Young, Avery, NMENV

From: Ganaway, David - RES <david.ganaway@wipp.ws>
Sent: Tuesday, March 10, 2020 2:13 PM
To: Young, Avery, NMENV
Subject: [EXT] Comments on the draft DP-831 permit dated March 2, 2020

This e-mail is for submitting my comments on the draft DP-831 permit dated March 2, 2020.

Permit conditions 6, 12, 13, 17, and 22 require that the permittee shall maintain and install fences to control access by the general public and animals. As stated, without specifics to the animal(s) that the fence is intended to control, it could then be perceived that any animal found in the controlled area would result in a permit violation. A large array of taxa is considered to belong to the animal kingdom.

Permit condition 16 has a typo for the acronym for leak detection, collection, and recovery systems; LDRCS rather than LDCRS.

Thanks,

David R. Ganaway, WIPP Land Use Coordinator (LUC)
Amentum Management Services – Regulatory Environmental Services (RES)
A Nuclear Waste Partnership LLC Affiliate Company
Contractor to the U.S. Department of Energy
4021 National Parks Hwy – MS 452-09
Carlsbad, NM 88221-2078

Office: 575-234-8449
WIPP LUC cell: 575-725-1739

Michelle Lujan Grisham
Governor

Howie C. Morales
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 Saint Francis Drive / PO Box 5469
Santa Fe, NM 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

PUBLIC NOTICE

Groundwater Discharge Permit
Proposed for Approval
DP-831, Waste Isolation Pilot Plant
Public Comment Period Open Until April 22, 2020

The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) provides notice that the following Groundwater Discharge Permit has been proposed for approval: The U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP) proposes to renew and modify the Discharge Permit (DP-831) for the discharge of up to 9,586,995 gallons per day of industrial wastewater and stormwater to an impoundment and disposal system and up to 23,000 gallons per day of domestic wastewater to a treatment and disposal system. The modification consists of the addition of one new salt cell and four new impoundments that will receive industrial wastewater and stormwater.

Applicant: U.S. Department of Energy's WIPP, Gregory Sosson, Acting Manager, Carlsbad Field Office, P.O. Box 3090, Carlsbad, NM 88221

Facility Description: The WIPP facility is a mined geologic repository for the disposal of transuranic (TRU) waste. The underground repository is located 2,150 feet below land surface in the bedded salt of the Salado Formation. Discharges addressed by this permit are not directly associated with the storage of TRU waste.

Discharge Locations: Discharge locations include an impoundment system for domestic wastewater, three active salt cells, four lined impoundments for stormwater in contact with salt cells, three lined impoundments for stormwater not in contact with salt cells, and four lined impoundments for non-hazardous, industrial wastewater.

Activities that Produce the Discharge: Discharges include stormwater collected from the facility grounds and from active and inactive salt cells which is discharged to synthetically lined impoundments. Additionally, industrial wastewater from various sources including brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous wastewaters, are discharged to synthetically lined impoundments. The facility's domestic wastewater is discharged to a synthetically lined impoundment system for treatment and disposal by evaporation. Brine produced from the operations of the to be constructed Salt Reduction System will be discharged to two synthetically lined impoundments.

Facility Location: The facility is located off Highway 128, approximately 26 miles southeast of Carlsbad, in Sections 20, 21, 28, and 29, Township 22S, Range 31E, Eddy County.

Potential Contaminants: Potential contaminants from this type of discharge include nitrogen compounds, dissolved solids, and chloride.

Groundwater Most Likely to be Affected by the Discharge: Groundwater most likely to be affected is at a depth of approximately 35 to 160 feet and had a pre-discharge total dissolved solids concentration of 3,400 milligrams per liter.

How to obtain more information: To learn more about this Discharge Permit and the permitting process or to obtain a copy of the draft permit, the Fact Sheet, or Public Involvement Plan, please contact the NMED Permit Contact, Ms. Avery Young by phone at (505) 827-2909 or email at Avery.Young@state.nm.us. NMED maintains a facility-specific mailing list for persons wishing to receive notices for permitting actions associated with this facility. Additionally, NMED maintains a facility specific Public Involvement Plan (PIP) for each permitting action to plan for providing public participation opportunities and information that may be needed for the community to participate in a permitting process.

> **Access documents online**: The draft permit, Fact Sheet, and PIP may be viewed online at https://www.env.nm.gov/gwqb/dp-831/. For a Spanish translation of the Fact Sheet, visit https://www.env.nm.gov/gwqb/dp-831-es/.
>
> **Access documents at a document repository in Eddy County**: A hard copy of the draft permit, the permit summary, and the PIP may be viewed at the following document repository locations: Eunice Public Library, 1003 Avenue N, Eunice, NM 88231; NMED Carlsbad Field Office, 406 N. Guadalupe, Carlsbad, NM 88220; and Carlsbad Public Library, 101 S. Halagueno St, Carlsbad, NM 88220.

How to submit a comment or request a hearing: NMED will allow 45 days after the date of publication of this notice for submittal of written comments and/or a request for a public hearing. Requests for a public hearing shall be in writing and shall set forth the reasons why a hearing should be held. Comments or a request for hearing regarding a draft permit should be addressed to the GWQB, PO Box 5469, Santa Fe, NM 87502-5469, or emailed to the NMED Permit contact, Avery Young, at Avery.Young@state.nm.us.

A hearing will be held if the NMED Cabinet Secretary determines that there is substantial public interest. If a hearing is held, a hearing officer will be appointed by the NMED Cabinet Secretary and will be held in the locally affected community. During the hearing process, members of the public may file technical testimony prior to the hearing and may provide verbal and written comments during the hearing itself. Once the hearing is complete, the hearing officer will provide the NMED Cabinet Secretary with a hearing report that includes a suggested determination. The NMED Cabinet Secretary will then issue a Final Order which will complete the Administrative Record for the permitting action. After the Administrative Record for a permitting action is complete and all required information is available, NMED will approve, approve with conditions, or disapprove the Permit based on the Administrative Record and/or Final Order from the NMED Cabinet Secretary.

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How to request accommodations: If you are a non-English speaker, do not speak English well, or if you have a disability, you may contact Avery Young by phone at (505) 827-2909 or email at Avery.Young@state.nm.us to request assistance, translation services, an interpreter, or an accommodation in order to learn more about a Discharge Permit or the permitting process, or to participate in activities associated with the permitting process. Requested translation, interpretation services, and accommodations or services for persons with disabilities will be arranged to the extent possible. Telephone conversation assistance is available through Relay New Mexico at no charge for people who are deaf, hard of hearing, or have difficulty speaking on the phone, by calling 1-800-659-1779; TTY users: 1-800-659-8331; Spanish: 1-800-327-1857. Telephone interpretation assistance for persons that are a non-English speaker or do not speak English well is available at no charge when calling NMED.

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Parts 5 and 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non- discrimination programs, policies or procedures, you may contact: Kristine Yurdin, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. If you believe that you have been discriminated against with respect to a NMED program or activity, you may contact the Non-Discrimination Coordinator identified above or visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

DEPARTAMENTO DE MEDIO AMBIENTE
DE NUEVO MÉXICO

Oficina de Calidad de Aguas Subterráneas

1190 Saint Francis Drive / PO Box 5469
Santa Fe, NM 87502-5469
Teléfono (505) 827-2900 Fax (505) 827-2965
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Michelle Lujan Grisham
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Jennifer J. Pruett
Subsecretaria

AVISO PÚBLICO

Permiso de Descarga de Aguas Subterráneas propuesto para su aprobación DP-831, Planta Piloto de Aislamiento de Residuos Período de comentarios públicos abierto hasta el 22 de abril de 2020

La Oficina de Calidad de Aguas Subterráneas (GWQB, por sus siglas en inglés) del Departamento de Medio Ambiente de Nuevo México (NMED, por sus siglas en inglés) notifica que el siguiente Permiso de Descarga de Aguas Subterráneas ha sido propuesto para su aprobación: La Planta Piloto de Aislamiento de Residuos (WIPP, por sus siglas en inglés) del Departamento de Energía de los Estados Unidos propone renovar y modificar el Permiso de Descarga (DP-831) para la descarga de hasta 9,586,995 galones por día de aguas residuales industriales y aguas pluviales a un sistema de embalse y eliminación y hasta 23,000 galones por día de aguas residuales domésticas a un sistema de tratamiento y eliminación. La modificación consiste en la adición de una nueva celda de sal y cuatro nuevos embalses que recibirán aguas residuales industriales y aguas pluviales.

Solicitante: WIPP del Departamento de Energía de los Estados Unidos, Gregory Sosson, gerente en funciones, oficina local en Carlsbad, P.O. Box 3090, Carlsbad, NM 88221

Descripción de la instalación: La instalación WIPP es un depósito geológico minado para la eliminación de residuos transuránicos (TRU, por sus siglas en inglés). El depósito subterráneo está situado a 2,150 pies por debajo de la superficie del suelo en el lecho de sal de la Formación Salado. Los vertidos a los que se refiere este permiso no están directamente relacionados con el almacenamiento de los residuos TRU.

Ubicaciones de las descargas: Las ubicaciones de las descargas incluyen un sistema de embalses para aguas residuales domésticas, tres celdas de sal activas, cuatro embalses revestidos para aguas pluviales en contacto con celdas de sal, tres embalses revestidos para aguas pluviales que no están en contacto con celdas de sal y cuatro embalses revestidos para aguas residuales industriales no peligrosas.

Actividades que producen las descargas: Las descargas incluyen aguas pluviales recogidas en los terrenos de las instalaciones y de celdas de sal activas e inactivas que descargan en embalses revestidos sintéticamente. Además, las aguas residuales industriales de diversas fuentes, incluyendo salmuera, aguas de purga de muestreo y de pozos de monitoreo en vías de desarrollo de la Instalación y otras diversas aguas residuales industriales no peligrosas se descargan en embalses revestidos sintéticamente. Las aguas residuales domésticas de la instalación se descargan en un sistema de embalse revestido de material sintético para su tratamiento y eliminación por evaporación. La salmuera producida por las operaciones del sistema de reducción de sal que se construirá se descargará en dos embalses revestidos sintéticamente.

Ubicación de la instalación: La instalación se encuentra junto a la carretera 128, aproximadamente a 26 millas al sureste de Carlsbad, en las Secciones 20, 21, 28 y 29, Municipio 22S, Rango 31E, condado de Eddy.

Posibles contaminantes: Los posibles contaminantes de este tipo de descarga incluyen compuestos de nitrógeno, sólidos disueltos y cloruro.

Agua subterránea con más probabilidad de ser afectada por la descarga: El agua subterránea con más probabilidad de ser afectada se encuentra a una profundidad de 35 a 160 pies aproximadamente y tenía una concentración de sólidos disueltos totales antes del vertido de 3,400 miligramos por litro.

Cómo obtener más información: Para obtener más información sobre este Permiso de Descarga y el proceso de obtención de permisos o para obtener una copia del Borrador del Permiso, la Hoja de Datos, o el Plan de Participación Pública, comuníquese con la persona que sirve como contacto de permisos de NMED, La Sra. Avery Young, por teléfono llamando al (505) 827-2709 o por correo electrónico a Avery.Young@state.nm.us. NMED mantiene una lista de correo específica de la instalación para las personas que desean recibir avisos sobre las acciones de permisos asociados con esta instalación. Además, NMED mantiene un Plan de Participación Pública (PIP, por sus siglas en inglés) específico para cada instalación para cada acción de permiso para planear y proveer oportunidades de participación pública e información que puede ser necesaria para que la comunidad participe en el proceso de permisos.

> **Acceso a los documentos en línea**: El Borrador del Permiso, el PIP y la Hoja de Datos pueden verse en línea en https://www.env.nm.gov/gwqb/dp-831-es/. Para obtener una traducción en español de la Hoja de Datos visite https://www.env.nm.gov/gwqb/dp-831/.
>
> **Acceso a los documentos en el depósito de documentos en el condado de Eddy**: Una copia impresa del Borrador del Permiso, el resumen del Permiso y el PIP pueden ser vistos en las siguientes ubicaciones de depósito de documentos: Biblioteca Pública de Eunice, 1003 Avenue N, Eunice, NM 88231; Oficina local de NMED en Carlsbad, 406 N. Guadalupe, Carlsbad, NM 88220; y la Biblioteca Pública de Carlsbad, 101 S Halagueno St, Carlsbad, NM 88220.

Cómo presentar un comentario o solicitar una audiencia: NMED permitirá 45 días después de la fecha de la publicación de este aviso para la presentación de comentarios por escrito y/o una solicitud de audiencia pública. Las solicitudes de audiencia pública deberán hacerse por escrito y deberán exponer las razones por las que se debe llevar a cabo una audiencia. Los comentarios o la solicitud de audiencia con respecto al Borrador del Permiso deben dirigirse a GWQB, P.O. Box 5469, Santa Fe, NM 87502-5469, o por correo electrónico al contacto de permisos de NMED, Avery Young, a Avery.Young@state.nm.us.

Se llevará a cabo una audiencia si el secretario del gabinete de NMED determina que hay un considerable interés por parte del público. Si se lleva a cabo una audiencia, un funcionario de audiencias será designado por el secretario del gabinete de NMED y se llevará a cabo en la comunidad local afectada. Durante el proceso de audiencia, los miembros del público pueden presentar un testimonio técnico antes de la audiencia y pueden proporcionar comentarios verbales y por escritos durante la audiencia misma. Una vez terminada la audiencia el funcionario de audiencias proveerá al secretario del gabinete de NMED un informe de la audiencia que incluye una determinación sugerida. El secretario del gabinete de NMED entonces emitirá una Orden Final que completará el Registro Administrativo para la acción de permiso. Después de que el Registro Administrativo para la acción de permiso esté completo y toda la información requerida esté disponible, el NMED aprobará, aprobará con condiciones, o rechazará el Permiso basado en el Registro Administrativo y/o la Orden Final del secretario del gabinete de NMED.

Cómo solicitar acomodaciones: Si usted no habla inglés, no habla bien el inglés, o si tiene una discapacidad, puede comunicarse con Avery Young por teléfono llamando al (505) 827-2709 o por correo electrónico a Avery.Young@state.nm.us para solicitar asistencia, servicios de traducción, un intérprete, o acomodación para poder aprender más sobre un permiso de descarga o el proceso de permiso, o para participar en actividades asociadas con el proceso de permiso. Los servicios de traducción e interpretación solicitados y las acomodaciones o servicios para personas con discapacidades se organizarán en la medida de lo posible. Hay disponible asistencia para conversaciones telefónicas a través de Relay New Mexico de forma gratuita para las personas sordas, con problemas de audición o con dificultades para hablar por teléfono llamando al 1-800-659-1779; los usuarios de TTY: 1-800-659-8331; español: 1-800-327-1857. La asistencia telefónica de interpretación para personas que no hablan inglés o no hablan bien el inglés está disponible de forma gratuita llamando al NMED.

NMED no discrimina por motivos de raza, color, origen nacional, discapacidad, edad o sexo en la administración de sus programas o actividades, según lo exigido por las leyes y los reglamentos correspondientes. NMED es responsable de la coordinación de los esfuerzos de cumplimiento y la recepción de consultas relativas a los requisitos de no discriminación implementados por 40 C.F.R. Partes 5 y 7, incluido el Título VI de la Ley de Derechos Civiles de 1964, según enmendada; Sección 504 de la Ley de Rehabilitación de 1973; la Ley de Discriminación por Edad de 1975, Título IX de las Enmiendas de Educación de 1972 y la Sección 13 de las Enmiendas a la Ley Federal de Control de Contaminación del Agua de 1972. Si usted tiene preguntas sobre este aviso o sobre cualquier programa, política o procedimiento de no discriminación de NMED, usted puede comunicarse con la Coordinadora de No Discriminación: Kristine Yurdin, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. Si usted piensa que ha sido discriminado/a con respecto a un programa o actividad de NMED, usted puede comunicarse con la Coordinadora de No Discriminación antes indicada o visitar nuestro sitio web en https://www.env.nm.gov/non-employee-discrimination-complaint-page/ para aprender cómo y dónde presentar una queja de discriminación.

DP-831

Carlsbad Current Argus.

PART OF THE USA TODAY NETWORK

Affidavit of Publication

Ad # 0004097892

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NMED / GROUND WATER QUALITY BUREAU
PO BOX 5469

SANTA FE, NM 87502-5469

I, a legal clerk of the **Carlsbad Current Argus**, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

03/08/2020

Kathleen Allen

Legal Clerk

Subscribed and sworn before me this March 8, 2020:

Vicky Felty

State of WI, County of Brown
NOTARY PUBLIC

9-19-21

My commission expires

Ad # 0004097892
PO #: 66700-0000033656
# of Affidavits 1

This is not an invoice

VICKY FELTY
NOTARY PUBLIC
STATE OF WISCONSIN

PUBLIC N____E

Groundwater Discharge Permit Proposed for Approval, DP-831, Waste Isolation Pilot Plant, Public Comment Period Open Until April 22, 2020

The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) provides notice that the following Groundwater Discharge Permit has been proposed for approval: The U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP) proposes to renew and modify the Discharge Permit (DP-831) for the discharge of up to 9,586,995 gallons per day of industrial wastewater and stormwater to an impoundment and disposal system and up to 23,000 gallons per day of domestic wastewater to a treatment and disposal system. The modification consists of the addition of one new salt cell and four new impoundments that will receive industrial wastewater and stormwater.

Applicant: U.S. Department of Energy's WIPP, Gregory Sosson, Acting Manager, Carlsbad Field Office, P.O. Box 3090, Carlsbad, NM 88221

Facility Description: The WIPP facility is a mined geologic repository for the disposal of transuranic (TRU) waste. The underground repository is located 2,150 feet below land surface in the bedded salt of the Salado Formation. Discharges addressed by this permit are not directly associated with the storage of TRU waste.

Discharge Locations: Discharge locations include an impoundment system for domestic wastewater, three active salt cells, four lined impoundments for stormwater in contact with salt cells, three lined impoundments for stormwater not in contact with salt cells, and four lined impoundments for non-hazardous, industrial wastewater.

Activities that Produce the Discharge: Discharges include stormwater collected from the facility grounds and from active and inactive salt cells which is discharged to synthetically lined impoundments. Additionally, industrial wastewater from various sources including brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous wastewaters, are discharged to synthetically lined impoundments. The facility's domestic wastewater is discharged to a synthetically lined impoundment system for treatment and disposal by evaporation. Brine produced from the operations of the to be constructed Salt Reduction System will be discharged to two synthetically lined impoundments.

Facility Location: The facility is located off Highway 128, approximately 26 miles southeast of Carlsbad, in Sections 20, 21, 28, and 29, Township 22S, Range 31E, Eddy County.

Potential Contaminants: Potential contaminants from this type of discharge include nitrogen compounds, dissolved solids, and chloride.

Groundwater Most Likely to be Affected by the Discharge: Groundwater most likely to be affected is at a depth of approximately 35 to 160 feet and had a pre-discharge total dissolved solids concentration of 3,400 milligrams per liter.

How to obtain more information: To learn more about this Discharge Permit and the permitting process or to obtain a copy of the draft permit, the Fact Sheet, or Public Involvement Plan, please contact the NMED Permit Contact, Ms. Avery Young by phone at (505) 827-2909 or email at Avery.Young@state.nm.us. NMED maintains a facility-specific mailing list for persons wishing to receive notices for permitting actions associated with this facility. Additionally, NMED maintains a facility specific Public Involvement Plan (PIP) for each permitting action to plan for providing public participation opportunities and information that may be needed for the community to participate in a permitting process.

Access documents online: The draft permit, Fact Sheet, and PIP may be viewed online at https://www.env.nm.gov/gwqb/dp-831/. For a Spanish translation of the Fact Sheet, visit https://www.env.nm.gov/gwqb/dp-831-es/.

Access documents at a document repository in Eddy County: A hard copy of the draft permit, the permit summary, and the PIP may be viewed at the following document repository locations: Eunice Public Library, 1003 Avenue N, Eunice, NM 88231; NMED Carlsbad Field Office, 406 N. Guadalupe, Carlsbad, NM 88220; and Carlsbad Public Library, 101 S. Halagueno St, Carlsbad, NM 88220.

How to submit a comment or request a hearing: NMED will allow 45 days after the date of publication of this notice for submittal of written comments and/or a request for a public hearing. Requests for a public hearing shall be in writing and shall set forth the reasons why a hearing should be held. Comments or a request for hearing regarding a draft permit should be addressed [illegible] GWQB, PO Box 5469, Santa Fe, NM 87502-5469, or emailed to the NMED Permit contact, Avery Young, at Avery.Young@state.nm.us.

A hearing will be held if the NMED Cabinet Secretary determines that there is substantial public interest. If a hearing is held, a hearing officer will be appointed by the NMED Cabinet Secretary and will be held in the locally affected community. During the hearing process, members of the public may file technical testimony prior to the hearing and may provide verbal and written comments during the hearing itself. Once the hearing is complete, the hearing officer will provide the NMED Cabinet Secretary with a hearing report that includes a suggested determination. The NMED Cabinet Secretary will then issue a Final Order which will complete the Administrative Record for the permitting action. After the Administrative Record for a permitting action is complete and all required information is available, NMED will approve, approve with conditions, or disapprove the Permit based on the Administrative Record and/or Final Order from the NMED Cabinet Secretary.

How to request accommodations: If you are a non-English speaker, do not speak English well, or if you have a disability, you may contact Avery Young by phone at (505) 827-2909 or email at Avery.Young@state.nm.us to request assistance, translation services, an interpreter, or an accommodation in order to learn more about a Discharge Permit or the permitting process, or to participate in activities associated with the permitting process. Requested translation, interpretation services, and accommodations or services for persons with disabilities will be arranged to the extent possible. Telephone conversation assistance is available through Relay New Mexico at no charge for people who are deaf, hard of hearing, or have difficulty speaking on the phone, by calling 1-800-659-1779; TTY users: 1-800-659-8331; Spanish: 1-800-327-1857. Telephone interpretation assistance for persons that are a non-English speaker or do not speak English well is available at no charge when calling NMED.

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Pub: March 8, 2020 #4097892

DP-331 A-Y

Carlsbad Current Argus.

PART OF THE USA TODAY NETWORK

Affidavit of Publication

Ad # 0004097937

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NMED / GROUND WATER QUALITY BUREAU
PO BOX 5469

SANTA FE, NM 87502-5469

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State of WI, County of Brown
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VICKY FELTY
NOTARY PUBLIC
STATE OF WISCONSIN

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AVISO PI____)

Permiso de Descarga de Aguas Subterráneas propuesto para su aprobación, DP-831, Planta Piloto de Aislamiento de Residuos, Período de comentarios públicos abierto hasta el 22 de abril de 2020

La Oficina de Calidad de Aguas Subterráneas (GWQB, por sus siglas en inglés) del Departamento de Medio Ambiente de Nuevo México (NMED, por sus siglas en inglés) notifica que el siguiente Permiso de Descarga de Aguas Subterráneas ha sido propuesto para su aprobación: La Planta Piloto de Aislamiento de Residuos (WIPP, por sus siglas en inglés) del Departamento de Energía de los Estados Unidos propone renovar y modificar el Permiso de Descarga (DP-831) para la descarga de hasta 9,586,995 galones por día de aguas residuales industriales y aguas pluviales a un sistema de embalse y eliminación y hasta 23,000 galones por día de aguas residuales domésticas a un sistema de tratamiento y eliminación. La modificación consiste en la adición de una nueva celda de sal y cuatro nuevos embalses que recibirán aguas residuales industriales y aguas pluviales.

Solicitante: WIPP del Departamento de Energía de los Estados Unidos, Gregory Sosson, gerente en funciones, oficina local en Carlsbad, P.O. Box 3090, Carlsbad, NM 88221

Descripción de la instalación: La instalación WIPP es un depósito geológico minado para la eliminación de residuos transuránicos (TRU, por sus siglas en inglés). El depósito subterráneo está situado a 2,150 pies por debajo de la superficie del suelo en el lecho de sal de la Formación Salado. Los vertidos a los que se refiere este permiso no están directamente relacionados con el almacenamiento de los residuos TRU.

Ubicaciones de las descargas: Las ubicaciones de las descargas incluyen un sistema de embalses para aguas residuales domésticas, tres celdas de sal activas, cuatro embalses revestidos para aguas pluviales en contacto con celdas de sal, tres embalses revestidos para aguas pluviales que no están en contacto con celdas de sal y cuatro embalses revestidos para aguas residuales industriales no peligrosas.

Actividades que producen las descargas: Las descargas incluyen aguas pluviales recogidas en los terrenos de las instalaciones y de celdas de sal activas e inactivas que descargan en embalses revestidos sintéticamente. Además, las aguas residuales industriales de diversas fuentes, incluyendo salmuera, aguas de purga de muestreo y de pozos de monitoreo en vías de desarrollo de la instalación y otras diversas aguas residuales industriales no peligrosas se descargan en embalses revestidos sintéticamente. Las aguas residuales domésticas de la instalación se descargan en un sistema de embalse revestido de material sintético para su tratamiento y eliminación por evaporación. La salmuera producida por las operaciones del sistema de reducción de sal que se construirá se descargará en dos embalses revestidos sintéticamente.

Ubicación de la instalación: La instalación se encuentra junto a la carretera 128, aproximadamente a 26 millas al sureste de Carlsbad, en las Secciones 20, 21, 28 y 29, Municipio 22S, Rango 31E, condado de Eddy.

Posibles contaminantes: Los posibles contaminantes de este tipo de descarga incluyen compuestos de nitrógeno, sólidos disueltos y cloruro.

Agua subterránea con más probabilidad de ser afectada por la descarga: El agua subterránea con más probabilidad de ser afectada se encuentra a una profundidad de 35 a 160 pies aproximadamente y tenía una concentración de sólidos disueltos totales antes del vertido de 3,400 miligramos por litro.

Cómo obtener más información: Para obtener más información sobre este Permiso de Descarga y el proceso de obtención de permisos o para obtener una copia del Borrador del Permiso, la Hoja de Datos, o el Plan de Participación Pública, comuníquese con la persona que sirve como contacto de permisos de NMED, La Sra. Avery Young, por teléfono llamando al (505) 827-2709 o por correo electrónico a Avery.Young@state.nm.us. NMED mantiene una lista de correo específica de la instalación para las personas que desean recibir avisos sobre las acciones de permisos asociados con esta instalación. Además, NMED mantiene un Plan de Participación Pública (PIP, por sus siglas en inglés) específico para cada instalación para cada acción de permiso para planear y proveer oportunidades de participación pública e información que puede ser necesaria para que la comunidad participe en el proceso de permisos.

Acceso a los documentos en línea: El Borrador del Permiso, el PIP y la Hoja de Datos pueden verse en línea en https://www.env.nm.gov/gwqb/dp-831-es/. Para obtener una traducción en español de la H[illegible] datos visite https://ww w.env.nm.gov/gwqb/dp-831/.

Acceso a los documentos en el depósito de documentos en el condado de Eddy: Una copia impresa del Borrador del Permiso, el resumen del Permiso y el PIP pueden ser vistos en las siguientes ubicaciones de depósito de documentos: Biblioteca Pública de Eunice, 1003 Avenue N, Eunice, NM 88231; Oficina local de NMED en Carlsbad, 406 N. Guadalupe, Carlsbad, NM 88220; y la Biblioteca Pública de Carlsbad, 101 S Halagueno St, Carlsbad, NM 88220.

Cómo presentar un comentario o solicitar una audiencia: NMED permitirá 45 días después de la fecha de la publicación de este aviso para la presentación de comentarios por escrito y/o una solicitud de audiencia pública. Las solicitudes de audiencia pública deberán hacerse por escrito y deberán exponer las razones por las que se debe llevar a cabo una audiencia. Los comentarios o la solicitud de audiencia con respecto al Borrador del Permiso deben dirigirse a GWQB, P.O. Box 5469, Santa Fe, NM 87502-5469, o por correo electrónico al contacto de permisos de NMED, Avery Young, a Avery.Young@state.nm.us.

Se llevará a cabo una audiencia si el secretario del gabinete de NMED determina que hay un considerable interés por parte del público. Si se lleva a cabo una audiencia, un funcionario de audiencias será designado por el secretario del gabinete de NMED y se llevará a cabo en la comunidad local afectada. Durante el proceso de audiencia, los miembros del público pueden presentar un testimonio técnico antes de la audiencia y pueden proporcionar comentarios verbales y por escritos durante la audiencia misma. Una vez terminada la audiencia el funcionario de audiencias proveerá al secretario del gabinete de NMED un informe de la audiencia que incluye una determinación sugerida. El secretario del gabinete de NMED entonces emitirá una Orden Final que completará el Registro Administrativo para la acción de permiso. Después de que el Registro Administrativo para la acción de permiso esté completo y toda la información requerida esté disponible, el NMED aprobará, aprobará con condiciones, o rechazará el Permiso basado en el Registro Administrativo y/o la Orden Final del secretario del gabinete de NMED.

Cómo solicitar acomodaciones: Si usted no habla inglés, no habla bien el inglés, o si tiene una discapacidad, puede comunicarse con Avery Young por teléfono llamando al (505) 827-2709 o por correo electrónico a Avery.Young@stat e.nm.us para solicitar asistencia, servicios de traducción, un intérprete, o acomodación para poder aprender más sobre un permiso de descarga o el proceso de permiso, o para participar en actividades asociadas con el proceso de permiso. Los servicios de traducción e interpretación solicitados y las acomodaciones o servicios para personas con discapacidades se organizarán en la medida de lo posible. Hay disponible asistencia para conversaciones telefónicas a través de Relay New Mexico de forma gratuita para las personas sordas, con problemas de audición o con dificultades para hablar por teléfono llamando al 1-800-659-1779; los usuarios de TTY: 1-800-659-8331; español: 1-800-327-1857. La asistencia telefónica de interpretación para personas que no hablan inglés o no hablan bien el inglés está disponible de forma gratuita llamando al NMED.

NMED no discrimina por motivos de raza, color, origen nacional, discapacidad, edad o sexo en la administración de sus programas o actividades, según lo exigido por las leyes y los reglamentos correspondientes. NMED es responsable de la coordinación de los esfuerzos de cumplimiento y la recepción de consultas relativas a los requisitos de no discriminación implementados por 40 C.F.R. Partes 5 y 7, incluido el Título VI de la Ley de Derechos Civiles de 1964, según enmendada; Sección 504 de la Ley de Rehabilitación de 1973; la Ley de Discriminación por Edad de 1975, Título IX de las Enmiendas de Educación de 1972 y la Sección 13 de las Enmiendas a la Ley Federal de Control de Contaminación del Agua de 1972. Si usted tiene preguntas sobre este aviso o sobre cualquier programa, política o procedimiento de no discriminación de NMED, usted puede comunicarse con la Coordinadora de No Discriminación: Kristine Yurdin, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.n m.us. Si usted piensa que ha sido discriminado/a con respecto a un programa o actividad de NMED, usted puede comunicarse con la Coordinadora de No Discriminación antes indicada o visitar nuestro sitio web en https://www.en v.nm.gov/non-employee-discrimination-complaint-page/ para aprender cómo y dónde presentar una queja de discriminación.

Pub: March 8, 2020 #4097937

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AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO

County of Bernalillo SS

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Elise Rodriguez , the undersigned, on oath states that she is an authorized Representative of The Albuquerque Journal, and that this newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Session Laws of 1937, and that payment therefore has been made of assessed as court cost; that the notice, copy of which hereto attached, was published in said paper in the regular daily edition, for 1 time(s) on the following date(s):

03/08/2020

OFFICIAL SEAL
Susan Ramirez
NOTARY PUBLIC - STATE OF NEW MEXICO
My Commission Expires: 2/15/2023

Sworn and subscribed before me, a Notary Public, in and for the County of Bernalillo and State of New Mexico this 9 day of March of 2020

PRICE $571.39

Statement to come at the end of month.

ACCOUNT NUMBER 1007595

AVISO PÚBLICO

Permiso de Descarga de Aguas Subterráneas propuesto para su aprobación, DP-831, Planta Piloto de Aislamiento de Residuos, Período de comentarios públicos abierto hasta el 22 de abril de 2020

La Oficina de Calidad de Aguas Subterráneas (GWQB, por sus siglas en inglés) del Departamento de Medio Ambiente de Nuevo México (NMED, por sus siglas en inglés) notifica que el siguiente Permiso de Descarga de Aguas Subterráneas ha sido propuesto para su aprobación: La Planta Piloto de Aislamiento de Residuos (WIPP, por sus siglas en inglés) del Departamento de Energía de los Estados Unidos propone renovar y modificar el Permiso de Descarga (DP-831) para la descarga de hasta 9,566,995 galones por día de aguas residuales industriales y aguas pluviales a un sistema de embalse y eliminación y hasta 23,000 galones por día de aguas residuales domésticas a un sistema de tratamiento y eliminación. La modificación consiste en la adición de una nueva celda de sal y cuatro nuevos embalses que recibirán aguas residuales industriales y aguas pluviales.

Solicitante: WIPP del Departamento de Energía de los Estados Unidos, Gregor[illegible]sson, gerente en funciones, oficina local en Carlsbad, P.O. Box 3090, Carlsbad, NM 88221

Descripción de la instalación: La instalación WIPP es un depósito geológico minado para la eliminación de residuos transuránicos (TRU, por sus siglas en inglés). El depósito subterráneo está situado a 2,150 pies por debajo de la superficie del suelo en el lecho de sal de la Formación Salado. Los vertidos a los que se refiere este permiso no están directamente relacionados con el almacenamiento de los residuos TRU.

Ubicaciones de las descargas: Las ubicaciones de las descargas incluyen un sistema de embalses para aguas residuales domésticas, tres celdas de sal activas, cuatro embalses revestidos para aguas pluviales en contacto con celdas de sal, tres embalses revestidos para aguas pluviales que no están en contacto con celdas de sal y cuatro embalses revestidos para aguas residuales industriales no peligrosas.

Actividades que producen las descargas: Las descargas incluyen aguas pluviales recogidas en los terrenos de las instalaciones y de celdas de sal activas e inactivas que descargan en embalses revestidos sintéticamente. Además, las aguas residuales industriales de diversas fuentes, incluyendo salmuera, aguas de purga de muestreo y de pozos de monitoreo en vías de desarrollo de la instalación y otras diversas aguas residuales industriales no peligrosas se descargan en embalses revestidos sintéticamente. Las aguas residuales domésticas de la instalación se descargan en un sistema de embalse revestido de material sintético para su tratamiento y eliminación por evaporación. La salmuera producida por las operaciones del sistema de reducción de sal que se construirá se descargará en dos embalses revestidos sintéticamente.

Ubicación de la instalación: La instalación se encuentra junto a la carrete[illegible] 128, aproximadamente a 26 millas al sureste de Carlsbad, en las Secciones 20, 21, [illegible] 29, Municipio 22S, Rango 31E, condado de Eddy.

Posibles contaminantes: Los posibles contaminantes de este tipo de descarga incluyen compuestos de nitrógeno, sólidos disueltos y cloruro.

Agua subterránea con más probabilidad de ser afectada por la descarga: El agua subterránea con más probabilidad de ser afectada se encuentra a una profundidad de 35 a 160 pies aproximadamente y tenía una concentración de sólidos disueltos totales antes del vertido de 3,400 miligramos por litro.

Cómo obtener más información: Para obtener más información sobre este Permiso de Descarga y el proceso de obtención de permisos o para obtener una copia del Borrador del Permiso, la Hoja de Datos, o el Plan de Participación Pública, comuníquese con la persona que sirve como contacto de permisos de NMED, La Sra. Avery Young, por teléfono llamando al (505) 827-2709 o por correo electrónico a Avery.Young@state.nm.us. NMED mantiene una lista de correo específica de la instalación para las personas que desean recibir avisos sobre las acciones de permisos asociados con esta instalación. Además, NMED mantiene un Plan de Participación Pública (PIP, por sus siglas en inglés) específico para cada instalación para cada acción de permiso para planear y proveer oportunidades de participación pública e información que puede ser necesaria para que la comunidad participe en el proceso de permisos.

Acceso a los documentos en línea: El Borrador del Permiso, el PIP y la Hoja de Datos pueden verse en línea en https://www.env.nm.gov/gwqb/dp-831-es/. Para obtener una traducción en español de la Hoja de Datos visite https://www.env.nm.gov/gwqb/dp-831/ .

Acceso a los documentos en el depósito de documentos en el condado de Eddy: Una copia impresa del Borrador del Permiso, el resumen del Permiso y el PIP pueden ser vistos en las siguientes ubicaciones de depósito de documentos: Biblioteca Pública de Eunice, 1003 Avenue N, Eunice, NM 88231; Oficina local de NMED en Carlsbad, 406 N. Guadalupe, Carlsba[illegible]M 88220; y la Biblioteca Pública de Carlsbad, 101 S Halagueno St, Carlsbad, NM 88220.

Cómo presentar un comentario o solicitar una audiencia: NMED permitirá 45 días después de la fecha de la publicación de este aviso para la presentación de comentarios por escrito y/o una solicitud de audiencia pública. Las solicitudes de audiencia pública deberán hacerse por escrito y deberán exponer las razones por las que se debe llevar a cabo una audiencia. Los comentarios o la solicitud de audiencia con respecto al Borrador del Permiso deben dirigirse a GWQB, P. O. Box 5469, Santa Fe, NM 87502-5469, o por correo electrónico al contacto de permisos de NMED, Avery Young, a Avery.Young@state.nm.us .

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Journal: March 8, 2020

AFFIDAVIT OF PUBLICATION

STATE OF NEW MEXICO

County of Bernalillo SS

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Elise Rodriguez , the undersigned, on oath states that she is an authorized Representative of The Albuquerque Journal, and that this newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Session Laws of 1937, and that payment therefore has been made of assessed as court cost; that the notice, copy of which hereto attached, was published in said paper in the regular daily edition, for 1 time(s) on the following date(s):

03/08/2020

OFFICIAL SEAL
Susan Ramirez
NOTARY PUBLIC - STATE OF NEW MEXICO
My Commission Expires: 2/15/2023

Sworn and subscribed before me, a Notary Public, in and for the County of Bernalillo and State of New Mexico this 9 day of March of 2020

PRICE $480.35

Statement to come at the end of month.

ACCOUNT NUMBER 1007595

PUBLIC NOTICE

Groundwater Discharge Permit Proposed for Approval, DP-831, Waste Isolation Pilot Plant, Public Comment Period Open Until April 22, 2020

The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) provides notice that the following Groundwater Discharge Permit has been proposed for approval: The U.S. Department of Energy's Waste Isolation Pilot Plant (WIPP) proposes to renew and modify the Discharge Permit (DP-831) for the discharge of up to 9,586,995 gallons per day of industrial wastewater and stormwater to an impoundment and disposal system and up to 23,000 gallons per day of domestic wastewater to a treatment and disposal system. The modification consists of the addition of one new salt cell and four new impoundments that will receive industrial wastewater and stormwater.

Applicant: U.S. Department of Energy's WIPP, Gregory Sosson, Acting Manager, Carlsbad Field Office, P.O. Box 3090, Carlsbad, NM 88221

Facility Description: The WIPP facility is a mined geologic repository for the disposal of transuranic (TRU) waste. The underground repository is located 2,150 feet below land surface in the bedded salt of the Salado Formation. Discharges addressed by this permit are not directly associated with the storage of TRU waste.

Discharge Locations: Discharge locations include an impoundment system for domestic wastewater, three active salt cells, four lined impoundments for stormwater in contact with salt cells, three lined impoundments for stormwater not in contact with salt cells, and four lined impoundments for non-hazardous, industrial wastewater.

Activities that Produce the Discharge: Discharges include stormwater collected from the facility grounds and from active and inactive salt cells which is discharged to synthetically lined impoundments. Additionally, industrial wastewater from various sources including brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous wastewaters, are discharged to synthetically lined impoundments. The facility's domestic wastewater is discharged to a synthetically lined impoundment system for treatment and disposal by evaporation. Brine produced from the operations of the to be constructed Salt Reduction System will be discharged to two synthetically lined impoundments.

Facility Location: The facility is located off Highway 128, approximately 26 miles southeast of Carlsbad, in Sections 20, 21, 28, and 29, Township 22S, Range 31E, Eddy County.

Potential Contaminants: Potential contaminants from this type of discharge include nitrogen compounds, dissolved solids, and chloride.

Groundwater Most Likely to be Affected by the Discharge: Groundwater most likely to be affected is at a depth of approximately 35 to 160 feet and had a pre discharge total dissolved solids concentration of 3,400 milligrams per liter.

How to obtain more information: To learn more about this Discharge Permit and the permitting process or to obtain a copy of the draft permit, the Fact Sheet, or Public Involvement Plan, please contact the NMED Permit Contact, Ms. Avery Young by phone at (505) 827-2909 or email at Avery.Young@state.nm.us. NMED maintains a facility-specific mailing list for persons wishing to receive notices for permitting actions associated with this facility. Additionally, NMED maintains a facility specific Public Involvement Plan (PIP) for each permitting action to plan for providing public participation opportunities and information that may be needed for the community to participate in a permitting process.

Access documents online: The draft permit, Fact Sheet, and PIP may be viewed online at https://www.env.nm.gov/gwqb/dp 831/ . For a Spanish translation of the Fact Sheet, visit https://www.env.nm.gov/gwqb/dp-831-es/ .

Access documents at a document repository in Eddy County: A hard copy of the draft permit, the permit summary, and the PIP may be viewed at the following document repository locations: Eunice Public Library, 1003 Avenue N, Eunice, NM 88231; NMED Carlsbad Field Office, 406 N. Guadalupe, Carlsbad, NM 88220; and Carlsbad Public Library, 101 S. Halagueno St, Carlsbad, NM 88220.

How to submit a comment or request a hearing: NMED will allow 45 days after the date of publication of this notice for submittal of written comments and/or a request for a public hearing. Requests for a public hearing shall be in writing and shall set forth the reasons why a hearing should be held. Comments or a request for hearing regarding a draft permit should be addressed to the GWQB, PO Box 5469, Santa Fe, NM 87502-5469, or emailed to the NMED Permit contact, Avery Young, at Avery.Young@state.nm.us .

A hearing will be held if the NMED Cabinet Secretary determines that there is substantial public interest. If a hearing is held, a hearing officer will be appointed by the NMED Cabinet Secretary and will be held in the locally affected community. During the hearing process, members of the public may file technical testimony prior to the hearing and may provide verbal and written comments during the hearing itself. Once the hearing is complete, the hearing officer will provide the NMED Cabinet Secretary with a hearing report that includes a suggested determination. The NMED Cabinet Secretary will then issue a Final Order which will complete the Administrative Record for the permitting action. After the Administrative Record for a permitting action is complete and all required information is available, NMED will approve, approve with conditions, or disapprove the Permit based on the Administrative Record and/or Final Order from the NMED Cabinet Secretary.

How to request accommodations: If you are a non-English speaker, do not speak English well, or if you have a disability, you may contact Avery Young by phone at (505) 827-2909 or email at Avery.Young@state.nm.us to request assistance, translation services, an interpreter, or an accommodation in order to learn more about a Discharge Permit or the permitting process, or to participate in activities associated with the permitting process. Requested translation, interpretation services, and accommodations or services for persons with disabilities will be arranged to the extent possible. Telephone conversation assistance is available through Relay New Mexico at no charge for people who are deaf, hard of hearing, or have difficulty speaking on the phone, by calling 1 800 659-1779; TTY users: 1-800-659-8331; Spanish: 1-800-327-1857. Telephone interpretation assistance for persons that are a non-English speaker or do not speak English well is available at no charge when calling NMED.

NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Parts 5 and 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non- discrimination programs, policies or procedures, you may contact: Kristine Yurdin, Non-Discrimination Coordinator, New Mexico Environment Department, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. If you believe that you have been discriminated against with respect to a NMED program or activity, you may contact the Non-Discrimination Coordinator identified above or visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

Journal: March 8, 2020

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 Saint Francis Drive / PO Box 5469
Santa Fe, NM 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

Michelle Lujan Grisham
Governor

Howie C. Morales
Lieutenant Governor

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Street, or PO Box P.O. Box 3090
City, St Carlsbad, NM
PS Form 3800, August 2006

CERTIFIED MAIL – RETURN RECEIPT REQUEST

March 2, 2020

Gregory Sosson, Acting Manager
U.S. Department of Energy, Carlsbad Field Office
P.O. Box 3090
Carlsbad, NM 88221

RE: Draft Discharge Permit Renewal and Modification, DP-831, Waste Isolation Pilot Plant (WIPP)

Dear Mr. Sosson:

The New Mexico Environment Department (NMED) hereby gives notice to the U.S. Department of Energy of the proposed approval of Ground Water Discharge Permit Renewal and Modification, DP-831, (copy enclosed), pursuant to Subsection H of 20.6.2.3108 NMAC. NMED will publish notice of the availability of the draft Discharge Permit in the near future and will forward a copy of the notice to you.

Prior to making a final ruling on the proposed Discharge Permit, NMED will allow 30 days from the date the public notice is published in the newspaper for any interested party, including the Discharge Permit applicant, to submit written comments and/or a request a public hearing. A hearing request shall set forth the reasons why a hearing is requested. NMED will hold a hearing in response to a timely hearing request if the NMED Secretary determines there is substantial public interest in the proposed Discharge Permit.

Please review the enclosed draft Discharge Permit carefully. Please be aware that this Discharge Permit may contain conditions that require the permittee to implement operational, monitoring or closure actions by a specified deadline.

Please submit written comments or a request for hearing to my attention at the address above or via email to avery.young@state.nm.us. If NMED does not receive written comments or a request for hearing during the public comment period, the draft Discharge Permit will become final. Thank you for your cooperation during the review process. Feel free to contact me with any questions at (505) 827-2909.

Sincerely,

Avery Young
Environmental Scientist

Encl: Draft Discharge Permit Renewal and Modification, DP-831
Groundwater Discharge Permit DP-831 Fact Sheet

cc: Mike Brown, U.S. Department of Energy, mike.brown@wipp.ws
Rick Chavez, AECOM, rick.chavez@wipp.ws

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.

Gregory Sosson, Acting Manager
US Department of Energy
Carlsbad Field Office
P.O. Box 3090
Carlsbad, NM 88221

9590 9402 5496 9249 4104 78

2. Article Number (Transfer from service label)
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PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

Michelle Lujan Grisham
Governor

Howie C. Morales
Lieutenant Governor

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

1190 Saint Francis Drive / PO Box 5469
Santa Fe, NM 87502-5469
Phone (505) 827-2900 Fax (505) 827-2965
www.env.nm.gov

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

Draft: March 2, 2020

GROUND WATER QUALITY BUREAU
DISCHARGE PERMIT
Issued under 20.6.2 NMAC

DRAFT

Facility Name:	Waste Isolation Pilot Plant (WIPP)
Discharge Permit Number:	DP-831
Facility Location:	Highway 128, 26 miles southeast of Carlsbad Sections 20, 21, 28, and 29, Township 22S, Range 31E
County:	Eddy County
Permittee:	U.S. Department of Energy
Mailing Address:	Gregory Sosson, Acting Manager U.S. Department of Energy, Carlsbad Field Office P.O. Box 3090 Carlsbad, NM 88221
Facility Contact:	Mike Proctor, Facility Operator
Telephone Number/Email:	(575) 234-8143/mike.proctor@wipp.ws
Permitting Action:	Renewal and Modification
Permit Effective Date:	DATE
Permit Expiration Date:	DATE
NMED Permit Contact:	Avery Young
Telephone Number/Email:	(505) 827-2909/ avery.young@state.nm.us

MICHELLE HUNTER
Chief, Ground Water Quality Bureau
New Mexico Environment Department

Date

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GROUND WATER DISCHARGE PERMIT RENEWAL and MODIFICATION
Waste Isolation Pilot Plant (WIPP), DP-831

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Discharge Permit Renewal and Modification (Discharge Permit), DP-831, to the U.S. Department of Energy (DOE or permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the Waste Isolation Pilot Plant (WIPP or facility) into ground and surface water, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses, and to protect public health. In issuing this Discharge Permit, NMED has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been met. Pursuant to Section 20.6.2.3104 NMAC, it is the responsibility of the permittee to comply with the terms and conditions of this Discharge Permit; failure may result in an enforcement action(s) by NMED (20.6.2.1220 NMAC).

The activities that produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics of the discharge are briefly described as follows:

Domestic wastewater is discharged to a synthetically lined impoundment system for treatment and disposal by evaporation at a rate of up to 23,000 gallons per day (gpd). The system consists of seven synthetically lined impoundments (Facultative Lagoon System) comprised of Settling Lagoons 1 and 2, Polishing Lagoons 1 and 2, and Effluent Lagoons A, B, and C.

Non-domestic wastewater may be discharged at the facility in the following ways:

- Up to 27,000 gpd of industrial wastewaters from the following sources: wastewater from compressed air systems, brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous wastewaters. These industrial wastewaters are discharged to Effluent Lagoons B and C of the Facultative Lagoon System for disposal by evaporation.

- Up to 50,000 gpd of industrial wastewaters from the following sources: brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous wastewaters. These industrial wastewaters are discharged to a separate synthetically lined impoundment for disposal by evaporation (Evaporation Pond H-19).

- Up to 2,210 gpd of brine produced from the operations of the, to be constructed, Salt Reduction System within the Safety Significant Confinement Ventilation System (SSCVS) will be discharged to two double synthetically lined impoundments, each with a leak detection system (Brine Retention Ponds East and West, collectively Brine Ponds). One brine retention pond will be in service while the other brine retention pond is closed for evaporation and removal of precipitated salt in order to maintain at least two feet of freeboard. Any remaining brine in the closed Brine Pond will be transferred to Brine Salt Storage Pond 4 for disposal by evaporation.

- Salt and other subsurface materials mined during construction of the Facility, as well as currently mined salt, are stored at the surface in four stockpiles. The stockpiles currently storing salt, or that will be used in the future as salt is mined from the Facility's underground panels, are referred to as Salt Cells 2, 3, and 5. Stormwater runoff in contact with Salt Cells 2 and 3 is collected in two double synthetically-lined stormwater impoundments, each with a leak detection system (Salt Storage Ponds 2 and 3). The total storage capacity of Salt Storage Ponds 2 and 3 is 21,737,254 gallons. Stormwater runoff in contact with Salt Cell 5 will be collected in a double synthetically-lined stormwater impoundment with a leak detection system (Salt Storage Pond 5). The storage capacity of Salt Storage Pond 5 will be 6,355,404 gallons. Salt Cell 1 no longer receives salt and is capped with synthetic material and an earthen cover. Stormwater runoff in contact with this stockpile is collected in synthetically-lined diversion ditches directed to a synthetically-lined impoundment (Salt Storage Pond 1). The storage capacity of Salt Storage Pond 1 is 3,301,634 gallons. The storage capacity of each salt storage pond is sufficient to contain a 24-hour, 100-year (5.84-inch rainfall) storm event.

- Stormwater runoff from the SSCVS area is collected in a double synthetically lined storm water impoundment with a leak detection system (Brine Salt Storage Pond 4). The storage capacity of Brine Salt Storage Pond 4 is 8,668,722 gallons. The capacity of the Brine Salt Storage Pond 4 is sufficient to contain a 24-hour, 100-year (5.84-inch rainfall) storm event.

- Additional stormwater runoff from the Facility's paved areas and roofs is collected in three synthetically-lined impoundments (Storm Water Ponds 1, 2, and 3). This runoff does not contact the salt stockpiles or other waste materials at the Facility and may be used by the permittee for dust control, soil compaction, and other construction activities.

Salt and other subsurface materials mined during construction of the facility, as well as currently mined salt, are stored on the surface in four stockpiles (Salt Cells 1, 2, 3, and 5). Salt Cell 1 is closed with a 60-mil HDPE synthetic liner cover and two feet of native soil, as well as a 60-mil HDPE synthetically lined drainage system for stormwater runoff collection. Salt Cells 2 and 3 were constructed with six inches of prepared subgrade, a 60-mil HDPE liner, a 200-mil Geonet drainage layer, an eight-ounce geotextile fabric, and the fabric is then covered with two feet of screened native soil. Each salt cell is sloped toward the center, which contains a collection trench and pipe for conveyance of water to Salt Storage Ponds 2 and 3. Salt Cell 5 will be constructed with a 60-mil HDPE liner on the bottom with a protective layer of native soil on top to protect the liner. A HDPE pipe will be installed to collect and transmit by gravity the leachate and stormwater runoff water from Salt Cell 5 to Salt Storage Pond 5.

The Site and Preliminary Design Validation (SPDV) material pile was constructed as the shafts were excavated when construction first began at the WIPP site. The SPDV material pile was closed in the year 2000 with a geosynthetic liner cover installed on 6 inches of bedding material and covered with a minimum of three feet of earthen material.

The modification consists of the addition of one new salt storage cell and four new impoundments: Salt Cell 5, Salt Storage Pond 5, Brine Salt Storage Pond 4, Brine Retention Pond East, and Brine Retention Pond West.

The discharge contains water contaminants that may be elevated above the standards of Section 20.6.2.3103 NMAC.

The facility is located near the Jal Highway (NM-128), 26 miles southeast of Carlsbad, in Sections 20, 21, 28, and 29, Township 22S, Range 31E, Eddy County.

The WIPP facility is a mined geologic repository for the disposal of transuranic (TRU) waste. The underground repository is located 2,150 feet below land surface in the bedded salt of the Salado Formation. The WIPP first began accepting waste in March 1999. In addition to this groundwater Discharge Permit, the WIPP is also regulated by the NMED Hazardous Waste Bureau under the New Mexico Hazardous Waste Act and New Mexico's Hazardous Waste Regulations.

The WIPP facility is geologically situated in the southeast portion of New Mexico within the Delaware Basin, which is part of the larger Permian Basin. The geologic formations below the facility that are pertinent to this Discharge Permit, from deepest to shallowest, include: the Salado Formation, the Rustler Formation, the Dewey Lake Formation, and, in the northeastern portion of the facility, the Santa Rosa Formation. The Salado Formation, which is first encountered at an approximate depth of 850 feet and is approximately 2,000 feet thick, consists predominately of polyhalite, with some halite, carbonates, anhydrites, and clay seams. The Rustler Formation ranges from 350 to 500 feet thick and consists of carbonates, anhydrites, and halites. The Dewey Lake Formation is approximately 500 feet thick and consists almost entirely of mudstone, claystone, siltstone, and interbedded sandstone, and is frequently referred to as the Dewey Lake Redbeds Formation.

Groundwater below the facility most likely to be affected by a discharge is at a depth of approximately 35 to 160 feet. Natural groundwater is located in the middle portion of the Dewey Lake Formation at a depth of approximately 160 feet and has an average total dissolved solids concentration of approximately 3,400 milligrams per liter. The WIPP discovered a perched water zone in the lower Santa Rosa and upper Dewey Lake Formations in 1995 and determined that the probable sources of this shallow groundwater were the unlined impoundments constructed to capture stormwater runoff at the facility and runoff from the above-ground salt piles. This shallow groundwater has been found to be contaminated with total dissolved solids, sulfate (SO_4), and chloride. After the discovery of the anthropogenically created shallow groundwater (referred to as shallow groundwater), all impoundments at the facility were lined and a network of monitoring wells was installed. The shallow groundwater has a flow direction of north to south. Natural, non-anthropogenic, groundwater occurs in the Dewey Lake Formation (referred to as natural groundwater in the Dewey Lake Formation) south of the WIPP facility at a depth of 160 feet. The Dewey Lake Formation has a relatively low hydraulic conductivity.

The first laterally continuous water-bearing zone below the facility is within an approximately 30-foot-thick section of the Culebra Member of the Rustler Formation. Water in the Culebra Member is usually present in fractures and is confined by overlaying anhydrite and underlying clay and anhydrite beds. The Culebra Member is monitored through a network of monitoring wells.

The original Discharge Permit was issued on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998 and on January 24, 2000, renewed on April 29, 2003, modified on December 22, 2003 and on December 29, 2006, renewed and modified on July 23, 2008, and last renewed on July 29, 2014. The application (i.e., discharge plan) consists of the materials submitted by the permittee dated December 3, 2018 and materials contained in the administrative record prior to issuance of this Discharge Permit.

The discharge shall be managed in accordance with all conditions and requirements of this Discharge Permit.

Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to require a Discharge Permit Modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under this Discharge Permit are not protective of groundwater quality, and that more stringent requirements to protect groundwater quality may be required by NMED. The permittee may be required to implement abatement of water pollution and remediate groundwater quality.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

The following acronyms and abbreviations may be used in this Discharge Permit.

Abbreviation	Explanation
BOD_5	biochemical oxygen demand (5-day)
CFR	Code of Federal Regulations
CFU	Colony Forming Unit
Cl	chloride
EPA	United States Environmental Protection Agency
gpd	gallons per day
LAA	land application area
LADS	land application data sheet(s)
mg/L	milligrams per liter
mL	milliliters
MPN	Most Probable Number

Abbreviation	Explanation
NMED	New Mexico Environment Department
NMSA	New Mexico Statutes Annotated
NO_3-N	nitrate-nitrogen
NTU	nephelometric turbidity units
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
total nitrogen	= TKN + NO_3-N
TRC	total residual chlorine
TSS	total suspended solids
WQA	New Mexico Water Quality Act
WQCC	Water Quality Control Commission

Abbreviation	Explanation		Abbreviation	Explanation
NMAC	New Mexico Administrative Code		WWTF	Wastewater Treatment Facility

II. FINDINGS

In issuing this Discharge Permit, NMED finds the following.

1. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move directly or indirectly into groundwater within the meaning of Section 20.6.2.3104 NMAC.

2. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move into groundwater of the State of New Mexico that has an existing concentration of 10,000 mg/L or less of TDS within the meaning of Subsection A of 20.6.2.3101 NMAC.

3. The discharge from the facility is not subject to any of the exemptions of Section 20.6.2.3105 NMAC.

III. AUTHORIZATION TO DISCHARGE

Pursuant to 20.6.2.3104 NMAC, it is the responsibility of the permittee to ensure that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein.

The permittee is authorized to discharge up to 23,000 gpd of domestic wastewater to a synthetically-lined facultative lagoon system for disposal by evaporation. The Facultative Lagoon System is authorized to accept up to 27,000 gpd of non-hazardous industrial wastewater from compressed air systems at the facility, brine, purge waters from sampling and developing wells, and miscellaneous industrial non-hazardous wastewater for disposal by evaporation. Up to 50,000 gpd of brine, purge waters, and miscellaneous non-hazardous process waters is authorized to be discharged into to Evaporation Pond H-19. Up to 2,210 gpd of brine is authorized to be discharged from a 3,000-gallon holding tank to Brine Retention Ponds East and West for disposal by evaporation. In order to maintain at least two feet of freeboard, the remaining brine in the Brine Ponds is authorized to be transferred to the Brine Salt Storage Pond 4.

The permittee is authorized to stockpile mined salt in four salt cells: Salt Pile 1 is closed with a cover; Salt Cells 2, 3 and 5 have authorized footprints of 6.2 acres, 5.2 acres, and 5.1 acres, respectively. The permittee is authorized to collect storm water runoff from these salt cells in three double synthetically lined impoundments with leak detection systems (Salt Storage Pond 2, Salt Storage Pond 3, and Salt Storage Pond 5) and one synthetically lined impoundment with a drainage system (Salt Storage Pond 1) for disposal by evaporation. The permittee is also authorized to collect storm water runoff from the facility's paved areas and roofs in Storm Water Ponds 1, 2, and 3, as well as Brine Salt Storage Pond 4. This runoff is not in contact with the salt stockpiles at the facility, and runoff from Storm Water Ponds 1, 2, and 3 may be used for dust control, soil compaction, and other construction activities.

This Discharge Permit sets forth requirements for the discharge and disposal of domestic and non-domestic wastewater. Conditions in the Operational Plan, the Monitoring and Reporting, and the Closure Plan sections are categorized as follows:

- **Part A. Generally Applicable to All Discharges;**
- **Part B. Applicable to the Facultative Lagoon System;**
- **Part C. Applicable to the Evaporation Pond H-19, Brine Retention Pond East, Brine Retention Pond West, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3;**
- **Part D. Applicable to the Impoundments Containing Storm Water Runoff in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, 3, and 5) and to Salt Stockpiles (Salt Cells 1, 2, 3, and 5);**
- **Part E. Applicable to Ground Water Monitoring.**

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

IV. CONDITIONS

NMED issues this Discharge Permit for the discharge of water contaminants subject to the following conditions.

OPERATIONAL PLAN

Part A. Generally Applicable to All Discharges

#	Operating Conditions Applicable to All Discharges
1.	The permittee shall implement the following operational plan to ensure compliance with Title 20, Chapter 6, Parts 2 and 4 NMAC. [Subsection C of 20.6.2.3109 NMAC]
2.	The permittee shall operate in a manner such that standards and requirements of Sections 20.6.2.3101 and 20.6.2.3103 NMAC are not violated. [20.6.2.3101 NMAC, 20.6.2.3103 NMAC, Subsection C of 20.6.2.3109 NMAC]
3.	The permittee shall maintain the impoundment liners in such a manner as to avoid conditions that could affect the liner or the structural integrity of the impoundments. Such conditions include or may be characterized by the following: • erosion damage; • animal burrows or other damage;

#	Operating Conditions Applicable to All Discharges
	• the presence of vegetation including aquatic plants, weeds, woody shrubs or trees growing within five feet of the top inside edge of a sub-grade impoundment, within five feet of the toe of the outside berm of an above-grade impoundment, or within the impoundment itself; • the presence of large debris or large quantities of debris in the impoundment; • evidence of seepage; or • evidence of berm subsidence. Vegetation growing around the impoundments shall be routinely controlled by mechanical removal in a manner that is protective of the impoundment liner. The permittee shall visually inspect the impoundments and surrounding berms on a monthly basis to ensure proper maintenance. In the event that inspection reveals any evidence of damage that threatens the structural integrity of an impoundment berm or liner, or that may result in an unauthorized discharge, the permittee shall enact the contingency plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
4.	The permittee shall preserve a minimum of one foot of freeboard between the liquid level in all the impoundments and the elevation of the top of the impoundment liner, except the Brine Retention Ponds East and West shall maintain two feet of freeboard. In the event that the permittee determines that the specified freeboard cannot be preserved in the impoundments, the permittee shall enact the contingency plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

Part B. Applicable to the Facultative Lagoon System

#	Facultative Lagoon System - Operational Actions with Implementation Deadlines
5.	Within three years following the effective date of this Discharge Permit (**by DATE**), the permittee shall measure the thickness of the settled solids in two impoundments (Settling Lagoon 1 and Settling Lagoon 2) that are part of the Facultative Lagoon System and report the results of the solids thickness measurements to NMED. The permittee shall measure the thickness of settled solids in each impoundment in accordance with the following procedure. a) The total surface area of the treatment impoundment shall be divided into nine equal sub-areas. b) A settled solids measurement device (core sampler) shall be utilized to obtain one measurement (to the nearest half-foot) per sub-area.

#	Facultative Lagoon System - Operational Actions with Implementation Deadlines
	c) The nine measurements shall be averaged. In the event the average solids accumulation exceeds one-third of the maximum allowable liquid depth in the impoundments, the permittee shall propose a plan for the removal and disposal of the solids. The solids removal and disposal plan shall be submitted to NMED for approval within two years and two months following the effective date of this Discharge Permit (**by DATE**) and shall include the following information: a) A method for removal of the solids to a depth of less than six inches throughout the treatment impoundment in a manner that is protective of the impoundment liner. b) A description of how the solids will be contained, transported, and disposed of in accordance with all local, state, and federal regulations, including 40 CFR Part 503. c) A schedule for completion of the solids removal and disposal project. The permittee shall initiate implementation of the plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

#	Facultative Lagoon System - Operating Conditions
6.	The permittee shall maintain fences around the Facultative Lagoon System to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
7.	The permittee shall maintain signs indicating that the wastewater at the facility is not potable. Signs shall be posted at the Facultative Lagoon System's entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish remain visible and legible. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
8.	The permittee shall utilize operators, certified by the State of New Mexico at the appropriate level, to operate the domestic wastewater collection, treatment and disposal systems. The operations and maintenance of all or any part of the wastewater system shall be performed by, or under the direct supervision of, a certified operator. [Subsection C of 20.6.2.3109 NMAC, 20.7.4 NMAC]

Part C. Applicable to the Evaporation Pond H-19, Brine Retention Pond East, Brine Retention Pond West, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operational Actions with Implementation Deadlines**
9.	Prior to discharging to the proposed Brine Retention Pond East, the Brine Retention Pond West, or the Brine Salt Storage Pond 4, the permittee shall submit written notification to NMED stating the date the discharge(s) is to commence. [Subsection C of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
10.	Prior to discharging to Brine Retention Pond East, Brine Retention Pond West, or Brine Salt Storage Pond 4, the permittee shall complete construction of the Ponds in accordance with the final construction plans and specifications submitted to NMED as part of the Discharge Permit application received on December 3, 2018. The permittee shall notify NMED prior to the commencement of construction to allow NMED personnel to be onsite for inspection during construction. [Subsections A and C of 20.6.2.1202 NMAC, Subsection C of 20.6.2.3109 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
11.	The permittee shall submit record drawings that bear the seal and signature of a licensed New Mexico professional engineer (pursuant to the New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority) for the constructed Brine Retention Pond East, Brine Retention Pond West, and Brine Salt Storage Pond 4 to NMED within 30 days of completion. [Subsections A and C of 20.6.2.1202 NMAC, Subsection C of 20.6.2.3109 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
12.	Within 180 days following the effective date of this Discharge Permit **(by DATE)**, the permittee shall install fences around Stormwater Ponds 1, 2 and 3 to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates and shall be maintained. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
13.	Prior to discharging to Brine Salt Storage Pond 4, the permittee shall install fences around said impoundment to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates and shall be maintained. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
14.	Prior to discharging to Brine Salt Storage Pond 4, the permittee shall post signs indicating that the wastewater in the impoundment is not potable. Signs shall be posted at the facility

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operational Actions with Implementation Deadlines**
	entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish and shall remain visible and legible. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
15.	Within two years following the effective date of this Discharge Permit (by **DATE**), the permittee shall measure the thickness of the settled solids in Evaporation Pond H-19 and report the results of the solids thickness measurements to NMED. The permittee shall measure the thickness of settled solids in accordance with the following process. a) Measure the water level via the staff gauge located in the impoundment. b) Lower a sounding line to the top of the salt deposit and measure the length of the line from the top of the salt deposit to the water level. c) Subtract the depth to the salt deposit from the water level. In the event the average solids accumulation exceeds one-third of the maximum liquid depth in the impoundment, the permittee shall propose a plan for the removal and disposal of the solids. The solids removal and disposal plan shall be submitted to NMED for approval within two years and two months following the effective date of this Discharge Permit (by **DATE**) and shall include the following information. a) A method for removal of the solids to a depth of less than six inches throughout the treatment impoundment in a manner that is protective of the impoundment liner. b) A description of how the solids will be contained, transported, and disposed of in accordance with all local, state, and federal regulations. c) A schedule for completion of the solids removal and disposal project. The permittee shall initiate implementation of the plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operating Conditions**
16.	The permittee shall construct, maintain and operate the leak detection, collection, and recovery systems (LDCRS) for Brine Salt Storage Pond 4 and Brine Retention Ponds East and West in a manner that will result in less than one foot of hydraulic head on the secondary liners in the impoundments. In the event that the permittee cannot maintain less than one foot of hydraulic head on the secondary liners for Brine Salt Storage Pond 4 and Brine Retention Ponds East and West, the permittee shall notify NMED within 48 hours of discovery and shall submit a

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operating Conditions**
	corrective action plan to NMED which evaluates the primary liner leakage rate, proposes options for reducing the leakage if optimal, or otherwise proposes a means to maintain less than one foot of hydraulic head on the secondary liner. The plan shall be submitted to NMED for approval within 60 days after the discovery that the hydraulic head on the secondary liner has surpassed one foot. In the event that it becomes necessary to modify a LDRCS for an impoundment, the permittee shall submit a report describing the proposed revised methodology for NMED approval. [20.6.2.3107 NMAC]
17.	The permittee shall maintain fences around Evaporation Pond H-19 to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
18.	The permittee shall maintain signs indicating that the wastewater in Evaporation Pond H-19 is not potable. Signs shall be posted at the impoundment entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish and shall remain visible and legible. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]

Part D. Applicable to the Impoundments Containing Storm Water Runoff in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, 3, and 5) and to Salt Stockpiles (Salt Cells 1, 2, 3, and 5)

#	**Salt Storage Ponds and Salt Stockpiles - Operational Actions with Implementation Deadlines**
19.	Prior to discharging to Salt Storage Pond 5, the permittee shall submit written notification to NMED stating the date the discharge is to commence. [Subsection C of 20.6.2.3107 NMAC]
20.	Prior to discharging to Salt Storage Pond 5 and prior to utilizing Salt Cell 5, the permittee shall complete construction in accordance with the final construction plans and specifications submitted to NMED as part of the Discharge Permit application received on December 3, 2018. The permittee shall notify NMED prior to construction to allow NMED personnel to be onsite for inspection during construction.

#	**Salt Storage Ponds and Salt Stockpiles - Operational Actions with Implementation Deadlines**
	[Subsections A and C of 20.6.2.1202 NMAC, Subsection C of 20.6.2.3109 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
21.	The permittee shall submit record final drawings that bear the seal and signature of a licensed New Mexico professional engineer (pursuant to the New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority) for the constructed Salt Storage Pond 5 and Salt Cell 5 to NMED within 30 days of completion. [Subsections A and C of 20.6.2.1202 NMAC, Subsection C of 20.6.2.3109 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
22.	Within 90 days following the effective date of this Discharge Permit (by **DATE**), the permittee shall install fences around Salt Storage Ponds 1, 2 and 3 to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
23.	Within 120 days following the effective date of this Discharge Permit (by **DATE**), the permittee shall post signs indicating that the wastewater in Salt Storage Ponds 1, 2 and 3 is not potable. Signs shall be posted at the facility entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish and shall remain visible and legible. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
24.	Within two years following the effective date of this Discharge Permit (**by DATE**), the permittee shall measure the thickness of the settled solids in Salt Storage Pond 1, 2, and 3 and report the results of the solids thickness measurements to NMED. The permittee shall measure the thickness of settled solids in each Salt Storage Pond in accordance with the following procedure. a) Measure the water level via the staff gauge located in the impoundment. b) Lower a sounding line to the top of the salt deposit and measure the length of the line from the top of the salt deposit to the water level c) Subtract the depth to the salt deposit from the water level. In the event the average solids accumulation exceeds one-third of the maximum liquid depth in the impoundments, the permittee shall propose a plan for the removal and disposal of the solids. The solids removal and disposal plan shall be submitted to NMED for approval within two years and two months following the effective date of this Discharge Permit (**by DATE**) and shall include the following information. a) A method for removal of the solids to a depth of less than six inches throughout the treatment impoundment in a manner that is protective of the impoundment liner.

#	**Salt Storage Ponds and Salt Stockpiles - Operational Actions with Implementation Deadlines**
	b) A description of how the solids will be contained, transported, and disposed of in accordance with all local, state, and federal regulations. c) A schedule for completion of the solids removal and disposal project. The permittee shall initiate implementation of the plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

#	**Salt Storage Ponds and Salt Stockpiles - Operating Conditions**
25.	The permittee shall maintain and operate the leak detection, collection, and removal systems (LDCRS) for Salt Storage Ponds 2, 3 and 5 in a manner that will result in less than one foot of hydraulic head on the secondary liners in the ponds. In the event that the permittee cannot maintain less than one foot of hydraulic head on the secondary liners for Salt Storage Ponds 2, 3 and 5, the permittee shall notify NMED within 48 hours of the discovery and shall submit a corrective action plan to NMED which evaluates the primary liner leakage rate, proposes options for reducing the leakage if optimal, or otherwise proposes a means to maintain less than one foot of hydraulic head on the secondary liner. The plan shall be submitted to NMED for approval within 60 days after the discovery that the hydraulic head on the secondary liner has surpassed one foot. In the event that it becomes necessary to modify a LDCRS for a pond, the permittee shall submit a report describing the proposed revised methodology for NMED approval. [20.6.2.3107 NMAC]
26.	The permittee shall conduct regular inspection of the earthen cover on Salt Cell 1 and the SPDV material pile. Inspections shall be conducted monthly and after storm events of 2 inches or greater in a 24-hour period to evaluate the integrity of the covers, including erosional impact and vegetation success. General observations and minor cover repairs shall be reported to NMED in the subsequent semi-annual report. In the event of significant erosion, such as the formation of gullies, rills, or areas where ponding is occurring, vegetative failure, or impending liner damage, the permittee shall provide a plan and schedule for repair to NMED for approval within 90 days of discovery. [20.6.2.3107 NMAC]

MONITORING AND REPORTING

Part A. Generally Applicable to Monitoring

#	Monitoring and Reporting Conditions
27.	The permittee shall conduct monitoring, reporting, and the other requirements listed below in accordance with the monitoring requirements of this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
28.	METHODOLOGY – Unless otherwise specified by this Discharge Permit, or approved in writing by NMED, the permittee shall use sampling and analytical techniques that conform with the references listed in Subsection B of 20.6.2.3107 NMAC. [Subsection B of 20.6.2.3107 NMAC]
29.	Semi-annual monitoring shall be performed during the following periods and reports submitted to NMED as follows: • January 1st through June 30th – **due by August 1st; and** • July 1st through December 31st – **due by February 1st.** [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
30.	The permittee shall submit its "Waste Isolation Pilot Plant Annual Site Environmental Report" to NMED with the next semi-annual monitoring report following its publication. [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Lagoon System

#	Facultative Lagoon System - Monitoring and Reporting Conditions
31.	The permittee shall estimate the monthly volume of domestic wastewater discharged to the Facultative Lagoon System by obtaining readings on a monthly basis from a totalizing flow meter that measures total domestic water usage. The permittee shall submit the monthly meter readings and calculated monthly and average daily water usage volumes to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
32.	The permittee shall measure the total monthly volume and record the origin of all industrial wastewater discharged to Effluent Lagoons B and C. Discharge volumes to Effluent Lagoons B and C shall be calculated by a time/volume method or volumetric measurement of the transport container(s). The monthly discharge volumes and other volumetric

#	**Facultative Lagoon System - Monitoring and Reporting Conditions**
	calculations each month shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
33.	The permittee shall collect a composite wastewater sample on a semi-annual basis (once every six months) from Effluent Lagoon A. The composite sample shall consist of a minimum of six equal aliquots collected at equal distances around the entire perimeter of the evaporative impoundment and thoroughly mixed. The composite sample shall be analyzed for: • TKN; • NO_3-N; • TDS; • Cl; and • SO_4. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
34.	In the event that the permittee discharges any industrial wastewater to Effluent Lagoon B or C within a monitoring reporting period, the permittee shall collect a composite wastewater sample from the impoundment(s) that received the industrial wastewater discharge. The composite sample(s) shall consist of a minimum of six equal aliquots collected at equal distances around the entire perimeter of the evaporative impoundment(s) and thoroughly mixed. The composite sample(s) shall be analyzed for: • TDS; • Cl; and • SO_4. Sample(s) shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. NMED may require comprehensive laboratory analyses of the industrial wastewater discharged to Effluent Lagoons B and C prior to discharge when NMED determines that additional information is needed. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]

Part C. Applicable to the Evaporation Pond H-19, Brine Retention Pond East, Brine Retention Pond West, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions**
35.	The permittee shall measure the total monthly volume and record the origin of all wastewater discharged to Evaporation Pond H-19. Discharge volumes to Evaporation Pond H-19 shall be calculated by a time/volume method or volumetric measurement of the transport container(s). The monthly discharge volumes and other volumetric calculations each month shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
36.	The permittee shall measure the total monthly volume of brine received by Brine Retention Ponds East and West. Discharge volumes to Brine Retention Ponds East and West shall be calculated by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. The monthly discharge volumes and other volumetric calculations each month shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
37.	The permittee shall measure the total weekly volume of liquid pumped from the leak detection sumps for Brine Salt Storage Pond 4 and Brine Retention Ponds East and West. The total volume of liquid pumped shall be calculated by a totalizing flow meter. The weekly volumes shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
38.	The permittee shall collect a composite wastewater sample annually after a storm event of two inches or greater in a 24-hour period from Storm Water Ponds 1, 2, and 3. The composite sample shall consist of a minimum of six equal aliquots collected at equal distances around the perimeter of the evaporative impoundments and thoroughly mixed. The composite sample shall be analyzed for: • SO_4; • TDS; and • Cl. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports.

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions**
	[Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
39.	The permittee shall collect a composite wastewater sample on a semi-annual basis (once every six months) from Evaporation Pond H-19 and from Brine Salt Storage Pond 4, once it becomes operational. The composite sample shall consist of a minimum of six equal aliquots collected at equal distances around the perimeter of the evaporative impoundment and thoroughly mixed. The composite sample shall be analyzed for: • SO_4; • TDS; and • Cl. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. NMED may require comprehensive laboratory analyses of the industrial wastewater discharged to Evaporation Pond H-19 prior to discharge when NMED determines that additional information is needed. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
40.	During the first year following the effective date of the Discharge Permit (**by DATE**), the permittee shall collect a grab sample (except as noted for pH) of wastewater from Evaporation Pond H-19 and analyze the sample for the following inorganic contaminants (dissolved fraction, except as noted): • aluminum (CAS 7429-90-5) • antimony (CAS 7440-36-0) • arsenic (CAS 7440-38-2) • barium CAS 7440-39-3 • beryllium (CAS 7440-41-7) • boron (CAS 7440-42-8) • cadmium (CAS 7440-43-9) • chromium (CAS 7440-47-3) • cobalt (CAS 7440-48-4) • copper (CAS 7440-50-8) • cyanide CAS 57-12-5) • fluoride (CAS 16984-48-8) • iron (CAS 7439-89-6) • lead (CAS 7439-92-1) • manganese (CAS 7439-96-5) • molybdenum (CAS 7439-98-7) • total mercury (nonfiltered) (CAS 7439-97-6) • pH (instantaneous) • nickel (CAS 7440-02-0) • radioactivity: combined radium-226 & radium-228 (CAS 15262-20-1) • selenium (CAS 7782-49-2) • silver (CAS 7440-224) • sulfate (CAS 14808-79-8) • thallium (CAS 7440-28-0) • uranium (CAS 7440-61-1) • zinc (CAS 7440-66-6)

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions**
	Samples shall be properly collected, prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Reporting limits shall be less than the corresponding numerical groundwater standards identified in 20.6.2.3103 NMAC. A summary of detected concentrations compared with the corresponding groundwater standards, and a copy of the laboratory report, including the analytical results and QA/QC summary report, shall be submitted to NMED in the next monitoring report. [Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]
41.	During the first year following the effective date of the Discharge Permit **(by DATE)**, the permittee shall collect a grab sample of wastewater from Evaporation Pond H-19 and analyze the non-filtered sample for the following organic contaminants: • atrazine (CAS 1912-24-9) • benzene (CAS 71-43-2) • benzo-a-pyrene (CAS 50-32-8) • carbon tetrachloride (CAS 56-23-5) • chloroform (CAS 67-66-3) • 1,2-dichlorobenzene (CAS 95-50-1) • 1,4-dichlorobenzene (CAS 106-46-7) • 1,1-dichloroethane (CAS 75-34-3) • 1,2-dichloroethane (EDC, CAS 107-06-2) • 1,1-dichloroethene (1,1-DCE, CAS 75-35-4) • cis-1,2-dichloroethene (CAS 156-59-2) • trans-1,2-dichloroethene (CAS 156-60-5) • 1,2-dichloropropane (PDC, CAS 78-87-5) • ethylbenzene (CAS 100-41-4) • ethylene dibromide (EDB, CAS 106-93-4) • methylene chloride (CAS 75-09-2) • <u>PAHs</u>: total naphthalene (CAS 91-20-3) plus monomethylnaphthalenes • Phenols • polychlorinated biphenyls (PCBs, CAS 1336-36-3) • pentachlorophenol (CAS 87-86-5) • toluene (CAS 108-88-3) • styrene (CAS 100-42-5) • 1,1,2,2-tetrachloroethane (CAS 79-34-5) • tetrachloroethene (PCE, CAS 127-18-4) • 1,2,4-trichlorobenzene (CAS 120-82-1) • 1,1,1-trichloroethane (1,1,1-TCA, CAS 71-55-6) • 1,1,2-trichloroethane (CAS 79-00-5) • trichloroethene (TCE, CAS 79-01-6) • vinyl chloride (CAS 75-01-4) • total xylenes (CAS 1330-20-7) Samples shall be properly collected, prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Reporting limits shall

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions**
	be less than the corresponding numerical groundwater standards identified in 20.6.2.3103 NMAC. A summary of detected concentrations compared with the corresponding groundwater standards, and a copy of the laboratory report, including the analytical results and QA/QC summary report, shall be submitted to NMED in the next monitoring report. [Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]
42.	The permittee shall measure the water depth in Storm Water Ponds 1, 2, and 3 and Brine Salt Storage Pond 4 monthly to the nearest tenth of a foot (0.1 ft). The approximate monthly volume of water shall be calculated and submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC and Subsection H of 20.6.2.3109 NMAC]
43.	The permittee shall collect at least one sample quarterly rotating between Brine Retention Pond East and Brine Retention Pond West of the liquid present and analyze the sample for every constituent listed in Subsection A of 20.6.2.3103 NMAC. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. After four consecutive quarterly sampling events, the permittee may request to reduce the sampling frequency and analyte list set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
44.	The permittee shall submit any analytical results from Brine Retention Ponds East and West submitted to the NMED Hazardous Waste Bureau to the Ground Water Quality Bureau. [Subsection A of 20.6.2.3107 NMAC]
45.	The permittee shall submit a copy of all records of solids (salt) removal from the Brine Retention Basins East and West and the associated disposal documentation to NMED in the associated semi-annual monitoring report. [Subsection A of 20.6.2.3107 NMAC]

Part D. Applicable to the Impoundments Containing Storm Water Runoff in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, 3, and 5) and to Salt Stockpiles (Salt Cells 1, 2, 3, and 5)

#	Salt Storage Ponds and Salt Stockpiles - Monitoring and Reporting Conditions
46.	The permittee shall collect a composite wastewater sample annually after a storm event of 2 inches or greater in a 24-hour period from Salt Storage Ponds 1, 2, 3, and 5. The composite sample shall consist of a minimum of six equal aliquots collected at equal distances around the perimeter of the evaporative impoundments and thoroughly mixed. The composite sample shall be analyzed for: • SO_4; • TDS; and • Cl. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
47.	The permittee shall measure the water depth monthly to the nearest tenth of a foot (0.1 ft) in the Salt Storage Ponds 1, 2, 3, and 5. The approximate volume of water shall be calculated and submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
48.	The permittee shall measure the total volume of liquid pumped from the leak detection sumps for Salt Storage Ponds 2 and 3 during every pumping event. The total volume of liquid pumped shall be calculated by a volumetric measurement of the container(s) filled. The volumetric calculations for each pumping event shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
49.	The permittee shall measure the weekly volume of liquid pumped from the leak detection sump for Salt Storage Pond 5. The total volume of liquid pumped shall be calculated by a totalizing flow meter. The weekly volumes shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]

Part E. Groundwater Monitoring and Reporting

#	Groundwater Monitoring Actions with Implementation Deadlines
50.	Within 60 days following the effective date of this Discharge Permit (**by DATE**), the permittee shall install the following new monitoring wells in accordance to the Monitoring Well Proposal submitted to NMED on February 18, 2020 and approved by NMED on February 20, 2020. • One monitoring well (PZ-17) located 20 to 50 feet hydrologically downgradient of the Facultative Lagoon System in the natural groundwater of the Dewey Lake Formation and intended to monitor the Facultative Lagoon System. • One monitoring well (PZ-19) located 20 to 50 feet hydrologically downgradient of Evaporation Pond H-19 in the natural groundwater of the Dewey Lake Formation and intended to monitor Evaporation Pond H-19. The well shall be completed in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Guidelines*, Revision 1.1, March 2011 or alternative methods submitted for approval. Construction and lithologic logs shall be submitted to NMED within 120 days of well completion in a cumulative well report. [Subsection A of 20.6.2.3107 NMAC]
51.	Prior to discharging to Brine Salt Storage Pond 4, Salt Storage Pond 5, and Brine Retentions Ponds East and West, the permittee shall install the following new monitoring wells in accordance to the Monitoring Well Proposal submitted to NMED on February 18, 2020 and approved by NMED on February 20, 2020. • One monitoring well (PZ-16) located 20 to 50 feet hydrologically downgradient of Brine Salt Storage Pond 4 in the shallow groundwater. • One monitoring well (PZ-18) located 20 to 50 feet hydrologically downgradient of Salt Storage Pond 5 in the shallow groundwater. The wells shall be completed in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Guidelines*, Revision 1.1, March 2011 or alternative methods submitted for approval. Construction and lithologic logs shall be submitted to NMED within 120 days of well completion in a cumulative well report. [Subsection A of 20.6.2.3107 NMAC]
52.	Following the installation of the monitoring wells required by Condition 50 and 51 of this Discharge Permit, the permittee shall sample groundwater in the wells and analyze the samples for temperature, pH, specific conductance (field measured); and for SO_4, TDS, and Cl.

#	Groundwater Monitoring Actions with Implementation Deadlines
	Groundwater sample collection, preservation, transport and analysis shall be performed according to the following procedure: a) The pump intake shall be placed in the following manner: fully submerged, within the screened interval, and at least two feet above the base of the screen. b) The drawdown will be minimized such that it will maintain depression of the water level, but not exceed one liter per minute. c) Allow field-measured temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, temperature, and specific conductance are within ± 10% of the last three consecutive readings. d) Obtain samples from the well for analysis. e) Properly prepare, preserve and transport samples. f) Analyze samples in accordance with the methods authorized in this Discharge Permit. A well completion report including the Office of the State Engineer permit, depth-to-most-shallow groundwater measurements, groundwater analytical results (including the laboratory QA/QC summary report), and a facility layout map showing the location and number of each well, shall be submitted to NMED within 120 days of the installation of the monitoring wells in a cumulative well report. [Subsection A of 20.6.2.3107 NMAC]
53.	Within 120 days following the effective date of this Discharge Permit **(by DATE)**, the permittee shall survey all newly constructed monitoring wells in the natural groundwater of the Dewey Lake Formation and in the shallow groundwater to a U.S. Geological Survey (USGS) or other permanent benchmark. Survey data shall include northing, easting and elevation to the nearest hundredth of a foot and shall be in accordance with the "Minimum Standards for Surveying in New Mexico" (12.8.2 NMAC). A survey elevation shall be established at the top-of-casing, with a permanent marking indicating the point of survey. The survey shall bear the seal and signature of a licensed New Mexico professional surveyor (pursuant to the New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority). Depth-to-most-shallow groundwater shall be measured to the nearest hundredth of a foot in all surveyed wells and referenced to mean sea level, and the data shall be used to develop a groundwater elevation contour map showing the location of all monitoring wells and the direction and gradient of groundwater flow at the facility. The data and groundwater elevation contour map shall be submitted to NMED within 120 days of the installation of the monitoring wells in a cumulative well report. [Subsection A of 20.6.2.3107 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]

#	**Groundwater Monitoring Actions with Implementation Deadlines**
54.	The permittee shall perform aquifer testing to determine the local hydraulic properties of the aquifer near the monitoring wells required by this Discharge Permit and that contain groundwater within 60 days of the complete installation of each new monitoring well. The purpose of the aquifer testing shall be to quantify the movement of groundwaters in the vicinity of each well or piezometer. Aquifer testing shall be performed in wells in both the shallow groundwater and in the natural groundwater in the Dewey Lake Formation where groundwater is present. Aquifer testing shall measure hydraulic conductivity, transmissivity, and storage coefficient and shall be performed utilizing procedures previously utilized at the facility so as to produce comparable results. The measured hydraulic properties for each monitoring well shall be submitted to NMED within 120 days of the installation of the monitoring wells in a cumulative well report. [Subsection A of 20.6.2.3107 NMAC]

#	**Groundwater Monitoring Conditions**
55.	The permittee shall measure the depth to groundwater to the nearest hundredth of a foot (0.01 ft) quarterly in the following piezometers/monitoring wells: • PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-17, PZ-18, and PZ-19 • C-2505, C-2506, C-2507, C-2811, and WQSP-6A Depth-to-groundwater measurements shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
56.	Within the first year of the permit term, the permittee shall perform sampling in the following piezometers/monitoring wells and analyze the samples for temperature, pH, specific conductance (field measured); Uranium and combined Radium-226 and Radium-228: • PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-17, PZ-18, and PZ-19 • C-2507, C-2811, and WQSP-6A Monitoring wells WQSP-6A, PZ-17, and PZ-19 are intended to monitor the natural groundwater of the Dewey Lake Formation, which occurs in the subsurface at the southern end of the facility. All other monitoring wells are intended to monitor the shallow

#	**Groundwater Monitoring Conditions**
	groundwater. Groundwater sample collection, preservation, transport and analysis shall be performed according to the following low-flow sampling procedure: a) The pump intake shall be placed in the following manner: fully submerged, within the screened interval, and at least two feet above the base of the screen. b) The drawdown will be minimized such that it will maintain depression of the water level, but not exceed one liter per minute. c) Allow field-measured temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, temperature, and specific conductance are within ± 10% of the last three consecutive readings. d) Obtain samples from the well for analysis. e) Properly prepare, preserve and transport samples. f) Analyze samples in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED in the next semi-annual monitoring report following sampling. [Subsection A of 20.6.2.3107 NMAC]
57.	The permittee shall perform semi-annual groundwater sampling in the following piezometers/monitoring wells and analyze the samples for temperature, pH, specific conductance (field measured); and for SO_4, TDS, and Cl: • PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-17, PZ-18, and PZ-19 • C-2507, C-2811, and WQSP-6A Monitoring wells WQSP-6A, PZ-17, and PZ-19 are intended to monitor the natural groundwater of the Dewey Lake Formation, which occurs in the subsurface at the southern end of the facility. All other monitoring wells are intended to monitor the shallow groundwater. Groundwater sample collection, preservation, transport and analysis shall be performed according to the following low-flow sampling procedure: a) The pump intake shall be placed in the following manner: fully submerged, within the screened interval, and at least two feet above the base of the screen. b) The drawdown will be minimized such that it will maintain depression of the water level, but not exceed one liter per minute.

#	**Groundwater Monitoring Conditions**
	c) Allow field-measured temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, temperature, and specific conductance are within ± 10% of the last three consecutive readings. d) Obtain samples from the well for analysis. e) Properly prepare, preserve and transport samples. f) Analyze samples in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
58.	The permittee shall perform semi-annual groundwater sampling in the following monitoring wells and analyze the samples for TKN and NO_3-N. • PZ-17, located south of the Facultative Lagoon System and intended to be located hydrologically downgradient of the Facultative Lagoon System in the natural groundwater of the Dewey Lake Formation. Groundwater sample collection, preservation, transport and analysis shall be performed according to the following procedure, or as otherwise approved by NMED. Groundwater sample collection, preservation, transport and analysis shall be performed according to the following low-flow sampling procedure: a) The pump intake shall be placed in the following manner: fully submerged, within the screened interval, and at least two feet above the base of the screen. b) The drawdown will be minimized such that it will maintain depression of the water level, but not exceed one liter per minute. c) Allow field-measured temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, temperature, and specific conductance are within ± 10% of the last three consecutive readings. d) Obtain samples from the well for analysis. e) Properly prepare, preserve and transport samples. f) Analyze samples in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]

#	Groundwater Monitoring Conditions
59.	The permittee shall develop a groundwater elevation contour map for the shallow groundwater and for the natural groundwater in the Dewey Lake Formation on a semi-annual basis. The permittee shall use the top of casing elevation data from the monitoring well surveys and quarterly depth-to-groundwater measurements, referenced to mean sea level, obtained from the groundwater monitoring wells required by this Discharge Permit. The groundwater elevation contour maps shall depict the groundwater flow direction based on the groundwater elevation contours. Groundwater elevations between monitoring well locations shall be estimated using common interpolation methods. A contour interval appropriate to the data shall be used, but the interval shall, in no case, be greater than two feet. Groundwater elevation contour maps shall depict the groundwater flow direction, using arrows, based on the orientation of the groundwater elevation contours, and the location and identification of each monitoring well and contaminant source, e.g., surface impoundment. The groundwater elevation contour maps shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
60.	A single table in a paper and electronic format (i.e., EXCEL spreadsheet) of water level measurements and water quality data with only those constituents analyzed and water levels measured during a single event shown in columns shall be submitted to NMED in the semi-annual monitoring reports. The table shall include the following tabulated field measurements: temperature, pH, and electrical conductivity corrected to 25 degrees Celsius. The monitoring sites shall be shown in rows on the table, and the second column shall contain the date of the sampling event. Values exceeding standards shall be bolded. Any constituent not analyzed for at a particular site shall be shown as "NA", any site not sampled shall be shown as "NS" with an associated reason, and any site not measured for water levels shall be shown as "NM" with an associated reason. [Subsection A of 20.6.2.3107 NMAC]
61.	A single table that includes all available groundwater data to date shall be submitted annually to NMED in the semi-annual monitoring reports due February 1st. For each monitoring well, the name of the well shall be entered in the far-left column in a row by itself. Sampling events, beginning with the earliest event first, shall be entered in subsequent rows with the sampling date in the second column and the corresponding analytical data in columns further to the right. Each new sampling event shall be added as an additional row to the existing spreadsheet with the corresponding date of the sampling event noted in the second column next to the monitoring well name. [Subsection A of 20.6.2.3107 NMAC]

ADDITIONAL STUDIES REQUIRED

#	Terms and Conditions
62.	The permittee's groundwater monitoring data and reports document that the shallow groundwater beneath the site is contaminated with TDS, chloride, and sulfate above the standards of 20.6.2.3103 NMAC. This information indicates that the contaminated groundwater is primarily anthropogenic, having resulted from the leaking of impoundments at the facility, and has spread laterally since the installation of impoundment liners. Within six months following the effective date of this Discharge Permit **(by DATE)**, the permittee shall submit for NMED approval a site investigation workplan and implementation schedule. The purpose of the site investigation shall be to evaluate the efficacy of existing source controls, to determine the current lateral and vertical extent of the shallow contaminated groundwater, and to identify any potential impacts to the downgradient and naturally occurring groundwater in the Dewey Lake Formation. The site investigation may build upon the previous investigations completed by Daniel B. Stephens and Associates in 2003 and 2008. The permittee shall implement the site investigation upon NMED approval of the workplan and shall submit a completion report no later than two years following the effective date of this Discharge Permit **(by DATE)**. NMED may require the permittee to take corrective actions pursuant to 20.6.2.1203 NMAC or to abate water pollution consistent with the requirements and provisions of Section 20.6.2.4101, Section 20.6.2.4103, Subsections C and E of 20.6.2.4106, Section 20.6.2.4107, Section 20.6.2.4108 and Section 20.6.2.4112 NMAC. [20.6.2.3107 NMAC, 20.6.2.4103 NMAC]

CONTINGENCY PLAN

#	Terms and Conditions
63.	In the event that groundwater monitoring indicates that a groundwater quality standard identified in Section 20.6.2.3103 NMAC is newly exceeded, the permittee shall collect a confirmatory sample from the monitoring well within 15 days of receipt of the initial sampling results to confirm the initial sampling results. Within 90 days of confirmation of groundwater contamination, the permittee shall submit to NMED a Corrective Action Plan that proposes, at a minimum, source control measures and an implementation schedule. The Plan shall be enacted as approved by NMED. Once invoked (whether during the term of this Discharge Permit, or after the term of this Discharge Permit and prior to the completion of the Discharge Permit closure plan requirements), this condition shall apply until the permittee has fulfilled the requirements

#	Terms and Conditions
	of this condition and groundwater monitoring confirms for a minimum of eight (8) consecutive quarterly samples that the standards of Section 20.6.2.3103 NMAC are not exceeded in groundwater. If the groundwater standard continues to be violated 180 days after the confirmation of groundwater contamination, the permittee may be required to abate water pollution consistent with the requirements and provisions of Section 20.6.2.4101, Section 20.6.2.4103, Subsections C and E of 20.6.2.4106, Section 20.6.2.4107, Section 20.6.2.4108 and Section 20.6.2.4112 NMAC. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]
64.	In the event that information available to NMED indicates that a groundwater monitoring well or piezometer is not constructed in a manner consistent with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Guidelines*, Revision 1.1, March 2011; contains insufficient water to effectively monitor groundwater quality; or is not completed in a manner that is protective of groundwater quality, the permittee shall install a replacement well(s) within 120 days following notification from NMED. The permittee shall survey the replacement monitoring well(s)/piezometer(s) within 150 days following notification from NMED. Replacement well locations shall be approved by NMED prior to installation and completed in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. The permittee shall submit construction and lithologic logs, survey data and a groundwater elevation contour map to NMED within 60 days following well completion. Upon completion of the replacement monitoring well, the monitoring well requiring replacement shall be properly plugged and abandoned. Well plugging, abandonment and documentation of the abandonment procedures shall be completed in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011, and all applicable local, state, and federal regulations. The well abandonment documentation shall be submitted to NMED within 60 days of completion of well plugging activities. [Subsection A of 20.6.2.3107 NMAC]
65.	In the event that groundwater flow information obtained pursuant to this Discharge Permit indicates that a monitoring well/piezometer is not located hydrologically downgradient of the discharge location it is intended to monitor, the permittee shall install a replacement well within 180 days following notification from NMED. The permittee shall survey the replacement monitoring well within 210 days following notification from NMED.

#	Terms and Conditions
	Replacement well locations shall be approved by NMED prior to installation and completed in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. The permittee shall submit construction and lithologic logs, survey data and a groundwater elevation contour map within 30 days following well completion. [Subsection A of 20.6.2.3107 NMAC]
66.	In the event that the site investigation required by this Discharge Permit or an inspection reveals significant damage likely to affect the structural integrity of a lined impoundment or its ability to contain contaminants, the permittee shall propose to repair or the replacement of the impoundment liner by submitting a Corrective Action Plan to NMED for approval. The Plan shall be submitted to NMED within 30 days after discovery by the permittee or following notification from NMED that significant liner damage is evident. The Corrective Action Plan shall include a schedule for completion of corrective actions and the permittee shall initiate implementation of the Plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
67.	In the event that the required freeboard cannot be preserved in an impoundment, the permittee shall take actions authorized by this Discharge Permit and all applicable local, state, and federal regulations to restore the required freeboard. In the event that the required freeboard cannot be restored within a period of 72 hours following discovery, the permittee shall propose actions to be immediately implemented to restore of the required freeboard by submitting a short-term Corrective Action Plan to NMED for approval. Examples of short-term corrective actions include the pumping and hauling of excess wastewater from the impoundment or reducing the volume of wastewater discharged to the impoundment. The Plan shall include a schedule for completion of corrective actions and shall be submitted within 15 days following the date when the freeboard deficiency was initially discovered. The permittee shall initiate implementation of the Plan following approval by NMED. In the event that the short-term corrective actions failed to restore the required freeboard, the permittee shall propose permanent corrective actions in a long-term Corrective Action Plan submitted to NMED within 90 days following failure of the short-term Corrective Action Plan. Examples include the installation of an additional storage impoundment, or a significant/permanent reduction in the volume of wastewater discharged to the impoundment. The Plan shall include a schedule for completion of corrective actions and implementation of the Plan shall be initiated following approval by NMED. [Subsection A of 20.6.2.3107 NMAC]

#	**Terms and Conditions**
68.	In the event that a release (commonly known as a "spill") occurs that is not authorized under this Discharge Permit, the permittee shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in Section 20.6.2.1203 NMAC and summarized below. Within <u>24 hours</u> following discovery of the unauthorized discharge, the permittee shall verbally notify NMED and provide the following information. a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility. b) The name and address of the facility. c) The date, time, location, and duration of the unauthorized discharge. d) The source and cause of unauthorized discharge. e) A description of the unauthorized discharge, including its estimated chemical composition. f) The estimated volume of the unauthorized discharge. g) Any actions taken to mitigate immediate damage from the unauthorized discharge. Within <u>one week</u> following discovery of the unauthorized discharge, the permittee shall submit written notification to NMED with the information listed above and any pertinent updates. Within <u>15 days</u> following discovery of the unauthorized discharge, the permittee shall submit a corrective action report/plan to NMED describing any corrective actions taken and/or to be taken relative to the unauthorized discharge that includes the following information. a) A description of proposed actions to mitigate damage from the unauthorized discharge. b) A description of proposed actions to prevent future unauthorized discharges of this nature. c) A schedule for completion of proposed actions. In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of Section 20.6.2.4103 NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to Paragraph (1) of Subsection A of 20.6.2.1203 NMAC, the permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC. Nothing in this condition shall be construed as relieving the permittee of the obligation to comply with all requirements of Section 20.6.2.1203 NMAC. [20.6.2.1203 NMAC]

#	Terms and Conditions
69.	In the event that NMED or the permittee identifies any failures of the discharge plan or this Discharge Permit not specifically noted herein, NMED may require the permittee to submit a Corrective Action Plan and a schedule for completion of corrective actions to address the failure(s). Additionally, NMED may require a Discharge Permit modification to achieve compliance with 20.6.2 NMAC. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]

CLOSURE PLAN

Part A. Generally Applicable to All Discharges

#	Terms and Conditions
70.	The permittee shall close the facility covered under this Discharge Permit, either wholly or in part, in accordance with the closure plan in the March 10, 2005 Discharge Permit application. Where that closure plan references the closure plans in the WIPP Hazardous Waste Facility Permit and the WIPP Land Management Plan, the permittee shall use the most up-to-date version of the plans. [Subsection A of 20.6.2.3107 NMAC]
71.	For the purpose of post-closure monitoring, after closure of all authorized units is complete the permittee shall continue groundwater monitoring until the monitoring confirms for a minimum of eight (8) consecutive quarterly groundwater sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded. Total dissolved solids and chloride shall meet pre-discharge conditions. If during post-closure monitoring results show that a groundwater quality standard in Section 20.6.2.3103 NMAC is exceeded, the permittee shall implement the contingency plan required by this Discharge Permit. Following notification from NMED that post-closure monitoring may cease, the permittee shall plug and abandon all monitoring wells and piezometers in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Guidelines*, Revision 1.1, March 2011. [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Lagoon System

#	**Terms and Conditions**
72.	In the event the Facultative Lagoon System is proposed to be permanently closed, the permittee shall perform the following closure measures: Within <u>60 days</u> of ceasing to discharge to the Facultative Lagoon System impoundments, the line leading to the impoundments shall be plugged so that a discharge can no longer occur. Within <u>60 days</u> of ceasing to discharge to the Facultative Lagoon System impoundments, wastewater shall be evaporated or removed from the impoundments and any other wastewater system components and it shall be disposed of in accordance with all local, state, and federal regulations. Within <u>90 days</u> of ceasing to discharge to the Facultative Lagoon System impoundments, the permittee shall submit a sludge removal and disposal plan to NMED for approval. The permittee shall initiate implementation of the plan within 30 days following approval by NMED. The sludge removal and disposal plan shall include the following: a) The estimated volume and dry weight of sludge to be removed and disposed, including measurements and calculations. b) Analytical results for samples of the sludge taken from the impoundment for TKN, NO_3-N, percent total solids, hazardous constituents, and any other parameters tested (reported in mg/kg, dry weight basis). c) The method(s) of sludge *removal* from the impoundments. d) The method(s) of *disposal* for all of the sludge removed from the impoundments. The method(s) shall comply with all local, state and federal regulations, including 40 CFR Part 503. *Note: A proposal that includes the surface disposal of sludge may be subject to Ground Water Discharge Permitting requirements pursuant to 20.6.2.3104 NMAC that are separate from the requirements of this Discharge Permit.* e) A schedule for completion of sludge removal and disposal not to exceed two years from the date discharge to the impoundments ceased. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove all lines leading to and from the Facultative Lagoon System impoundments, or permanently plug and abandon them in place. b) Remove or demolish any other wastewater system components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liners. d) Fill the impoundments with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding.

#	Terms and Conditions
	[Subsection A of 20.6.2.3107 NMAC, 40 CFR Part 503]

Part C. Applicable to the Evaporation Pond H-19, Brine Retention Pond East, Brine Retention Pond West, Storm Water Ponds 1, 2, and 3, and Brine Salt Storage Pond 4

#	Terms and Conditions
73.	Upon cessation of operation, the permittee shall close Evaporation Pond H-19 and Storm Water Ponds 1, 2, and 3. Remaining liquids in Storm Water Ponds shall be removed and/or evaporated, and remaining liquids in Evaporation Pond H-19 shall be evaporated. All sludge shall be sampled to determine if it contains hazardous constituents and then managed and/or disposed of in accordance with applicable regulations. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove or plug all piping and other ancillary components b) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liners. d) Fill the impoundments with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [Subsection A of 20.6.2.3107 NMAC]

Part D. Applicable to the Impoundments Containing Storm Water Runoff in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, 3, and 5) and to Salt Stockpiles (Salt Cells 1, 2, 3, and 5)

#	Terms and Conditions
74.	Upon cessation of operation, all mined salt at the facility shall be removed from the site. The permittee is permitted to use the mined salt as backfill in shafts and as interior fill material in berms and permanent markers after closure. All mined salt remaining after backfilling and after construction of surface structures shall be removed from the site. The permittee shall submit a plan and schedule for salt removal to NMED for approval within 120 days prior to the facility closure. The WIPP Land Management Plan reflects the Land Withdrawal Act's requirements for disposition of the salt. The WIPP's Hazardous Waste Facility Permit also addresses closure activities that include closure of the salt storage areas in accordance with the provisions of the WIPP Land Management Plan. The salt storage area shall be reclaimed in the manner described in these documents.

	[Subsection A of 20.6.2.3107 NMAC]
75.	Upon cessation of operation, the permittee shall close Salt Storage Ponds 1, 2, 3, and 5. Remaining liquids in each impoundment shall be evaporated. All sludge shall be sampled to determine if it contains hazardous constituents and then managed and/or disposed of in accordance with applicable regulations. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove or plug all piping and other ancillary components. b) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liners. d) Fill the impoundments with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [Subsection A of 20.6.2.3107 NMAC]

GENERAL TERMS AND CONDITIONS

#	Terms and Conditions
76.	RECORD KEEPING - The permittee shall maintain a written record of: • information and data used to complete the application for this Discharge Permit; • any releases (commonly known as "spills") not authorized under this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC; • the operation, maintenance, and repair of all facilities/equipment used to treat, store or dispose of wastewater; • facility record drawings (plans and specifications) showing the actual construction of the facility and bear the seal and signature of a licensed New Mexico professional engineer; • copies of monitoring reports completed and/or submitted to NMED pursuant to this Discharge Permit; • the volume of wastewater or other wastes discharged pursuant to this Discharge Permit; • groundwater quality and wastewater quality data collected pursuant to this Discharge Permit; • copies of construction records (well log) for all groundwater monitoring wells required to be sampled pursuant to this Discharge Permit; • the maintenance, repair, replacement or calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit; and • data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit, including:

#	**Terms and Conditions**
	- the dates, location and times of sampling or field measurements; - the name and job title of the individuals who performed each sample collection or field measurement; - the sample analysis date of each sample - the name and address of the laboratory, and the name of the signatory authority for the laboratory analysis; - the analytical technique or method used to analyze each sample or collect each field measurement; - the results of each analysis or field measurement, including raw data; - the results of any split, spiked, duplicate or repeat sample; and - a copy of the laboratory analysis chain-of-custody as well as a description of the quality assurance and quality control procedures used. The written record shall be maintained by the permittee at a location accessible during a facility inspection by NMED for a period of at least five years from the date of application, report, collection or measurement and shall be made available to the department upon request. [Subsections A and D of 20.6.2.3107 NMAC]
77.	INSPECTION and ENTRY – The permittee shall allow inspection by NMED of the facility and its operations that are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC. The permittee shall allow NMED to have access to and reproduce for their use any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge Permit and the WQCC regulations. Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED under the WQA, the WQCC Regulations, or any other local, state or federal regulations. [Subsection D of 20.6.2.3107 NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]
78.	DUTY to PROVIDE INFORMATION - The permittee shall, upon NMED's request, allow for NMED's inspection/duplication of records required by this Discharge Permit and/or furnish to NMED copies of such records. [Subsection D of 20.6.2.3107 NMAC]

#	**Terms and Conditions**
79.	MODIFICATIONS and/or AMENDMENTS – In the event the permittee proposes a change to the facility or the facility's discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the facility, the permittee shall notify NMED prior to implementing such changes. The permittee shall obtain approval (which may require modification of this Discharge Permit) by NMED prior to implementing such changes. [Subsection C of 20.6.2.3107 NMAC, Subsections E and G of 20.6.2.3109 NMAC]
80.	PLANS and SPECIFICATIONS – In the event the permittee is proposing to construct a wastewater system or change a process unit of an existing system such that the quantity or quality of the discharge will change substantially from that authorized by this Discharge Permit, the permittee shall submit construction plans and specifications to NMED for the proposed system or process unit prior to the commencement of construction. In the event the permittee implements changes to the wastewater system authorized by this Discharge Permit that result in only a minor effect on the character of the discharge, the permittee shall report such changes (including the submission of record drawings, where applicable) as of January 1 and June 30 of each year to NMED. [Subsections A and C of 20.6.2.1202 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
81.	CIVIL PENALTIES - Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or facilities, or any refusal or failure to provide NMED with records or information, may subject the permittee to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10(C) and 74-6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to $10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the permittee waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10 and 74-6-10.1]
82.	CRIMINAL PENALTIES – No person shall: • make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained under the WQA;

#	**Terms and Conditions**
	• falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained under the WQA; or • fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation. Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth-degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is guilty of a third-degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental impact is guilty of a third-degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily injury to any other person is guilty of a second-degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]
83.	COMPLIANCE with OTHER LAWS - Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of the obligation to comply with any other applicable federal, state, and/or local laws, regulations, zoning requirements, nuisance ordinances, permits or orders. [NMSA 1978, § 74-6-5.L]
84.	RIGHT to APPEAL - The permittee may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC within thirty days of the receipt of postal notice of this Discharge Permit and shall include a statement of the issues to be raised and the relief sought. Unless a timely petition for review is made, the decision of NMED shall be final and not subject to judicial review. [20.6.2.3112 NMAC, NMSA 1978, § 74-6-5.O]
85.	TRANSFER of DISCHARGE PERMIT - Prior to the transfer of any ownership, control, or possession of this facility or any portion thereof, the permittee shall: • notify the proposed transferee in writing of the existence of this Discharge Permit; • include a copy of this Discharge Permit with the notice; and • deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee.

#	Terms and Conditions
	Until both ownership and possession of the facility have been transferred to the transferee, the permittee shall continue to be responsible for any discharge from the facility. [20.6.2.3111 NMAC]
86.	PERMIT FEES - Payment of permit fees is due at the time of Discharge Permit approval. Permit fees shall be paid in a single payment or shall be paid in equal installments on a yearly basis over the term of the Discharge Permit. Single payments shall be remitted to NMED no later than 30 days following the effective date of the Discharge Permit. Initial installment payments shall be remitted to NMED no later than 30 days following the effective date of the Discharge Permit; subsequent installment payments shall be remitted to NMED no later than the anniversary of the effective date of the Discharge Permit. Permit fees are associated with issuance of this Discharge Permit. Nothing in this Discharge Permit shall be construed as relieving the permittee of the obligation to pay all permit fees assessed by NMED. A permittee that ceases discharging or does not commence discharging from the facility during the term of the Discharge Permit shall pay all permit fees assessed by NMED. An approved Discharge Permit shall be suspended or terminated if the facility fails to remit an installment payment by its due date. [Subsection F of 20.6.2.3114 NMAC, NMSA 1978, § 74-6-5.K]

New Mexico Environment Department Ground Water Quality Bureau
Discharge Permit Summary

Facility Information

Facility Name	Waste Isolation Pilot Plant (WIPP)
Discharge Permit Number	DP-831
Legally Responsible Party	Kirk D. Lachman, Acting Manager U.S. Department of Energy, Carlsbad Field Office P.O. Box 3090 Carlsbad, NM 88221 (575) 234-7300

Treatment, Disposal and Site Information

Primary Waste Type	Domestic and Industrial
Facility Type	Federal Agency - U.S. Department of Energy

Evaporative Impoundment Locations

Domestic Wastewater

Type	Designation	Description & Comments
Settling Impoundment	Settling Lagoon 1	Primary treatment; 60-mil HDPE synthetically lined; permitted one foot of freeboard; capacity of 963,214 gallons.
Settling Impoundment	Settling Lagoon 2	Primary treatment; 60-mil HDPE synthetically lined; permitted one foot of freeboard; capacity of 963,214 gallons.
Polishing Impoundment	Polishing Lagoon 1	Passive secondary treatment; 60-mil HDPE synthetically lined; permitted one foot of freeboard; capacity of 414,901 gallons.
Polishing Impoundment	Polishing Lagoon 2	Passive secondary treatment; 60-mil HDPE synthetically lined; permitted one foot of freeboard; capacity of 141,901 gallons.
Evaporation Impoundment	Effluent Lagoon A	Effluent storage; 30-mil LLDP synthetically lined; disposal by evaporation; permitted one foot of freeboard; capacity of 566,610 gallons.
Evaporation Impoundment	Effluent Lagoon B	Effluent storage; 30-mil LLDP synthetically lined; disposal by evaporation; permitted discharges are domestic waste, brine, purge waters, and miscellaneous industrial non-hazardous wastewater; permitted one foot of freeboard; capacity of 846,257 gallons.
Evaporation Impoundment	Effluent Lagoon C	Effluent Storage; 30-mil HDPE synthetically lined; disposal by evaporation; permitted discharges are domestic waste, brine, purge waters, and miscellaneous industrial non-hazardous wastewater; permitted one foot of freeboard; capacity of 846,257 gallons.

Storm Water Control

Type	Designation	Description & Comments
Storm Water Impoundment	Storm Water Pond 1	Constructed using a 60-mil HDPE synthetic liner; receives clean non-contact storm water from paved areas, roofs, air conditioner condensate, and water from domestic water lines; disposal by evaporation; permitted one foot of freeboard; capacity of 626,076 gallons.
Storm Water Impoundment	Storm Water Pond 2	Constructed using a 60-mil HDPE synthetic liner; receives clean non-contact storm after from the facilities paved areas, roofs, air conditioner condensate, and draining domestic water lines; disposal by evaporation; permitted one foot of freeboard; capacity of 2,268,330 gallons.
Storm Water Impoundment	Storm Water Pond 3	Constructed using a 60-mil HDPE synthetic liner; receives clean non-contact storm after from the facilities paved areas, roofs, air conditioner condensate, and draining domestic water lines; disposal by evaporation; permitted one foot of freeboard; capacity of 7,211,967 gallons.

Non-Domestic Wastewater

Type	Designation	Description & Comments
Evaporation Impoundment	Evaporation Pond H-19	Constructed using a 36-mil Hypalon synthetic liner; permitted discharges are brine, purge waters, and miscellaneous industrial non-hazardous wastewater; disposal by evaporation; permitted one foot of freeboard; capacity of 346,085 gallons.
Evaporation Impoundment	Salt Storage Pond 1	Constructed using a 60-mil HDPE synthetic liner; disposal by evaporation; permitted one foot of freeboard; capacity of 3,301634 gallons.
Evaporation Impoundment	Salt Storage Pond 2/3	Constructed using 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system; disposal by evaporation; permitted one foot of freeboard; capacity of 21,737,254 gallons
Evaporation Impoundment	Salt Storage Pond 5	To be constructed, 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system; disposal by evaporation; permitted two feet of freeboard; capacity of 6,355,404 gallons.

Evaporation Impoundment	Brine Salt Storage Pond 4	To be constructed, 60-mil HDPE geomembrane double liner with a leak detection system; permitted discharges are clean non-contact stormwater from the facilities paved areas, roofs, air conditioner condensate, draining domestic water lines, and brine from Brine Retention Ponds East and West; Disposal by evaporation; permitted one foot of freeboard; capacity of 8,668,722 gallons.
Retention Basin	Brine Retention Pond East	To be constructed, 60-mil HDPE geomembrane double liner with a leak detection system and an epoxy coated concrete bottom; disposal by evaporation; permitted two feet of freeboard; capacity of 46,094 gallons.
Retention Basin	Brine Retention Pond West	To be constructed, 60-mil HDPE geomembrane double liner with a leak detection system and an epoxy coated concrete bottom; disposal by evaporation; permitted two feet of freeboard; capacity of 46,094 gallons.
Holding tank	Brine Holding Tank	To be constructed, 3,000-gallon fiberglass reinforced plastic holding tank for brine prior to being discharged to either Brine Retention Pond East or West.

Salt Storage Locations

Type	Designation	Description & Comments
Salt Pile	Salt Cell 1	Inactive; approximately 18.8 acres; graded to 2% slope covered with sand and 60 mil HDPE liner and with two feet of native soil; seeded; run-off collects in Salt Storage Pond 1.
Salt Pile	Salt Cell 2	Active; 6.2 acres; run-off area of 326,350 sq. ft.; constructed using of six-inch prepared subgrade, 60-mil HDPE liner, 200-mil drainage layer, eight oz. geotextile fabric covered with two feet of native soil; runoff collects in Salt Storage Ponds 2 and/or 3.
Salt Pile	Salt Cell 3	Active; 5.2 acres; run-off area of 272,850 sq. ft.; constructed using of six-inch prepared subgrade, 60-mil HDPE liner, 200-mil drainage layer, eight oz. geotextile fabric covered with two feet of native soil; runoff collects in Salt Storage Ponds 2 and/or 3.
Salt Pile	Salt Cell 5	To be constructed; 5.09 acres; run-off area of 221,841 sq. ft.; 60-mil HDPE geomembrane liner with a protective native soil layer; runoff collects in Salt Storage Pond 5.
Salt Pile	Site and Preliminary Design Validation Pile	Closed in 2000; covered with a geosynthetic liner, six inches of bedding material, and three feet of soil; Seeded.

Flow Metering Locations

Type	Designation	Description & Comments
Totalizing Flow Meter	Ultrasonic Flow Meter	Located at the facility Pump House – water supply; estimates domestic wastewater discharged to the facultative sewage impoundment system.
Primary Measurement Device		To be installed. Measures brine discharged to Brine Retention Ponds East and West from the New Filter Building.
Totalizing Flow Meters		To be installed. Four separate meters to measure the brine pumped from the leak detection sumps for Brine Salt Storage Pond 4, Brine Retention Ponds East and West, and Salt Storage Pond 5.

Ground Water Monitoring Locations

Type	Designation	Description & Comments
Monitoring Wells	C-2505, C-2506, PZ-2, PZ-3, PZ-4	Quarterly depth to water measurement; all wells drilled in the shallow groundwater.
Monitoring Wells	C-2507, C-2811, PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-18	Quarterly depth to water measurement; semi-annual collection of field parameters for temperature, pH, and specific conductance; semi-annual monitoring for SO4, Cl, TDS, Uranium, and combined Radium-226 and Radium-228; all wells drilled in the shallow groundwater.
Monitoring Well	PZ-17	Quarterly depth to water measurement; semi-annual collection of field parameters for temperature, pH, and specific conductance; semi-annual monitoring for SO_4, Cl, TDS, TKN and NO_3-N; well drilled in the shallowest, water bearing zone of the Dewey Lake Formation and intended to monitor the Facultative Lagoon System.
Monitoring Wells	PZ-19 and WQSP-6A	Quarterly depth to water measurement; semi-annual collection of field parameters for temperature, pH, and specific conductance; semi-annual monitoring for SO4, Cl, and TDS; both wells drilled in the shallowest, water bearing zone of the Dewey Lake Formation and PZ-17 is intended to monitor Evaporation Pond H-19.

Depth-to-Ground Water	100 feet
Total Dissolved Solids (TDS)	3,400 mg/L

Permit Information

Original Permit Issued	January 16, 1992

Permit Amended	August 28, 1995
Permit Renewal	July 3, 1997
Permit Amended	June 12, 1998
Permit Amended	January 24, 2000
Permit Renewal	April 29, 2003
Permit Modification	December 22, 2003
Permit Modification	December 29, 2006
Permit Renewal and Modification	July 23, 2008
Permit Renewal	July 29, 2014
Current Action	**Permit Renewal and Modification**
Application Received	December 3, 2018
Public Notice Published	[not yet published]
Permit Issued (Effective Date)	[effective date]
Permitted Discharge Volume	Domestic – 23,000 gallons per day Non-Domestic – 9,586,995 gallons per day

NMED Contact Information

Mailing Address	Ground Water Quality Bureau P.O. Box 5469 Santa Fe, New Mexico 87502-5469
GWQB Telephone Number	(505) 827-2900
NMED Lead Staff	Avery Young
Lead Staff Telephone Number	(505) 827-2909
Lead Staff Email	avery.young@state.nm.us

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Groundwater Discharge Permit Guidance for Synthetically Lined Lagoons – Liner Material and Site Preparation

This guidance document represent minimum liner material and site preparation requirements for wastewater treatment, storage and evaporation lagoons. These requirements do not apply to lagoons storing hazardous wastes or high strength waste. The Ground Water Quality Bureau may impose additional requirements (e.g., double-lined lagoons with leak detection) for facilities discharging hazardous or high strength waste to lagoons through the development of specific Discharge Permit conditions for such facilities.

Liner Material Requirements:

1. The liner shall be chemically compatible with any material that will contact the liner.
2. The liner material shall be resistant to deterioration by sunlight if any portion of the liner will be exposed.
3. Synthetic liner material shall be of sufficient thickness to have adequate tensile strength and tear and puncture resistance. Under no circumstances shall a synthetic liner material less than 40 mils in thickness be accepted. Any liner material shall be certified by a licensed New Mexico professional engineer and approved by the New Mexico Environment Department (NMED) prior to its installation.

Lagoon Design and Site Preparation Requirements:

1. The system shall be certified by a licensed New Mexico professional engineer and approved by NMED prior to installation.
2. Inside slopes shall be a maximum of 3 (horizontal): 1 (vertical), and a minimum of 4 (horizontal); 1 (vertical).
3. Lagoon volume shall be designed to allow for a minimum of 24 inches of freeboard.
4. The liner shall be installed with sufficient liner material to accommodate shrinkage due to temperature changes. Folds in the liner are not acceptable.
5. To a depth of at least six inches below the liner, the sub-grade shall be free of sharp rocks, vegetation and stubble. In addition, liners shall be placed on a sub-grade of sand or fine soil. The surface in contact with the liner shall be smooth to allow for good contact between liner and sub-grade. The surface shall be dry during liner installation.
6. Sub-grade shall be compacted to a minimum of 90% of standard proctor density.
7. The minimum dike width shall be eight feet to allow vehicle traffic for maintenance.
8. The base of the pond shall be as uniform as possible and shall not vary more than three inches from the average finished elevation.
9. Synthetic liners shall be anchored in an anchor trench in the top of the berm. The trench shall be a minimum of 12 inches wide, 12 inches deep and shall be set back at least 24 inches from the inside edge of the berm.
10. If the lagoon is installed over areas of decomposing organic materials or shallow groundwater, a liner vent system shall be installed.
11. Any opening in the liner through which a pipe or other fixture protrudes shall be properly sealed. Liner penetrations shall be detailed in the construction plans and record drawings.
12. A synthetic liner shall not be installed in temperatures below freezing.
13. The liner shall be installed or supervised by an individual that has the necessary training and experience as required by the liner manufacturer.
14. All manufacturer's installation and field seaming guidelines shall be followed.
15. All synthetic liner seams shall be field tested by the installer and verification of the adequacy of the seams shall be submitted to NMED along with the record drawings.
16. Concrete slabs installed on top of the synthetic liner for operational purposes shall be completed in accordance with manufacturer and installer recommendations to ensure liner integrity.

NEW MEXICO ENVIRONMENT DEPARTMENT
GROUND WATER QUALITY BUREAU
MONITORING WELL CONSTRUCTION AND ABANDONMENT GUIDELINES

Purpose: These guidelines identify minimum construction and abandonment details for installation of water table monitoring wells under groundwater Discharge Permits issued by the NMED's Ground Water Quality Bureau (GWQB) and Abatement Plans approved by the GWQB. Proposed locations of monitoring wells required under Discharge Permits and Abatement Plans and requests to use alternate installation and/or construction methods for water table monitoring wells or other types of monitoring wells (e.g., deep monitoring wells for delineation of vertical extent of contaminants) must be submitted to the GWQB for approval prior to drilling and construction.

General Drilling Specifications:

1. All well drilling activities must be performed by an individual with a current and valid well driller license issued by the State of New Mexico in accordance with 19.27.4 NMAC. Use of drillers with environmental well drilling experience and expertise is highly recommended.
2. Drilling methods that allow for accurate determinations of water table locations must be employed. All drill bits, drill rods, and down-hole tools must be thoroughly cleaned immediately prior to the start of drilling. The borehole diameter must be drilled a minimum of 4 inches larger than the casing diameter to allow for the emplacement of sand and sealant.
3. After completion, the well should be allowed to stabilize for a minimum of 12 hours before development is initiated.
4. The well must be developed so that formation water flows freely through the screen and is not turbid, and all sediment and drilling disturbances are removed from the well.

Well Specifications (see attached monitoring well schematic):

5. Schedule 40 (or heavier) polyvinyl chloride (PVC) pipe, stainless steel pipe, carbon steel pipe, or pipe of an alternate appropriate material that has been approved for use by NMED must be used as casing. The casing must have an inside diameter not less than 2 inches. The casing material selected for use must be compatible with the anticipated chemistry of the groundwater and appropriate for the contaminants of interest at the facility. The casing material and thickness selected for use must have sufficient collapse strength to withstand the pressure exerted by grouts used as annular seals and thermal properties sufficient to withstand the heat generated by the hydration of cement-based grouts. Casing sections may be joined using welded, threaded, or mechanically locking joints; the method selected must provide sufficient joint strength for the specific well installation. The casing must extend from the top of the screen to at least one foot above ground surface. The top of the casing must be fitted with a removable cap, and the exposed casing must be protected by a locking steel well shroud. The shroud must be large enough in diameter to allow easy access for removal of the cap. Alternatively, monitoring wells may be completed below grade. In this case, the casing must extend from the top of the screen to 6 to 12 inches below the ground surface; the monitoring wells must be sealed with locking, expandable well plugs; a flush-mount, watertight well vault that is rated to withstand traffic loads must be emplaced around the wellhead; and the cover must be secured with at least one bolt. The vault cover must indicate that the wellhead of a monitoring well is contained within the vault.
6. A 20-foot section (maximum) of continuous-slot, machine slotted, or other manufactured PVC or stainless steel well screen or well screen of an alternate appropriate material that has been approved for use by NMED must be installed across the water table. Screens created by cutting slots into solid casing with saws or other tools must not be used. The screen material selected for use must be compatible with the anticipated chemistry of the ground water and appropriate for the contaminants of interest at the facility. Screen sections may be joined using welded, threaded, or mechanically

locking joints; the method selected must provide sufficient joint strength for the specific well installation and must not introduce constituents that may reasonably be considered contaminants of interest at the facility. A cap must be attached to the bottom of the well screen; sumps (i.e., casing attached to the bottom of a well screen) should not be installed. The bottom of the screen must be installed no more than 15 feet below the water table; the top of the well screen must be positioned not less than 5 feet above the water table. The well screen slots must be appropriately sized for the formation materials and should be selected to retain 90 percent of the filter pack. A slot size of 0.010 inches is generally adequate for most installations.

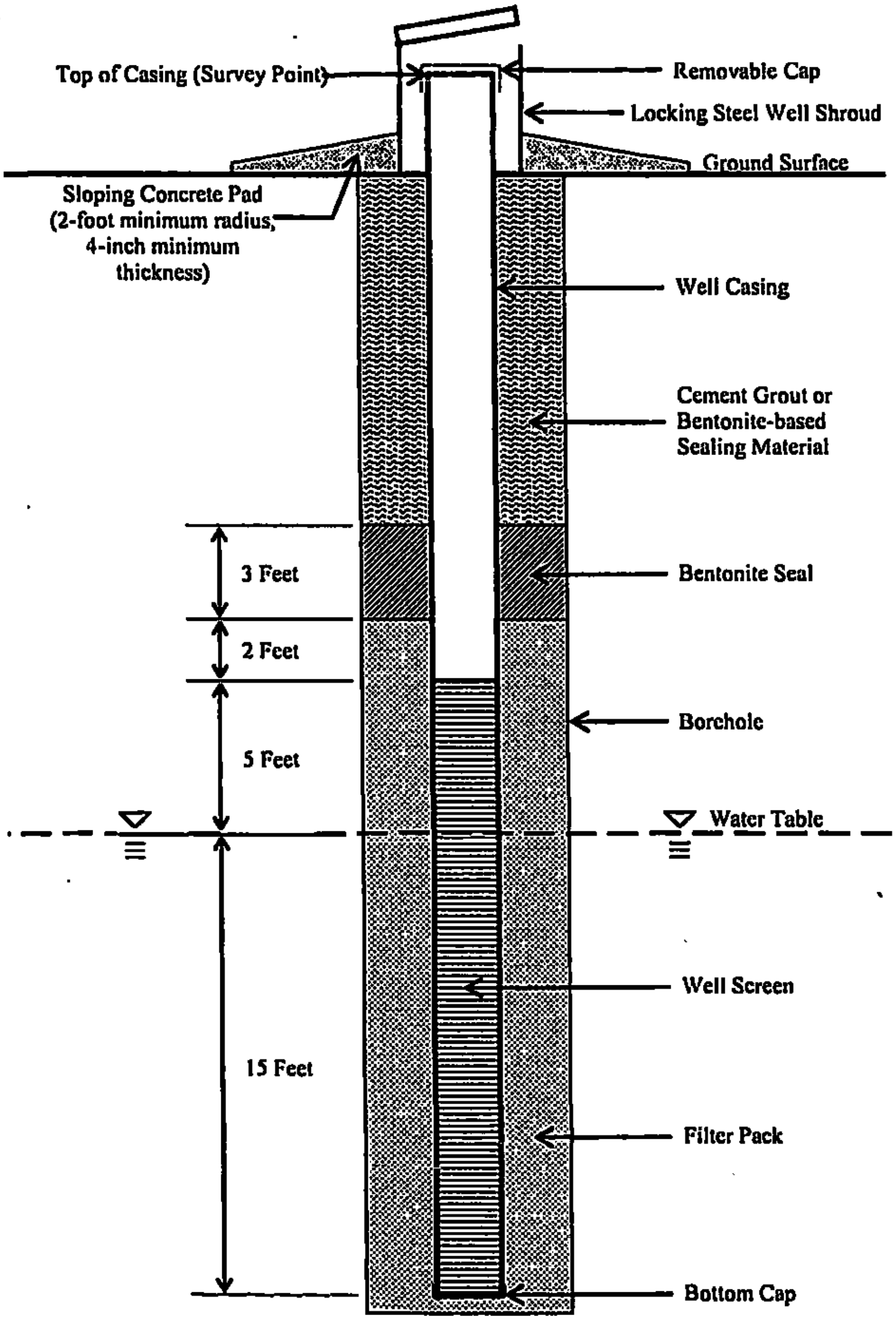
7. Casing and well screen must be centered in the borehole by placing centralizers near the top and bottom of the well screen.
8. A filter pack must be installed around the screen by filling the annular space from the bottom of the screen to 2 feet above the top of the screen with clean silica sand. The filter pack must be properly sized to prevent fine particles in the formation from entering the well; clean medium to coarse silica sand is generally adequate as filter pack material for 0.010-inch slotted well screen. For wells deeper than 30 feet, the sand must be emplaced by a tremmie pipe. The well should be surged or bailed to settle the filter pack and additional sand added, if necessary, before the bentonite seal is emplaced.
9. A bentonite seal must be constructed immediately above the filter pack by emplacing bentonite chips or pellets (3/8-inch in size or smaller) in a manner that prevents bridging of the chips/pellets in the annular space. The bentonite seal must be 3 feet in thickness and hydrated with clean water. Adequate time should be allowed for expansion of the bentonite seal before installation of the annular space seal.
10. The annular space above the bentonite seal must be sealed with cement grout or a bentonite-based sealing material acceptable to the State Engineer pursuant to 19.27.4 NMAC. A tremmie pipe must be used when placing sealing materials at depths greater than 20 feet below the ground surface. Annular space seals must extend from the top of the bentonite seal to the ground surface (for wells completed above grade) or to a level 3 to 6 inches below the top of casing (for wells completed below grade).
11. For monitoring wells finished above grade, a concrete pad (2-foot minimum radius, 4-inch minimum thickness) must be poured around the shroud and wellhead. The concrete and surrounding soil must be sloped to direct rainfall and runoff away from the wellhead. The installation of steel posts around the well shroud and wellhead is recommended for monitoring wells finished above grade to protect the wellhead from damage by vehicles or equipment. For monitoring wells finished below grade, a concrete pad (2-foot minimum radius, 4-inch minimum thickness) must be poured around the well vault and wellhead. The concrete and surrounding soil must be sloped to direct rainfall and runoff away from the well vault.

<u>**Abandonment**</u>:

12. Approval for abandonment of monitoring wells used for ground water monitoring in accordance with Discharge Permit and Abatement Plan requirements must be obtained from NMED prior to abandonment.
13. Well abandonment must be accomplished by removing the well casing and placing neat cement grout, bentonite-based plugging material, or other sealing material approved by the State Engineer for wells that encounter water pursuant to 19.27.4 NMAC from the bottom of the borehole to the ground surface using a tremmie pipe. If the casing cannot be removed, neat cement grout, bentonite-based plugging material, or other sealing material approved by the State Engineer must be placed in the well using a tremmie pipe from the bottom of the well to the ground surface.
14. After abandonment, written notification describing the well abandonment must be submitted to the NMED. Written notification of well abandonment must consist of a copy of the well plugging record submitted to the State Engineer in accordance with 19.27.4 NMAC, or alternate documentation containing the information to be provided in a well plugging record required by the State Engineer as specified in 19.27.4 NMAC.

Deviation from Monitoring Well Construction and Abandonment Requirements: Requests to construct water table monitoring wells or other types of monitoring wells for groundwater monitoring under groundwater Discharge Permits or Abatement Plans in a manner that deviates from the specified requirements must be submitted in writing to the GWQB. Each request must state the rationale for the proposed deviation from these requirements and provide detailed evidence supporting the request. The GWQB will approve or deny requests to deviate from these requirements in writing.

MONITORING WELL SCHEMATIC
(Not to Scale)



FACT SHEET
Groundwater Discharge Permit DP-831
March 2020

Facility Name:	Waste Isolation Pilot Plant (WIPP)
Facility Location:	Highway 128, 26 miles southeast of Carlsbad Carlsbad, NM Sections 20, 21, 28 and 29, Township 22S, Range 31E
County:	Eddy County
Applicant/Permittee:	Gregory Sosson, Acting Manager U.S. Department of Energy, Carlsbad Field Office P.O. Box 3090 Carlsbad, NM 88221
Proposed Permitting Action:	Discharge Permit Renewal and Modification
Regulatory Authority:	Water Quality Control Commission's Ground and Surface Water Protection Regulations, 20.6.2 NMAC
Issuing Agency:	Ground Water Quality Bureau (GWQB) of the New Mexico Environment Department (NMED)
GWQB Contact:	Avery Young P.O. Box 5469, Santa Fe, NM 87502-5469 Phone: (505) 827-2909 Email: avery.young@state.nm.us

The Ground Water Quality Bureau has prepared this Fact Sheet as required by Subsection I of 20.6.2.3108 NMAC because the proposed discharge is at a federal facility and is not comprised solely of domestic liquid waste.

The original Discharge Permit was issued on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998 and on January 24, 2000, renewed on April 29, 2003, modified on December 22, 2003 and on December 29, 2006, renewed and modified on July 23, 2008, and last renewed on July 29, 2014. The application (i.e., discharge plan) consists of the materials submitted by the permittee dated December 3, 2018 and materials contained in the administrative record prior to issuance of this draft Discharge Permit and draft Fact Sheet.

The draft Discharge Permit that accompanies this draft Fact Sheet is for a renewal and modification. The modification consists of the addition of one new salt storage cell and four new impoundments: Salt Cell 5, Salt Storage Pond 5, Brine Salt Storage Pone 4, Brine Retention Pond East, and Brine Retention Pond West. Additional changes made to the Discharge Permit issued to the Waste Isolation Pilot Plant (WIPP or Facility) on July 29, 2014 are described below.

Comment Period / Request for Hearing

NMED will allow at least thirty days during which time written comments may be submitted and a public hearing may be requested. NMED will allow for these activities after publishing notice of the availability of this Draft Permit and Fact Sheet. Requests for public hearing shall be in writing and shall set forth the reasons why a hearing should be held. A hearing will be held if the NMED Secretary determines that there is substantial public interest. To obtain a copy of the Draft Permit, to submit a comment, or to request a hearing on this matter, contact the GWQB Contact listed at the beginning of this Fact Sheet.

Regulatory Framework

The Ground and Surface Water Protection Regulations, 20.6.2 NMAC, establish the regulatory framework for controlling discharges onto or below the surface of the ground through the issuance of groundwater discharge permits. The purpose of the regulations pertaining to groundwater discharge permits, as stated in Section 20.6.2.3101 NMAC, is "to protect all ground water of the state of New Mexico which has an existing concentration of 10,000 mg/l or less of total dissolved solids, for present and potential future use as domestic and agricultural water supply, and to protect those segments of surface waters which are gaining because of ground water inflow, for uses designated" in the Standards for Interstate and Intrastate Surface Waters, 20.6.4 NMAC. (See the New Mexico Commission of Public Records website to view 20.6.2 and 20.6.4 NMAC: http://www.srca.nm.gov/chapter-6-water-quality/.)

The regulations establish groundwater standards as identified in Section 20.6.2.3103 NMAC.

Persons proposing to discharge effluent or leachate in such a manner that it could move directly or indirectly into groundwater must obtain and comply with a discharge permit (20.6.2.3104 NMAC). In order to obtain a discharge permit, an applicant must submit an application (or "discharge plan" – 20.6.2.7 NMAC) proposing methods/techniques to be used or processes expected to naturally occur to ensure that the discharge of water contaminants does not result in the contamination of ground or surface water (20.6.2.3106 NMAC).

In reviewing and approving an application, NMED must ensure that the discharge plan will not result in a hazard to public health, undue risk to property, exceedance of the groundwater standards at any place of withdrawal of water for present or reasonably foreseeable future use, or violation of a stream standard (Subsections C and H of 20.6.3109 NMAC). "Hazard to public health" is defined in Section 20.6.2.7 NMAC and pertains to the exceedance of the groundwater standards in a drinking water supply.

Subsection B of 20.6.2.3109 NMAC directs the NMED Secretary to "approve, approve with conditions, or deny" a discharge permit application, after the administrative record is complete and all required information is available. This regulation authorizing permit approval "with conditions" provides the fundamental authority for including conditions in discharge permits.

General Facility Information

The WIPP is a mined geologic repository for the disposal of transuranic (TRU) waste. The underground repository is located 2,150 feet below land surface in the bedded salt of the Salado Formation. The WIPP first began accepting waste in March 1999. In addition to this groundwater Discharge Permit, the WIPP is also regulated by the NMED Hazardous Waste Bureau under the New Mexico Hazardous Waste Act and New Mexico's Hazardous Waste Regulations.

The WIPP facility is geologically situated in the southeast portion of New Mexico within the Delaware Basin, which is part of the larger Permian Basin. The geologic formations below the facility that are pertinent to this Discharge Permit, from deepest to shallowest, include: the Salado Formation, the Rustler Formation, the Dewey Lake Formation, and, in the northeastern portion of the facility, the Santa Rosa Formation. The Salado Formation, which is first encountered at an approximate depth of 850 feet and is approximately 2,000 feet thick, consists predominately of polyhalite, with some halite, carbonates, anhydrites, and clay seams. The Rustler Formation ranges from 350 to 500 feet thick and consists of carbonates, anhydrites, and halites. The Dewey Lake Formation is approximately 500 feet thick and consists almost entirely of mudstone, claystone, siltstone, and interbedded sandstone, and is frequently referred to as the Dewey Lake Redbeds Formation.

Groundwater below the facility most likely to be affected by this discharge is at a depth of approximately 35 to 160 feet. Natural groundwater is located in the middle portion of the Dewey Lake Formation, at a depth of approximately 160 feet, and has an average total dissolved solids concentration of approximately 3,400 milligrams per liter. The WIPP discovered a perched water zone in the lower Santa Rosa and upper Dewey Lake Formations in 1995 and determined that the probable sources of this shallow groundwater were the unlined impoundments constructed to capture stormwater runoff at the facility and runoff from the above-ground salt piles. This shallow groundwater has been found to be contaminated with total dissolved solids, sulfate, and chloride. After the discovery of the anthropogenically created shallow groundwater, all impoundments at the facility were lined and a network of monitoring wells was installed. The shallow groundwater has a flow direction of north to south. Natural, non-anthropogenic, groundwater occurs in the Dewey Lake Formation south of the WIPP facility at a depth of 160 feet. The Dewey Lake Formation has a relatively low hydraulic conductivity.

The first laterally continuous water-bearing zone below the facility is within an approximately 30-foot-thick section of the Culebra Member of the Rustler Formation. Water in the Culebra Member is usually present in fractures and is confined by overlaying anhydrite and underlying clay and anhydrite beds. The Culebra Member is monitored through a network of monitoring wells.

Description of the Proposed Discharge

The activities that produce the discharge and the quantity, quality, and flow characteristics of the proposed discharges at WIPP are briefly described as follows:

The source and disposition locations of proposed discharges at WIPP include the following: domestic wastewater to a facultative (treatment) lagoon system for; industrial, non-hazardous wastewater to evaporative impoundments; stormwater emanating generally from the Facility to evaporative impoundments, and stormwater emanating from the salt piles to evaporative impoundments.

Up to 23,000 gallons per day (gpd) of domestic wastewater may be discharged to seven synthetically lined impoundments (Facultative Lagoon System) comprised of Settling Lagoons 1 and 2, Polishing Lagoons 1 and 2, and Effluent Lagoons A, B, and C for disposal by evaporation and removal of precipitated domestic waste solids.

Non-domestic wastewater may be discharged at the Facility in the following ways:

- Up to 27,000 gpd of industrial wastewaters from the following sources: wastewater from compressed air systems, brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous wastewaters. These industrial wastewaters are discharged to the Effluent Lagoons B and C of the Facultative Lagoon System for disposal by evaporation.

- Up to 50,000 gpd of industrial wastewaters from the following sources: brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous wastewaters. These industrial wastewaters are discharged to a separate synthetically lined impoundment for disposal by evaporation (Evaporation Pond H-19).

- Up to 2,210 gpd of brine produced from the operation of the to be constructed Salt Reduction System within the Safety Significant Confinement Ventilation System (SSCVS) will be discharged to two double synthetically lined impoundments, each with a leak detection system (Brine Retention Ponds East and West, collectively Brine Ponds). One brine retention pond will be in service while the other brine retention pond is closed for evaporation and removal of precipitated salt in order to maintain at least two feet of freeboard. Any remaining brine in the closed Brine Pond will be transferred to Brine Salt Storage Pond 4 for disposal by evaporation.

- Salt and other subsurface materials mined during construction of the Facility, as well as currently mined salt, are stored at the surface in four stockpiles. The stockpiles currently storing salt, or that will be used in the future as salt is mined from the Facility's underground panels, are referred to as Salt Cells 2, 3, and 5. Stormwater runoff in contact with Salt Cells 2 and 3 is collected in two double synthetically-lined stormwater impoundments, each with a leak detection system (Salt Storage Ponds 2 and 3). The total storage capacity of Salt Storage Ponds 2 and 3 is 21,737,254 gallons. Stormwater runoff in contact with Salt Cell 5 will be collected in a double synthetically-lined stormwater impoundment with a leak detection system (Salt Storage Pond 5). The storage capacity of Salt Storage Pond 5 will be 6,355,404 gallons. Salt Cell 1 no longer receives salt and is capped with synthetic material and an earthen cover. Stormwater runoff in contact with this stockpile is collected in synthetically-lined diversion ditches directed to a synthetically-lined impoundment (Salt Storage Pond 1). The storage capacity of Salt Storage Pond 1 is 3,301,634 gallons. The storage capacity of each salt storage pond is more than sufficient to contain a 24-hour, 100-year (5.84-inch rainfall) storm event.

- Stormwater runoff from the SSCVS area is collected in a double synthetically-lined stormwater impoundment with a leak detection system (Brine Salt Storage Pond 4). The storage capacity of Brine Salt Storage Pond 4 is 8,668,722 gallons. The capacity of the Brine Salt Storage Pond 4 is more than sufficient to contain a 24-hour, 100-year (5.84-inch rainfall) storm event.

- Additional stormwater runoff from the Facility's paved areas and roofs is collected in three synthetically-lined impoundments (Storm Water Ponds 1, 2, and 3). This runoff does not contact the salt stockpiles or other waste materials at the Facility and may be used by the permittee for dust control, soil compaction, and other construction activities.

The modification consists of the addition of one new salt storage cell and four new impoundments: Salt Cell 5, Salt Storage Pond 5, Brine Salt Storage Pond 4, Brine Retention Pond East, and Brine Retention Pond West.

Basis for Draft Permit Conditions

The conditions in this Draft Permit are organized into the following Sections: Operational Plan, Monitoring and Reporting, Additional Studies Required, Contingency, Closure, and General Requirements. The Draft Permit conditions conform to the requirements of the regulations and are generally consistent with similar conditions in other groundwater discharge permits issued by the Department.

1. Operational Plan Conditions (pages 6-14 in the Draft Permit)

Conditions in this Section require the permittee to properly operate and maintain the disposal systems, to restrict access to the systems via fencing so that unauthorized persons cannot damage a system or be exposed to unsafe conditions, and to post appropriate cautionary signs.

This Section contains operating conditions typically required for discharge systems composed of lined treatment impoundments for domestic wastewater and lined evaporative impoundments for industrial wastewater and stormwater. These conditions include requirements to appropriately maintain the synthetic impoundment liners, to maintain a specific freeboard within impoundments to prevent overtopping, to measure the thickness of settled solids within impoundments and to remove those solids if storage capacity is diminished to a specific limit. Proper operation and maintenance of the discharge system is critical for the Discharge Permit to achieve the performance criteria established in Subsection C of 20.6.2.3109 NMAC.

This Section requires the Permittee to monitor impoundment leak detection systems associated with specific salt storage ponds and the proposed impoundments. This requirement in-part addresses the requirement that a discharge plan include procedures for detecting a failure of the discharge system as specified in 20.6.2.3107 NMAC. The Permittee must construct, maintain, and operate impoundment leak detection, collection, and recovery systems (LDCRS) in a manner that will result in less than one foot of hydraulic head on the secondary liner. If this impoundment leakage limit cannot be maintained, the Permittee is obligated to submit a corrective action plan to NMED for approval.

This Section also requires the Permittee to conduct regular inspection of the earthen covers on Salt Cell 1 and the Site and Preliminary Design Validation (SPDV) Material Pile. Both piles consist of salt excavated during the construction of the Facility. Both piles are no longer active, i.e., they no longer receive salt; therefore, they have been covered in order to prevent stormwater infiltration and destabilization of the piles.

The Draft Permit does not contain discharge quality limitations because all discharges are contained in evaporative disposal systems.

2. Monitoring and Reporting Conditions (pages 15 – 27 in the Draft Permit)

Conditions in this Section require the Permittee to monitor and report on various aspects of the discharge system and groundwater to demonstrate that operations are compliant with the Discharge Permit and that the Discharge Permit is achieving the expected results. Monitoring and reporting requirements are authorized by Subsection A of 20.6.2.3107 NMAC. A discharge permit may not be approved without provisions for flow measurement and sampling, pursuant to Subsection H of 20.6.2.3109 NMAC.

The facility subsections require monitoring of the quantity and quality of the discharges, specifically, the discharge volumes to the impoundments, the chemical characterization of the impounded fluids, and the volume of liquid pumped from the leak detection systems.

Once during the Discharge Permit term, the Permittee is required to evaluate industrial wastewater for a comprehensive list of chemical constituents pursuant to 20.6.2.3103 NMAC. This comprehensive analysis pertains to the industrial waste discharges having varied origins, including brine, purge waters from sampling and developing monitoring wells, and miscellaneous industrial non-hazardous wastewaters.

The Groundwater Monitoring and Reporting subsection requires monitoring groundwater downgradient of the following potential contaminant sources: impoundments containing stormwater runoff in contact with salt piles, the domestic wastewater impoundment system, capped salt piles, uncapped salt piles, and impoundments containing industrial discharges. This Section requires groundwater monitoring of two perched water zones, the shallow anthropogenic groundwater measured at approximately 35 to 80 feet below ground surface and the shallowest non-anthropogenic water-bearing zone in the Dewey Lake Formation measured at approximately 160 feet below ground surface.

The Permittee is required to sample for total dissolved solids, chloride, and sulfate in groundwater monitoring wells designated to monitor salt piles and impoundments containing stormwater runoff in contact with salt piles. The Permittee is required to sample for nitrate as nitrogen and total Kjeldahl nitrogen in the groundwater monitoring well designated to monitor the domestic wastewater impoundment system. The Permittee is required to sample for uranium and combined radium-226 and radium-228 in the groundwater monitoring wells designated to monitor all domestic and non-domestic discharge locations at the Facility. The sampling requirements for uranium and radium-226/radium-228 are included because these constituents are the only radioactive constituents for which New Mexico has groundwater protection standards.

Monitoring wells WQSP-6A, PZ-17, and PZ-19 are intended to monitor the shallowest non-anthropogenic water-bearing zone in the Dewey Lake Formation, which occurs in the subsurface at the southern end of the Facility. All other monitoring wells are intended to monitor the shallow anthropogenic groundwater.

This subsection requires the installation of four new groundwater monitoring wells to monitor groundwater associated with newly authorized impoundments, to replace an improperly located well, and to monitor previously unmonitored locations. One monitoring well is required to be installed downgradient of the Facultative Lagoon System to replace an improperly located well. One monitoring well is required to be installed downgradient of Evaporation Pond H-19 because the impoundment is comprised of a single, 40-mil synthetic liner; therefore, a monitoring well is required downgradient to monitor the integrity of the liner. One monitoring well is required to be installed downgradient of the proposed Brine Salt Storage Pond 4 to monitor that impoundment system. One well is required to be installed downgradient of the proposed Salt Storage Pond 5 in order to monitor that impoundment system.

This Section requires the submittal of semi-annual monitoring reports that include the following: the chemical analytical results of domestic effluent and non-domestic wastewater; discharge volumes; record of solids (salt) removal and disposal; leak detection system measurements; the submittal of DOE's "Waste Isolation Pilot Plant Annual Site Environmental Report"; groundwater characterization data; groundwater depth measurements; and groundwater elevation contour maps.

3. Additional Studies Required (pages 27 - 28 in the Draft Permit)

This Section requires the Permittee to submit for NMED approval a workplan to investigate the shallow groundwater beneath the site, which contains concentrations of total dissolved solids, chloride, and sulfate above the standards of 20.6.2.3103 NMAC. Contingency Condition 26 of WIPP's previous Discharge Permit dated July 29, 2014 requires a response to exceedances to the standards of 20.6.2.3103 NAMC. Facility records identify the probable source of this groundwater as unlined stormwater impoundments from the time of initial construction of the Facility to the time the impoundments were lined in 2005. The purpose of the site investigation is to determine the efficacy of existing source controls, to determine the current lateral and vertical extent of this contaminated shallow groundwater, and to identify any potential impacts to the downgradient and naturally occurring downgradient groundwater in the Dewey Lake Formation. The site investigation may build upon the previous investigations completed by Daniel B. Stephens and Associates in 2003 and 2008.

This requirement is consistent with Section 20.6.2.3107 NMAC, which allows the Secretary to require a system of monitoring and reporting to verify that the permit is achieving the expected results and to require reporting of other information. The site investigation will provide additional information necessary to prevent further contamination and to determine whether to require corrective action or abatement.

4. Contingency Plan Conditions (pages 28 -31 in the Draft Permit)

Conditions in this Section require the Permittee to implement specified actions, or to propose corrective actions for NMED's approval, in the case of failure of any aspect of the discharge system. The conditions, which reflect standard language used in other industrial discharge permits, address the exceedance of groundwater standards, damage to impoundment liners, lack of required freeboard in impoundments, and monitoring well deficiencies (e.g., improper construction, improper location for monitoring the intended source, insufficient water for sampling). Contingency plans are authorized by Subsection A(10) of 20.6.2.3107 NMAC. The Permittee is required to report and address unauthorized discharges in accordance with 20.6.2.1203 NMAC.

5. Closure Conditions (pages 32 – 35 in the Draft Permit)

Conditions in this Section prescribe measures and timeframes for closing part, or all, of the Facility so that discharges can no longer occur and so that the exceedance of groundwater standards does not occur after the cessation of the operation. NMED understands that the Permittee does not plan to close the Facility during the term of this Discharge Permit, however general closure conditions are always included in discharge permits. Closure requirements are authorized by Subsection A(11) of 20.6.2.3107 NMAC, which also stipulates that closure requirements survive the termination or expiration of the Discharge Permit.

Groundwater monitoring is required after a discharge ceases and all means of transferring liquid to a discharge impoundment are sealed. This period after "closure" is commonly referred to as "post-closure" and generally continues until a minimum of eight consecutive quarters of groundwater sampling and analysis confirm no exceedance of standards. This two-year period allows for the potential movement of contaminants through the vadose zone and is consistent with the time period established in remediation programs for demonstrating that remediation is complete, e.g., 20.6.2.4103 NMAC (abatement plans) and 20.5.119.1929 NMAC (petroleum storage tank systems).

This Section includes a condition for properly closing the Facility in accordance with the WIPP Land Withdrawal Act, WIPP's Hazardous Waste Facility Permit (NM4890139088-TSDF), and the WIPP Land Management Plan's requirements for disposition of salt. In particular, the condition requires removal of all salt stockpiles from the land surface at the Facility so that the salt does not remain as a potential source of a contaminant discharge to groundwater.

6. General Terms and Conditions (pages 35 – 39 in the Draft Permit)

This Section's general terms and conditions are standard conditions in all discharge permits.

The Permittee is required to maintain certain records and provide them if requested to NMED, as authorized by Subsections A and D of 20.6.2.3107 NMAC. The Permittee is required to notify NMED of proposed changes to the volume, location, or character of the discharge, as this may require a "discharge permit modification" as defined in Subsection D of 20.6.2.7 NMAC and is consistent with the notification requirement in Subsection C of 20.6.2.3107 NMAC.

This Section identifies the Permittee's obligations, pursuant to the Ground and Surface Water Protection Regulations, regarding the transfer of the discharge permit, permit fees, and submittal construction plans and specifications. The Section also cites New Mexico Water Quality Act provisions allowing for inspections, civil and criminal penalties, and the duty to comply with other laws.

Young, Avery, NMENV

From:	Vajda, Josh - RES <Josh.Vajda@wipp.ws>
Sent:	Monday, February 24, 2020 10:49 AM
To:	Young, Avery, NMENV; Chavez, Rick - RES; Jaco, Bill - RES
Cc:	Pullen, Steve, NMENV
Subject:	[EXT] RE: WIPP Leak Detection Condition
Attachments:	WIPP Pond Volume Calc Methodology.docx; WIPP Pond Volume Calc Action Limits.docx

Avery,

We have reviewed the proposed language regarding the LDCRS for the ponds and we have no comments. The language is ok as written. I am also including the pond volume calculations and pond calculation methodology as requested. Please understand that the annulus spacing value is an assumption based on design and as-built information. Let us know if you have any further questions.

Joshua Vajda
WIPP-RES
(575) 234-3214

From: Young, Avery, NMENV <Avery.Young@state.nm.us>
Sent: Friday, February 21, 2020 12:03 PM
To: Vajda, Josh - RES <Josh.Vajda@wipp.ws>; Chavez, Rick - RES <Rick.Chavez@wipp.ws>; Jaco, Bill - RES <bill.jaco@wipp.ws>
Cc: Pullen, Steve, NMENV <steve.pullen@state.nm.us>
Subject: [EXTERNAL] WIPP Leak Detection Condition

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WARNING - EXTERNAL EMAIL
*********************************************************************
This message does not originate from a known WIPP email system.
Use caution if this message contains attachments, links or requests
for information.
*********************************************************************
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Hello,

Please see the draft leak detection condition below for your comment:

The permittee shall maintain and operate the leak detection, collection, and removal systems (LDCRS) for Salt Storage Ponds 2, 3 and 5 in a manner that will result in less than one foot of hydraulic head on the secondary liners in the ponds.

In the event that the permittee cannot maintain less than one foot of hydraulic head on the secondary liners for Salt Storage Ponds 2, 3 and 5, the permittee shall notify NMED within 48 hours of the discovery and shall submit a corrective action plan to NMED which evaluates the primary liner leakage rate, proposes options for reducing the leakage if optimal, or otherwise proposes a means to maintain less than one foot of hydraulic head on the secondary liner. The plan shall be submitted for NMED approval within 60 days after the discovery that the hydraulic head on the secondary liner has surpassed one foot.

In the event that it becomes neces..., to modify a LDCRS for a pond, the permittee shall submit a report describing the proposed revised methodology for NMED approval.

This condition will be the same for Brine Salt Storage Pond 4 and Brine Retention Ponds East and West.

Thank you,

Avery Young, Environmental Scientist
New Mexico Environment Department
Ground Water Quality Bureau
1190 Saint Francis Dr, Santa Fe, NM 87505
505-827-2909
https://www.env.nm.gov/gwqb/
Avery.Young@state.nm.us

WIPP Pond Calculation Methodology

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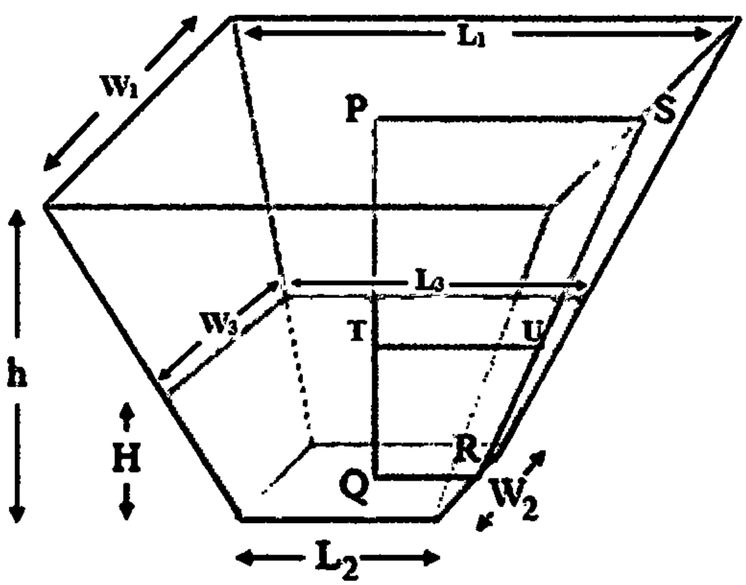
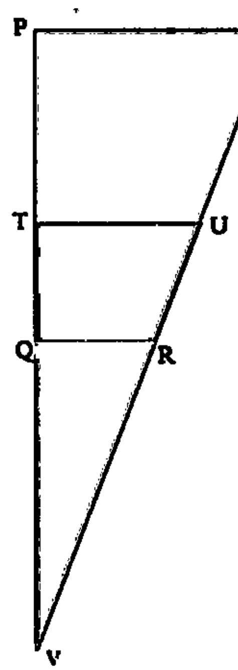
Volume of a pyramidal frustum:

$$V = \frac{1}{3}h(A_1 + A_2 + (A_1 A_2)^{0.5})$$

Where h is the height, A_1 is the top area and A_2 is the bottom area.

The rectangle at the base of the pond is L_2 units long by W_2 units wide; the rectangle at the top of the pond is L_1 units long by W_1 units wide; the pond is "h" units in height and the water in the pond is "H" units deep; "P" is the midpoint of the top rectangle; "Q" is the midpoint of the bottm rectangle and "R" and "S" are the midpoints of their respective sides. Let the rectangle formed by the surface of the water be L_3 units long and W_3 units wide.





Consider the two dimensional figure PQRS displayed at the right.

Extend the sides PQ and SR to meet at point V.

$|QR| = \frac{L_2}{2}$; $|TU| = \frac{L_3}{2}$; $|PS| = \frac{L_1}{2}$; $|PT| = h - H$; and $|TQ| = H$

Let the distance from Q to V be "x" feet.

The triangles QRV, TUV and PSV are similar; therefore

$$\frac{|PS|}{|PV|} = \frac{|TU|}{|TV|} = \frac{|QR|}{|QV|}$$

$$\frac{\frac{L_1}{2}}{(h+x)} = \frac{\frac{L_3}{2}}{(H+x)} = \frac{\frac{L_2}{2}}{x}$$

Solve the following expression for "x"

$$\frac{\frac{L_1}{2}}{(h+x)} = \frac{\frac{L_2}{2}}{x} \quad \dashrightarrow \quad x = \frac{hL_2}{(L_1 - L_2)}$$

Now substitute "x" into the following equation and simplify to get L_3.

$$\frac{\frac{L_1}{2}}{(h+x)} = \frac{\frac{L_3}{2}}{(H+x)}$$

$$\frac{\frac{L_1}{2}}{\left(h + \frac{hL_2}{(L_1 - L_2)}\right)} = \frac{\frac{L_3}{2}}{\left(H + \frac{hL_2}{(L_1 - L_2)}\right)}$$

$$L_3 = \frac{L_1\left(H + \frac{hL_2}{(L_1 - L_2)}\right)}{\left(h + \frac{hL_2}{(L_1 - L_2)}\right)} \quad \dashrightarrow \quad L_3 = \frac{HL_1 + (h - H)L_2}{h}$$

In a similar fashion, W_3 can be derived:

$$W_3 = \frac{HW_1 + (h - H)W_2}{h}$$

Now that we know the dimensions of the rectangle formed by the surface of the water, we can use the expression for the pyramidal frustum to calculate the volume at any desired water depth.

Volume Calculations for the WIPP Leak Detection Collection and Removal System – Seconday Liners

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Truncated Rectangular Pyramid (pyramidal frustum)				
Salt Storage Pond # 2				
	$V_{annulus} = (V_{secondary}) - (V_{primary})$			
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
$t_{annulus\_in}$	Thickness of annulus (space between liners)	1.0	in	1 inch on bottom dimension; 0.5 inches on the side walls
$t_{annulus\_ft}$	Thickness of annulus (space between liners)	0.08333	ft	$t_{annulus\_ft} = (t_{annulus\_in})(\frac{1\ ft}{12\ inches})$
L_{top_p}	Length of the top dimension of primary liner	321.9375	ft	
W_{top_p}	Width of the top dimension of primary liner	280.8536	ft	
A_{top_p}	Area at the top of the primary liner	90,417	ft^2	$A_{top\_p} = (L_{top\_p})(W_{top\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	280.0000	ft	
W_{bottom_p}	Width of the base dimension of primary liner	252.0116	ft	
A_{bottom_p}	Area at the base of the primary liner	70,563	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
h_p	Height to the top of pond from primary liner	10.5000	ft	
L_{top_s}	Length of the top dimension of secondary liner	322.0208	ft	$L_{top\_s} = (L_{top\_p}) + (t_{annulus\_ft})$
W_{top_s}	Width of the top dimension of secondary liner	280.9369	ft	$W_{top\_s} = (W_{top\_p}) + (t_{annulus\_ft})$
A_{top_s}	Area at the top of the secondary liner	90,468	ft^2	$A_{top\_s} = (L_{top\_s})(W_{top\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	279.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	251.9283	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	70,519	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
h_s	Height to the top of pond from secondary liner	10.5833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
$V_{secondary}$	Volume of pond from secondary liner	849,698	ft^3	$V_{secondary} = (\frac{1}{3})(h_s)(A_{top\_s} + A_{bottom\_s} + (A_{top\_s}A_{bottom\_s})^{0.5})$
$V_{primary}$	Volume of pond from primary liner	842,997	ft^3	$V_{primary} = (\frac{1}{3})(h_p)(A_{top\_p} + A_{bottom\_p} + (A_{top\_p}A_{bottom\_p})^{0.5})$
$V_{annulus\_cf}$	Volume of annulus (space between liners)	6,701	ft^3	$V_{annulus} = (V_{secondary}) - (V_{primary})$
$V_{annulus\_gal}$	Volume of annulus (space between liners)	50,127	gal	$V_{annulus\_gal} = (V_{annulus\_cf})(\frac{7.4805\ gal}{1\ ft^3})$

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Leak Detection Action Level for Secondary Pond Liner

EPA Guidance --> Maximum of 1 Foot of Hydraulic Head

Volume of Water in Pond Sump

Salt Storage Pond # 2

$$V_{water\_sump} = (V_{water\_s}) - (V_{water\_p})$$

Variable	Variable Description	Value	Units	Equations/Comments/Notes
H	Height of water from secondary liner	0.001	ft	Equivalent hydraulic head pressure from sump depth (gravel fill)
h_s	Height to the top of pond from secondary liner	10.5833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
L_{water_s}	Length of water level dimension (secondary liner)	279.9206	ft	$L_{water\_s} = \frac{(H)(L_{top\_s}) + (h_s - H)(L_{bottom\_s})}{h_s}$
W_{water_s}	Width of water level dimension (secondary liner)	251.9310	ft	$W_{water\_s} = \frac{(H)(W_{top\_s}) + (h_s - H)(W_{bottom\_s})}{h_s}$
A_{water_s}	Area at water level from the secondary liner	70,521	ft^2	$A_{water\_s} = (L_{water\_s})(W_{water\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	279.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	251.9283	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	70,519	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
$V_{secondary\_water}$	Volume of water from secondary liner	70.52	ft^3	$V_{secondary\_water} = (\frac{1}{3})(H)(A_{water\_s} + A_{bottom\_s} + (A_{water\_s}A_{bottom\_s})^{0.5})$
h_p	Height to the top of pond from primary liner	10.5000	ft	
H_p	Height of water from primary liner	-0.0823	ft	$H_p = (H) - (h_s - h_p)$
L_{water_p}	Length of water level dimension (primary liner)	279.6712	ft	$L_{water\_p} = \frac{(H_p)(L_{top\_p}) + (h_p - H_p)(L_{bottom\_p})}{h_p}$
W_{water_p}	Width of water level dimension (primary liner)	251.7854	ft	$W_{water\_p} = \frac{(H_p)(W_{top\_p}) + (h_p - H_p)(W_{bottom\_p})}{h_p}$
A_{water_p}	Area at water level from the primary liner	70,417	ft^2	$A_{water\_p} = (L_{water\_p})(W_{water\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	280.0000	ft	
W_{bottom_p}	Width of the base dimension of primary liner	252.0116	ft	
A_{bottom_p}	Area at the base of the primary liner	70,563	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
$V_{primary\_water}$	Volume of water from primary liner	0.0000	ft^3	$V_{primary\_water} = (\frac{1}{3})(H_p)(A_{water\_p} + A_{bottom\_p} + (A_{water\_p}A_{bottom\_p})^{0.5})$
				If Hp is < 0, then Hp = 0, otherwise Hp = value
$V_{water\_sump\_cf}$	Volume of water in sump at height "H"	70.5198	ft^3	$V_{water\_sump\_cf} = (V_{secondary\_water}) - (V_{primary\_water})$
$V_{water\_sump\_gal}$	Volume of water in sump at height "H"	528	gal	$V_{water\_sump\_gal} = (V_{water\_sump\_cf})(\frac{7.4805\ gal}{1\ ft^3})$

Leak Detection Action Level for Secondary Pond Liner
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head
Volume of Water in Pond Annulus
Salt Storage Pond # 2

$$V_{water\_annulus} = (V_{water\_s}) - (V_{water\_p})$$

Variable	Variable Description	Value	Units	Equations/Comments/Notes
H	Height of water from secondary liner	1.0000	ft	
h_s	Height to the top of pond from secondary liner	10.5833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
L_{water_s}	Length of water level dimension [secondary liner]	283.8950	ft	$L_{water\_s} = \frac{(H)(L_{top\_s}) + (h_s - H)(L_{bottom\_s})}{h_s}$
W_{water_s}	Width of water level dimension [secondary liner]	254.6692	ft	$W_{water\_s} = \frac{(H)(W_{top\_s}) + (h_s - H)(W_{bottom\_s})}{h_s}$
A_{water_s}	Area at water level from the secondary liner	72,299	ft^2	$A_{water\_s} = (L_{water\_s})(W_{water\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	279.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	251.9283	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	70,519	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
$V_{secondary\_water}$	Volume of water from secondary liner	71,407	ft^3	$V_{secondary\_water} = (\frac{1}{3})(H)(A_{water\_s} + A_{bottom\_s} + (A_{water\_s}A_{bottom\_s})^{0.5})$
h_p	Height to the top of pond from primary liner	10.5000	ft	
H_p	Height of water from primary liner	0.9167	ft	$H_p = (H) - (h_s - h_p)$
L_{water_p}	Length of water level dimension [primary liner]	283.6612	ft	$L_{water\_p} = \frac{(H_p)(L_{top\_p}) + (h_p - H_p)(L_{bottom\_p})}{h_p}$
W_{water_p}	Width of water level dimension [primary liner]	254.5296	ft	$W_{water\_p} = \frac{(H_p)(W_{top\_p}) + (h_p - H_p)(W_{bottom\_p})}{h_p}$
A_{water_p}	Area at water level from the primary liner	72,200	ft^2	$A_{water\_p} = (L_{water\_p})(W_{water\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	280.0000	ft	
W_{bottom_p}	Width of the base dimension of primary liner	252.0116	ft	
A_{bottom_p}	Area at the base of the primary liner	70,563	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
$V_{primary\_water}$	Volume of water from primary liner	65,432	ft^3	$V_{primary\_water} = (\frac{1}{3})(H_p)(A_{water\_p} + A_{bottom\_p} + (A_{water\_p}A_{bottom\_p})^{0.5})$
				If Hp is < 0, then Hp = 0, otherwise Hp = value
$V_{water\_annulus\_cf}$	Volume of water in annulus at height "H"	5,975	ft^3	$V_{water\_annulus\_cf} = (V_{secondary\_water}) - (V_{primary\_water})$
$V_{water\_annulus\_gal}$	Volume of water in annulus at height "H"	44,700	gal	$V_{water\_annulus\_gal} = (V_{water\_annulus\_cf})(\frac{7.4805\ gal}{1\ ft^3})$
$V_{actionlimit}$	Max water able to pump down for H=1 ft	44,172	gal	$V_{action\ limit} = (V_{water\_annulus\_gal}) - (V_{water\_sump\_gal})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Truncated Rectangular Pyramid [pyramidal frustum]				
Salt Storage Pond # 3				
	$V_{annulus} = (V_{secondary}) - (V_{primary})$			
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
$t_{annulus\_in}$	Thickness of annulus [space between liners]	1.0	in	1 inch on bottom dimension; 0.5 inches on the side walls
$t_{annulus\_ft}$	Thickness of annulus [space between liners]	0.08333	ft	$t_{annulus\_ft} = (t_{annulus\_in})(\frac{1\ ft}{12\ inches})$
L_{top_p}	Length of the top dimension of primary liner	537.0029	ft	
W_{top_p}	Width of the top dimension of primary liner	430.0000	ft	
A_{top_p}	Area at the top of the primary liner	230,911	ft^2	$A_{top\_p} = (L_{top\_p})(W_{top\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	431.9751	ft	
W_{bottom_p}	Width of the base dimension of primary liner	335.0393	ft	
A_{bottom_p}	Area at the base of the primary liner	144,729	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
h_p	Height to the top of pond from primary liner	20.0000	ft	
L_{top_s}	Length of the top dimension of secondary liner	537.0862	ft	$L_{top\_s} = (L_{top\_p}) + (t_{annulus\_ft})$
W_{top_s}	Width of the top dimension of secondary liner	430.0833	ft	$W_{top\_s} = (W_{top\_p}) + (t_{annulus\_ft})$
A_{top_s}	Area at the top of the secondary liner	230,992	ft^2	$A_{top\_s} = (L_{top\_s})(W_{top\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	431.8918	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	334.9560	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	144,665	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
h_s	Height to the top of pond from secondary liner	20.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
$V_{secondary}$	Volume of pond from secondary liner	3,738,566	ft^3	$V_{secondary} = (\frac{1}{3})(h_s)(A_{top\_s} + A_{bottom\_s} + (A_{top\_s}A_{bottom\_s})^{0.5})$
$V_{primary}$	Volume of pond from primary liner	3,722,999	ft^3	$V_{primary} = (\frac{1}{3})(h_p)(A_{top\_p} + A_{bottom\_p} + (A_{top\_p}A_{bottom\_p})^{0.5})$
$V_{annulus\_cf}$	Volume of annulus [space between liners]	15,567	ft^3	$V_{annulus} = (V_{secondary}) - (V_{primary})$
$V_{annulus\_gal}$	Volume of annulus [space between liners]	116,452	gal	$V_{annulus\_gal} = (V_{annulus\_cf})(\frac{7.4805\ gal}{1\ ft^3})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Water in Pond Sump				
Salt Storage Pond # 3				
	$V_{water\_sump} = (V_{water\_s}) - (V_{water\_p})$			
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
H	Height of water from secondary liner	0.001	ft	Equivalent hydraulic head pressure from sump depth (gravel fill)
h_s	Height to the top of pond from secondary liner	20.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
L_{water_s}	Length of water level dimension (secondary liner)	431.8970	ft	$L_{water\_s} = \frac{(H)(L_{top\_s}) + (h_s - H)(L_{bottom\_s})}{h_s}$
W_{water_s}	Width of water level dimension (secondary liner)	334.9607	ft	$W_{water\_s} = \frac{(H)(W_{top\_s}) + (h_s - H)(W_{bottom\_s})}{h_s}$
A_{water_s}	Area at water level from the secondary liner	144,669	ft^2	$A_{water\_s} = (L_{water\_s})(W_{water\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	431.8918	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	334.9560	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	144,665	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
$V_{secondary\_water}$	Volume of water from secondary liner	144.67	ft^3	$V_{secondary\_water} = (\frac{1}{3})(H)(A_{water\_s} + A_{bottom\_s} + (A_{water\_s}A_{bottom\_s})^{0.5})$
h_p	Height to the top of pond from primary liner	20.0000	ft	
H_p	Height of water from primary liner	-0.08233	ft	$H_p = (H) - (h_s - h_p)$
L_{water_p}	Length of water level dimension (primary liner)	431.5427	ft	$L_{water\_p} = \frac{(H_p)(L_{top\_p}) + (h_p - H_p)(L_{bottom\_p})}{h_p}$
W_{water_p}	Width of water level dimension (primary liner)	334.6484	ft	$W_{water\_p} = \frac{(H_p)(W_{top\_p}) + (h_p - H_p)(W_{bottom\_p})}{h_p}$
A_{water_p}	Area at water level from the primary liner	144,415	ft^2	$A_{water\_p} = (L_{water\_p})(W_{water\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	431.9751	ft	
W_{bottom_p}	Width of the base dimension of primary liner	335.0393	ft	
A_{bottom_p}	Area at the base of the primary liner	144,729	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
$V_{primary\_water}$	Volume of water from primary liner	0.0000	ft^3	$V_{primary\_water} = (\frac{1}{3})(H_p)(A_{water\_p} + A_{bottom\_p} + (A_{water\_p}A_{bottom\_p})^{0.5})$
				If Hp is < 0, then Hp = 0, otherwise Hp = value
$V_{water\_sump\_cf}$	Volume of water in sump at height "H"	144.67	ft^3	$V_{water\_sump\_cf} = (V_{secondary\_water}) - (V_{primary\_water})$
$V_{water\_sump\_gal}$	Volume of water in sump at height "H"	1,082	gal	$V_{water\_sump\_gal} = (V_{water\_sump\_cf})(\frac{7.4805\ gal}{1\ ft^3})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Water in Pond Annulus				
Salt Storage Pond # 3				
	$V_{water\_annulus} = (V_{water\_s}) - (V_{water\_p})$			
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
H	Height of water from secondary liner	1.0000	ft	
h_s	Height to the top of pond from secondary liner	20.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
L_{water_s}	Length of water level dimension (secondary liner)	437.1297	ft	$L_{water\_s} = \frac{(H)(L_{top\_s}) + (h_s - H)(L_{bottom\_s})}{h_s}$
W_{water_s}	Width of water level dimension (secondary liner)	339.6926	ft	$W_{water\_s} = \frac{(H)(W_{top\_s}) + (h_s - H)(W_{bottom\_s})}{h_s}$
A_{water_s}	Area at water level from the secondary liner	148,490	ft^2	$A_{water\_s} = (L_{water\_s})(W_{water\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	431.8918	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	334.9560	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	144,665	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
$V_{secondary\_water}$	Volume of water from secondary liner	146,573	ft^3	$V_{secondary\_water} = (\frac{1}{3})(H)(A_{water\_s} + A_{bottom\_s} + (A_{water\_s}A_{bottom\_s})^{0.5})$
h_p	Height to the top of pond from primary liner	20.0000	ft	
H_p	Height of water from primary liner	0.9167	ft	$H_p = (H) - (h_s - h_p)$
L_{water_p}	Length of water level dimension (primary liner)	436.7889	ft	$L_{water\_p} = \frac{(H_p)(L_{top\_p}) + (h_p - H_p)(L_{bottom\_p})}{h_p}$
W_{water_p}	Width of water level dimension (primary liner)	339.3917	ft	$W_{water\_p} = \frac{(H_p)(W_{top\_p}) + (h_p - H_p)(W_{bottom\_p})}{h_p}$
A_{water_p}	Area at water level from the primary liner	148,243	ft^2	$A_{water\_p} = (L_{water\_p})(W_{water\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	431.9751	ft	
W_{bottom_p}	Width of the base dimension of primary liner	335.0393	ft	
A_{bottom_p}	Area at the base of the primary liner	144,729	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
$V_{primary\_water}$	Volume of water from primary liner	134,275	ft^3	$V_{primary\_water} = (\frac{1}{3})(H_p)(A_{water\_p} + A_{bottom\_p} + (A_{water\_p}A_{bottom\_p})^{0.5})$
$V_{water\_annulus\_cf}$	Volume of water in annulus at height "H"	12,298	ft^3	$V_{water\_annulus\_cf} = (V_{secondary\_water}) - (V_{primary\_water})$
$V_{water\_annulus\_gal}$	Volume of water in annulus at height "H"	91,994	gal	$V_{water\_annulus\_gal} = (V_{water\_annulus\_cf})(\frac{7.4805\ gal}{1\ ft^3})$
$V_{action\ limit}$	Max water able to pump down for H=1 ft	90,912	gal	$V_{action\ limit} = (V_{water\_annulus\_gal}) - (V_{water\_sump\_gal})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Truncated Rectangular Pyramid (pyramidal frustum)				
Pond # 4 (NEW IMPOUNDMENT)				
	$V_{annulus} = (V_{secondary}) - (V_{primary})$			
Variable	Variable Description	Value	Units	Equations/Comments/Notes
$t_{annulus\_in}$	Thickness of annulus (space between liners)	1.0	in	1 inch on bottom dimension; 0.5 inches on the side walls
$t_{annulus\_ft}$	Thickness of annulus (space between liners)	0.08333	ft	$t_{annulus\_ft} = (t_{annulus\_in})(\frac{1\ ft}{12\ inches})$
L_{top_p}	Length of the top dimension of primary liner	341.3330	ft	
W_{top_p}	Width of the top dimension of primary liner	341.3330	ft	
A_{top_p}	Area at the top of the primary liner	116,508	ft^2	$A_{top\_p} = (L_{top\_p})(W_{top\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	214.0000	ft	
W_{bottom_p}	Width of the base dimension of primary liner	214.0000	ft	
A_{bottom_p}	Area at the base of the primary liner	45,796	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
h_p	Height to the top of pond from primary liner	20.0000	ft	
L_{top_s}	Length of the top dimension of secondary liner	341.4163	ft	$L_{top\_s} = (L_{top\_p}) + (t_{annulus\_ft})$
W_{top_s}	Width of the top dimension of secondary liner	341.4163	ft	$W_{top\_s} = (W_{top\_p}) + (t_{annulus\_ft})$
A_{top_s}	Area at the top of the secondary liner	116,565	ft^2	$A_{top\_s} = (L_{top\_s})(W_{top\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	213.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	213.9167	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	45,760	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
h_s	Height to the top of pond from secondary liner	20.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
$V_{secondary}$	Volume of pond from secondary liner	1,575,605	ft^3	$V_{secondary} = (\frac{1}{3})(h_s)(A_{top\_s} + A_{bottom\_s} + (A_{top\_s}A_{bottom\_s})^{0.5})$
$V_{primary}$	Volume of pond from primary liner	1,568,997	ft^3	$V_{primary} = (\frac{1}{3})(h_p)(A_{top\_p} + A_{bottom\_p} + (A_{top\_p}A_{bottom\_p})^{0.5})$
$V_{annulus\_cf}$	Volume of annulus (space between liners)	6,609	ft^3	$V_{annulus} = (V_{secondary}) - (V_{primary})$
$V_{annulus\_gal}$	Volume of annulus (space between liners)	49,435	gal	$V_{annulus\_gal} = (V_{annulus\_cf})(\frac{7.4805\ gal}{1\ ft^3})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Water in Pond Sump				
Pond # 4 [NEW IMPOUNDMENT]				
	$V_{water\_sump} = (V_{water\_s}) - (V_{water\_p})$			
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
H	Height of water from secondary liner	0.001	ft	Equivalent hydraulic head pressure from sump depth (gravel fill)
h_s	Height to the top of pond from secondary liner	20.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
L_{water_s}	Length of water level dimension (secondary liner)	213.9230	ft	$L_{water\_s} = \frac{(H)(L_{top\_s}) + (h_s - H)(L_{bottom\_s})}{h_s}$
W_{water_s}	Width of water level dimension (secondary liner)	213.9230	ft	$W_{water\_s} = \frac{(H)(W_{top\_s}) + (h_s - H)(W_{bottom\_s})}{h_s}$
A_{water_s}	Area at water level from the secondary liner	45,763	ft^2	$A_{water\_s} = (L_{water\_s})(W_{water\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	213.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	213.9167	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	45,760	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
$V_{secondary\_water}$	Volume of water from secondary liner	45.76	ft^3	$V_{secondary\_water} = (\frac{1}{3})(H)(A_{water\_s} + A_{bottom\_s} + (A_{water\_s}A_{bottom\_s})^{0.5})$
h_p	Height to the top of pond from primary liner	20.0000	ft	
H_p	Height of water from primary liner	-0.08233	ft	$H_p = (H) - (h_s - h_p)$
L_{water_p}	Length of water level dimension (primary liner)	213.4758	ft	$L_{water\_p} = \frac{(H_p)(L_{top\_p}) + (h_p - H_p)(L_{bottom\_p})}{h_p}$
W_{water_p}	Width of water level dimension (primary liner)	213.4758	ft	$W_{water\_p} = \frac{(H_p)(W_{top\_p}) + (h_p - H_p)(W_{bottom\_p})}{h_p}$
A_{water_p}	Area at water level from the primary liner	45,572	ft^2	$A_{water\_p} = (L_{water\_p})(W_{water\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	214.0000	ft	
W_{bottom_p}	Width of the base dimension of primary liner	214	ft	
A_{bottom_p}	Area at the base of the primary liner	45,796	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
$V_{primary\_water}$	Volume of water from primary liner	0.0000	ft^3	$V_{primary\_water} = (\frac{1}{3})(H_p)(A_{water\_p} + A_{bottom\_p} + (A_{water\_p}A_{bottom\_p})^{0.5})$
				If Hp is < 0, then Hp = 0, otherwise Hp = value
$V_{water\_sump\_cf}$	Volume of water in sump at height "H"	45.76	ft^3	$V_{water\_sump\_cf} = (V_{secondary\_water}) - (V_{primary\_water})$
$V_{water\_sump\_gal}$	Volume of water in sump at height "H"	342	gal	$V_{water\_sump\_gal} = (V_{water\_sump\_cf})(\frac{7.4805\ gal}{1\ ft^3})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Water in Pond Annulus				
Pond # 4 [NEW IMPOUNDMENT]				
	$V_{water\_annulus} = (V_{water\_s}) - (V_{water\_p})$			
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
H	Height of water from secondary liner	1.0000	ft	
h_s	Height to the top of pond from secondary liner	20.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
L_{water_s}	Length of water level dimension [secondary liner]	220.2652	ft	$L_{water\_s} = \frac{(H)(L_{top\_s}) + (h_s - H)(L_{bottom\_s})}{h_s}$
W_{water_s}	Width of water level dimension [secondary liner]	220.2652	ft	$W_{water\_s} = \frac{(H)(W_{top\_s}) + (h_s - H)(W_{bottom\_s})}{h_s}$
A_{water_s}	Area at water level from the secondary liner	48,517	ft^2	$A_{water\_s} = (L_{water\_s})(W_{water\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	213.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	213.9167	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	45,760	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
$V_{secondary\_water}$	Volume of water from secondary liner	47,132	ft^3	$V_{secondary\_water} = (\frac{1}{3})(H)(A_{water\_s} + A_{bottom\_s} + (A_{water\_s}A_{bottom\_s})^{0.5})$
h_p	Height to the top of pond from primary liner	20.0000	ft	
H_p	Height of water from primary liner	0.9167	ft	$H_p = (H) - (h_s - h_p)$
L_{water_p}	Length of water level dimension (primary liner)	219.8361	ft	$L_{water\_p} = \frac{(H_p)(L_{top\_p}) + (h_p - H_p)(L_{bottom\_p})}{h_p}$
W_{water_p}	Width of water level dimension (primary liner)	219.8361	ft	$W_{water\_p} = \frac{(H_p)(W_{top\_p}) + (h_p - H_p)(W_{bottom\_p})}{h_p}$
A_{water_p}	Area at water level from the primary liner	48,328	ft^2	$A_{water\_p} = (L_{water\_p})(W_{water\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	214.0000	ft	
W_{bottom_p}	Width of the base dimension of primary liner	214.0000	ft	
A_{bottom_p}	Area at the base of the primary liner	45,796	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
$V_{primary\_water}$	Volume of water from primary liner	43,135	ft^3	$V_{primary\_water} = (\frac{1}{3})(H_p)(A_{water\_p} + A_{bottom\_p} + (A_{water\_p}A_{bottom\_p})^{0.5})$
$V_{water\_annulus\_cf}$	Volume of water in annulus at height "H"	3,997	ft^3	$V_{water\_annulus\_cf} = (V_{secondary\_water}) - (V_{primary\_water})$
$V_{water\_annulus\_gal}$	Volume of water in annulus at height "H"	29,899	gal	$V_{water\_annulus\_gal} = (V_{water\_annulus\_cf})(\frac{7.4805\ gal}{1\ ft^3})$
$V_{action limit}$	Max water able to pump down for H=1 ft	29,557	gal	$V_{action\ limit} = (V_{water\_annulus\_gal}) - (V_{water\_sump\_gal})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Truncated Rectangular Pyramid (pyramidal frustum)				
Pond # 5 (NEW IMPOUNDMENT)				
	$V_{annulus} = (V_{secondary}) - (V_{primary})$			
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
$t_{annulus\_in}$	Thickness of annulus (space between liners)	1.0	in	1 inch on bottom dimension; 0.5 inches on the side walls
$t_{annulus\_ft}$	Thickness of annulus (space between liners)	0.08333	ft	$t_{annulus\_ft} = (t_{annulus\_in})(\frac{1\ ft}{12\ inches})$
L_{top_p}	Length of the top dimension of primary liner	368.0000	ft	
W_{top_p}	Width of the top dimension of primary liner	362.0000	ft	
A_{top_p}	Area at the top of the primary liner	133,216	ft^2	$A_{top\_p} = (L_{top\_p})(W_{top\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	260.0000	ft	
W_{bottom_p}	Width of the base dimension of primary liner	250.0000	ft	
A_{bottom_p}	Area at the base of the primary liner	65,000	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
h_p	Height to the top of pond from primary liner	12.0000	ft	
L_{top_s}	Length of the top dimension of secondary liner	368.0833	ft	$L_{top\_s} = (L_{top\_p}) + (t_{annulus\_ft})$
W_{top_s}	Width of the top dimension of secondary liner	362.0833	ft	$W_{top\_s} = (W_{top\_p}) + (t_{annulus\_ft})$
A_{top_s}	Area at the top of the secondary liner	133,277	ft^2	$A_{top\_s} = (L_{top\_s})(W_{top\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	259.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	249.9167	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	64,958	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
h_s	Height to the top of pond from secondary liner	12.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
$V_{secondary}$	Volume of pond from secondary liner	1,173,208	ft^3	$V_{secondary} = (\frac{1}{3})(h_s)(A_{top\_s} + A_{bottom\_s} + (A_{top\_s}A_{bottom\_s})^{0.5})$
$V_{primary}$	Volume of pond from primary liner	1,165,080	ft^3	$V_{primary} = (\frac{1}{3})(h_p)(A_{top\_p} + A_{bottom\_p} + (A_{top\_p}A_{bottom\_p})^{0.5})$
$V_{annulus\_cf}$	Volume of annulus (space between liners)	8,128	ft^3	$V_{annulus} = (V_{secondary}) - (V_{primary})$
$V_{annulus\_gal}$	Volume of annulus (space between liners)	60,800	gal	$V_{annulus\_gal} = (V_{annulus\_cf})(\frac{7.4805\ gal}{1\ ft^3})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Water in Pond Sump				
Pond # 5 [NEW IMPOUNDMENT]				
	$V_{water\_sump} = (V_{water\_s}) - (V_{water\_p})$			
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
H	Height of water from secondary liner	0.001	ft	Equivalent hydraulic head pressure from sump depth [gravel fill]
h_s	Height to the top of pond from secondary liner	12.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
L_{water_s}	Length of water level dimension [secondary liner]	259.9256	ft	$L_{water\_s} = \frac{(H)(L_{top\_s}) + (h_s - H)(L_{bottom\_s})}{h_s}$
W_{water_s}	Width of water level dimension [secondary liner]	249.9259	ft	$W_{water\_s} = \frac{(H)(W_{top\_s}) + (h_s - H)(W_{bottom\_s})}{h_s}$
A_{water_s}	Area at water level from the secondary liner	64,962	ft^2	$A_{water\_s} = (L_{water\_s})(W_{water\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	259.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	249.9167	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	64,958	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
$V_{secondary\_water}$	Volume of water from secondary liner	64.96	ft^3	$V_{secondary\_water} = (\frac{1}{3})(H)(A_{water\_s} + A_{bottom\_s} + (A_{water\_s}A_{bottom\_s})^{0.5})$
h_p	Height to the top of pond from primary liner	12.0000	ft	
H_p	Height of water from primary liner	-0.08233	ft	$H_p = (H) - (h_s - h_p)$
L_{water_p}	Length of water level dimension [primary liner]	259.2590	ft	$L_{water\_p} = \frac{(H_p)(L_{top\_p}) + (h_p - H_p)(L_{bottom\_p})}{h_p}$
W_{water_p}	Width of water level dimension [primary liner]	249.2316	ft	$W_{water\_p} = \frac{(H_p)(W_{top\_p}) + (h_p - H_p)(W_{bottom\_p})}{h_p}$
A_{water_p}	Area at water level from the primary liner	64,616	ft^2	$A_{water\_p} = (L_{water\_p})(W_{water\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	260.00	ft	
W_{bottom_p}	Width of the base dimension of primary liner	250.00	ft	
A_{bottom_p}	Area at the base of the primary liner	65,000	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
$V_{primary\_water}$	Volume of water from primary liner	0.0000	ft^3	$V_{primary\_water} = (\frac{1}{3})(H_p)(A_{water\_p} + A_{bottom\_p} + (A_{water\_p}A_{bottom\_p})^{0.5})$
				If Hp is < 0, then Hp = 0, otherwise Hp = value
$V_{water\_sump\_cf}$	Volume of water in sump at height "H"	64.96	ft^3	$V_{water\_sump\_cf} = (V_{secondary\_water}) - (V_{primary\_water})$
$V_{water\_sump\_gal}$	Volume of water in sump at height "H"	486	gal	$V_{water\_sump\_gal} = (V_{water\_sump\_cf})(\frac{7.4805\ gal}{1\ ft^3})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Water in Pond Annulus				
Pond # 5 [NEW IMPOUNDMENT]				
	$V_{water\_annulus} = (V_{water\_s}) - (V_{water\_p})$			
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
H	Height of water from secondary liner	1.0000	ft	
h_s	Height to the top of pond from secondary liner	12.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
L_{water_s}	Length of water level dimension (secondary liner)	268.8684	ft	$L_{water\_s} = \frac{(H)(L_{top\_s}) + (h_s - H)(L_{bottom\_s})}{h_s}$
W_{water_s}	Width of water level dimension (secondary liner)	259.1994	ft	$W_{water\_s} = \frac{(H)(W_{top\_s}) + (h_s - H)(W_{bottom\_s})}{h_s}$
A_{water_s}	Area at water level from the secondary liner	69,691	ft^2	$A_{water\_s} = (L_{water\_s})(W_{water\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	259.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	249.9167	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	64,958	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
$V_{secondary\_water}$	Volume of water from secondary liner	67,310	ft^3	$V_{secondary\_water} = (\frac{1}{3})(H)(A_{water\_s} + A_{bottom\_s} + (A_{water\_s}A_{bottom\_s})^{0.5})$
h_p	Height to the top of pond from primary liner	12.0000	ft	
H_p	Height of water from primary liner	0.9167	ft	$H_p = (H) - (h_s - h_p)$
L_{water_p}	Length of water level dimension (primary liner)	268.2500	ft	$L_{water\_p} = \frac{(H_p)(L_{top\_p}) + (h_p - H_p)(L_{bottom\_p})}{h_p}$
W_{water_p}	Width of water level dimension (primary liner)	258.5556	ft	$W_{water\_p} = \frac{(H_p)(W_{top\_p}) + (h_p - H_p)(W_{bottom\_p})}{h_p}$
A_{water_p}	Area at water level from the primary liner	69,358	ft^2	$A_{water\_p} = (L_{water\_p})(W_{water\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	260.0000	ft	
W_{bottom_p}	Width of the base dimension of primary liner	250.0000	ft	
A_{bottom_p}	Area at the base of the primary liner	65,000	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
$V_{primary\_water}$	Volume of water from primary liner	61,570	ft^3	$V_{primary\_water} = (\frac{1}{3})(H_p)(A_{water\_p} + A_{bottom\_p} + (A_{water\_p}A_{bottom\_p})^{0.5})$
$V_{water\_annulus\_cf}$	Volume of water in annulus at height "H"	5,740	ft^3	$V_{water\_annulus\_cf} = (V_{secondary\_water}) - (V_{primary\_water})$
$V_{water\_annulus\_gal}$	Volume of water in annulus at height "H"	42,941	gal	$V_{water\_annulus\_gal} = (V_{water\_annulus\_cf})(\frac{7.4805\ gal}{1\ ft^3})$
$V_{actionlimit}$	Max water able to pump down for H=1 ft	42,455	gal	$V_{action\ limit} = (V_{water\_annulus\_gal}) - (V_{water\_sump\_gal})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Truncated Rectangular Pyramid (pyramidal frustum)				
Brine Evaporation Pond East (NEW IMPOUNDMENT)				
	$V_{annulus} = (V_{secondary}) - (V_{primary})$			
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
$t_{annulus\_in}$	Thickness of annulus (space between liners)	1.0	in	1 inch on bottom dimension; 0.5 inches on the side walls
$t_{annulus\_ft}$	Thickness of annulus (space between liners)	0.08333	ft	$t_{annulus\_ft} = (t_{annulus\_in})(\frac{1\ ft}{12\ inches})$
L_{top_p}	Length of the top dimension of primary liner	80.00	ft	
W_{top_p}	Width of the top dimension of primary liner	70.00	ft	
A_{top_p}	Area at the top of the primary liner	5,600	ft^2	$A_{top\_p} = (L_{top\_p})(W_{top\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	10.00	ft	
W_{bottom_p}	Width of the base dimension of primary liner	8.75	ft	
A_{bottom_p}	Area at the base of the primary liner	88	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
h_p	Height to the top of pond from primary liner	7.00	ft	
L_{top_s}	Length of the top dimension of secondary liner	80.0833	ft	$L_{top\_s} = (L_{top\_p}) + (t_{annulus\_ft})$
W_{top_s}	Width of the top dimension of secondary liner	70.0833	ft	$W_{top\_s} = (W_{top\_p}) + (t_{annulus\_ft})$
A_{top_s}	Area at the top of the secondary liner	5,613	ft^2	$A_{top\_s} = (L_{top\_s})(W_{top\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	9.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	8.6667	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	86	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
h_s	Height to the top of pond from secondary liner	7.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
$V_{secondary}$	Volume of pond from secondary liner	15,095	ft^3	$V_{secondary} = (\frac{1}{3})(h_s)(A_{top\_s} + A_{bottom\_s} + (A_{top\_s}A_{bottom\_s})^{0.5})$
$V_{primary}$	Volume of pond from primary liner	14,904	ft^3	$V_{primary} = (\frac{1}{3})(h_p)(A_{top\_p} + A_{bottom\_p} + (A_{top\_p}A_{bottom\_p})^{0.5})$
$V_{annulus\_cf}$	Volume of annulus (space between liners)	190	ft^3	$V_{annulus} = (V_{secondary}) - (V_{primary})$
$V_{annulus\_gal}$	Volume of annulus (space between liners)	1,424	gal	$V_{annulus\_gal} = (V_{annulus\_cf})(\frac{7.4805\ gal}{1\ ft^3})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Water in Pond Sump				
Brine Evaporation Pond East [NEW IMPOUNDMENT]				
	$V_{water\_sump} = (V_{water\_s}) - (V_{water\_p})$			
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
H	Height of water from secondary liner	0.015	ft	Equivalent hydraulic head pressure from sump depth [gravel fill]
h_s	Height to the top of pond from secondary liner	7.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
L_{water_s}	Length of water level dimension [secondary liner]	10.0684	ft	$L_{water\_s} = \frac{(H)(L_{top\_s}) + (h_s - H)(L_{bottom\_s})}{h_s}$
W_{water_s}	Width of water level dimension [secondary liner]	8.7995	ft	$W_{water\_s} = \frac{(H)(W_{top\_s}) + (h_s - H)(W_{bottom\_s})}{h_s}$
A_{water_s}	Area at water level from the secondary liner	89	ft^2	$A_{water\_s} = (L_{water\_s})(W_{water\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	9.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	8.6667	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	86	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
$V_{secondary\_water}$	Volume of water from secondary liner	1.34	ft^3	$V_{secondary\_water} = (\frac{1}{3})(H)(A_{water\_s} + A_{bottom\_s} + (A_{water\_s}A_{bottom\_s})^{0.5})$
h_p	Height to the top of pond from primary liner	7.00	ft	
H_p	Height of water from primary liner	-0.06801	ft	$H_p = (H) - (h_s - h_p)$
L_{water_p}	Length of water level dimension [primary liner]	9.3199	ft	$L_{water\_p} = \frac{(H_p)(L_{top\_p}) + (h_p - H_p)(L_{bottom\_p})}{h_p}$
W_{water_p}	Width of water level dimension [primary liner]	8.1549	ft	$W_{water\_p} = \frac{(H_p)(W_{top\_p}) + (h_p - H_p)(W_{bottom\_p})}{h_p}$
A_{water_p}	Area at water level from the primary liner	76	ft^2	$A_{water\_p} = (L_{water\_p})(W_{water\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	10.00	ft	
W_{bottom_p}	Width of the base dimension of primary liner	8.75	ft	
A_{bottom_p}	Area at the base of the primary liner	88	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
$V_{primary\_water}$	Volume of water from primary liner	0.0000	ft^3	$V_{primary\_water} = (\frac{1}{3})(H_p)(A_{water\_p} + A_{bottom\_p} + (A_{water\_p}A_{bottom\_p})^{0.5})$
				If Hp is < 0, then Hp = 0, otherwise Hp = value
$V_{water\_sump\_cf}$	Volume of water in sump at height "H"	1.34	ft^3	$V_{water\_sump\_cf} = (V_{secondary\_water}) - (V_{primary\_water})$
$V_{water\_sump\_gal}$	Volume of water in sump at height "H"	10.00	gal	$V_{water\_sump\_gal} = (V_{water\_sump\_cf})(\frac{7.4805\ gal}{1\ ft^3})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Water in Pond Annulus				
Brine Evaporation Pond East (NEW IMPOUNDMENT)				
$V_{water\_annulus} = (V_{water\_s}) - (V_{water\_p})$				
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
H	Height of water from secondary liner	1.00	ft	
h_s	Height to the top of pond from secondary liner	7.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
L_{water_s}	Length of water level dimension (secondary liner)	19.8225	ft	$L_{water\_s} = \frac{(H)(L_{top\_s}) + (h_s - H)(L_{bottom\_s})}{h_s}$
W_{water_s}	Width of water level dimension (secondary liner)	17.3373	ft	$W_{water\_s} = \frac{(H)(W_{top\_s}) + (h_s - H)(W_{bottom\_s})}{h_s}$
A_{water_s}	Area at water level from the secondary liner	344	ft^2	$A_{water\_s} = (L_{water\_s})(W_{water\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	9.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	8.6667	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	86	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
$V_{secondary\_water}$	Volume of water from secondary liner	200	ft^3	$V_{secondary\_water} = (\frac{1}{3})(H)(A_{water\_s} + A_{bottom\_s} + (A_{water\_s}A_{bottom\_s})^{0.5})$
h_p	Height to the top of pond from primary liner	7.00	ft	
H_p	Height of water from primary liner	0.9167	ft	$H_p = (H) - (h_s - h_p)$
L_{water_p}	Length of water level dimension (primary liner)	19.1667	ft	$L_{water\_p} = \frac{(H_p)(L_{top\_p}) + (h_p - H_p)(L_{bottom\_p})}{h_p}$
W_{water_p}	Width of water level dimension (primary liner)	16.7708	ft	$W_{water\_p} = \frac{(H_p)(W_{top\_p}) + (h_p - H_p)(W_{bottom\_p})}{h_p}$
A_{water_p}	Area at water level from the primary liner	321	ft^2	$A_{water\_p} = (L_{water\_p})(W_{water\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	10.00	ft	
W_{bottom_p}	Width of the base dimension of primary liner	8.75	ft	
A_{bottom_p}	Area at the base of the primary liner	88	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
$V_{primary\_water}$	Volume of water from primary liner	176	ft^3	$V_{primary\_water} = (\frac{1}{3})(H_p)(A_{water\_p} + A_{bottom\_p} + (A_{water\_p}A_{bottom\_p})^{0.5})$
$V_{water\_annulus\_cf}$	Volume of water in annulus at height "H"	24	ft^3	$V_{water\_annulus\_cf} = (V_{secondary\_water}) - (V_{primary\_water})$
$V_{water\_annulus\_gal}$	Volume of water in annulus at height "H"	182	gal	$V_{water\_annulus\_gal} = (V_{water\_annulus\_cf})(\frac{7.4805\ gal}{1\ ft^3})$
$V_{actionlimit}$	Max water able to pump down for H=1 ft	172	gal	$V_{action\ limit} = (V_{water\_annulus\_gal}) - (V_{water\_sump\_gal})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Truncated Rectangular Pyramid (pyramidal frustum)				
Brine Evaporation Pond West (NEW IMPOUNDMENT)				
	$V_{annulus} = (V_{secondary}) - (V_{primary})$			
Variable	Variable Description	Value	Units	Equations/Comments/Notes
$t_{annulus\_in}$	Thickness of annulus (space between liners)	1.0	in	1 inch on bottom dimension; 0.5 inches on the side walls
$t_{annulus\_ft}$	Thickness of annulus (space between liners)	0.08333	ft	$t_{annulus\_ft} = (t_{annulus\_in})(\frac{1\ ft}{12\ inches})$
L_{top_p}	Length of the top dimension of primary liner	80.00	ft	
W_{top_p}	Width of the top dimension of primary liner	70.00	ft	
A_{top_p}	Area at the top of the primary liner	5,600	ft^2	$A_{top\_p} = (L_{top\_p})(W_{top\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	10.00	ft	
W_{bottom_p}	Width of the base dimension of primary liner	8.75	ft	
A_{bottom_p}	Area at the base of the primary liner	88	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
h_p	Height to the top of pond from primary liner	7.00	ft	
L_{top_s}	Length of the top dimension of secondary liner	80.0833	ft	$L_{top\_s} = (L_{top\_p}) + (t_{annulus\_ft})$
W_{top_s}	Width of the top dimension of secondary liner	70.0833	ft	$W_{top\_s} = (W_{top\_p}) + (t_{annulus\_ft})$
A_{top_s}	Area at the top of the secondary liner	5,613	ft^2	$A_{top\_s} = (L_{top\_s})(W_{top\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	9.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	8.6667	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	86	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
h_s	Height to the top of pond from secondary liner	7.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
$V_{secondary}$	Volume of pond from secondary liner	15,095	ft^3	$V_{secondary} = (\frac{1}{3})(h_s)(A_{top\_s} + A_{bottom\_s} + (A_{top\_s}A_{bottom\_s})^{0.5})$
$V_{primary}$	Volume of pond from primary liner	14,904	ft^3	$V_{primary} = (\frac{1}{3})(h_p)(A_{top\_p} + A_{bottom\_p} + (A_{top\_p}A_{bottom\_p})^{0.5})$
$V_{annulus\_cf}$	Volume of annulus (space between liners)	190	ft^3	$V_{annulus} = (V_{secondary}) - (V_{primary})$
$V_{annulus\_gal}$	Volume of annulus (space between liners)	1,424	gal	$V_{annulus\_gal} = (V_{annulus\_cf})(\frac{7.4805\ gal}{1\ ft^3})$

Leak Detection Action Level for Secondary Pond Liner				
EPA Guidance --> Maximum of 1 Foot of Hydraulic Head				
Volume of Water in Pond Sump				
Brine Evaporation Pond West [NEW IMPOUNDMENT]				
	$V_{water\_sump} = (V_{water\_s}) - (V_{water\_p})$			
Variable	**Variable Description**	**Value**	**Units**	**Equations/Comments/Notes**
H	Height of water from secondary liner	0.015	ft	Equivalent hydraulic head pressure from sump depth [gravel fill]
h_s	Height to the top of pond from secondary liner	7.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
L_{water_s}	Length of water level dimension [secondary liner]	10.0684	ft	$L_{water\_s} = \frac{(H)(L_{top\_s}) + (h_s - H)(L_{bottom\_s})}{h_s}$
W_{water_s}	Width of water level dimension [secondary liner]	8.7995	ft	$W_{water\_s} = \frac{(H)(W_{top\_s}) + (h_s - H)(W_{bottom\_s})}{h_s}$
A_{water_s}	Area at water level from the secondary liner	89	ft^2	$A_{water\_s} = (L_{water\_s})(W_{water\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	9.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	8.6667	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	86	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
$V_{secondary\_water}$	Volume of water from secondary liner	1.34	ft^3	$V_{secondary\_water} = (\frac{1}{3})(H)(A_{water\_s} + A_{bottom\_s} + (A_{water\_s}A_{bottom\_s})^{0.5})$
h_p	Height to the top of pond from primary liner	7.00	ft	
H_p	Height of water from primary liner	-0.06801	ft	$H_p = (H) - (h_s - h_p)$
L_{water_p}	Length of water level dimension [primary liner]	9.3199	ft	$L_{water\_p} = \frac{(H_p)(L_{top\_p}) + (h_p - H_p)(L_{bottom\_p})}{h_p}$
W_{water_p}	Width of water level dimension [primary liner]	8.1549	ft	$W_{water\_p} = \frac{(H_p)(W_{top\_p}) + (h_p - H_p)(W_{bottom\_p})}{h_p}$
A_{water_p}	Area at water level from the primary liner	76	ft^2	$A_{water\_p} = (L_{water\_p})(W_{water\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	10.00	ft	
W_{bottom_p}	Width of the base dimension of primary liner	8.75	ft	
A_{bottom_p}	Area at the base of the primary liner	88	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
$V_{primary\_water}$	Volume of water from primary liner	0.0000	ft^3	$V_{primary\_water} = (\frac{1}{3})(H_p)(A_{water\_p} + A_{bottom\_p} + (A_{water\_p}A_{bottom\_p})^{0.5})$
				If Hp is < 0, then Hp = 0, otherwise Hp = value
$V_{water\_sump\_cf}$	Volume of water in sump at height "H"	1.34	ft^3	$V_{water\_sump\_cf} = (V_{secondary\_water}) - (V_{primary\_water})$
$V_{water\_sump\_gal}$	Volume of water in sump at height "H"	10.00	gal	$V_{water\_sump\_gal} = (V_{water\_sump\_cf})(\frac{7.4805\ gal}{1\ ft^3})$

Leak Detection Action Level for Secondary Pond Liner

EPA Guidance --> Maximum of 1 Foot of Hydraulic Head

Volume of Water in Pond Annulus

Brine Evaporation Pond West [NEW IMPOUNDMENT]

$$V_{water\_annulus} = (V_{water\_s}) - (V_{water\_p})$$

Variable	Variable Description	Value	Units	Equations/Comments/Notes
H	Height of water from secondary liner	1.00	ft	
h_s	Height to the top of pond from secondary liner	7.0833	ft	$h_s = (h_p) + (t_{annulus\_ft})$
L_{water_s}	Length of water level dimension [secondary liner]	19.8225	ft	$L_{water\_s} = \frac{(H)(L_{top\_s}) + (h_s - H)(L_{bottom\_s})}{h_s}$
W_{water_s}	Width of water level dimension [secondary liner]	17.3373	ft	$W_{water\_s} = \frac{(H)(W_{top\_s}) + (h_s - H)(W_{bottom\_s})}{h_s}$
A_{water_s}	Area at water level from the secondary liner	344	ft^2	$A_{water\_s} = (L_{water\_s})(W_{water\_s})$
L_{bottom_s}	Length of the base dimension of secondary liner	9.9167	ft	$L_{bottom\_s} = (L_{bottom\_p}) - (t_{annulus\_ft})$
W_{bottom_s}	Width of the base dimension of secondary liner	8.6667	ft	$W_{bottom\_s} = (W_{bottom\_p}) - (t_{annulus\_ft})$
A_{bottom_s}	Area at the base of the secondary liner	86	ft^2	$A_{bottom\_s} = (L_{bottom\_s})(W_{bottom\_s})$
$V_{secondary\_water}$	Volume of water from secondary liner	200	ft^3	$V_{secondary\_water} = (\frac{1}{3})(H)(A_{water\_s} + A_{bottom\_s} + (A_{water\_s}A_{bottom\_s})^{0.5})$
h_p	Height to the top of pond from primary liner	7.00	ft	
H_p	Height of water from primary liner	0.9167	ft	$H_p = (H) - (h_s - h_p)$
L_{water_p}	Length of water level dimension [primary liner]	19.1667	ft	$L_{water\_p} = \frac{(H_p)(L_{top\_p}) + (h_p - H_p)(L_{bottom\_p})}{h_p}$
W_{water_p}	Width of water level dimension [primary liner]	16.7708	ft	$W_{water\_p} = \frac{(H_p)(W_{top\_p}) + (h_p - H_p)(W_{bottom\_p})}{h_p}$
A_{water_p}	Area at water level from the primary liner	321	ft^2	$A_{water\_p} = (L_{water\_p})(W_{water\_p})$
L_{bottom_p}	Length of the base dimension of primary liner	10.00	ft	
W_{bottom_p}	Width of the base dimension of primary liner	8.75	ft	
A_{bottom_p}	Area at the base of the primary liner	88	ft^2	$A_{bottom\_p} = (L_{bottom\_p})(W_{bottom\_p})$
$V_{primary\_water}$	Volume of water from primary liner	176	ft^3	$V_{primary\_water} = (\frac{1}{3})(H_p)(A_{water\_p} + A_{bottom\_p} + (A_{water\_p}A_{bottom\_p})^{0.5})$
$V_{water\_annulus\_cf}$	Volume of water in annulus at height "H"	24	ft^3	$V_{water\_annulus\_cf} = (V_{secondary\_water}) - (V_{primary\_water})$
$V_{water\_annulus\_gal}$	Volume of water in annulus at height "H"	182	gal	$V_{water\_annulus\_gal} = (V_{water\_annulus\_cf})(\frac{7.4805\ gal}{1\ ft^3})$
$V_{actionlimit}$	Max water able to pump down for H=1 ft	172	gal	$V_{action\ limit} = (V_{water\_annulus\_gal}) - (V_{water\_sump\_gal})$

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

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Michelle Lujan Grisham
Governor

Howie C. Morales
Lieutenant Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

February 20, 2020

Sent via email
Mike Brown, Director
Office of Environmental Protection
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221
mike.brown@cbfo.doe.gov

RE: Proposed Monitoring Well Location Approval, DP-831, Waste Isolation Pilot Plant

Dear Mr. Brown:

The New Mexico Environment Department (NMED) received on February 18, 2020 a Monitoring Well Decision Plan, which proposes locations for four monitoring wells to be installed at the facility referenced above. The proposed monitoring wells are to be located downgradient of two new impoundments and two existing impoundments. Based on the proposed location, proposed construction, and ground water flow direction information provided in the letter, NMED approves the proposed locations of the monitoring wells. Monitoring well installation shall be in accordance with the approved Monitoring Well Decision Plant. Also, construction and lithologic logs for the monitoring wells shall be submitted to NMED within 120 days of well completion. If you have any questions, feel free to call me at (505) 827-2909.

Sincerely,

Avery Young
Environmental Scientist
Ground Water Quality Bureau

cc: Rick Salness, richard.salness@wipp.ws
Rick Chaves, rick.chaves@wipp.ws

RECEIVED
FEB 18 2020
Ground Water Quality Bureau

DP-831 Well Decision Plan
Wells for Pond 4, Pond 5, Facultative Lagoon, and H-19

Introduction

The Waste Isolation Plant is in the midst of several construction projects. The Safety Significant Confined Ventilation System (SSCVS) is one of these projects. Associated with the New Filter Building and the new shaft, there will be two lined evaporation ponds, and a lined salt storage cell. The salt storage cell will hold the cuttings/spoils from shaft sinking. One evaporation pond (Pond 4) will capture water runoff from the area of the filter building, and the other evaporation pond (Pond 5) will be used to capture water collected from the shaft spoils pile. The new ponds and shaft spoils pile cell were included as modifications in the recently submitted DP-831 renewal application to the New Mexico Environment Department (NMED) Groundwater Quality Bureau (GWQB), and is under review by the GWQB. During the DP-831 GWQB review, WQB, an additional monitoring wells have been requested. Wells were requested at Pond 4, Pond 5, the Facultative lagoon, and the H-19 evaporation pond.

This paper discusses the history of the anthropogenic shallow subsurface water (SSW), location of each well, and where the wells are to be located, and describe the pre-installed well construction based on known or predicted geology at each location.

Historical Discussion of the SSW

Shallow subsurface water was first discovered seeping into the Waste Handling Shaft at WIPP during an inspection in 1996. Investigation of the seeps began in 1996 with the installation of three wells around the waste shaft followed by 13 more wells at the site. Subsequent hydrologic modeling suggested that that the SSW was anthropogenic, generated by unlined ponds and salt storage cells.

The SSW is a perched water system, created by permeability difference between the Santa Rosa Formation (Santa Rosa) and the underlying Dewey Lake Formation (Dewey Lake). At approximately 180 feet deep into the Dewey Lake Formation the matrix cement changes from a carbonate to a sulfate (gypsum). This change in cement change creates an aquiclude, which causes the perching of natural Dewey Lake Formation water. Because the Dewey Lake permeability is much lower than the Santa Rosa, infiltrating water is impeded from further vertical migration. Water is retained on the upper surface of the Dewey Lake, as identified by wells throughout the WIPP site and documented in semi-annual reports for the DP-831 Permit. The cement change from carbonate to sulfate, however, is not spatially continuous. Well WQSP-6A was installed in an area where the change in cement, and therefore the aquiclude, exists. There are wells 3 miles south of WIPP, at the Mills Ranch, where natural water is perched on this cementation change in the deep Dewey Lake.

Drilling Scenarios

Although four wells have been requested, as many as six wells may be required to monitor different depths of the Dewey Lake Formation, if water is present. The nomenclature for the wells will be consistent with the current nomenclature. The well designations will be PZ-16 for Pond 4, PZ-17 for the sewage lagoon, PZ-18 for Pond 5, and PZ-19 for the H-19 pond. Additional wells (maximum of two), into the deeper Dewey Lake, may be required to determine if there water is present, and if so, for monitoring this horizon. Pre-drilling well construction was based on this premise.

There may or may not be water discovered in Wells PZ-17 and PZ-19 drilled into the lower Dewey Lake. The draft DP-831 Permit requires two deep wells to be drilled. The first borehole drilled will be a shallow borehole to the Santa Rosa and Dewey Lake geological contact and will be observed for evidence of SSW and a well installed. An additional corehole will be drilled at these locations, after the shallow well, and a well will be installed only if water is detected in the Dewey Lake Formation at the cementation change. Continuous geologic core and geophysical logs will be obtained and examined for evidence of water. An overnight pause in drilling will take place to see if water collects into the deep drill holes. The drilling scenarios and resulting actions are as follows:

1.) Water is determined in both the shallow and deep zone: Install two wells; one in the deep Dewey Lake to monitor the water at the change in cementation and one in the shallow zone to monitor water at the Dewey Lake and Santa Rosa geologic contact. The shallow well will be drilled and installed before the deep corehole is drilled.
2.) Water is not detected in the lower Dewey Lake Formation plug the drill hole up to the surface.
3.) No water is detected at either interval, deep or shallow: Install only a shallow well to monitor if a leak occurs in the liner of the sewage lagoon.
4.). Plugging of the deep drill hole, if needed, will be by tremmie pipe with Portland Type II cement.

Final well construction will be determined while drilling, observing cuttings, continuous core, and rig penetration rates. During discussions with the NMED GWQB, their preference was to install the monitoring wells as close to the central axis of each impoundment and presumed downgradient flow direction. Geophysical logs will be: gamma, 3-arm caliper, single point resistance, 16' normal resistivity, deep resistivity, medium resistivity, neutron, far density, and bulk density. Drilling will be by dry drilling using air rotary until such a point that returns are weak and a surfactant mist (Halliburton Quick-Foam™) will be used. Geologic core will be archived for future examination by project participants and the NMED.

All wells are planned to be installed as close as possible to the central axis of the impoundment to the south; the presumed downgradient flow direction.

Location and Design of PZ-16

PZ-16 is located 50 feet from Pond 4, close to the central axis of the impoundment. (Figure 1). Proposed construction is presented in Figure 2. Final construction and placement of the well screen will be determined in the field based on examination of continuous core and geophysics. Drilling will be by dry drilling using air rotary until such a point that returns are weak and a surfactant mist (Halliburton Quick-Foam™) will be used. Twenty feet of well screen will be used with two feet extending beyond the geologic contact. A 5 feet of sump will be constructed to allow space if any future testing should occur.

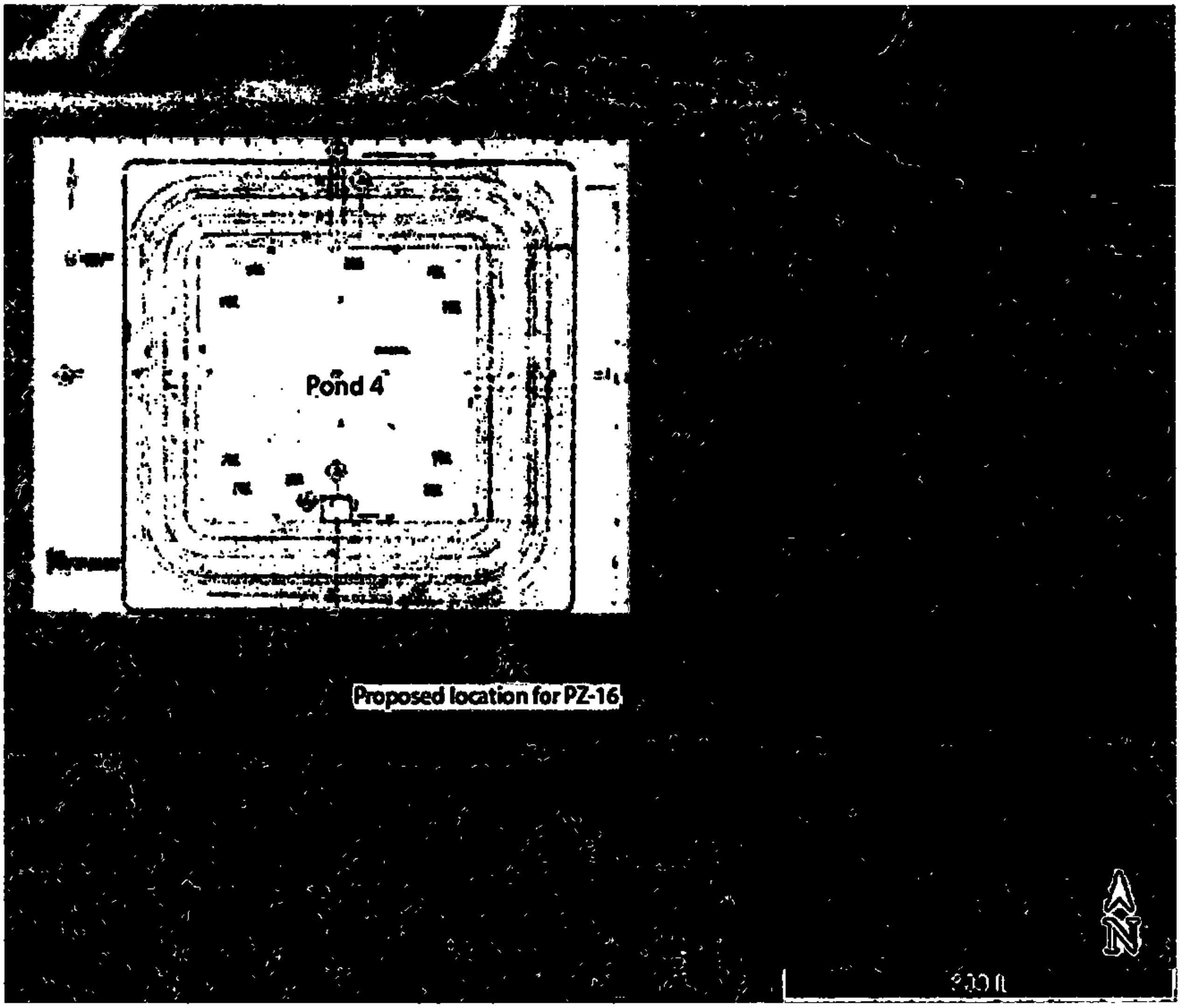
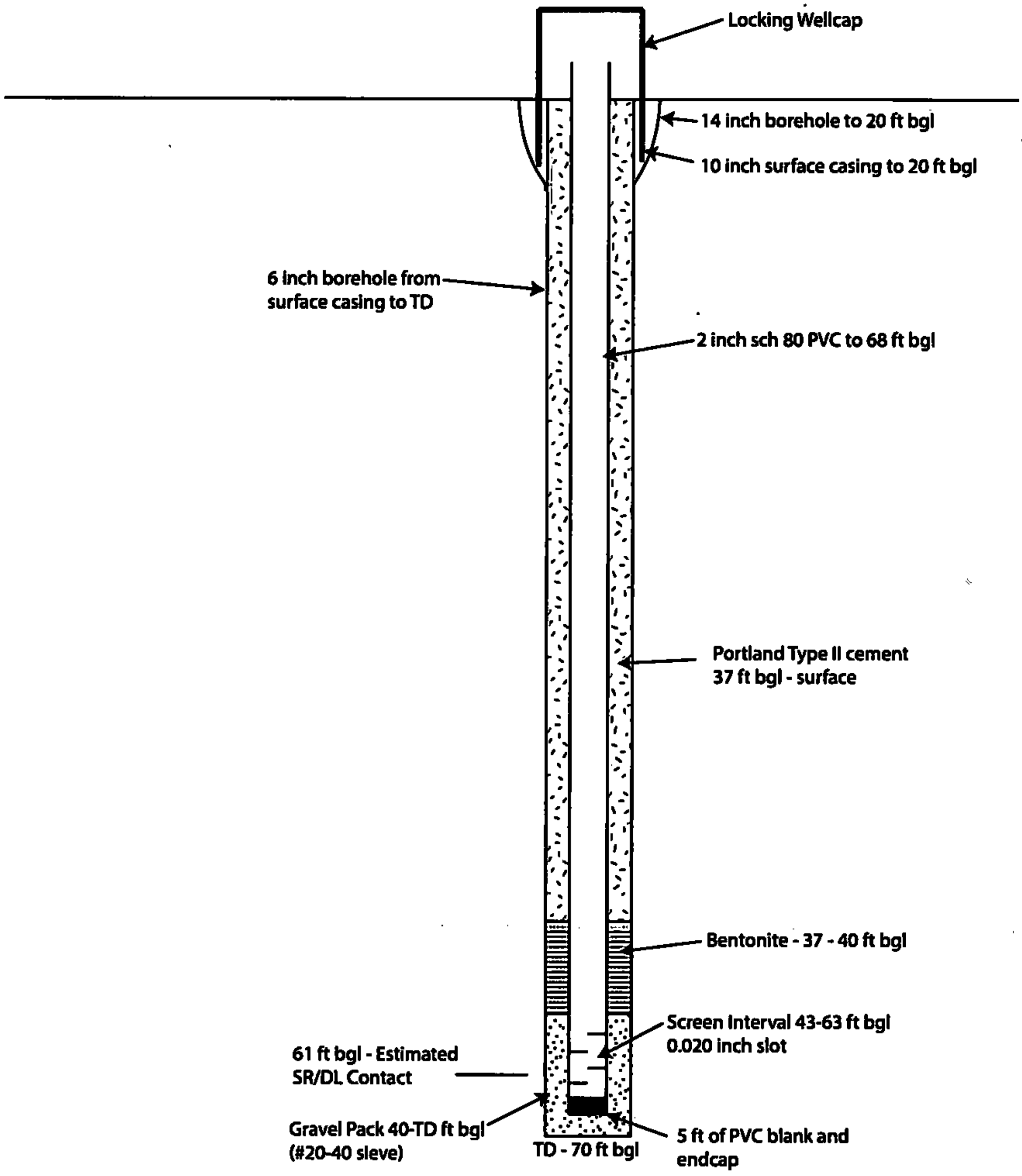


Figure 1: Proposed Location of PZ-16

Figure 2 : PZ-16 Construction

Not To Scale



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Location and Design of PZ-17

PZ-17 is located 20 feet south of the Sewage Lagoon in line with the central axis (Figure 3). At this location there is a possibility of installing two monitoring wells. The decision to install one or two wells will be made in the field using the criteria described in the drilling scenarios above. Drilling will be by dry drilling using air rotary until such a point that returns are weak and a surfactant mist (Halliburton Quick-Foam™) will be used.

One corehole will be drilled and the core will be examined to total depth. The target depth for this hole will be in the lower Dewey Lake where the cementation changes from carbonate to sulfate (gypsum). The intent of this well is to determine if there is water at the cementation change. (Figure 4)

If there is no identified water at the cementation change and water is identified in the shallow interval of the Santa Rosa and Dewey Lake geological contact, then the corehole will be plugged up to the surface using tremmie pipe and Portland Type II cement.

A single shallow well will be installed and screened across the Santa Rosa and Dewey Lake geologic contact. This will be used to monitor potential future influx of water. (Figure 5).

Final construction and placement of the well screen will be determined in the field based on examination of continuous core and geophysics. Twenty feet of well screen will be used with two feet extending beyond the geologic contact. A 5 foot sump will be constructed to allow space if any future testing should occur. A twenty foot steel surface casing will also be installed after coring of 25 feet.

If while drilling the deeper borehole, there is a greater influx of water from the Santa Rosa/Dewey Lake geologic contact, a contingency for this will be to install and cement steel casing across the geologic contact.

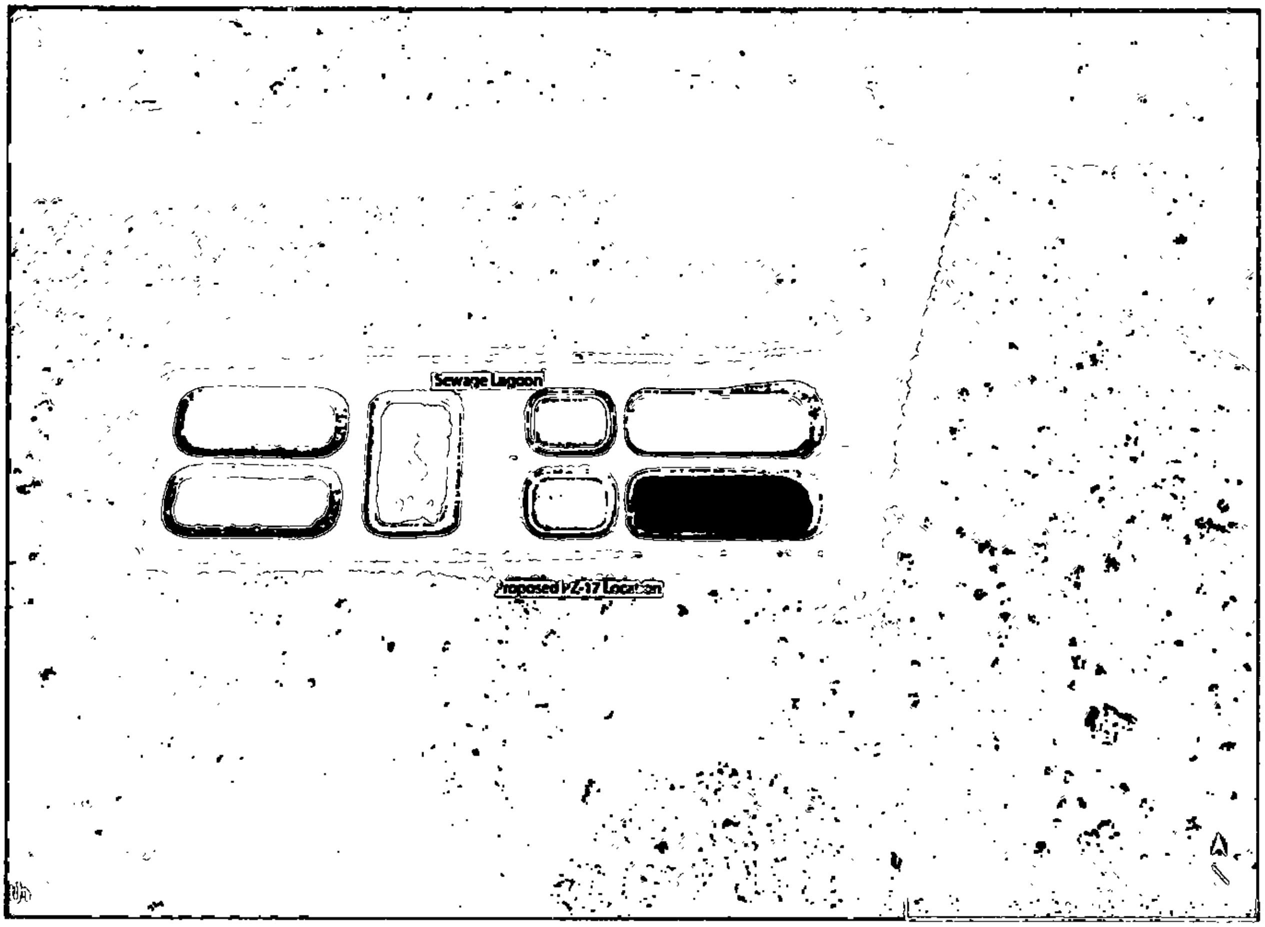

Figure 3: Proposed Location of PZ-17

Figure 4 : PZ-17a Construction

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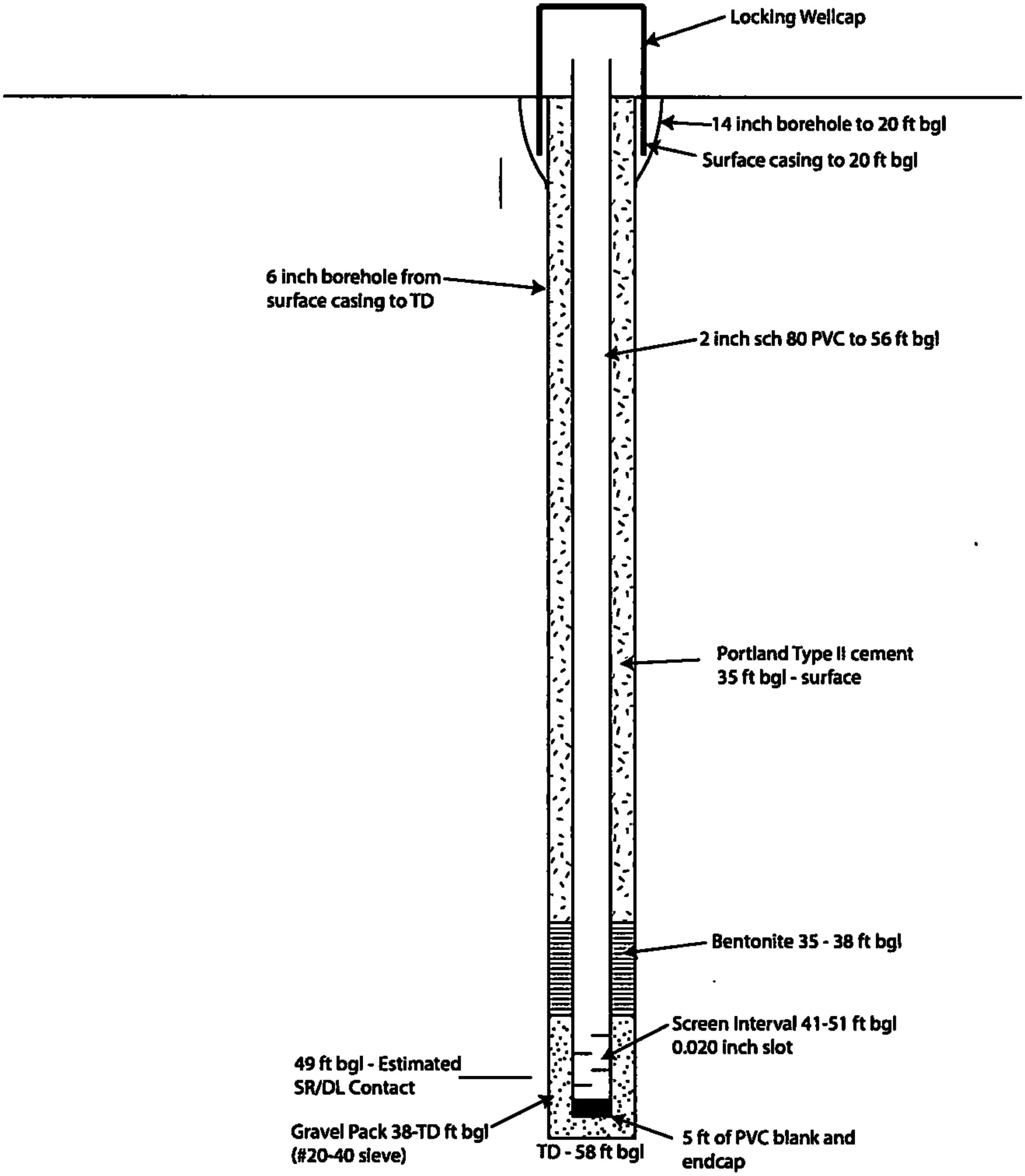

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Figure 5 : PZ-17b Cementation Change Construction

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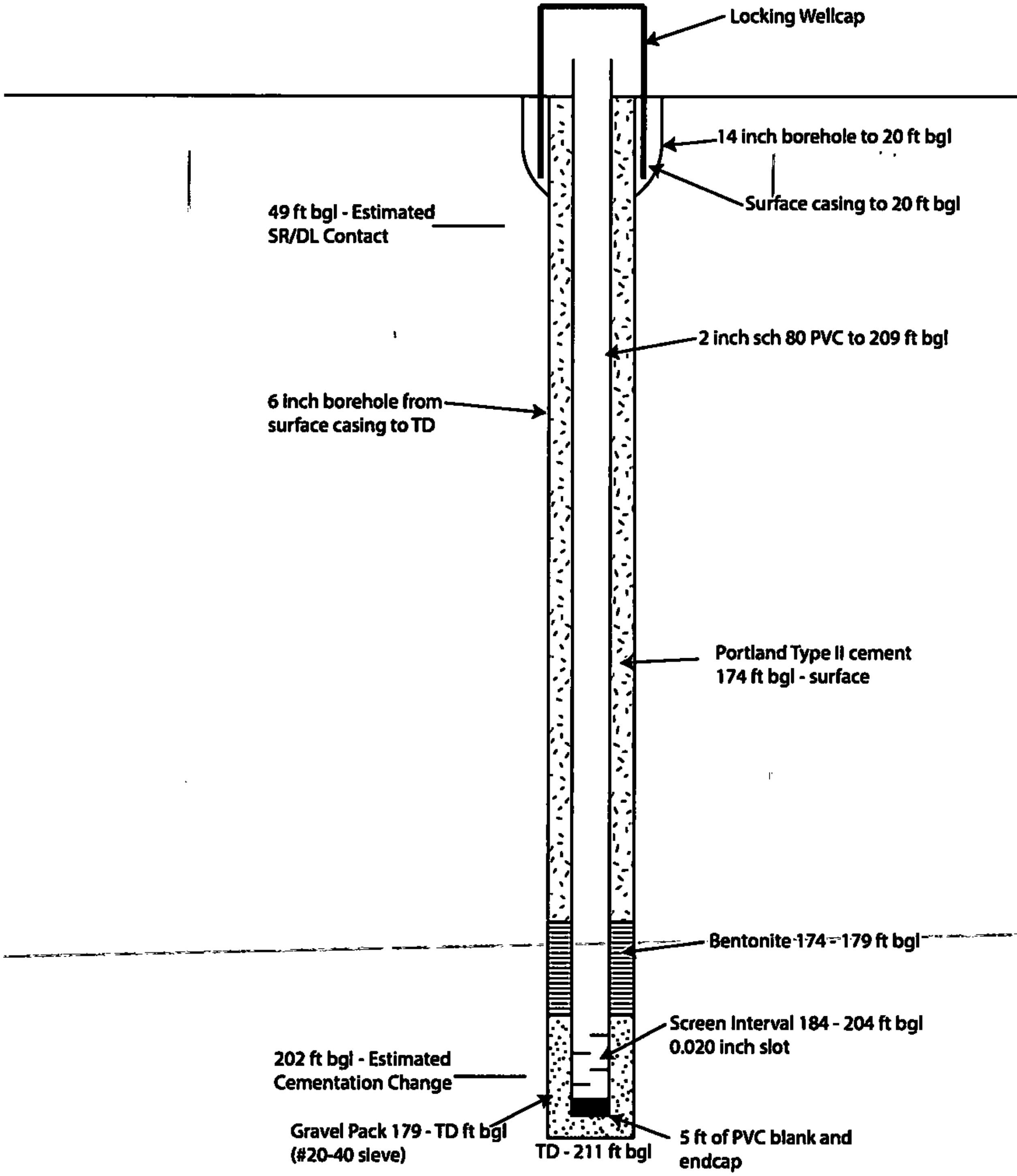

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Location and Design of PZ-18

PZ-18 is located 50 feet from Pond 5, close to the central axis of the impoundment. (Figure 6). Proposed construction is presented in Figure 7. Drilling will be by dry drilling using air rotary until such a point that returns are weak and a surfactant mist (Halliburton Quick-Foam™) will be used. Final construction and placement of the well screen will be determined in the field based on examination of continuous core and geophysics. Twenty feet of well screen will be used with two feet extending beyond the geologic contact. A 5 foot sump will be constructed to allow space if any future testing should occur

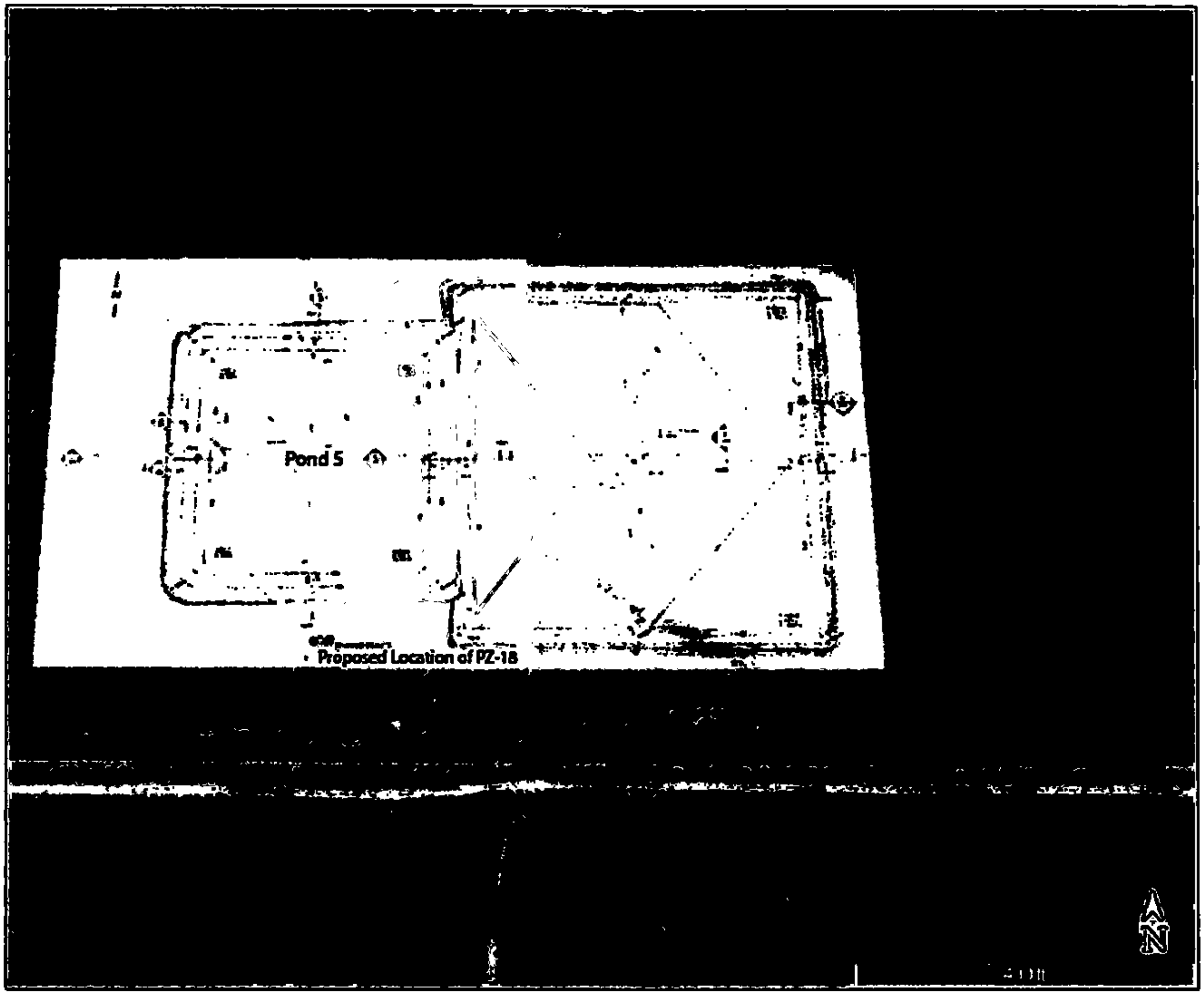

Figure 6: Proposed Location of PZ-18

Figure 7 : PZ-18 Construction

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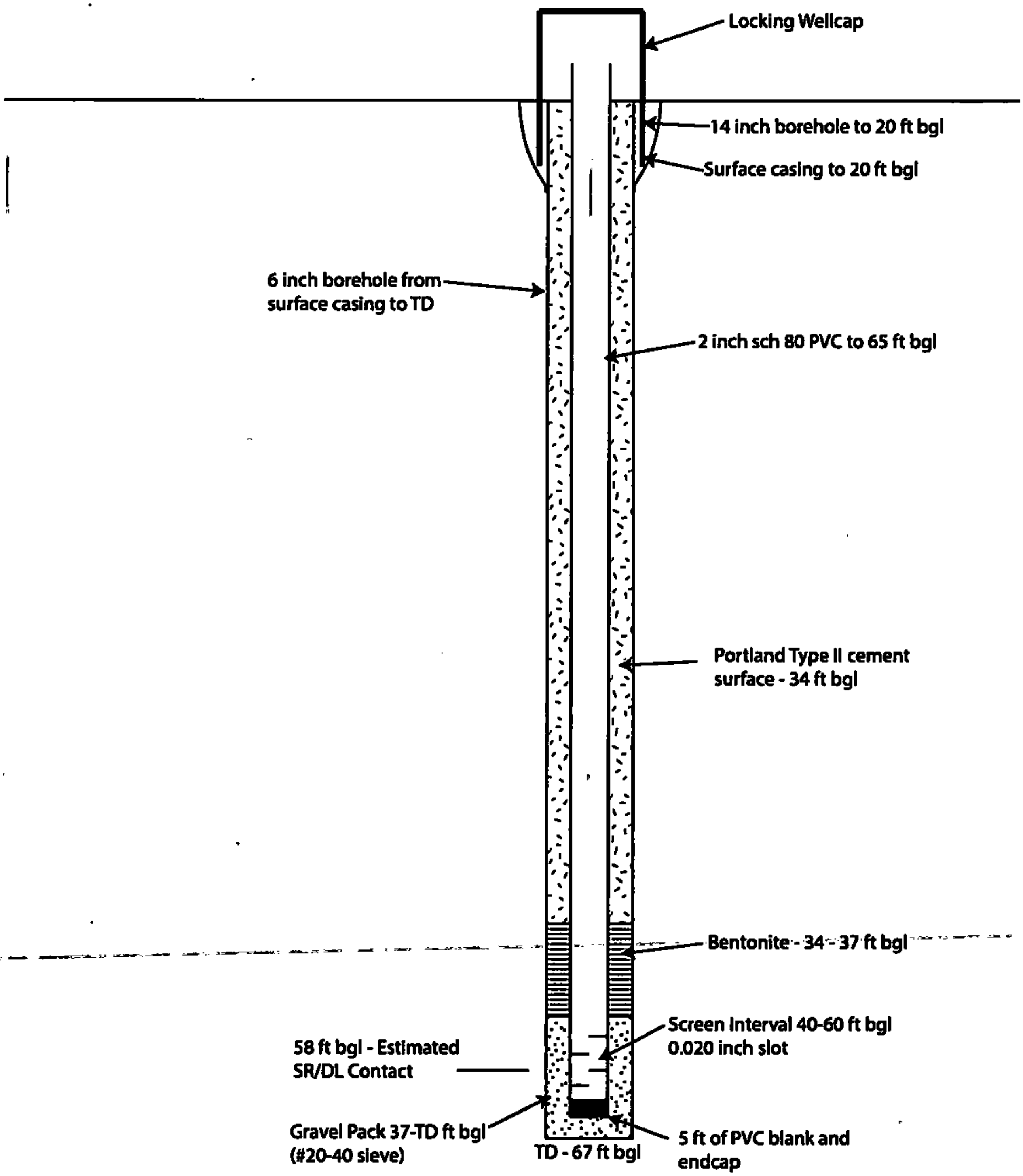

03270

Location and Design of PZ-19

PZ-19 is located 50 feet south of the H-19 evaporation pond in line with the central axis (Figure 8). At this location there is a possibility of installing two monitoring wells. The decision to install one or two wells will be made in the field using the criteria described in the drilling scenarios above. Drilling will be by dry drilling using air rotary until such a point that returns are weak and a surfactant mist (Halliburton Quick-Foam™) will be used.

One corehole will be drilled and the core will be examined to total depth. The target depth for this hole will be in the lower Dewey Lake where the cementation changes from carbonate to sulfate (gypsum). The intent of this well is to determine if there is water at the cementation change. (Figure 9)

If there is no identified water at the cementation change and water is identified in the shallow interval of the Santa Rosa and Dewey Lake geological contact, then the corehole will be plugged up to the surface using tremmie pipe and Portland Type II cement contact and a shallow well will be installed (Figure 10).

A single shallow well will be installed and screened across the Santa Rosa and Dewey Lake geologic contact. This will be used to monitor potential future influx of water. (Figure 10).

Final construction and placement of the well screen will be determined in the field based on examination of continuous core and geophysics. Twenty feet of well screen will be used with two feet extending beyond the geologic contact. A 5 foot sump will be constructed to allow space if any future testing should occur. A twenty foot steel surface casing will also be installed after coring of 25 feet

Final construction and placement of the well screen will be determined in the field based on examination of core and geophysics. If while drilling the deeper borehole, there is a greater influx of water from the Santa Rosa/Dewey Lake geologic contact, a contingency for this will be to install and cement steel casing across the geologic contact.

Figure 8: Proposed Location of PZ-19

Figure 9 : PZ-19a Construction

Not To Scale

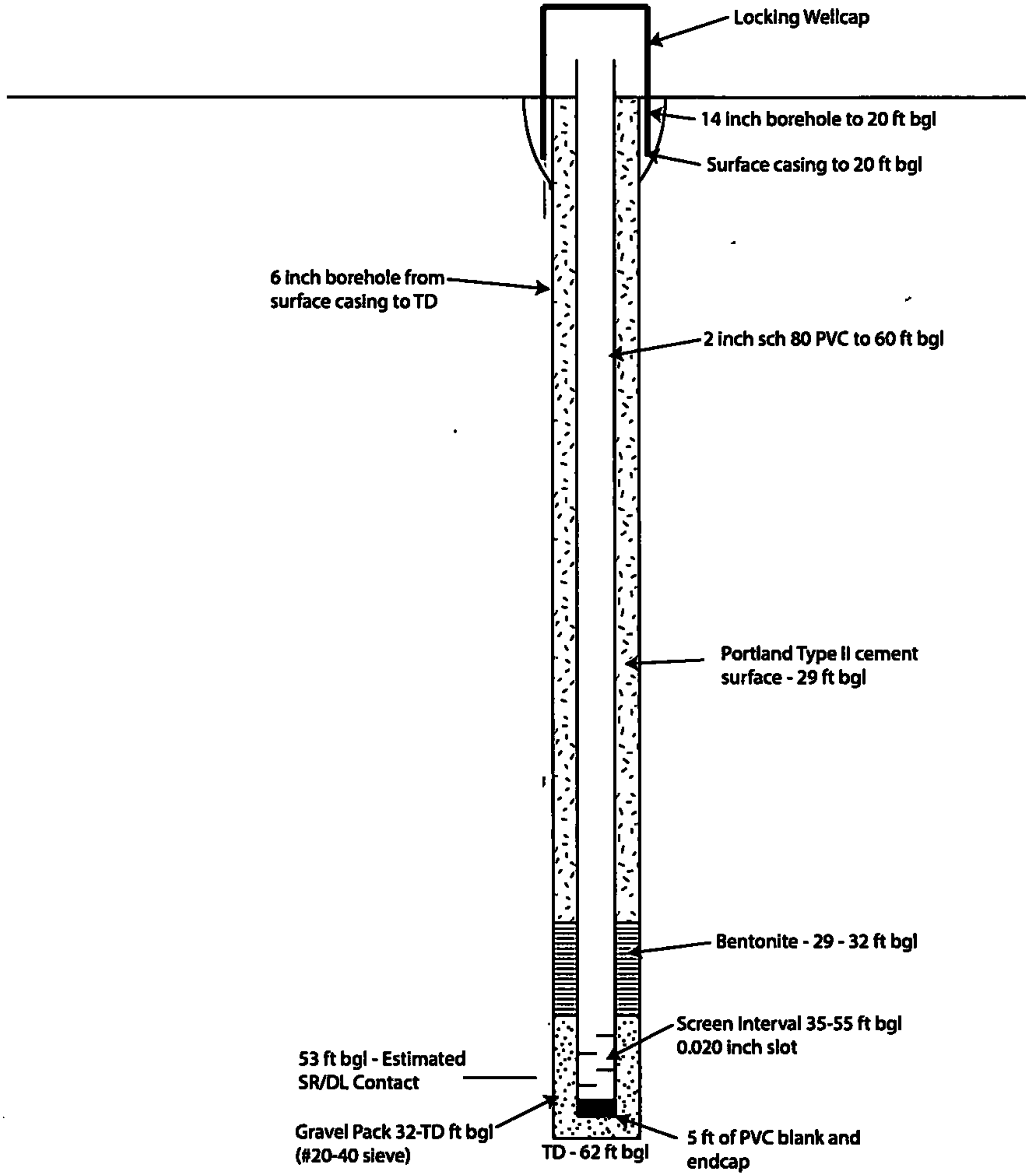

Figure 10 : PZ-19b Cementation Change Construction

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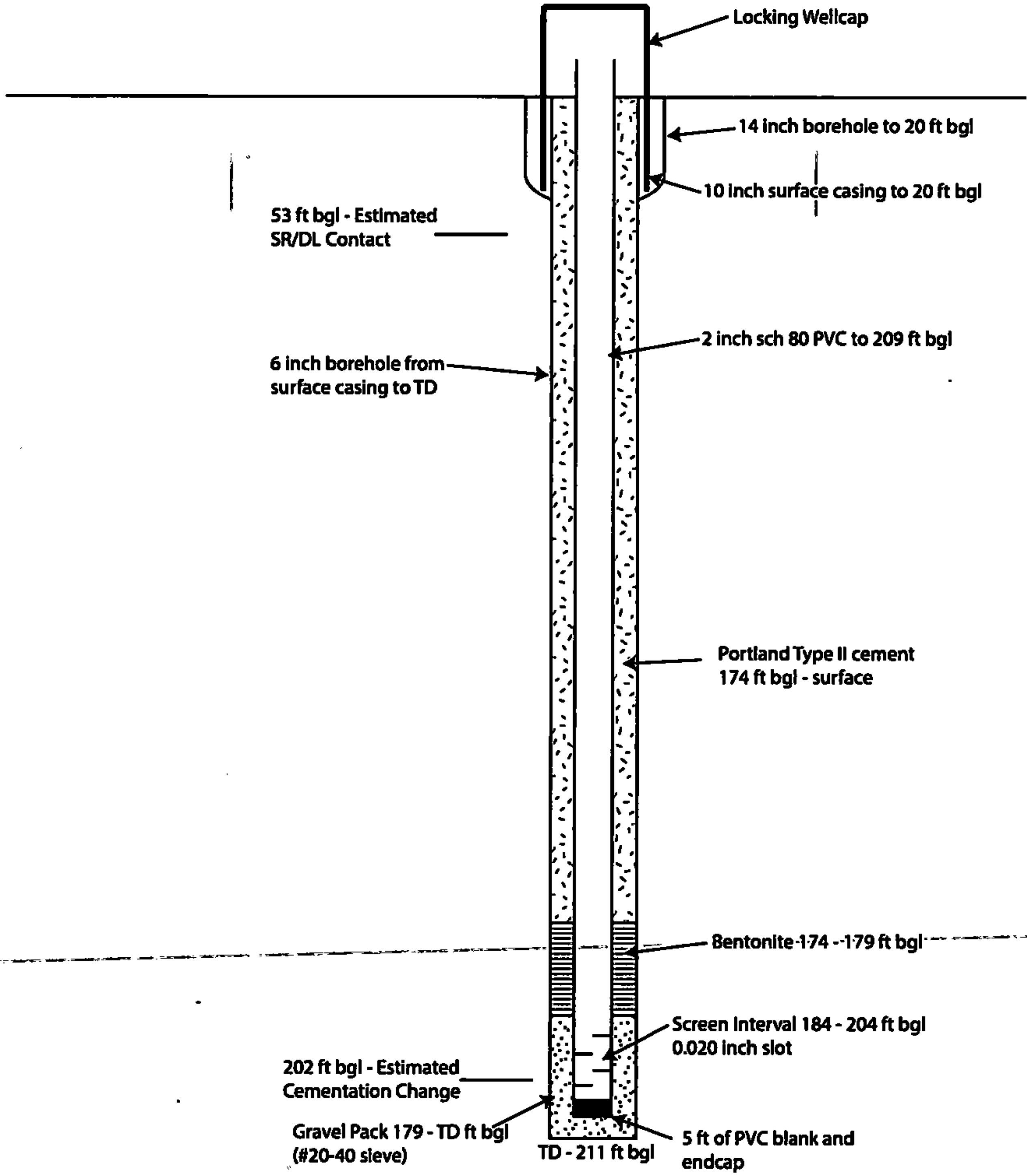

Future Wells Uses

Following the installation of wells, they will be monitored and sampled according to the conditions set forth in the final DP-831 Permit. All well locations are presented in Figure 11.

NEW MEXICO
ENVIRONMENT DEPARTMENT

Ground Water Quality Bureau

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Michelle Lujan Grisham
Governor

Howie C. Morales
Lieutenant Governor

James C. Kenney
Cabinet Secretary

Jennifer J. Pruett
Deputy Secretary

January 31, 2020

Mike Brown, Director
Office of Environmental Protection
U.S. Department of Energy
P.O. Box 3090
Carlsbad, NM 88221
mike.brown@cbfo.doe.gov

RE: NMED concerns regarding the DP-831 Well Decision Plan, DP-831, Waste Isolation Pilot Plant

Dear Mr. Brown,

The New Mexico Environment Department (NMED or Department) provides this response regarding a DP-831 proposed Well Decision Plan (Plan) submitted to the Department via email on January 27, 2020. The submittal requests an approval of the Plan. Before the Department can approve the Plan, the Department will need resolution of the following issues and associated commitments within the Plan.

The Plan provides drilling scenarios for PZ-17 and PZ-19, i.e. nested wells (one shallow and one deep), in a particular sequence. NMED believes it would be preferable to perform borehole drilling and well installation as follows.

a. The shallow borehole drilling and associated well installation (to the Santa Rosa/Dewey Lake contact, or shallow contact) should be performed first at each nested well location. NMED considers the original Plan's proposal to create an open borehole to the Lower Dewey Lake cementation change (deep contact) problematic due to the potential of aquifer cross-contamination. Should shallow water exist, it is anticipated that that water would inappropriately cascade down an open borehole to the deeper contact. NMED agrees that a shallow well will be installed at each location in each shallow borehole regardless of the presence of any groundwater.
b. The deep borehole drilling (and possible associated well installation) to the Lower Dewey Lake cementation change (or deep contact) at each nested well location should be performed second or after the shallow wells are installed and the presence of groundwater at the shallow contact is determined. Should water exist in the shallow well, it is preferable to install a surface casing that isolates the Santa Rosa Formation and any

shallow water in that formation while drilling the deeper portion. This borehole should be allowed to stand open overnight to ascertain the presence of deeper groundwater. Should groundwater accumulate at the bottom of the deep borehole, the Department concurs that a well should be installed in the hole. NMED agrees that a deep well will be installed at PZ-17 and PZ-19 only if groundwater is identified at the deep contact.

NMED considers it problematic that the original Plan proposes to first drill to the deep zone and, if no groundwater is encountered, to cement the borehole up to the shallow zone. It is difficult to emplace cement to a particular depth in a borehole without visual confirmation and it is possible that cement in the borehole in proximity to the shallow well screen will cause non-representative groundwater to exist in the shallow wells.

NMED anticipates that all boreholes, including both the shallow and deep boreholes, will be continuously cored and that core will be retained for future review by NMED. During our phone conversation on January 15, 2020, a WIPP representative committed to collecting continuous core, yet this commitment is not in the Plan.

NMED requests WIPP specify the types of geophysical logs proposed on the first paragraph of Page 2 of the Plan. Specific geophysical logging types will dictate numerous aspects of the borehole drilling and well construction.

NMED requests that, should the presence of groundwater in the bottom of each borehole not be readily obvious, that the borehole be allowed to stand open overnight to ascertain the existence of groundwater in the target zone.

NMED requests that WIPP identify the drilling method to be used. Clearly fluids associated with mud-rotary drilling would complicate the effort to identify saturated intervals in the boreholes.

NMED suggests that the Plan specify that monitoring wells will be located based on groundwater flow direction and the need for monitoring wells to be located downgradient of the monitored unit so as best to be able to detect a release from that unit. The Plan may state that without further information the wells will be located "close to the central axis of each impoundment."

NMED has the following comments on Figures 2, 4, 5, 7, 9, and 10.

a. NMED considers it advantageous to commit to utilizing 20 feet of surface casing in each borehole to maintain borehole stability from the ground surface to 20 feet below ground surface. The figures should reflect this.
b. NMED considers it preferable to utilize sch 80 PVC instead of sch 40 PVC to prevent casing deformation caused by heat created during cementation. The figures should reflect this.
c. NMED questions the reference to 15 feet of screened interval for each well. NMED suggests that the length of the screened interval be consistent with all other wells at the facility.

d. NMED suggests there be a commitment that all screened intervals will penetrate each monitored contact by precisely two feet.
e. NMED suggests that figures for the deeper boreholes detail the surface casing to be installed across the Santa Rosa Formation and how far that casing will penetrate the lower contact.
f. NMED would like an explanation of the purpose of the eight feet of PVC blank casing and end cap associated with each well. Eight feet is unusually long.

NMED would like a commitment to be sufficiently informed of when drilling will occur to allow NMED personnel to be onsite if available.

If you have any comments, questions, or concerns, please contact me at (505) 827-2909 or avery.young@state.nm.us.

Sincerely,

Avery Young
Environmental Scientist

cc: Rick Salness, richard.salness@wipp.ws
Rick Chavez, rick.chavez@wipp.ws
Anderson Ward, anderson.ward@cbfo.doe.gov
Brett Seal, brett.seal@wipp.ws

RECEIVED
JAN 27 2020
Ground Water Quality Bureau

DP-831 Well Decision Plan
Wells for Pond 4, Pond 5, Facultative Lagoon, and H-19

Introduction

The Waste Isolation Plant is in the midst of several construction projects. The Safety Significant Confined Ventilation System (SSCVS) is one of these projects. Associated with the New Filter Building and the new shaft, there will be two lined evaporation ponds, and a lined salt storage cell. The salt storage cell will hold the cuttings/spoils from shaft sinking. One evaporation pond (Pond 4) will capture water runoff from the area of the filter building, and the other evaporation pond (Pond 5) will be used to capture water collected from the shaft spoils pile. The new ponds and shaft spoils pile cell were included as modifications in the recently submitted DP-831 renewal application to the New Mexico Environment Department (NMED) Groundwater Quality Bureau (GWQB), and is under review by the GWQB. During the DP-831 GWQB review, WQB, an additional monitoring wells have been requested. Wells were requested at Pond 4, Pond 5, the Facultative lagoon, and the H-19 evaporation pond.

This paper discusses the history of the anthropogenic shallow subsurface water (SSW), location of each well, and where the wells are to be located, and describe the pre-installed well construction based on known or predicted geology at each location.

Historical Discussion of the SSW

Shallow subsurface water was first discovered seeping into the Waste Handling Shaft at WIPP during an inspection in 1996. Investigation of the seeps began in 1996 with the installation of three wells around the waste shaft followed by 13 more wells at the site. Subsequent hydrologic modeling suggested that that the SSW was anthropogenic, generated by unlined ponds and salt storage cells.

The SSW is a perched water system, created by permeability difference between the Santa Rosa Formation (Santa Rosa) and the underlying Dewey Lake Formation (Dewey Lake). At approximately 180 feet deep into the Dewey Lake Formation the matrix cement changes from a carbonate to a sulfate (gypsum). This change in cement change creates an aquiclude, which causes the perching of natural Dewey Lake Formation water. Because the Dewey Lake permeability is much lower than the Santa Rosa, infiltrating water is impeded from further vertical migration. Water is retained on the upper surface of the Dewey Lake, as identified by wells throughout the WIPP site and documented in semi-annual reports for the DP-831 Permit. The cement change from carbonate to sulfate, however, is not spatially continuous. Well WQSP-6A was installed in an area where the change in cement, and therefore the aquiclude, exists. There are wells 3 miles south of WIPP, at the Mills Ranch, where natural water is perched on this cementation change in the deep Dewey Lake.

Drilling Scenarios

Although four wells have been requested, as many as six wells may be required to monitor different depths of the Dewey Lake Formation, if water is present. The nomenclature for the wells will be consistent with the current nomenclature. The well designations will be PZ-16 for Pond 4, PZ-17 for the sewage lagoon, PZ-18 for Pond 5, and PZ-19 for the H-19 pond. Additional wells (maximum of two), into the deeper Dewey Lake, may be required to determine if there water is present, and if so, for monitoring this horizon. Pre-drilling well construction was based on this premise.

There may or may not be water discovered in Wells PZ-17 and PZ-19 drilled into the lower Dewey Lake. The draft DP-831 Permit requires two deep wells to be drilled. While drilling, the Santa Rosa and Dewey Lake geological contact will be observed for evidence of SSW. Well drilling will continue into the deep Dewey Lake Formation to the cementation change. Geologic core and geophysical logs will be examined for evidence of water. A pause in drilling will take place to see if water collects into the drill hole at both depths. The drilling scenarios and resulting actions are as follows:

1.) Water is determined in both the shallow and deep zone: Install two wells; one in the deep Dewey Lake to monitor the water at the change in cementation and one in the shallow zone to monitor water at the Dewey Lake and Santa Rosa geologic contact.
2.) Water is not detected in the lower Dewey Lake Formation, but it is in the shallow zone of the Dewey Lake and Santa Rosa geologic contact: finish drilling and cement drill hole up to the shallow zone and install only the shallow well.
3.) No water is detected at either interval, deep or shallow: Install only a shallow well to monitor if a leak occurs in the liner of the sewage lagoon.

Final well construction will be determined while drilling, observing cuttings, core, and rig penetration rates. During discussions with the NMED GWQB, their preference was to install the monitoring wells as close to the central axis of each impoundment.

Location and Design of PZ-16

PZ-16 is located 50 feet from Pond 4, close to the central axis of the impoundment. (Figure 1). Proposed construction is presented in Figure 2. Final construction and placement of the well screen will be determined in the field based on examination of core and geophysics.

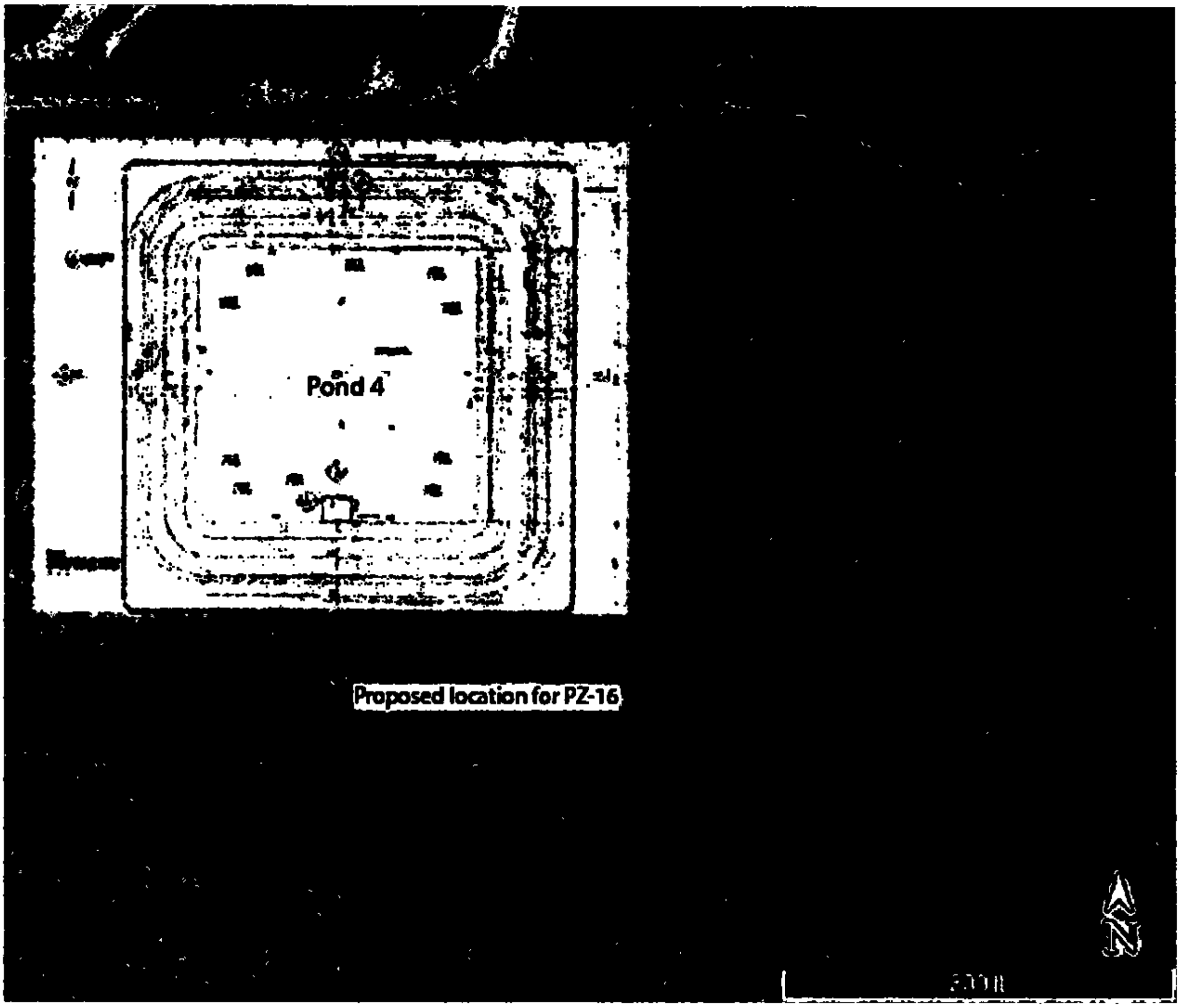

Figure 1: Proposed Location of PZ-16

Figure 2 : PZ-16 Construction

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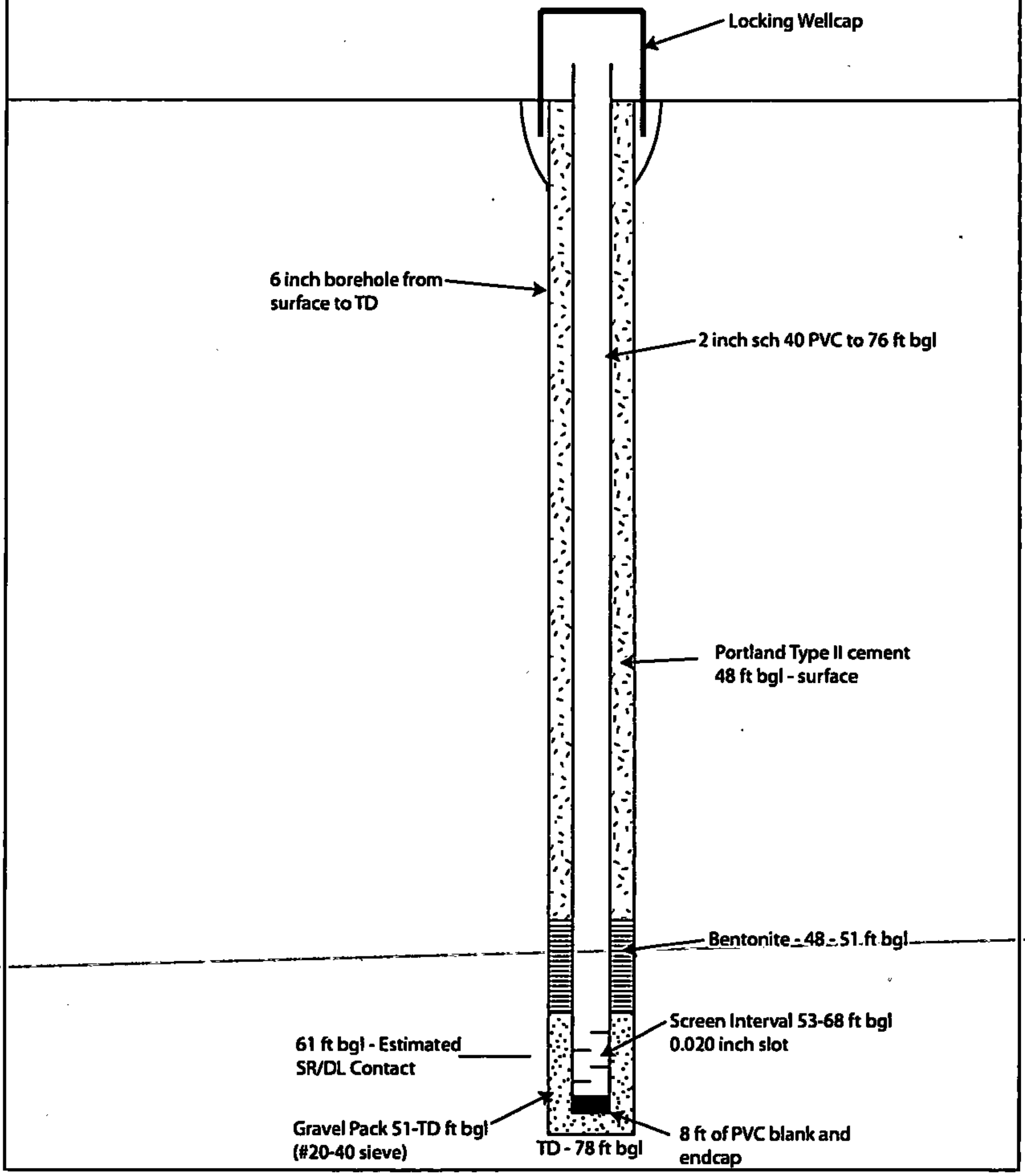

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Location and Design of PZ-17

PZ-17 is located 20 feet south of the Sewage Lagoon in line with the central axis (Figure 3). At this location there is a possibility of installing two monitoring wells. The decision to install one or two wells will be made in the field using the criteria described in the drilling scenarios above.

One corehole will be drilled and the core will be examined to total depth. The target depth for this hole will be in the lower Dewey Lake where the cementation changes from carbonate to sulfate (gypsum). The intent of this well is to determine if there is water at both the Santa Rosa and Dewey Lake geological contact and at the cementation change. If there is water at both target depths, then two wells will be installed to monitor the intervals. One will be a shallow screened well and the other a deep screened well (Figures 4 and 5)

The other scenario would be if there is no identified water at the cementation change and water is identified in the shallow interval of the Santa Rosa and Dewey Lake geological contact, then the corehole will be plugged up to the contact and a shallow well will be installed (Figure 4).

The third scenario is if there is no water in either interval, then a single shallow well will be installed screened across the Santa Rosa and Dewey Lake geologic contact. This will be used to monitor potential future influx of water in the future (Figure 4).

Final construction and placement of the well screen will be determined in the field based on examination of core and geophysics.

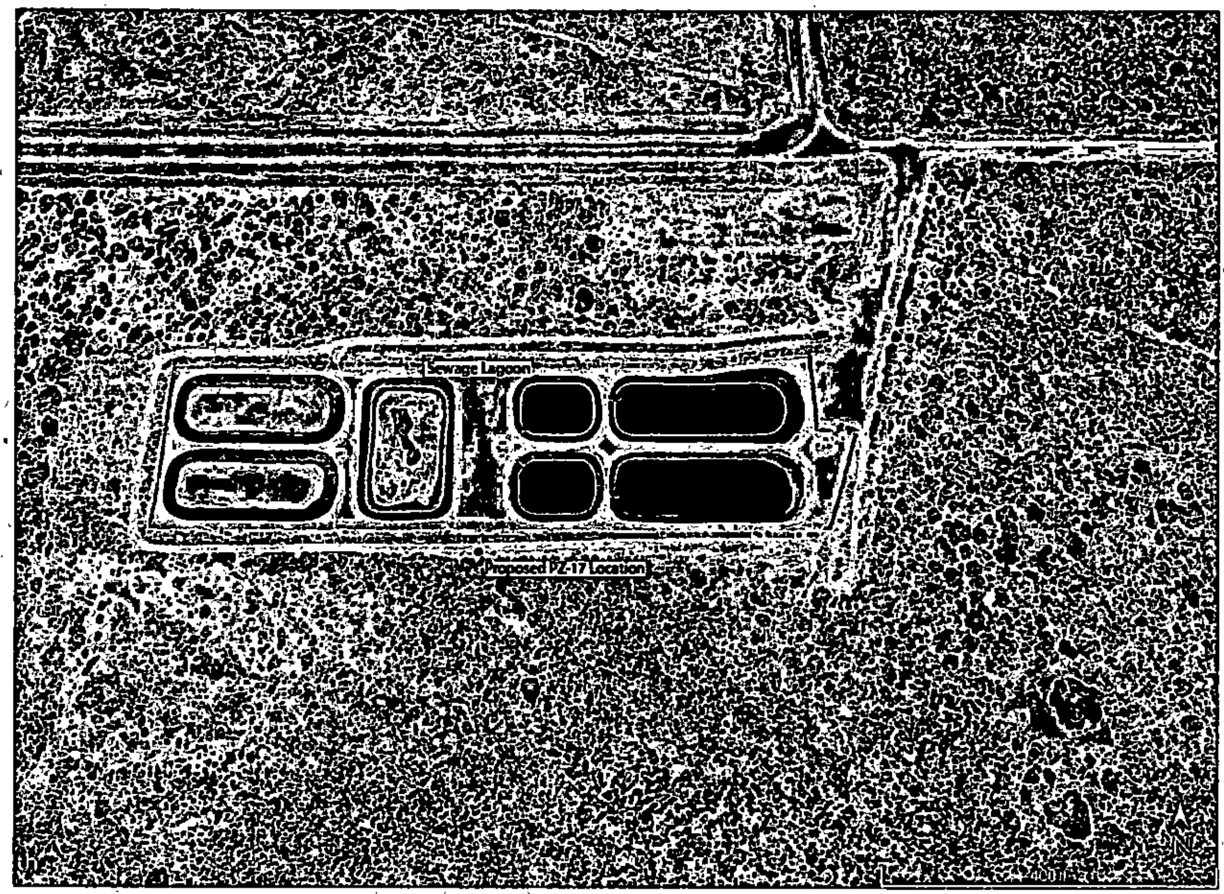

Figure 3: Proposed Location of PZ-17

Figure 4 : PZ-17 Construction

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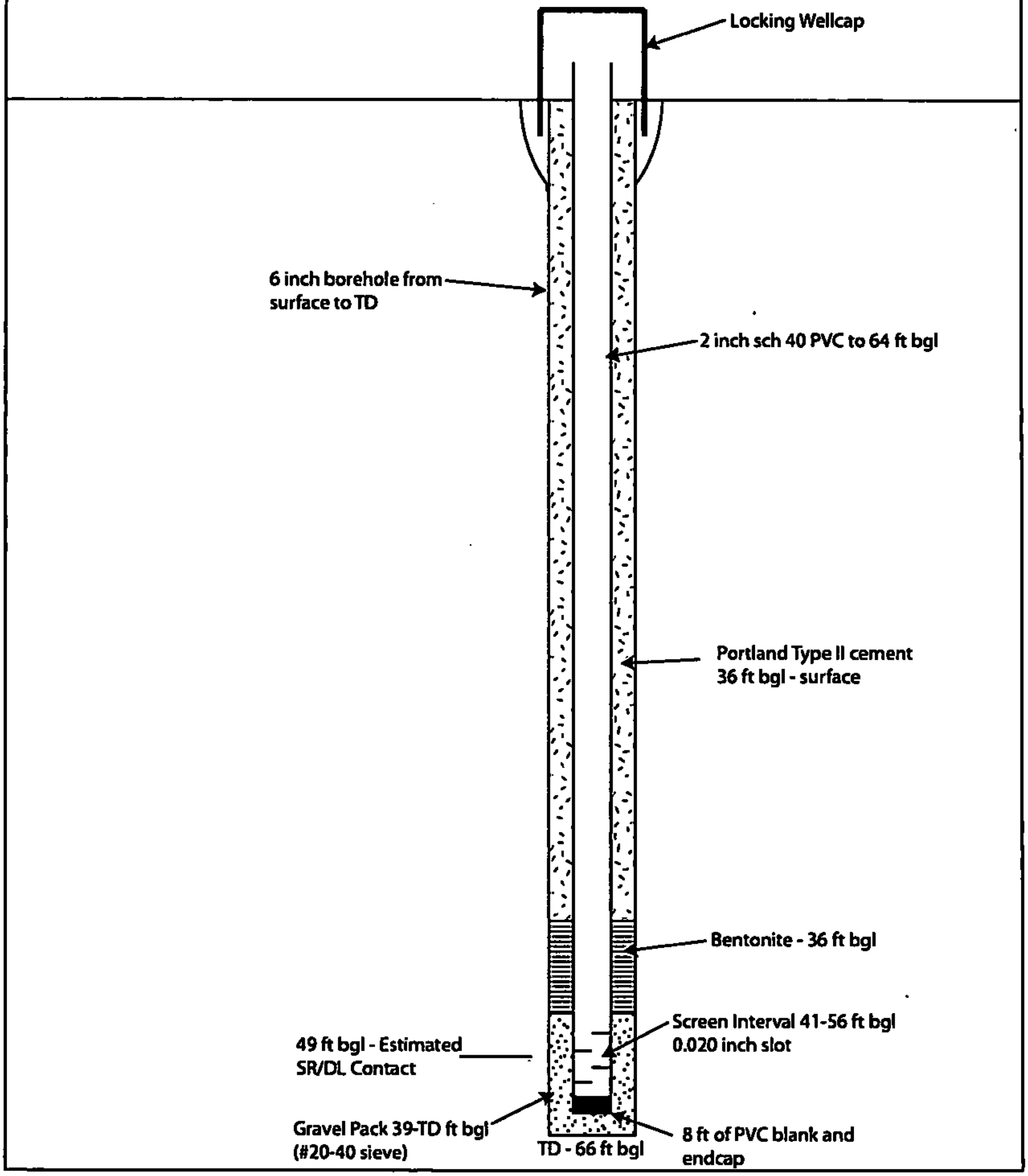

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Figure 5 : PZ-17 Cementation Change Construction

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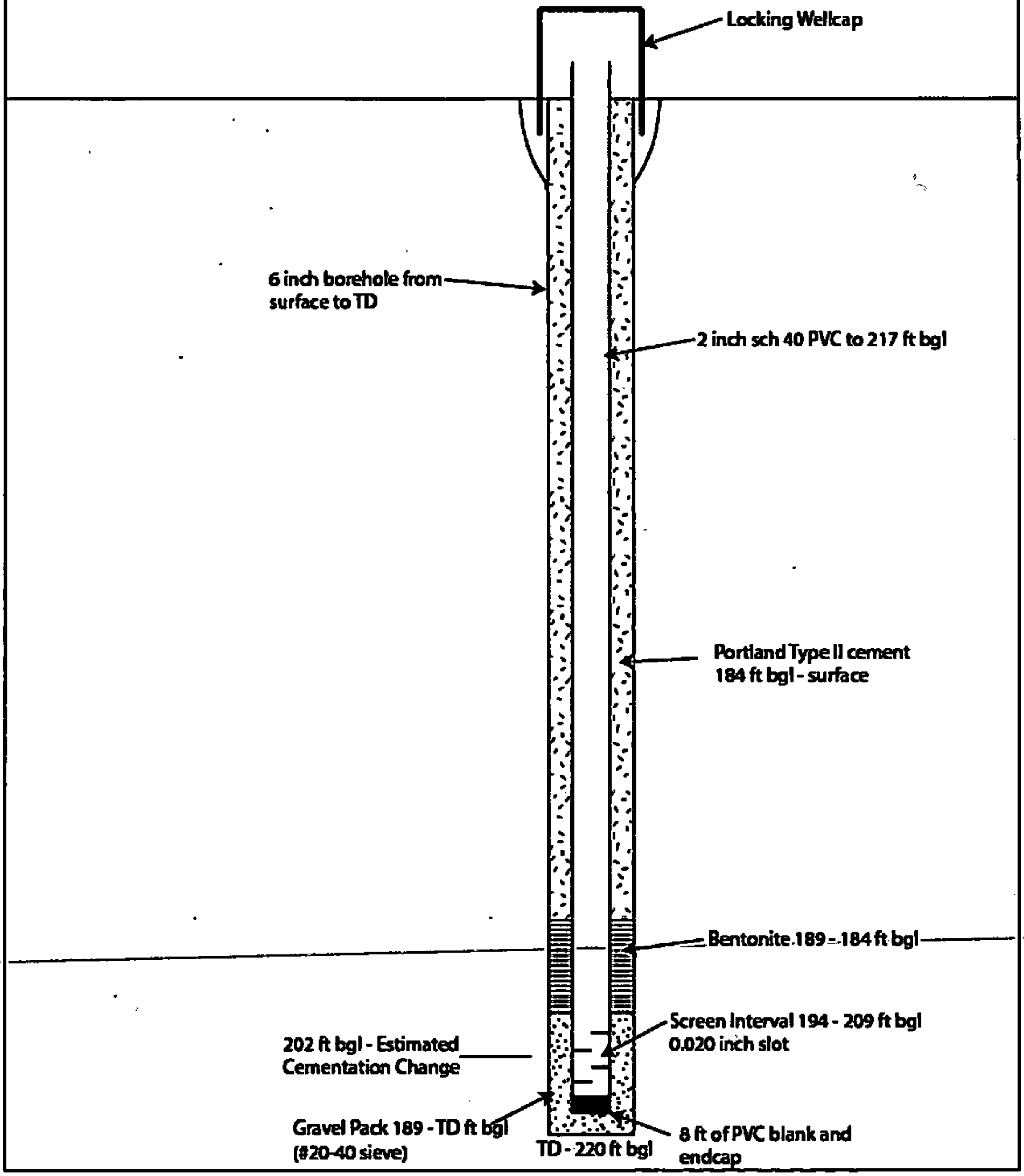

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Location and Design of PZ-18

PZ-18 is located 50 feet from Pond 5, close to the central axis of the impoundment. (Figure 6). Proposed construction is presented in Figure 7. Final construction and placement of the well screen will be determined in the field based on examination of core and geophysics.

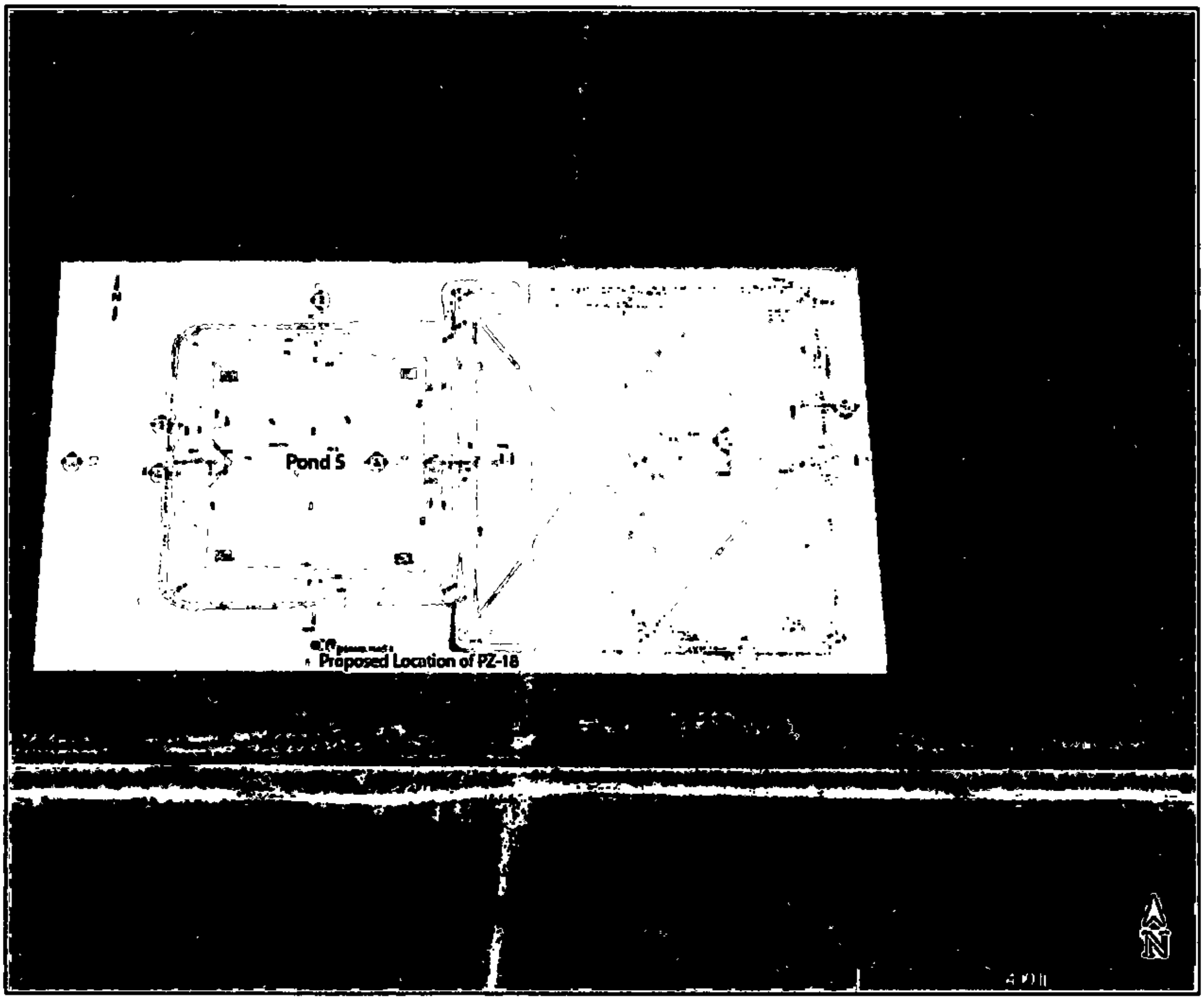

Figure 6: Proposed Location of PZ-18

Figure 7 : PZ-18 Construction

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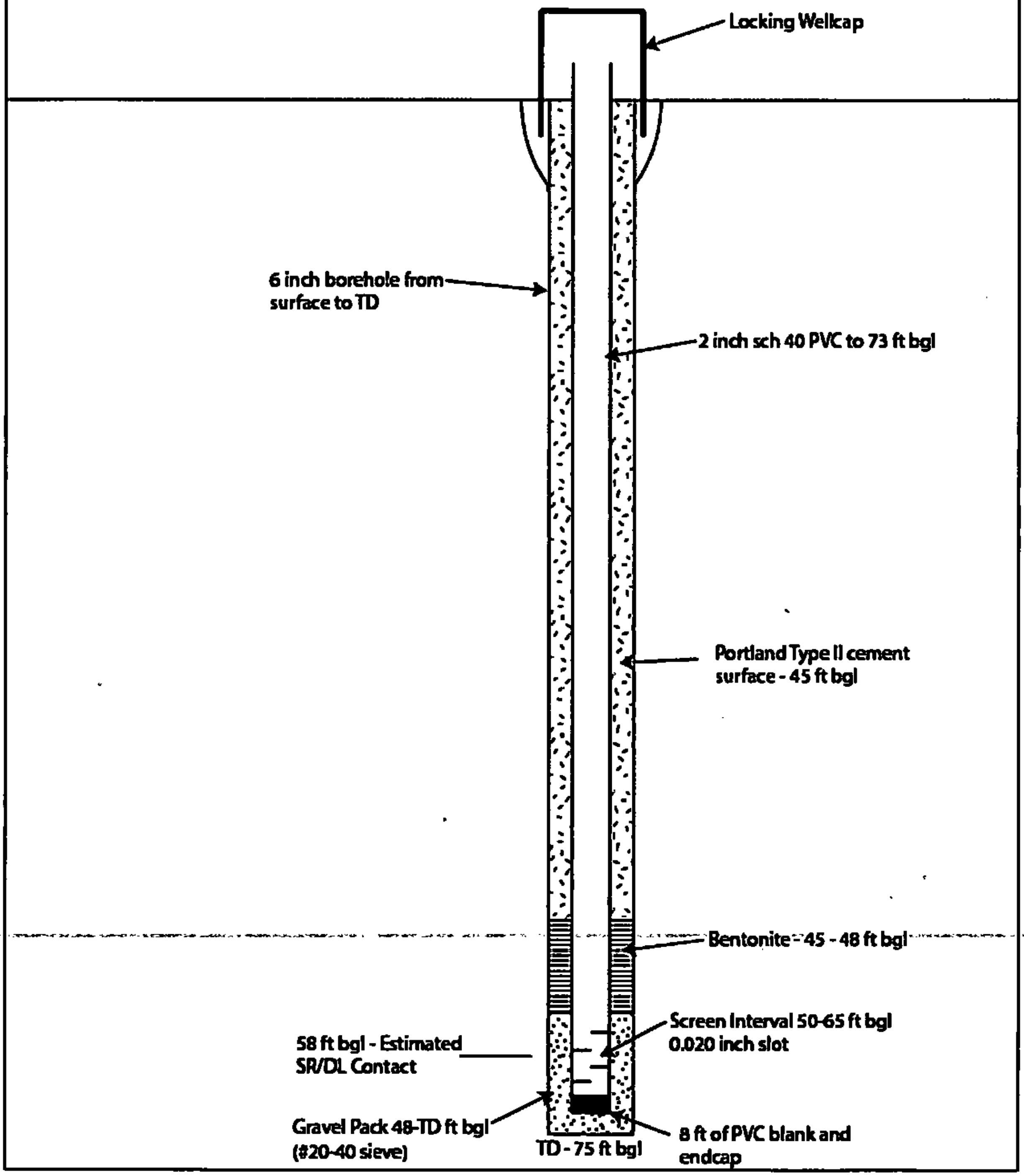

Location and Design of PZ-19

PZ-19 is located 50 feet south of the H-19 Evaporation Pond in line with the central axis (Figure 8). At this location there is a possibility of installing two monitoring wells. The decision to install one or two wells will be made in the field using the criteria described in the drilling scenarios above.

One corehole will be drilled and the core will be examined to total depth. The target depth for this hole will be in the lower Dewey Lake where the cementation changes from carbonate to sulfate (gypsum). The intent of this well is to determine if there is water at both the Santa Rosa and Dewey Lake geological contact and at the cementation change. If there is water at both target depths, then two wells will be installed to monitor the intervals. One will be a shallow screened well and the other a deep screened well (Figures 9 and 10)

The other scenario would be if there is no identified water at the cementation change and water is identified in the shallow interval of the Santa Rosa and Dewey Lake geological contact, then the corehole will be plugged up to the contact and a shallow well will be installed (Figure 9).

The third scenario is if there is no water in either interval, then a single shallow well will be installed screened across the Santa Rosa and Dewey Lake geologic contact. This will be used to monitor potential future influx of water in the future (Figure 10).

Final construction and placement of the well screen will be determined in the field based on examination of core and geophysics.

Figure 8: Proposed Location of PZ-19

Figure 9 : PZ-19 Construction

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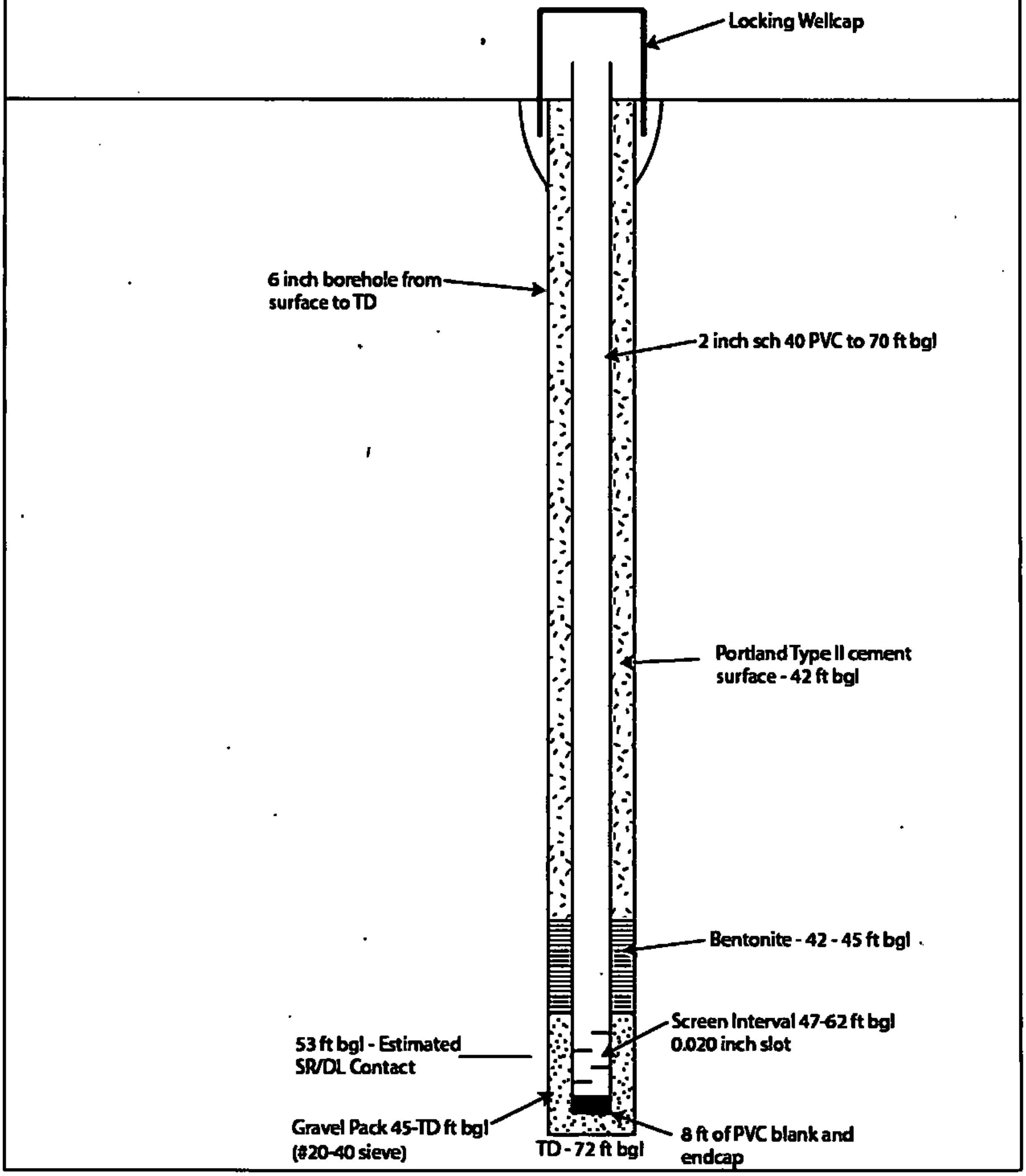

Figure 10 : PZ-19 Cementation Change Construction

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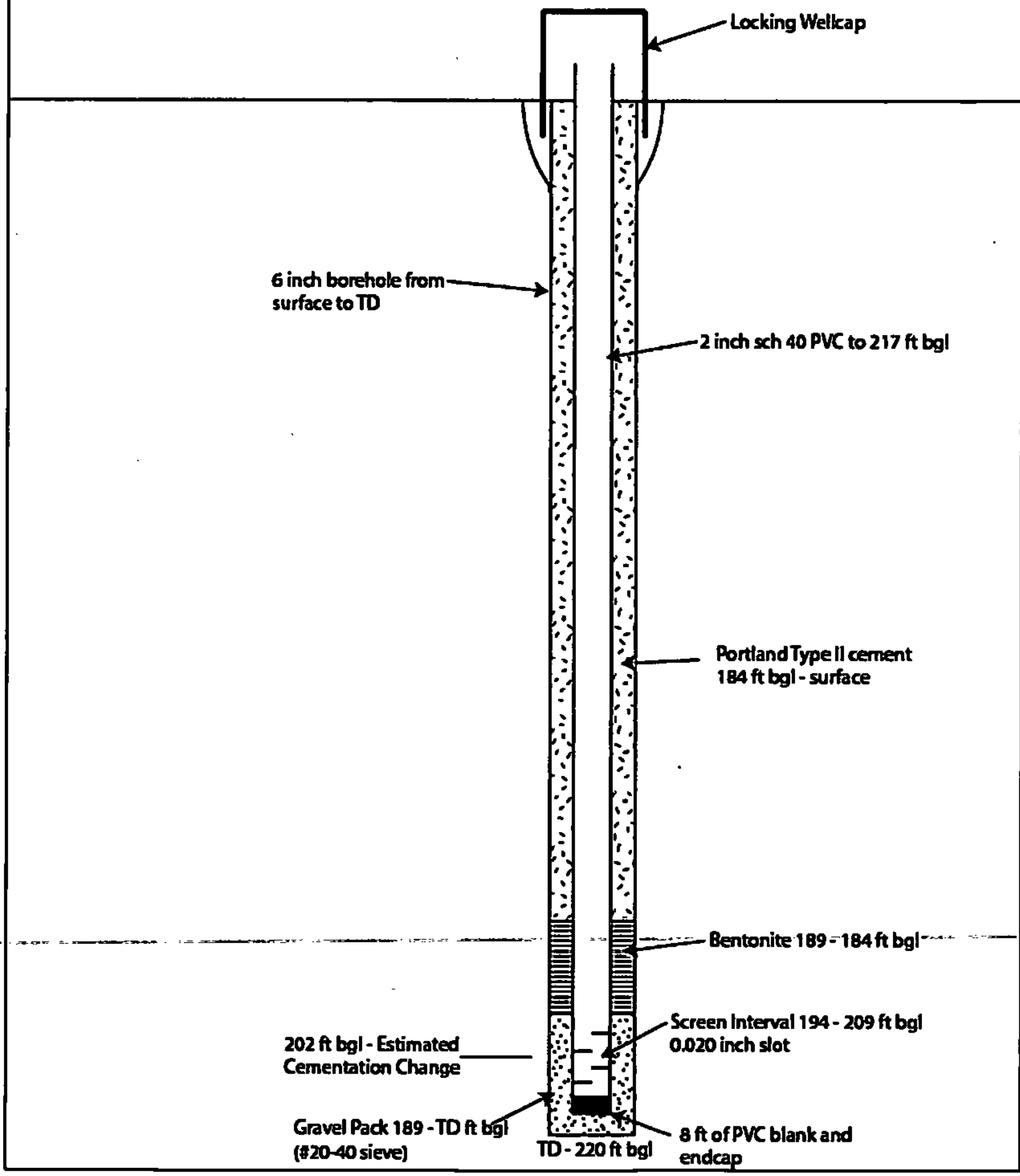
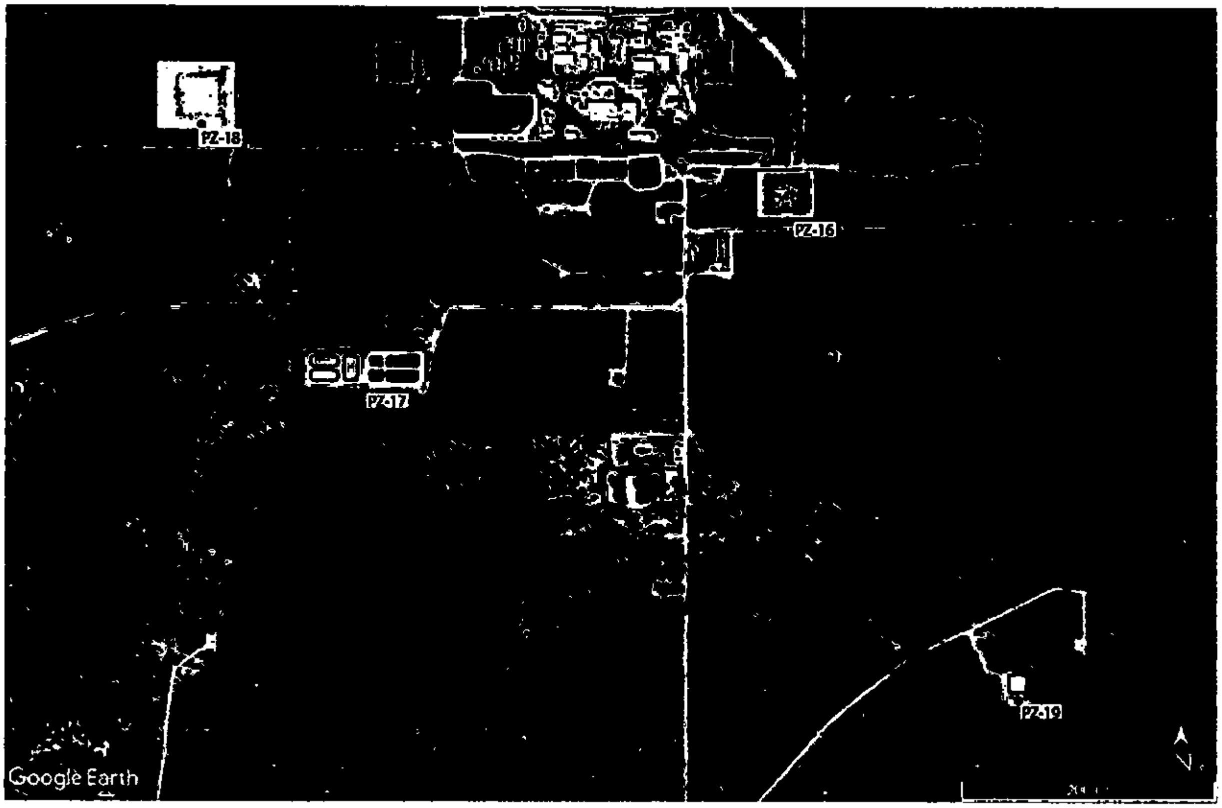


Future Wells Uses

Following the installation of wells, they will be monitored and sampled according to the conditions set forth in the final DP-831 Permit. All well locations are presented in Figure 11.



Pullen, Steve, NMENV

From:	Young, Avery, NMENV
Sent:	Wednesday, January 15, 2020 4:13 PM
To:	Pullen, Steve, NMENV
Subject:	FW: Design Drawings & Technical Specification for the LDCRS
Attachments:	SPECIAL CONDITIONS_ HDPE Geomembrane Liner, Geofabric, Geonet, and HDPE Pipe.pdf; DESIGN CRITERIA SPECIFICATION_LDCRS.pdf; Salt Storage Pond 5 _a_LDCRS.pdf; Salt Storage Pond 5_b_LDCRS.pdf; Brine Ponds_LDCRS.pdf; Pond 4 _LDCRS.pdf; Brine_Ponds & Pond 4_LDCRS.pdf

See the attachments.

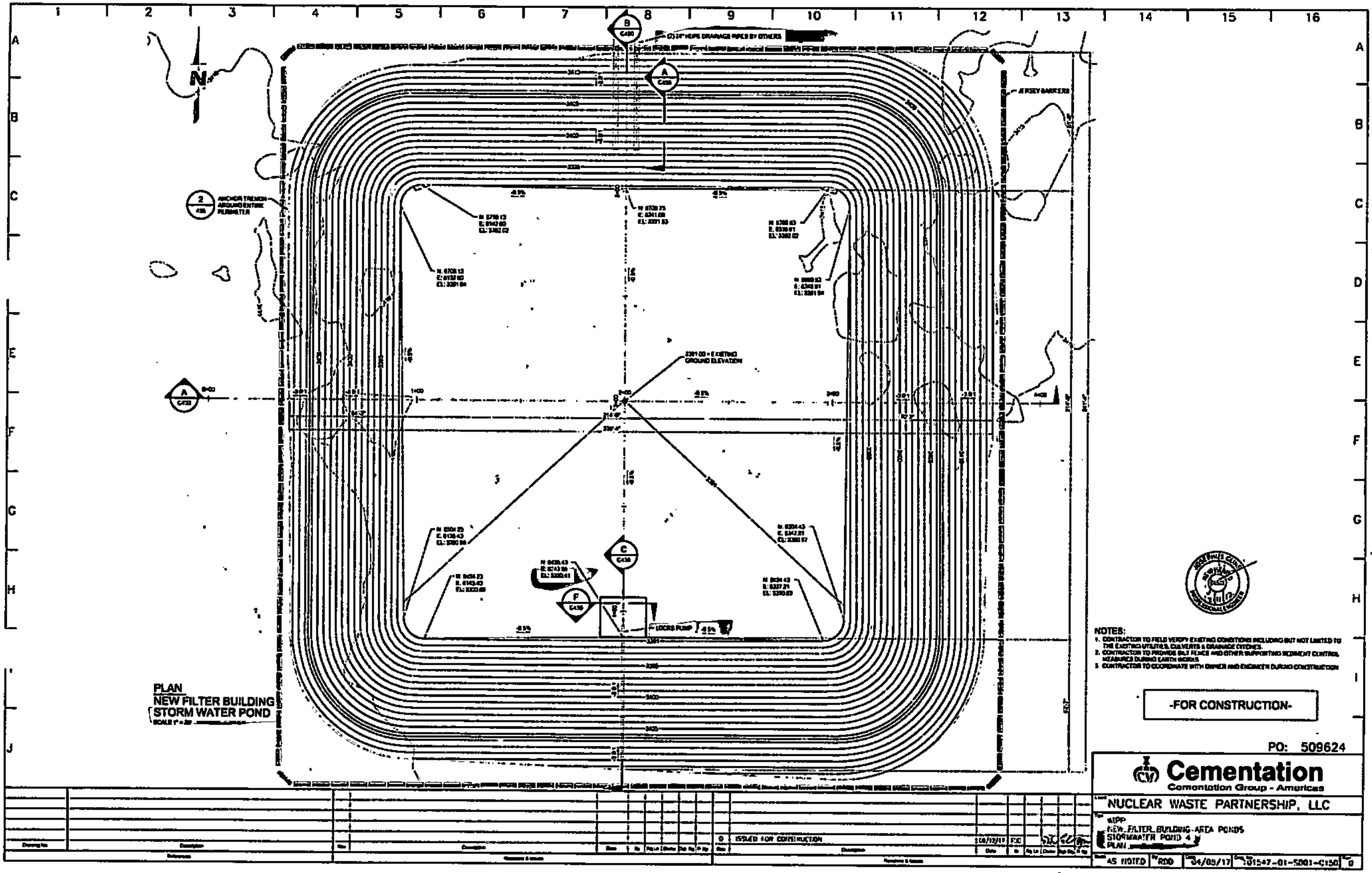
Avery Young, Environmental Scientist
New Mexico Environment Department
Ground Water Quality Bureau
1190 Saint Francis Dr, Santa Fe, NM 87505
505-827-2909
https://www.env.nm.gov/gwqb/
Avery.Young@state.nm.us

From: Vajda, Josh - RES <Josh.Vajda@wipp.ws>
Sent: Wednesday, January 15, 2020 4:10 PM
To: Young, Avery, NMENV <Avery.Young@state.nm.us>
Cc: Chavez, Rick - RES <Rick.Chavez@wipp.ws>; Brown, Michael (Mike) - FedNet <mike.brown@cbfo.doe.gov>
Subject: [EXT] Design Drawings & Technical Specification for the LDCRS

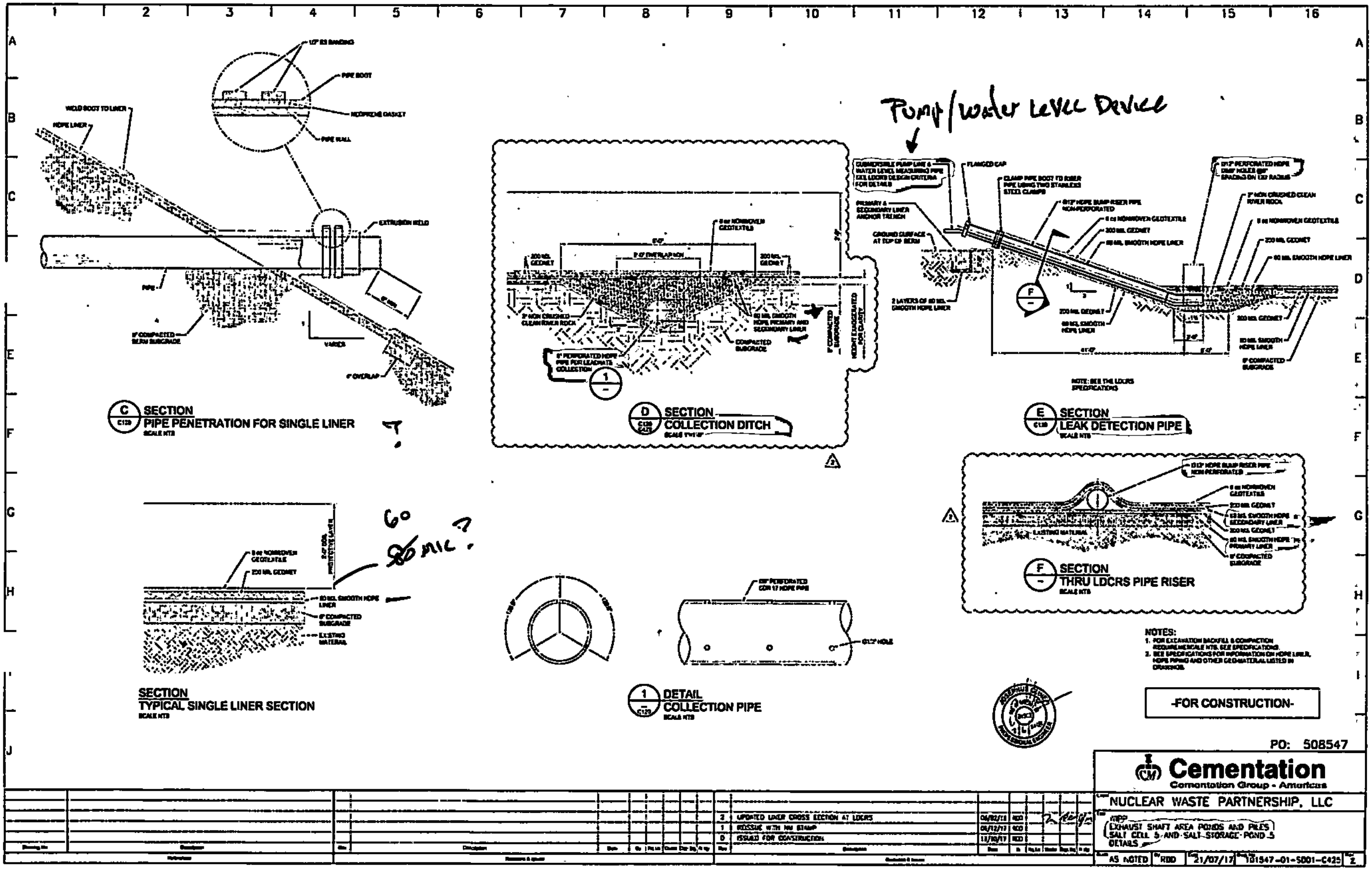
Avery,

The attached files, which contain design details and technical specifications for the LDCRS for the new impoundments. Let us know if you need anything else or require further design information.

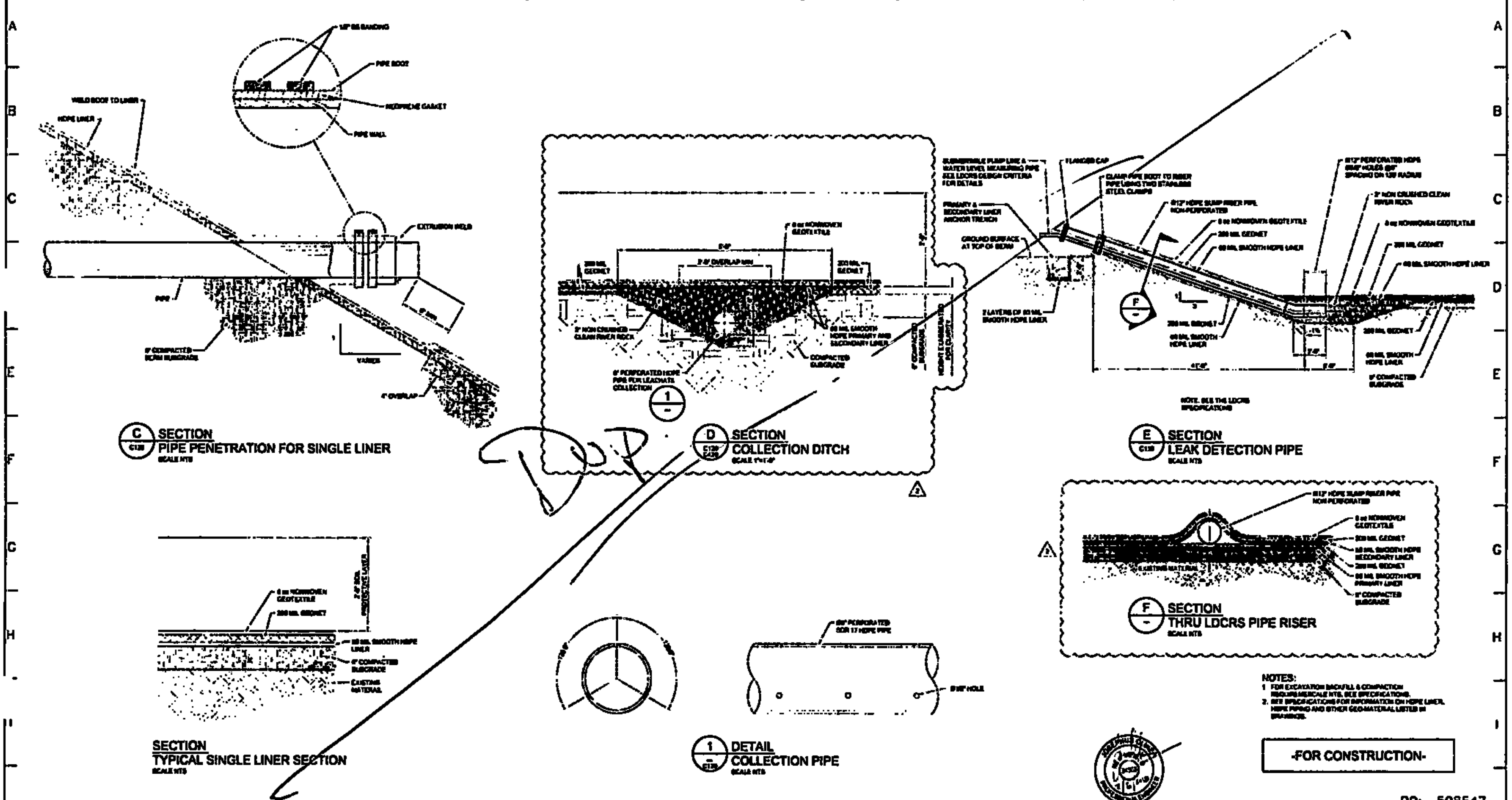
Joshua Vajda
AECOM-RES
(575) 234-3214



(2) 24" HDPE DRAINAGE PIPES BY OTHERS [redacted]
JERSEY BARRIERS
ANCHOR TRENCH AROUND ENTIRE PERIMETER
3301.00 = EXISTING GROUND ELEVATION
LOCKS PUMP
PLAN
NEW FILTER BUILDING
STORM WATER POND
NOTES:
1. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS INCLUDING BUT NOT LIMITED TO THE EXISTING UTILITIES, CULVERTS & DRAINAGE DITCHES.
2. CONTRACTOR TO PROVIDE SILT FENCE AND OTHER SUPPORTING SEDIMENT CONTROL MEASURES DURING EARTH WORKS.
3. CONTRACTOR TO COORDINATE WITH OWNER AND ENGINEER DURING CONSTRUCTION.
-FOR CONSTRUCTION-
PO: 509624
Cementation
Cementation Group - Americas
NUCLEAR WASTE PARTNERSHIP, LLC
WIPP
NEW FILTER BUILDING AREA PONDS
STORMWATER POND 4
PLAN
AS NOTED
RDO
04/05/17
101547-01-5001-C150
0
ISSUED FOR CONSTRUCTION



Pump/water level Device
C SECTION
PIPE PENETRATION FOR SINGLE LINER
D SECTION
COLLECTION DITCH
E SECTION
LEAK DETECTION PIPE
NOTE: SEE THE LDCRS SPECIFICATIONS
F SECTION
THRU LDCRS PIPE RISER
SECTION
TYPICAL SINGLE LINER SECTION
60
~~80~~ mil ?
1 DETAIL
COLLECTION PIPE
NOTES:
1. FOR EXCAVATION BACKFILL & COMPACTION REQUIREMENTS SEE SPECIFICATIONS.
2. SEE SPECIFICATIONS FOR INFORMATION ON HDPE LINER, HDPE PIPING AND OTHER GEOMATERIALS LISTED IN DRAWINGS.
-FOR CONSTRUCTION-
PO: 508547
Cementation
Cementation Group - Americas
NUCLEAR WASTE PARTNERSHIP, LLC
WIPP
EXHAUST SHAFT AREA PONDS AND PILES
SALT CELL 5 AND SALT STORAGE POND 5
DETAILS
2 UPDATED LINER CROSS SECTION AT LDCRS
1 REISSUE WITH NM STAMP
0 ISSUED FOR CONSTRUCTION
AS NOTED
RDD
21/07/17
101547-01-5001-C425
2



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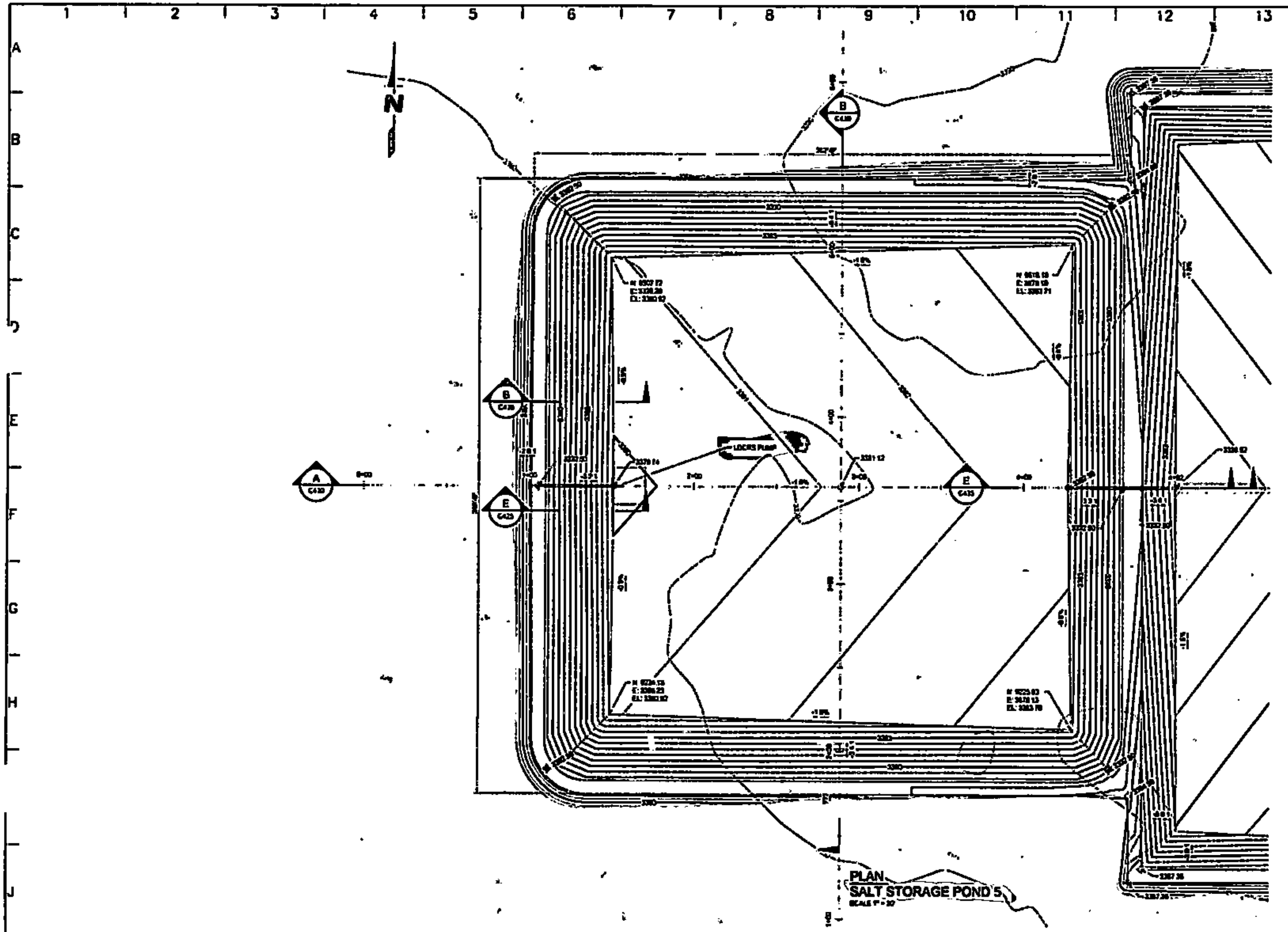
Cementation
Cementation Group - Americas

NUCLEAR WASTE PARTNERSHIP, LLC

WIPP
EXHAUST SHAFT AREA PONDS AND PILES
SALT CELL 5 AND SALT STORAGE POND 5
DETAILS

Rev	Description	Date	By
2	UPDATED LINER CROSS SECTION AT LDCRS	06/08/18	RDD
1	REISSUE WITH NM STAMP	06/12/17	RDD
0	ISSUED FOR CONSTRUCTION	13/10/17	RDD

Scale	By	Date	Drawing No.	Rev
AS NOTED	RDD	21/07/17	101547-01-3001-C425	2



NOTES:

1. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS INCLUDING BUT NOT LIMITED TO THE EXISTING UTILITIES, CULVERTS & DRAINAGE DITCHES
2. CONTRACTOR TO PROVIDE SILT FENCE AND OTHER SUPPORTING SEDIMENT CONTROL MEASURES DURING EARTH WORKS
3. CONTRACTOR TO COORDINATE WITH OWNER AND ENGINEER DURING CONSTRUCTION

-FOR CONSTRUCTION-

PO: 508547

Cementation
Cementation Group - Americas

NUCLEAR WASTE PARTNERSHIP, LLC

WIPP
EXHAUST SHAFT AREA PONDS AND PILES
SALT STORAGE POND 5
PLAN

Rev	Description	Date	By
1	REISSUE WITH PM STAMP	08/12/17	RDD
0	ISSUED FOR CONSTRUCTION	11/02/17	RDD

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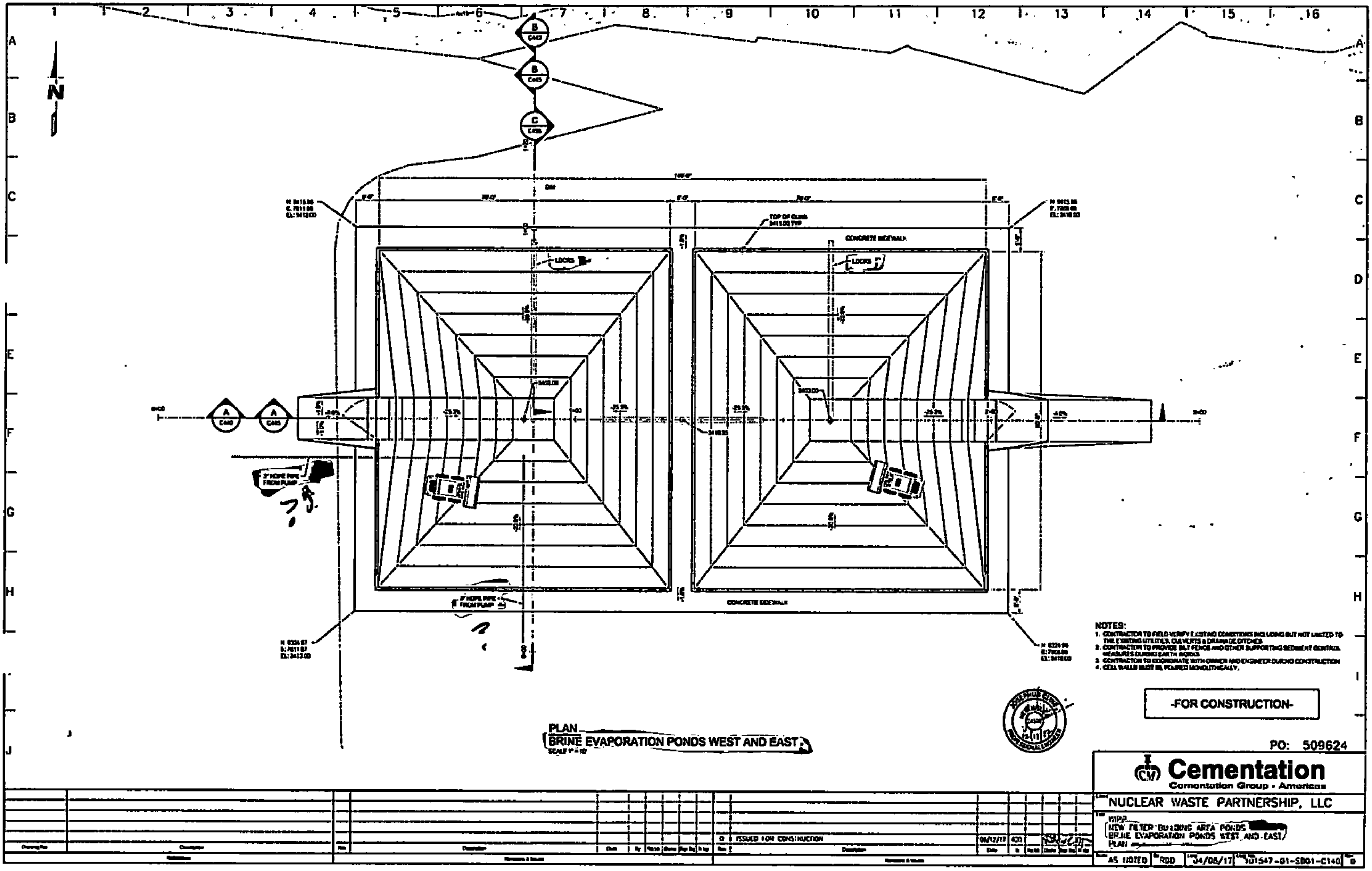
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CONCRETE SIDEWALK
CONCRETE SIDEWALK
PLAN
BRINE EVAPORATION PONDS WEST AND EAST
NOTES:
1. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS INCLUDING BUT NOT LIMITED TO THE EXISTING UTILITIES, CULVERTS & DRAINAGE DITCHES.
2. CONTRACTOR TO PROVIDE SILT FENCE AND OTHER SUPPORTING SEDIMENT CONTROL MEASURES DURING EARTH WORKS.
3. CONTRACTOR TO COORDINATE WITH OWNER AND ENGINEER DURING CONSTRUCTION.
4. CELL WALLS MUST BE POURED MONOLITHICALLY.
-FOR CONSTRUCTION-
PO: 509624
Cementation
Cementation Group - Americas
NUCLEAR WASTE PARTNERSHIP, LLC
WIPP
NEW FILTER BUILDING AREA PONDS
BRINE EVAPORATION PONDS WEST AND EAST
PLAN
AS NOTED
RDD
04/08/17
101547-01-S001-C140
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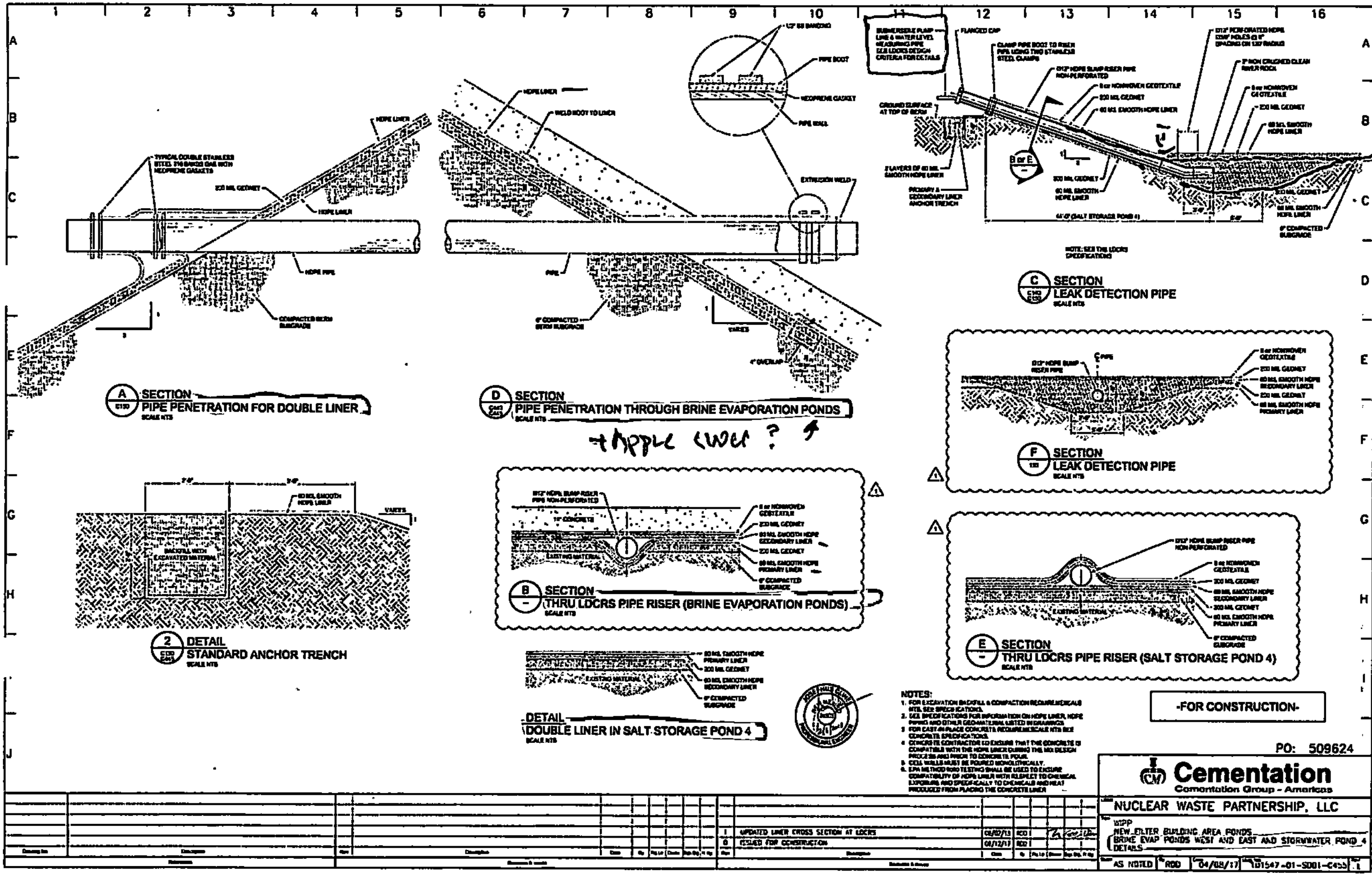
0 ISSUED FOR CONSTRUCTION 06/12/17

Pump / water level



A530-R-92-004
NTIS #PB92-128214

ACTION LEAKAGE RATES FOR LEAK DETECTION SYSTEMS

[Supplemental Background Document for
the Final Double Liners and Leak Detection Systems Rule for
Hazardous Waste Landfills, Waste Piles, and Surface Impoundments]

U. S. ENVIRONMENTAL PROTECTION AGENCY
Office of Solid Waste
January 1992

U.S. Environmental Protection Agency
-12J)
...vard, 12th Floor
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ABSTRACT

This document supplements the background document [Ref. 4] for the May 29, 1987 proposed double liners and leak detection systems rule. This supplement explains the application of the formulas in the original background document to calculate an action leakage rate (called rapid and extremely large leak in the proposal), presents the results of action leakage rate calculations for facilities meeting the minimum design specifications in the final rule, and provides results from a more sophisticated 3-dimensional model. The action leakage rates, based on the minimum specifications in the final rule and a safety factor of two, are 100 gallons per acre per day (gpad) for landfills and waste piles, and 1,000 gpad for surface impoundments. The output from the 3-D model helps to visualize the shape of the flow for various design specifications and shows the relative impact of a number of factors on flow capacity.

This supplemental background document also presents additional data on flow rates actually achieved at a number of double-lined facilities. These numbers support the proposed and final rules by showing that facilities with good construction quality assurance (CQA) perform significantly better than those without. Further, only about 70% of the well designed facilities with good CQA meet 20 gpad which was proposed as the upper bound for a base action leakage rate, and sources of liquids other than top liner leakage can themselves result in flow rates from the leak detection system greater than 20 gpad, indicating that the proposed 20 gpad is too low for a practical action leakage rate.

Finally, this supplemental document also references a number of technical guidances the Agency has issued since the three proposals[1] that contain useful information relative to all of the design, performance, monitoring, and response action standards in the final rule.

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[1] Proposed in the Federal Register on:
May 29, 1987--Liners and Leak Detection Systems [52 FR 20218].
March 28, 1986 and April 17, 1987--Double Liners and Leachate Collection and Removal Systems [51 FR 10706 and 52 FR 12566].

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1. INTRODUCTION

The purpose of this document is to supplement the original background documents supporting the 1986 and 1987 proposals for double liners and leachate collection and removal systems, and liners and leak detection system rules[2] for hazardous waste landfills, surface impoundments, and waste piles. A lot of information has been generated since the 1986 and 1987 proposals that further support this rulemaking. In particular, data on actual flow rates at double-lined landfills and surface impoundments and on top liner performance has been collected and evaluated, flow models have been applied to calculate action leakage rates, and a number of technical guidances have been published. This document discusses each of these.

2. ACTUAL FLOW RATES MEASURED IN THE FIELD

EPA acknowledged in the May 1987 preamble and background document that it had limited data on the performance capability of top liners in terms of flow rates and stated that the Agency is seeking additional data. Since the proposal, EPA has gathered information from a number of facilities, including some data submitted by commenters. This data is summarized here.

2.1 Data From Commenters

In response to EPA's request for more data, some commenters (facility operators) submitted actual flow data. One commenter claimed to achieve, after removal of construction water, a leakage rate of 2-3 gpad at six landfills and 0, 0, 18, and 75 gpad at four (non-regulated) surface impoundments. Commenters made a number of claims regarding other sources of liquids in leak detection systems: consolidation water (from clay in composite top liners) can be 10-50 gpad; construction water can be 10-50 gpad; vapor transmission through a top liner geomembrane can be 4 gpad; and ground water through a geomembrane in the bottom liner can be 20 gpad.

2.2 Data From Operating Units

Information on top liner performance can be obtained from an analysis of leachate detection, collection, and removal systems (LDCRS) flow rates. The results of field monitoring of LDCRS flows at double-lined landfills and surface impoundments have been presented by EPA [1987], Gross et al. [1990], and Bonaparte and Gross [1990]. The reference by Bonaparte and Gross includes the data from all the other references cited above, as well as a

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[2] Proposed in the Federal Register on:
May 29, 1987--Liners and Leak Detection Systems [52 FR 20218].
March 28, 1986 and April 17, 1987--Double Liners and Leachate Collection and Removal Systems [51 FR 10706 and 52 FR 12566].

significant body of otherwise unpublished information. The findings from Bonaparte and Gross are presented in Section 2.3.

2.3 Evaluation of Available Information

Bonaparte and Gross [1990] presented LDCRS flow rate data for 55 individually-monitored double-lined landfill cells and 14 individually-monitored double-lined surface impoundments. The units are located in different climatic regions across the United States; however, most of the units are located in relatively moist climatic regions with average annual rainfalls ranging from 35 to 43 in (900 to 1,100 mm). For each unit, they presented information on the design and operation of the unit, as well as the rate of flow from the LDCRS. Then they evaluated the probable sources of the flow from each unit. Potential sources of flow are illustrated in Figure 1 and include: (i) leakage through the top liner; (ii) water from precipitation that percolates into the LDCRS during construction ("construction water"); (iii) water squeezed out of the clay component of a composite top liner as a result of clay consolidation ("consolidation water"); and (iv) ground water that infiltrates the bottom liner and enters the LDCRS ("infiltration water").

Landfills with Geomembrane Top Liners

In their paper, Bonaparte and Gross evaluated flow rate data from 23 landfill cells that were constructed with geomembrane top liners (instead of composite top liners). A geomembrane top liner represents the minimum technology requirement for top liners at hazardous waste management units regulated under 40 CFR Parts 264 and 265. The authors determined that for 16 of the 23 landfills cells, there could be no consolidation water, and, based on design and operating considerations, construction water and infiltratin water were unlikely sources of LDCRS flow. As a result, the measured LDCRS flow could only be attributed to top liner leakage. Eleven of the 16 landfill cells had been constructed using construction quality assurance (CQA) procedures in substantial conformance with EPA [1986] guidance. The other five cells were constructed using less stringent CQA procedures or no CQA at all.

Table 1 presents a summary of the data for the 16 landfill cells constructed with geomembrane top liners. In Table 1, the LDCRS flow rates are reported in units of gallons per acre of lined area per day (gpad).

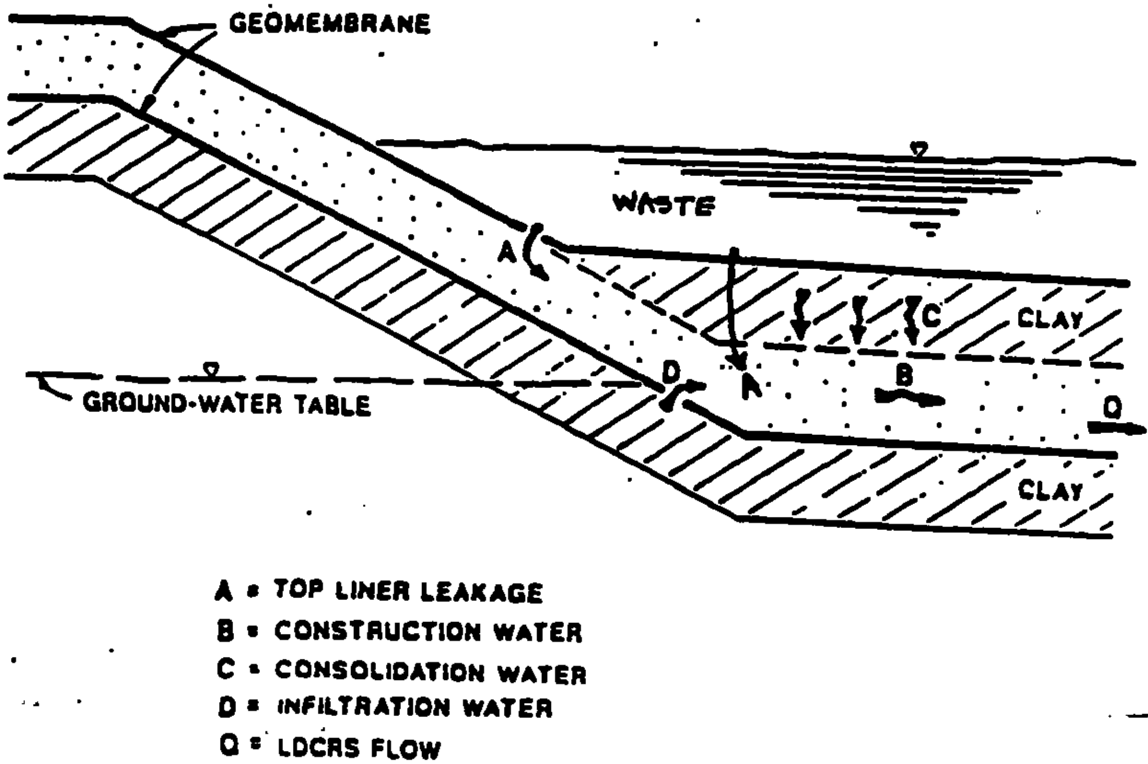

Figure 1. Sources of Flow in Leak Detection, Collection, and Removal Systems (LDCRSs).

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Table 1. Comparison of average LDCRS flow rates at 16 landfill cell with geomembrane top liners (from Bonaparte and Gross [1990]).

Leakage Detection Layer Flow Rate	No. of Cells	
	CQA	No CQA
Flow rate less than 5 gpad	4	-
Flow rate in range of 5 to 20 gpad	4	1
Flow rate in range of 20 to 50 gpad	3	-
Flow rate greater than 50 gpad	-	4

From Table 1, it can be seen that of the eleven landfill cells that were constructed using a CQA program, four cells had average flow rates less than 5 gpad (50 liters per hectare per day (lphd)), and a total of eight cells had average flow rates less than 20 gpad (200 lphd). The data in Table 1 show that a base leakage rate of 20 gpad (200 lphd), which is the top of the range for the base action leakage rate in the proposal, is too low (i.e., not "practicable") since only 73 percent (eight out of eleven) of the cells that had properly constructed geomembrane top liners using rigorous CQA procedures achieved a LDCRS flow rate of less than 20 gpad (200 lphd).

Table 1 also provides evidence of the benefit of a rigorous CQA program. All eleven units constructed using CQA procedures had LDCRS flow rates of less than 50 gpad (500 lphd), and eight of the eleven facilities had flow rates of less than 20 gpad (200 lphd). In contrast, four of the five units that were constructed with less rigorous CQA procedures or with no CQA at all had LDCRS flow rates in excess of 50 gpad (500 lphd), and two units had LDCRS flow rates in excess of 100 gpad (1,000 lphd). At these two units LDCRS flow rates were on the order of 300 gpad (1,000 lphd). In summary, the LDCRS flow rates from waste management units with rigourous CQA programs are significantly lower than the flow rates from units without rigorous programs.

Based on these data, it appears that flow rates from LDCRSs of landfills that are properly constructed using rigorous CQA programs should be well less than 100 gpad (1,000 lphd). On the other hand, if a unit is constructed using less rigorous CQA procedures, LDCRS flow rates greater than 100 gpad (1,000 lphd) may occur.

Surface Impoundments with Geomembrane Top Liners

Conclusions similar to those given above for landfills can also be drawn for surface impoundments. Bonaparte and Gross [1990] presented data on LDCRS flow rates from eight double-lined surface impoundments having geomembrane top liners. The authors determined that for six of these surface impoundments, top liner leakage was the likely source of any LDCRS flow. Five of the six surface impoundments were constructed with rigorous CQA programs, including either ponding tests or leak location surveys; it is not known if CQA was performed during the construction of the sixth surface impoundment. The authors reported that four of the six surface impoundments exhibited no LDCRS flow in the time period between the start of operation and the time the flow data was collected. The fifth surface impoundment exhibited no flow except during a short period between when a geomembrane defect developed and when it was repaired. The sixth surface impoundment exhibited a flow of about 0.2 gpad (2 lphd), except during a short period when the flow increased to about 40 gpad (400 lphd) due to a geomembrane defect. Thus, all six of the monitored surface impoundments with geomembrane top liners had LDCRS flow rates below 5 gpad (50 lphd) except during a short period between when a geomembrane defect developed and when it was repaired. This represents an extremely high level of performance; in fact it represents a higher level of top liner performance than was observed at landfills having geomembrane top liners. This high level of performance was obtained by using ponding tests and/or leak location surveys as part of the CQA program. These CQA techniques are typically better adapted to use at surface impoundments than landfills because surface impoundments are frequently smaller than landfill cells resulting in easier implementation of ponding tests or surveying techniques. In addition, geomembrane top liner defects that may develop after construction are generally easier to find and repair in a surface impoundment than in a landfill. The top liner in a surface impoundment is typically uncovered (or covered with only a thin veneer of soil), whereas the top liner in a landfill cell is covered with a drainage layer (leachate collection and removal system or LCRS) and then with a thick layer of waste which makes access to the liner difficult.

Based on the available data, it appears that flow rates from the LDCRSs of surface impoundments that are properly constructed using rigorous CQA programs (those that use leak location surveys or ponding tests) should be well less than 100 gpad (1,000 lphd). It should be anticipated, however, that if a unit is constructed using less rigorous CQA procedures, a flow rate greater than 100 gpad (1,000 lphd) could occur. It is interesting to note that leak location surveys and ponding tests represent two techniques that are frequently implemented as part of a response action plan at surface impoundments experiencing excessive flow from the LDCRS. The results described herein suggest that these techniques will be effective in reducing the LDCRS flow rate to below 100 gpad (1,000 lphd) at surface impoundments for which response actions are required.

Landfills with Composite Top Liners

The evaluations discussed above were for double-lined units having geomembrane top liners. It is also useful to consider units having composite top liners to assess the contribution of consolidation water from the clay component of the top liner toward potentially exceeding an action leakage rate. Although the action leakage rate in the final rule, as in the proposal, is based on total flow in the LDCRS, regardless of source, the response actions should consider sources other than leaks. For this reason, it is relevant to compare LDCRS flow rate data from units with composite top liners.

Bonaparte and Gross [1990] evaluated LDCRS flow rate data from 32 landfill units with a composite top liner. Because the top liner is a composite liner, the primary source of the flow can be attributed to construction water plus consolidation water if an analysis of the time required for leakage to flow through the top liner (i.e., leakage breakthrough time) was greater than the time since the end of construction of the landfill. For 18 of these units, the authors attributed the flow primarily to construction plus consolidation water from the clay component of the composite top liner. Data on these 18 units are provided in Table 2.

Thirteen of the waste management units used to generate the data in Table 2 were constructed using CQA programs in substantial accordance with EPA [1986] guidance; four were constructed without CQA programs; and it is not known if CQA was performed during construction of the remaining unit.

Table 2. Average LDCRS flow rates at 18 landfill cells with composite top liners (from Bonaparte and Gross [1990]).

Leak Detection Layer Flow Rate	No. of Cells
< 5 gpad	5
5 to 20 gpad	8
> 20 to 50 gpad	3
> 50 to 100 gpad	2
> 100 gpad	0

From Table 2, it can be seen that only five of 18 (28 percent) of the landfill cells constructed with composite top liners have LDCRS flow rates of less than 5 gpad (50 lphd), and 13 of 18 cells (72 percent) have LDCRS flow rates of less than 20 gpad (200 gpad). This data is similar to that for geomembrane only top liners, indicating that construction water is rather insignificant at these units (perhaps because overburden pressures have yet to squeeze out the consolidation water). This data also indicates that perhaps a significant source of the liquids at the geomembrane only units is construction water. At any rate, this data further supports the conclusion that an action leakage rate of 20 gpad (200 lphd) is inappropriate since it would mean most waste management units with composite top liners will also have LDCRS flow rates that exceed the action leakage rate under normal operating conditions.

All 18 units with composite top liners exhibited average LDCRS flows below 100 gpad (1,000 lphd). Thus, it appears that properly constructed waste management units with composite top

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liners are unlikely to exhibit LDCRS flows that exceed 100 gpad (1,000 lphd).

Surface Impoundments with Composite Top Liners

There is insufficient data to present observations on the performance of this category of facilities. However, it is anticipated that the performance of these facilities would be the same as the performance of landfills with composite top liners.

2.4. Theoretical Analysis of Top Liner Performance

A theoretical analysis of top liner performance was also performed. This analysis further supports the conclusion from the above data that 20 gpad is not a practical action leakage rate.

Available Information

In recent years, various investigators have developed analytical techniques for estimating leakage rates through liners. These investigations include: Bonaparte et al. [1989]; Brown et al. [1987]; EPA [1987]; Giroud and Bonaparte [1989a,b]; Giroud et al. [1991]; and Jayawickrama et al. [1987]. The reference presented by Bonaparte et al. [1989] presents equations to estimate leakage rates through both geomembrane liners and composite liners; these equations are used in the analysis below to estimate leakage rates through top liners.

To estimate the anticipated leakage rate through a top liner at a waste management unit, a frequency of defect and size of defect in the geomembrane component of the top liner must be assumed. Available information on the frequency and size of defects in properly-installed geomembrane liners had been reported by EPA [1987], Giroud and Bonaparte [1989a], Giroud and Fluent [1987], and Laine [1991]. This information is also used below to estimate leakage rates through top liners.

Results of Analysis

Frequency and Size of Geomembrane Defects. Giroud and Bonaparte [1989a] presented limited case study data, including CQA records, records of foresnic investigations, and LDCRS flow rate data, from which they drew "tentative" conclusions regarding the frequency and size of defects in geomembrane liners installed using rigorous CQA procedures. From their data, they recommended that for the purpose of estimating leakage rates through geomembranes, a geomembrane defect (hole) frequency of one to two per acre (two to five per hectare) be considered along with a defect size of 0.005 in^2 (3.2 mm^2). Recently Laine [1991] presented data from two leak location surveys in which geomembrane seam defects were identified at a frequency of two to five per acre (five to twelve per hectare). Thus, the frequency of defects found by Laine is twice as high as the frequency recommended by Giroud and Bonaparte for estimating leakage rates. However, the size of the defect found by Laine was typically very small, i.e., pinhole sized with areas on the order of 0.001 in^2 (0.6 mm^2) or less. The defect size is about five times smaller than the defect size recommended by Giroud and Bonaparte for estimating leakage rates. Since the calculated leakage rate for a given installed area of geomembrane is proportional to the product of the size of the defect and the frequency of defects, the findings of both of the above-described investigations lead to comparable top liner leakage rates when used.

For the analysis of top liner leakage rates presented below, a defect frequency of one per acre (two per hectare) and a defect size of 0.005 in^2 (3.2 mm^2) is assumed.

Analysis Results. The results of calculations using the equations from Bonaparte et al. [1989] for steady-state leakage through geomembrane holes are presented below. For the calculations, it was assumed that the top liner consists of a geomembrane alone, and the hydraulic conductivity of the material overlying the geomembrane is 1 x 10^{-2} cm/s (1 x 10^{-4} m/s) which is appropriate for a landfill with a granular leachate collection and removal system (LCRS). The calculated top liner leakage rates, given the above-described conditions, are presented in Table 3.

Table 3. Calculated leakage rates through a geomembrane top liner.

Liquid head on top liner (ft)	Steady-State leakage rate (gpad)
0.1	10
1.0	60
10.0	220

Calculated top liner leakage rates would be much lower than those given in Table 3 if the top liner was a composite liner rather than a geomembrane alone. Conversely, the calculated top liner leakage rate would be somewhat higher if the material above the top liner had a higher permeability, or if the liner was exposed (as might be the case for a surface impoundment).

The calculation results presented above must be interpreted separately with respect to landfills and surface impoundments. For landfills, the design maximum liquid head in the LCRS is 1 ft (0.3 m). However, the average liquid head under normal operating conditions should be only on the order of 0.1 ft (0.03 m); in many instances, the average head may be only on the order of 0.1 ft (0.03 m), or even less. In this case the calculated results support a conclusion that under normal operating conditions (i.e., when there is an average hydraulic head in the LCRS of 0.1 ft (0.03 m), or less), the leakage rate through a properly designed geomembrane top liner, constructed using proper procedures and rigorous CQA, will frequently be less than 20 gpad

(200 1 phd). During periods of maximum leachate flow (e.g, after major storm events), top liner leakage rates in landfills with geomembrane top liners could temporarily exceed 20 gpad (200 lphd) and approach 60 gpad (600 lphd), since the liquid head in the LCRS during this period could easily exceed 0.1 ft (0.03m).

The calculation results suggest that for surface impoundments constructed with geomembrane top liners (where the liquid head may be on the order of 10 ft (3 m)), top liner leakage rates could easily exceed 20 gpad (200 lphd) and approach 200 gpad (2,000 lphd) even if there is only one small geomembrane defect per acre (two defects per hectare) of liner. Thus, to keep top liner leakage rates below 20 gpad, or even 200 gpad, in surface impoundments with geomembrane top liners, geomembrane defects need to be virtually eliminated. In most cases, this will only be accomplished using ponding tests, leak location surveys, or other "extraordinary" CQA procedures. As shown by the monitoring data presented in Section 2.3 of this report, when these CQA procedures are used, top liner leakage can be largely eliminated, at least for some period of time.

2.5 Summary

As stated in the proposal, and restated by some of the commenters, the existing empirical data base at the time of the proposal regarding actual flow rates was quite limited. EPA has, however, accumulated empirical data since the proposal on the performance of different liner designs. This data help give meaning to different flow rates in terms of the ability of owner/operators and technology to achieve and in terms of leaks versus other sources of liquids. This additional leakage rate data are consistent with the data submitted by the commenters.

The actual flow rate data presented above are summarized in Table 4, for all 40 units.

Table 4. Actual Flow Rates at Double-Lined Individually-Monitored Landfill and Surface Impoundment Units.

LDS FLOW RATE (GPAD)	NO. of UNITS	% of UNITS
< 5	15	38
5-20	13	32
>20-50	6	15
>50	6	15

NOTES TO TABLE: These are units where other sources, except construction water, were determined not to be a factor. Thirty-one of the 40 units were constructed with rigorous CQA, 7 were not, and 2 are unknown. Of the six at >50 gpad, at least four had no rigorous CQA.

This data shows that only 70% of the 40 units meet 20 gpad; and only 85% of the 40 units, but at least 95% of the units with rigorous construction quality assurance (CQA), meet 50 gpad. This indicates that 20 gpad and even 50 gpad are not practicable action leakage rates for the general situation.

This data in conjunction with the previous EPA data show that over the past 10 years, and especially in more recent years, facility owners and operators have been building and operating liner systems that work better and better to minimize flow through the top liner. The major contributions to this improvement have been better installation practices and better CQA.

3. ACTION LEAKAGE RATE

In the final rule, as in the May 29, 1987 proposal, the owner or operator of units subject to the leak detection system requirements must propose and the Regional Administrator (or State Director in authorized States) must approve an action leakage rate. "Action leakage rate" is defined in the final rule as "the maximum design flow rate that the leak detection system (LDS) can remove without the fluid head on the bottom liner exceeding 1 foot. The action leakage rate must include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation, and location of the LDS, waste and leachate characteristics, likelihood and amounts of other sources of liquids in the LDS, and proposed response actions (e.g., the action leakage rate must consider decreases in the flow capacity of the system over time resulting from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.)." In short, the "action leakage rate" is the maximum design flow rate, with a safety factor, that the leak detection system can remove without the head on the bottom liner exceeding one foot (called rapid and extremely large leak in the May 29, 1987 proposal). The objective is to minimize the head or pressure on the bottom liner and thereby decrease the potential for migration of hazardous constituents out of the unit should a leak in the bottom liner, as well as the top liner, occur. The proposal background document [Ref. 4] presented a number of mathematical models for making such a determination. All of these models are based on Darcy's Law for non-turbulent flow through saturated media.

3.1 Determining an Action Leakage Rate

The proposal background document gives the following formula for flow originating through a hole in the liner, the most likely leak scenario for a geomembrane liner (pages 2.6-12 and 2.10-10, Ref. 4):

$$Q = k \cdot h \cdot \tan \alpha \cdot B_{avg} \qquad \text{[Equation 1]}$$

where Q = flow rate in the leak detection system (drainage layer),
h = head on the bottom liner,
k = hydraulic conductivity of the drainage medium,
α = slope of the leak detection system,

(B_{avg}) = average width of the flow in the leak detection system, perpendicular to the flow.

Assumming that the gradient of flow through the hole, at the hole, is sin α and depth of flow at the hole for concentrated flow = the thickness of the drainage layer:

$$B_{avg} = D/\sin \alpha$$

where D = leak detection system thickness.

Then, with D = 1 ft and sin α = 0.01, B_{avg} = 100 ft
0.02, B_{avg} = 50 ft
0.03, B_{avg} = 33 ft.

Using these values for B_{avg} and Equation 1 with h $\approx$ D = 1 ft (h $\approx$ D for small values of α), Q in gpad =

k (cm/sec)	sin α	B_{avg} (ft) 33	50	100
1	.01 .02 .03	---- ---- 21,000	---- 21,000 ----	21,000 ---- ----
.1	.01 .02 .03	---- ---- 2,100	---- 2,100 ----	2,100 ---- ----
.01	.01 .02 .03	---- ---- 210	---- 210 ----	210 ---- ----

Thus, using the minimum specifications in today's rule: 1% slope, 12-in-thick drainage layer, and 1 X 10^{-1} cm/sec hydraulic conductivity for surface impoundments and 1 X 10^{-2} cm/sec hydraulic conductivity for landfills and waste piles, and assuming that the head is 1 ft and the average width of flow (B_{avg}) is as given above, the results show maximum flow rates of 2,100 gpad for surface impoundments and 210 gpad for landfills and waste piles. Using a safety factor of two, as suggested in the example given in the proposed rule preamble, yields about 1,000 gpad for surface impoundments and 100 gpad for landfills and waste piles as the Agency recommended action leakage rates, for units that are designed to the minimum specifications in today's rule. As listed in the rule and above, the safety factor helps account for uncertainties in the design, construction, operation, and location of the drainage layer and potential decreases in flow over time as a result of overburden compressive forces and clogging caused by fines and biological and chemical actions in any leachate that seeps through. Of course, all of the above mechanisms that could result in potential decreases in flow over time should also be considered when selecting the design, especially the hydraulic conductivity of the drainage layer, and in construction. Because this calculation used the minimum technical requirements and other design assumptions to maximize potential head on the bottom liner, and uses a safety factor, EPA believes that the units meeting the minimum technical requirements would not require action leakage rates below 100 gpad for landfills and waste piles and 1,000 gpad for surface impoundments.

Assuming the wetted area in the drainage layer beneath a small hole leak has approximately the shape of a cone from side view and a parabola from top view, the width of the parabola (B) is:

$$B = \frac{2\sqrt{Q/k}}{\sin\alpha}\sqrt{1+\frac{2x\sin\alpha}{\sqrt{Q/k}}}$$

where x = plan distance downslope from hole (i.e., B is a function of the distance x from the hole; most of B is at the hole with only slight increases downslope).

Assuming x = 0 (i.e., looking at B under the hole, $B = \frac{2\sqrt{Q/k}}{\sin\alpha}$) and substituting this value for B into Equation 1 modified for a triangular cross-section of flow (i.e., $Q = 1/2\ k \cdot h \cdot \tan\alpha \cdot B$) and solving for Q yields:

$$Q = k \cdot h^2 \qquad \text{[Equation 2]}$$

where h = head on the bottom liner and h < thickness of drainage layer.

This equation becomes the following if the condition is changed from "h < thickness of the drainage layer (D)" to "h ≥ D" (which is important for geonet calculations):

$$Q = k \cdot D\ (2h - D) \qquad \text{[Equation 3].}$$

Solving Equation 3 using the minimum design specifications in the final rule, Q =

for .1 cm/sec: 2100 gpad
.01 cm/sec: 210 gpad
geonet: 6800 gpad.

These numbers are the same as the results given above for Equation 1.

Results Using a 3-D Model

Tables 1-4 and Figures 1-10 in Appendix B were developed from a 3-D model to show the relative effects of various design parameters and assumptions on flow capacity, and to show the shapes of the flow in the drainage layer for various designs and assumptions, including hole size and head. Appendix C gives background information on the 3-D model. The tables show that slope, length of run, and hole size have some effect on flow rate (e.g., 4% increase in flow rate when slope is increased from 1% to 2% [Tables 1, 3-5]; 1% increase in flow rate at 1% slope when increasing length of run from 20 ft to 80 ft [Table 1; Figure 4 shows that length of run has negligible effect for slopes at or greater than the 1% minimum]; 43% increase when hole size is increased from .25 ft^2 to 1.0 ft^2 but a much less significant increase for holes > 3 ft^2 [Table 2; Figure 5 graphically shows the effect of leak size on flow rates]). However, the effect of these three variables is relatively insignificant compared to hydraulic conductivity, head, and drainage layer thickness (e.g., ten times increase (900%) when increased from .01 cm/sec to .1 cm/sec hydraulic conductivity [Tables 1, 3-5]; 382% increase when increased from no head to 2 ft head above the top liner, e.g., in a 2 ft deep surface impoundment [Table 3]; and 210% increase when geonet thickness is doubled from 5 mm to 10 mm [Table 5]).

Figures 2a-2d (side view) and 3a-b (top view) show the shape of the saturated zone for various designs, assuming no head above the top liner. These show only small portions of the bottom liner are actually exposed to the 1 ft head (as assumed in the simpler models discussed above). Figures 6-8b, however, show that as the head increases, so does the area of the bottom liner exposed to the greater heads. The graph for 8 ft head for surface impoundments is almost rectangular and therefore is not shown. Table 5 and Figure 10 show the results for geonets, which because of their high hydraulic conductivities have high flow rates.

Table 4 shows flow rates of 204 gpad and 2,040 gpad respectively for the landfill and surface impoundment specifications (i.e., 1% slope and hydraulic conductivity of 10^{-1} cm/sec for surface impoundments and 10^{-1} cm/sec for landfills, but with 1 ft of head above the top liner, 180 ft length of run, and a 1 ft^2 hole size). Comparing the results of the 3-D model to those of Equations 1 and 3, using the 1% slope and 10^{-1} cm/sec hydraulic conductivity for surface impoundments, shows that if the hole size is somewhat less than .25 ft^2, the flow rate with a 2 ft head would be about 2100 gpad [Table 3]. For 0 ft head above the top liner, the hole would be somewhat larger than 30 ft^2, or close to uniform flow [Figure 5].

3.2 Alternative Action Leakage Rates

While EPA recommends the above action leakage rates (100 and 1,000 gpad) for units that are built to the minimum design specifications, the Agency recognizes that a number of site-specific factors affect the maximum flow capacity of a leak detection system, and owners and operators may want to propose alternative action leakage rates. For example, the leak detection system design may be different than the minimums specified in the final rule. As indicated above, the hydraulic conductivity is a factor that significantly affects the flow capacity of the system. Since they are directly proportional, a ten times increase in hydraulic conductivity (i.e., from 10^{-2} to 10^{-1} cm/sec) increases the flow capacity ten times. Therefore, EPA believes that leak detection systems with greater hydraulic conductivities would have higher action leakage rates. In addition, owners or operators may have information to justify a different width of flow in the above calculation. Or the owners or operators may justify a higher action leakage rate by using a different formula or model. While the Agency recommends the use of the above model for defining the maximum flow capacity of the leak detection system and action leakage rate, EPA recognizes that there may be alternative models available now or in the future that may more accurately predict system flow capacity to justify higher action leakage rates. Therefore owners or operators may propose to use an alternative model that they believe more accurately predicts the maximum flow capacity of the leak detection system. Or, owners or operators may want to do a field flow (pump) test on the leak detection system to show actual flow capacity, which may justify a higher action leakage rate. Finally, owners or operators may have flow rate data on similarly designed units to use to justify a different level. As more and more units are built, the Agency as well as owners or operators will develop a better data base that may be used to justify other action leakage rates.

3.3 Action Leakage Rate Significance

Action leakage rates must not exceed the maximum flow rate capacity of the leak detection system in order to assure that a response action is triggered for significant leaks. That is, if the action leakage rate were greater than the flow capacity of the system, the trigger level or action leakage rate would never be reached and response actions implemented, no matter how large or massive the failure. Further, an action leakage rate that is based on a maximum of 1 ft head assures that significant pressures on the bottom liner will not be experienced, thereby decreasing the potential for migration of hazardous constituents into the bottom liner. Finally, EPA believes that flow rates in excess of the minimum action leakage rates often indicate a major localized or general failure of the top liner. Flow rates of 1,000 gpad or greater represent significant flow rates and potentially significant hole sizes that may be readily identified and repaired. Flow rates between 100 gpad and 1,000 gpad are large enough that the sources other than a leak will probably not account for all the flow (i.e., there is probably a leak situation that should be looked into). For these reasons, it is necessary to maintain leak detection flow rates below the action leakage rate and for the owner or operator to take response actions for leaks greater than the action leakage rate. *

The appropriate response action must be based on site-specific circumstances, including the magnitude of the actual flow rate (which is related to leak size), the ease of determining the source of leak and repairing it (e.g., often in a surface impoundment a hole can be observed from the surface, or a bulge in the top liner from underlying pressures may be observed from the surface indicating the possible leak location), and status of the unit (e.g., for a disposal unit about to close, it may be best to close the unit and get a sound cover on top rather than seek to find and repair a leak, especially for relatively low flow rates).

4. ADDITIONAL GUIDANCES AND REFERENCES

A number of technical guidance manuals have been published by EPA that discuss all the design features of the final rule. Some of these are listed in Appendix A. These cover: foundations and dikes; flexible membrane liners or geomembranes; soil/clay liners; composite liners; hydraulic conductivity and other properties of granular drainage layers, geonets, and clay/soil liners; leachate collection, and removal systems and leak detection systems designs; sumps and pumps; clogging; construction quality assurance and test fills; Darcy's Law and calculation of flow quantities, flow capacities, and time of travel or breakthrough times; response action plans; and covers.

5. CLOGGING

EPA sponsored studies [Bass et al., 1983; Bass, 1986; Ghassemi et al., 1986; Koerner et al., 1991] indicate that clogging of drainage layers of waste management units may potentially occur under some conditions. The results of the studies indicate that drainage layer clogging is caused primarily by sedimentation or biological growth. The results of the studies also suggest that the potential for clogging can be minimized by proper design and construction of the drainage layer. The potential for clogging of LDCRSs is generally lower than that for overlying leachate collection and removal systems (LCRSs) due to the relatively low volumes of flow in LDCRSs. Clogging of LDCRSs, however, could hinder the detection of leakage and the rapid removal of liquid from the LDCRS.

With this in mind, EPA is supporting the use of relatively permeable LDCRS materials in waste management units to minimize their potential for clogging. Fundamentally, a drainage material with large particles and, hence, large pore spaces, would have less potential for clogging than a material with smaller particles and, hence, smaller pore spaces. That is to say that materials such as coarse sands and fine gravels with a minimum hydraulic conductivity of 1 cm/s (1×10^{-2} m/s) would be less likely to clog than materials such as fine sand or silty sand with a minimum hydraulic conductivity of 1×10^{-2} cm/s (1×10^{-4} m/s).

Landfill Clogging[1]

Following is a summary of a research study looking at clogging.

Tested: * 2x10-2 cm/sec Ottawa sand (subrounded uniform size, 0.42mm--no. 40 sieve--avg particle size);
* 5x10-3 to 4.7x10-1 cm/sec filter fabrics (7 different geotextiles, including polypropylene (PP), polyethylene (PE), and polyester (PET)).

[Note: geotextiles use less space, are easier to transport, easier to place, and less expensive].

Tested using municipal waste leachate of different strengths.

Conclusions

* Flow rates always decreased (from 10-100%) over time: usually a sharp initial decrease followed by a continued linear, slightly linear, or sharply exponential decrease. In some cases flow decreased to levels that were not measurable by the experimental design.

* Sand (over geotextiles) clogged considerably more than those with geotextiles alone (23% flow retained for sand/geotextiles vs 34-45% flow retained with geotextiles alone).

* Type of polymer (PP, PE, & PET) appears to have no significance. Biological degradation of polymeric-based geotextiles did not occur.

* Stronger leachates (i.e., with higher BOD, COD, & TS) have greater clogging impacts. Particulate clogging appeared to be synergistic with the biological clogging.

* Both anaerobic and aerobic conditions promote clogging.

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[1] Koerner, Robert and George Koerner, Landfill Leachate Clogging of Geotextile (and Soil) Filters, EPA 600/2-91/025, August 1991 (NTIS # PB91-213660).

6. CONCLUSIONS

Facilities with good CQA perform significantly better than those without.

Facilities with good CQA appear to consistently achieve 50 gpad or less, taking into account other sources of liquids such as construction water and consolidation water. Whereas only about 70% of the facilities with good CQA achieve 20 gpad, which was the top of the range in the May 29, 1987 proposed rule. These results coupled with the magnitude of other sources of liquids indicates a practical action leakage rate is ≥ 100 gpad.

Calculations and models used to determine the action leakage rate show:

* Flow rates of 100 gpad for landfills and waste piles and 1,000 gpad for surface impoundments appear to be reasonable action leakage rates for the minimum specifications for slope and hydraulic conductivity in the final rule;
* Hydraulic conductivity is a significant factor (in all the models) since the flow rate is directly proportional to hydraulic conductivity: a change from 10^{-2} to 10^{-1} cm/sec increases the flow rate 10 times;
* Slope is relatively insignificant;
* Length of run is not a factor for slopes ≥ 1%;
* With no head above the top liner, the shape of flow is basically conical below the hole and rapidly tapers off, but with heads above the top liner more of the bottom liner is exposed to the higher heads;
* The size of leak is a factor that also influences whether the action leakage rate or flow capacity of the leak detection system will be exceeded. In the formula in the proposal background document, the size of leak is not considered since it is assumed that the hole is large enough to provide the maximum flow rate (Q) calculated. The 3-D model however confirms that the size of leak is indeed a limiting factor;
* Models that assume uniform leakage (which is an unrealistic assumption because the top liner is a geomembrane, not clay or other porous media) give higher flow capacities than models assuming one or more leaks through the top liner.

Clogging by fines or biological and chemical actions needs to be considered in the design (e.g., by the use of gradation or fabric filters and higher permeability drainage materials) and in the safety factor.

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5. EPA, "Background Document: Proposed Liner and Leak Detection Rule", EPA/530-SW-87-015, May 1987, 526 p.

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7. EPA, "Technical Guidance Document: Construction Quality Assurance for Hazardous Waste Land Disposal Facilities", EPA/530-SW-86-031, Oct. 1986, 88 p.

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APPENDIX A

EPA LINER GUIDANCES

DESIGN & CONSTRUCTION OF LINER SYSTEMS

A1. Guide to Technical Resources for the Design of Land Disposal Facilities, EPA-625-6-88-018, December 1988, 63p.

A2. Seminars--Requirements for Hazardous Waste Landfill Design, Construction and Closure, CERI-88-33, June 1988, 441p.

A3. Seminar Publication: Requirements for Hazardous Waste Landfill Design, Construction, and Closure, EPA-625-4-89-022, CERI, August 1989, 127p.

A4. Lining of Waste Containment and Other Impoundment Facilities, EPA-600-2-88-052, RREL, Sept. 1988, 1026p.

A5. Technical Guidance Document: Construction Quality Assurance for Hazardous Waste Land Disposal Facilities, EPA-530-SW-86-031, Oct. 1986, 99p.

CLAY/SOIL LINERS

A6. Design, Construction, and Evaluation of Clay Liners for Waste Management Facilities, EPA-530-SW-86-007F, Nov. 1988.

FML SEAMS

A7. Technical Guidance Document: The Fabrication of Polyethylene FML Field Seams, EPA-530-SW-89-069, Sept. 1989, 42p.

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A9. Field Inspector's Manual: Stress Cracking of Flexible Membrane Liner Seams, EPA, December 1988.

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A10. Design and Construction of Covers for Solid Waste Landfills, EPA-600-2-79-165, MERL, August 1979, 274p.

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A20. Field Behavior of Double-Liner Systems, Rudolph Bonaparte and Beth Gross, Waste Containment Systems: Proceedings of ASCE Symposium, SFO, Nov. 6-7, 1990.

A21. Quantification of Leak Rates Through Holes in Landfill Liners, K. Brown et al for EPA, August 1987.

A22. Draft Background Document on Double Liner Rule, EMCON Associates for EPA, September 1987.

A23. "Durability and Aging of Geosynthetics--2nd GRI Seminar", December 8 & 9, 1988, 21 papers.

Liner-Waste Compatibility

A24. Liner Materials Exposed to Hazardous and Toxic Wastes, H. Haxo, Jr. et al, Matrecon, Inc. for EPA, September 1984, 271 pgs.

A25. "Liner Materials Exposed to Hazardous and Toxic Wastes", Waste Management & Research (1986) 4, 247-264, H. Haxo, Jr. et al.

A26. "Analysis and Fingerprinting of Unexposed and Exposed Polymeric Membrane Liners", H. Haxo, Jr., Matrecon, Inc.

A27. "Supplementary Guidance on Determining Liner/Leachate Collection System Compatibility" memo from Bruce Weddle to EPA Regions, August 7, 1986.

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FML Stress Cracking

A29. Environmental Stress Cracking of HDPE Geomembrane Seams and Related Studies, Geosynthetic Research Institute for EPA, March 20, 1988.

Permeability/Hydraulic Conductivity of Clays/Soils

See A6 and A1-5.

A30. Procedures for Modeling Flow Through Clay Liners to Determine Required Liner Thickness, EPA/530-SW-84-001, April 1984.

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A32. Assessment of Technology for Constructing and Installing Cover and Bottom Liner Systems for Hazardous Waste Facilities, Vol. I: Data Base Development: Perspectives of Industry Experts, State Regulators, and Owners and Operators; Vol. II: Technical Analysis (Final Report), TRW for EPA, April 1983.

DESIGN CRITERIA SPECIFICATION

SPECIFICATION 508547-000

Waste Isolation Pilot Plant
Leak Detection Collection & Removal System (LDCRS)

Salt Storage Pond #5

Cementation

Prepared by:

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THL Capital Inc. Sub-Contractor to Cementation USA Inc.

Contractor to Nuclear Waste Partnership LLC

REVISION LOG

REV	DATE	DESCRIPTION
0	9/25/2017	
1	9/6/2018	Added Specification Number

REVISION APPROVALS

REV	DATE	DESIGNATION	NAME
0	9/25/2017		Norman H. Tjhang
1	9/6/2018	Project Manager	Dan Miners

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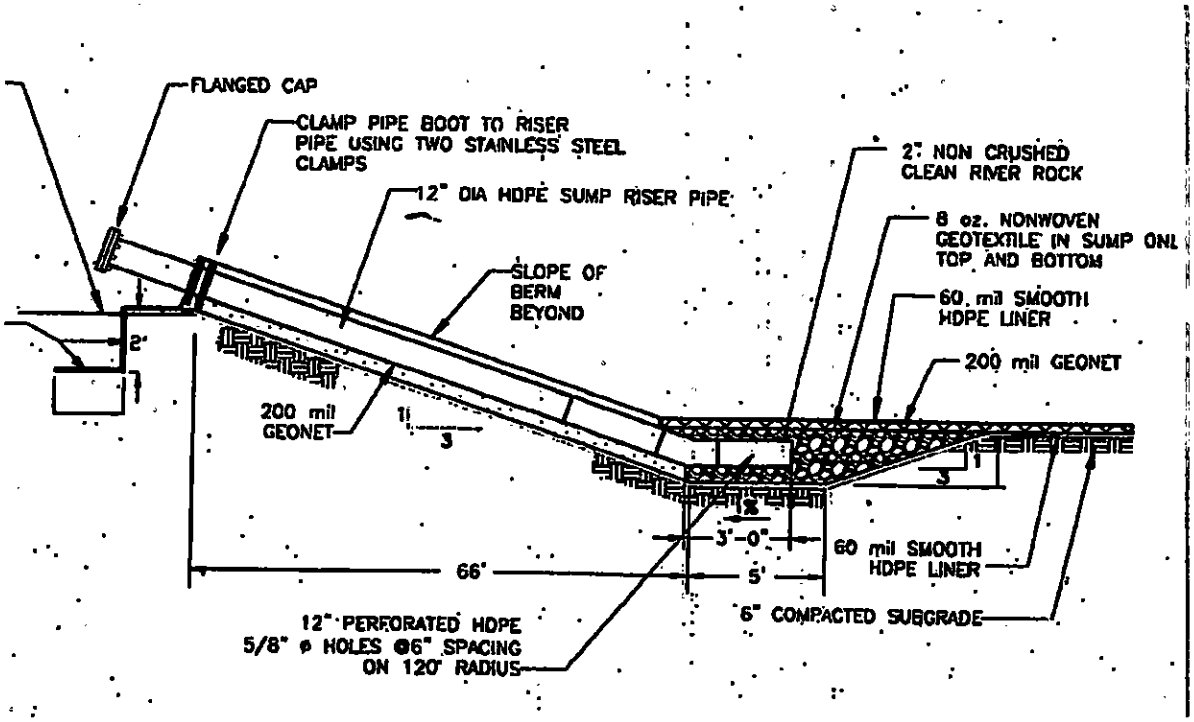
1.0 INTRODUCTION

Salt Storage Pond #5 will have a double liner and leak detection system that will be constructed with a CQA (Construction Quality Assurance) program. The leak detection, collection and removal system (LDCRS) will be monitored by checking the liquid level in the secondary liner in the pond's sump on a continuous basis.

This document provides a design criteria and descriptions, of the system for detection, collection and removal of leakage liquid in the sump between the top and bottom liner of the Salt Storage Pond #5.

2.0 DESIGN CRITERIA

The LDCRS will be designed to remove salt solution/leachate from the sump located between the primary and secondary liners of Salt Storage Pond #5. The sump will be located at the lowest elevation of the pond's bottom, and inside the berm's toe. The following is a proposed cross-sectional view of the Leachate Detection Collection and Removal System.



The leachate removal system will meet the following requirements:

1. Sized to fit through the existing 12 inch diameter HDPE riser pipe.
2. Operated automatically whenever the leachate is present in the sump.
3. Capable of removing the accumulated leachate at the earliest practicable time to minimize the leachate head on the liner.
4. The leachate (salt solution) depth in the sump will not exceed 12 inches.
5. Capable of recording the total volume of liquid in gallons, and the rate of leachate removed in Gallons per day.
6. Capable of conveying the leachate from the sump between the liners to the pond and overcome a minimum of 30 foot of pressure head.

3.0 LEACHATE REMOVAL SYSTEM COMPONENTS

There are four main components in the mechanics of the leachate removal system:

1. Submersible pump
2. PVC drain line
3. Flow meter and totalizer display
4. Power supply to the pump

– pressure transducer?,
– liquid level device

If there is no power grid within close proximity of the pond, it will be necessary to power the pump and the display with an off grid solar power system, which consists of:

1. Pure sine inverter charger
2. Battery temperature sensor
3. Solar panels
4. Solar charge controller
5. Deep cycle batteries

4.0 PUMP REQUIREMENTS

The pump will have the following characteristics:

1.0 Submersible type, (Grundfos SP series or approved equivalent) which eliminates the need for priming.

2.0 The motor will be:

- 2.1 Hermetically sealed and equipped with built in lightning protection.
- 2.2 Thermally protected to prevent overheating
- 2.3 Heavy duty and highly efficient

3.0 Tygon seal or similar for corrosion resistance in salt

4.0 Equipped with stainless steel housing or enclosure to eliminate corrosion

5.0 The pump can be inserted into the existing 12" diameter pipe riser

6.0 Capable to pump vertically to 50 feet or more

7.0 Equipped with thermoplastic impellers, diffusers, intake screen and check valve. (for corrosion resistance)

8.0 Flow (GPH) is a minimum of 300 at 60 ft. head

9.0 Maximum suction lifts 125 ft.

10.0 Maximum total head 120 ft.

An example of a pump which meets or exceeds the above requirements would be: Wayne 2 wire 4in. Submersible deep well pump, by Northern Tool & Equipment. Model No. T51S10-4, or equivalent.

5.0 FLOW METER AND TOTALIZER REQUIREMENTS

Flow meter and Totalizer are required to measure and monitor the amount of leakage rate in the double lined Salt Storage Pond #5. The flow meter requirements are as follows:

1.0 An insertion electromagnetic type, which would be easy to install, no maintenance and has no moving parts. It is highly accurate, insensitive to specific gravity, viscosity, pressure and temperature and non-corrosive.

2.0 Designed for use with conductive liquids in 1 to 6 inch diameter pipe.

3.0 Sensor body: PVC materials

4.0 Can be installed upstream

5.0 Designed for analog output and display of flow rate and total.

6.0 Non corrosive housing

7.0 Allow Rate and Totalizer to be mounted on the meter or remotely wall mounted.

8.0 Flow range 0 to 50 GPM (Maximum)

9.0 NRTL marked

The flow rate and total display will be:

1.0 Simple to set up

2.0 Looped powered

3.0 Rugged noncorrosive metal housing

4.0 Good for flow range of 0 to 50 GPM

5.0 Non-volatile memory

6.0 NEMA 4X (IP66) and NRTL marked

An example of an insertion electromagnetic flowmeter is FMG981P, or equivalent, with rate and total display, and complete with installation fittings and accessories when applicable, and if remotely mounted display is preferred.

6.0 SOLAR POWER REQUIREMENTS

The following equal or equivalent solar power kit is recommended:

1.0 Aims Power, 1440 watt, 24 Volt off grid solar kid with 2,000-Watt power inverter charger, model KITB-2K24120-C1. The panels are covered in tempered glass to protect hazardous weather. The PV wiring is protected against water, ozone, fluids, oil, salt and general weathering. Each system comes with a wiring diagram.

The kit includes the following parts:

- PICOGLF20W24V120V-2000 - watt pure sine inverter charger – 24 VOLT
- PICOGLFBATTS - qty 1- Battery temperature sensor
- PV240POLY- qty 6- 240-watt solar panels
- SCC60MPPT – 60-amp MPPT solar charge controller
- 6FM200H -qty 4 - 200AH deep cycle battery
- PVF100FT10AWG - 100-foot PV wire for solar panel (female)
- PVM100FT10AWG - 100-foot PV wire for solar panel (male)
- CBL08FT6AWGC - 8 ft. charge controller to battery cables
- CBL06FT6AWG - 6 ft. 6AWG cable (inverter cable)
- CBL02FT6AWG - 2 ft. 6AWG cable (battery cable)
- CBL01FT6AWGRED - qty 3- 1 ft. jumper for fuse kit and battery jumpers
- ANL100KIT – 100-amp inline fuse kit
- PVEXT15FT10AWG - qty 2 – 15 ft., PV extension wire
- PVMC4.A - 2F1M - MC4 Branch 2F to M
- PVMC4.A - 2M1F - MC4 Branch 2M to F

2.0 Apollo Solar Powered Piston Pump Model 102 or equivalent, with solar power set-up option consisting of solar panel, charge controller and batteries.

7.0 REFERENCES

1,0 EPA 530-R-92-004 NTIS 3PB 92-128 214 Action Leakage Rate for Leak Detection System January 1992

2.0 Drawing No. 23-C-011-W1........... Washington TRU Solution LLC

3.0 Drawing No. 23-C-011-W9 .... Washington TRU Solution LLC

4.0 Drawing No. 23-C-011-W16 .... Washington TRU Solution LLC

5.0 Drawing No. 23-C-014-W17 .... Washington TRU Solution LLC

6.0 Information from Suggested Equipment Suppliers

http://www.omega.com/Manuals/manualpdf/M5279.pdf

http://www.invertersupply.com/index.php?main.page=productinfo&cPath=425
566&products id=4346

http://blackhawkco.com/products/catalog/Apollo Solar-Powered Pump 102

http://www.northerntool.com/shop/tools/product 200311419 200311419

SPECIAL CONDITIONS

SPECIFICATION E-Z-475

Waste Isolation Pilot Plant

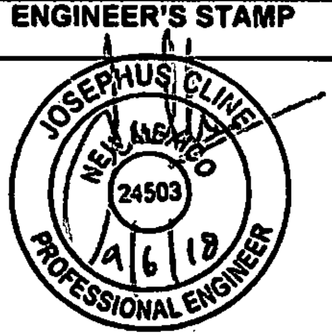
HDPE Geomembrane Liner, Geofabric, Geonet, and HDPE Pipe

Cementation

REVISION LOG		
REV	**DATE**	**DESCRIPTION**
A	9/29/2017	
0	10/27/2017	Final
1	12/08/2017	Stamped
2	9/6/2018	Added Specification Number

REVISION SIGNATURES				
REV	**DATE**	**DESIGNATION**	**NAME**	**SIGNATURE**
A	9/29/2017			
0	10/27/2017			
1	12/08/2017	Project Manager	Dan Miners	
2	9/6/2018	Project Manager	Dan Miners	

ENGINEER'S STAMP



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Action leakage?

1.0 SCOPE

1.1 DESCRIPTION OF WORK

1.1.1 This specification discusses the requirements to perform installation of new 60 mil high density polyethylene (HDPE) geomembrane liner at NWP WIPP Salt Cell 5, Salt Storage Pond 5, Storm Water Pond 4 and Brine Evaporation Ponds West and East. This work consists of the following steps:

A. Submit all geosynthetic product information and testing results on each roll of the liner, geonets, geofabrics, HDPE pipes.

B. To provide liner panels, geonets, geofabrics and HDPE pipes lay out and installation plan

C. Placing liner panels on prepared subgrade

D. Double fusion welding of the liner panels, and extrusion welding for patching and repair.

E. QA/QC testing on all weld seams and liner patch welds

F. Installation of geonets, geofabrics and HDPE pipes

G. To provide records on as built drawings, testing results

1.1.2 The contractor shall furnish all labor, materials, equipment, and incidentals required to perform the work, as shown on the drawings, and as specified in these specifications.

1.2 DEFINITIONS

1.2.1 Geomembrane: High Density Poly Ethylene (HDPE) plastic liner, used for lining Salt Cell 5, Salt Storage Pond 5, Storm Water Pond 4 and Brine Evaporation Ponds West and East.

1.2.2 Sheet/Panel: Each separate piece of geomembrane sheeting that is seamed to other sheets at the project site

1.2.3 Fusion Welding: The Split Hot Wedge welder is a fully automated device comprising of a heated copper wedge, pressure rollers and electronic controls. The copper wedge shall be controlled and constantly monitored by a programmable controller with an audible off-temperature alarm and a variable speed drive unit. The copper wedge shall create two contact fusion areas of a minimum width of 10mm and a 2mm minimum wide void between each of the separate parallel zones. This void shall be created over the entire seam length to allow for field weld pressure testing

1.2.4 Extrusion Welding: A finishing technique where a bead of molten HDPE plastic is used to weld thermoplastic geomembrane (HDPE Liner) materials. Extrusion Welding Machine:

consists of a heated barrel with a plasticizing screw to deliver molten plastic to a specially shaped shoe. The shoe is shaped to make a bead of plastic suitable for the HDPE liner material type and thickness. A preheat blower is attached to the machine to ensure the weld area is dry and clean.

1.2.5 Cap strip/ Patch: Unwrinkled, new HDPE Geomembrane sheet, cut and shaped to cover a cut on the existing HDPE Geomembrane liner. The patch material shall be identical in texture and thickness with the existing liner to be repaired.

1.2.6 Replacement Strip: Geomembrane material placed over a gap in previously place geomembrane.

2.0 APPLICABLE DOCUMENTS

2.1 CODES, SPECIFICATIONS AND STANDARDS

The latest version of codes, specifications and standards referred to by title or number shall fom a part of this specifications where referenced herein. These publications are not furnished with contract documents.

Geosynthetic Research Institute (GRI):

GRI Test Method GM 13	Test Properties, Testing Frequency and Recommended Warranty for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes.
GRI Test Method GM 19	Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes

National Sanitation Foundation (NSF)

NSF 54-1993	Standards for Flexible Membrane Liners

The following publications shall be used as applicable:

U.S. Environmental Protection Agency (EPA)

EPA/530-SW-86-031	Technical Guidance Document: Construction Quality Assurance for Hazardous Waste Land Disposal Facilities. October, 1986
EPA/530-SW-91/o51	Technical Guidance Document for the Fabrication of Geomembrane Field Seams. May, 1991
EPA/600/SR-93/182	Technical Guidance Document: Quality Assurance and Quality Control for waste Containment Facilities.

American Society for Testing and Materials (ASTM):

ASTM D 1505	Standard Test Method for Density of Plastics by the Density-Gradient Technique
ASTM D 1603	Standard Test Method for Carbon Black Content in Olefin Plastics
ASTM D 3786	Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics-Diaphragm Bursting Strength Tester Method
ASTM D4437	Standard Practice for Determining the Integrity of Field Seams Used in Joining Flexible Polymeric Sheet Geomembranes
ASTM D 4833	Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products

ASTM D 5035	Standard Test Method for Breaking Force and Elongation of Textiles Fabrics (Strip Method)
ASTM D 5199	Standard Test Method for Measuring Thickness of Textile Materials
ASTM D 5820	Standard practice for pressurized air channel Evaluation of Dual Seamed Geomembranes
ASTM D6365	Standard Practice for the Nondestructive Testing of Geomembrane Seams Using the Spark Test

2.2 RELATED WORK SPECIFIED ELSEWHERE

Specification E-Z-261	Specifications for Earthwork.

3.0 PRODUCTS PEROMANCE AND TESTING REQUIREMENTS

3.1 PRODUCTS

3.1.1 Geomembrane Liner

A. Geomembrane liner shall be HDPE liner, black, 60 mils thick, smooth, meeting the requirements in GRI Test Method GM-13.

Table 1 – Requirements for Smooth HDPE Liner

Property	Test Methods	60 Mil HDPE
Density g/cc	ASTM D 1505	0.094
Tensile Property	ASTM D638 (Type IV at 2 in/min)	
Yield lbs./in		126
Break Test lbs./in		228
Yield Elongation %		12
Break Elongation %		560
Tear Resistance	ASTM D 1004	42
Puncture Resistance, lb	ASTM D 4833	108
Carbon Black Content, %	ASTM D 1603	2-3
Carbon Black Dispersion	ASTM D5596	Cat 1-2
Seam Properties	ASTM D4437 (1-inch-wide at 2 in/min)	
Shear Strength, lb/in		120
Peel Strength, lb/in		78/FTB

B. The contractor shall furnish Manufacturer's certification that the geomembrane was manufactured and tested in accordance with GRI Test Method GM 13.

C. Provide a minimum 20 years manufacturer's warranty in writing, contractor shall warranty installation workmanship for one year, from completion of work.

D. Furnish the geomembrane in rolled, single ply continuous sheets with no factory seams.

E. Sheet width shall be minimum of 22 feet.

3.1.2 **The extrusion welding rod/wire**: shall have the same resin material characteristics as defined for geomembrane in GRI Test Method GM13

3.1.3 **Geonet**: Geonet shall consist of bi-planar 200 mil black HDPE drainage net thickness and provide transmissivity of 9.6 gallon/minute/foot

Property	Test Method	Frequency	Min. Avg. Roll Value
Thickness, Mil (mm)	ASTM D5199	50,000 sf	200 (5.1)
Peak Tensile Strength MD, lbs./in. (N/mm)	ASTM D5035/7179	50,000 sf	45 (7.9)
Density, g/cm3	ASTM D792, Method B	50,000 sf	0.94
Carbon Black Content (%)	ASTM D4218	50,000 sf	2 - 3
Transmissivity (2), m2/sec. (gal/min/ft)	ASTM D4716	500,000 sf	2 x 10-3 (9.6)

A. Geonet shall be free of visible defects, gels, undispersed ingredients, and any contamination or defects that may affect its serviceability. The geonet shall be free of cuts and tear.

B. The manufacturer shall provide certification that the material meets or exceeds the value listed above.

3.1.4 **Geotextile:** Geotextile shall be of 8 oz. per square yard polypropylene, staple fiber, needle punched nonwoven geotextile. The geotextile is resistant to ultraviolet degradation and to biological and chemical environments normally found in soils.

3.1.5 Meeting the following testing properties:

Property	Test Method	Frequency	Minimum Avg. Roll Value
Mass/Unit Area oz./sy (g/m2)	ASTM D-5261		8 (271)
Grab Tensile, lbs. (N)	ASTM-4632	100.000 SF	205 (910)
Elongation %	ASTM-4632	100,000 SF	50
CBR Puncture, lbs.(k N)	ASTM-6241	500.000 SF	500(2.2)
Trapezoidal Tear, lbs.(N)	ASTM-4533	100.000 SF	80 (359)
UV Resistance % strength retained after 500 hours	ASTM D-4365	Formulation	70
Apparent Opening Size, US Sieve (mm)	ASTM D-4751	500.000 SF	80 (0.180)
Permittivity, sec-1	ASTM D-4491	500.000 SF	1.1
Water Flow Rate, g/min/sf (l/min/m2)	ASTM D-4491	500.000 SF	90 (3675)

3.1.6 **HDPE Pipe:** The pipe shall be high density, high molecular weight, polyethylene pipe, shall conform to ASTM D3350 with a minimum cell classification value of 345464C. The pipe shall conform to the following physical property:

Property	Test Method	Value
Density	ASTMD1505	0.955 gms/ccm
Melt Index	ASTM D 1238	0.15 gms/10 min.
Flex Modulus	ASTM D790	110,000 to 160,000 psi
Tensile Strength @ yield	ASTM D638	3,200 to 3,500 psi
Slow Crack Growth Resistance	ASTM F1473	100 hours

Hydrostatic Design Basis	ASTM D2837	1,600 psi @ 23 Degree Celsius

3.2 DELIVERY STORAGE AND HANDLING OF ALL GEOSYNTHETIC MATERIALS

3.2.1 Materials shall be delivered onsite only after the NWP representative has approved all required submittals.

3.2.2 Care shall be taken to keep the materials clean and free from damage prior to installation.

3.3 EXTRUSION WELDING EQUIPMENT

3.3.1 Extrusion welding machines use a heated barrel with a plasticizing screw to deliver molten plastic to a specially shaped shoe. The shoe is shaped to make a bead of plastic suitable for the material type and thickness being welded. A hot air blower is attached to the extrusion welder to preheat the weld area. The welder uses its own weight to create the pressure required for welding and the operator steers the welder manually. Extrusion welders come in a number of sizes with different output rates. It is the contractor responsibility to choose the appropriate size for this work.

3.3.2 Hot Air Gun: use for temporary tacking the liner patch to cover the hole(s), before grinding and extrusion welding is applied.

3.3.3 Rotary Sander or grinder: use for removing oxidized liner surface prior to welding. It is a hand-held power tool, rotary grinder having a grinding disk of 4 inches in diameter and a sufficient quantity of #80 grit paper. Sand paper coarser than #80 is not acceptable.

3.3.4 Coupon Cutter: Use to perform easy productive cutting of weld sample specimens

3.3.5 Tensiometer: Use for destructive testing of a pre-weld trial seam. Contractor shall provide the current Calibration Certificate.

3.3.6 Vacuum Box tester: Use for non-destructive testing of a seam, to ensure no leakage on the seam. For more information see section 5.3 of this specification

3.3.7 Spark Tester: Use for non-destructive testing of a seam, to ensure no leakage on the seam. For more information, see Section 5.3 of this specifications.

3.3.8 Portable electric generator: Use for generating electricity to power the welding machine, hot air gun, rotary sander, and tensiometer. Provide generator with sufficient size to handle all power equipment and lighting when needed.

3.3.9 Extension cords with GFCI outlets to plug in all power equipment.

3.4 OTHER MATERIALS

3.4.1 Sand Bags used for hold-downs shall be tied and fastened with material that will not damage the liner. Metal wire shall not be used. The material makeup of the sandbags shall be sufficiently strong to withstand the forces that will be placed upon them during their use and shall be constructed to preclude spillage of sand contained therein. Leakage of sand onto liner shall not be permitted.

3.4.2 Sandbags shall be collected and remove from the work area and disposed of properly as directed by NWP representative, at the end project.

3.5 GASKETS, METAL BATTENS, CLAMPS, EMBEDDED CHANNELS, AND SEALANTS

3.5.1 Gasket material shall be neoprene, closed cell medium, 0.25-inch-thick, with adhesive on one side, or other gasket material as approved by the liner manufacturer.

3.5.2 Metal battens shall be 0.25-inch-thick by 2 inches wide stainless steel. Clamps shall be 0.5-inch-wide stainless steel.

3.5.3 Sealant shall be General Electric Silicone, RTV 103, or equivalent.

4.0 FIELD EXECUTION

4.1 PERFORMANCE REQUIREMENTS FOR LINER INSTALLATION

4.1.1 A liner installation plan and schedule shall be prepared detailing all aspects of geomembrane installation according to Contractor's approved schedule.

4.1.2 The liner shall be installed or supervised by an individual that has the necessary training and experience as required by the liner manufacturer. All manufacturer's installation and field seaming guidelines shall be followed. All synthetic liner seams shall be field tested by the installer and verification of the adequacy of the seams shall be submitted to NWP along with the record drawings and field testing records.

4.1.3 The contractor and NWP's QA representative shall visually inspect the subgrade where the liner shall be installed. The subgrade shall:

A. Have no sharp objects or rocks greater than ½"

B. Have smooth surface

C. Be even and no abrupt change in elevations

D. Be firm and unyielding.

E. Be dry, and no standing liquid or puddle.

The liner installation contractor shall prepare a certificate of "Subgrade Surface Acceptance" that documents the areas that the parties present (including the liner installer).

4.1.4 The contractor shall install the geomembrane HDPE liner as specified in this specification section 4.2 and have agreed that the criteria have been met for installation of geomembrane.

4.1.5 The contractor's seamer/welder shall perform pre-welding trial seam(s) as specified in section 5.1.

4.1.6 Only approved welder and welding machine team should apply extrusion weld to the seam uniformly and continuously, to cover the seam all around the patches.

4.1.7 Prior to the beginning of a seam, the extrusion welding machine shall be purged until all potentially heat degraded extruded material has been removed from the barrel

4.1.8 Installed liner shall not be backfilled or covered by sand or soil without prior approval and witness by NWP's QA representative

4.1.9 Driving construction equipment on any installed liners shall be prohibited unless the surface has been covered with at least 24 inches of protective soil to prevent damage by the equipment.

4.1.10 Installed liner shall be protected from any damage from placing protective sand or soil or backfill or any earth work. Any damages to the liner shall be reported to NWP representative and repaired immediately.

4.1.11 During the placement of any fill materials on top of the liner, NWP's QA representative shall be present to witness it.

4.1.12 Anchor trench backfilling shall be performed after the slack has been locked in and shall be in accordance with the Specifications EZ- 262 Earth Work

4.2 GEOMEMBRANE DEPLOYMENT

4.2.1 No geomembrane deployment shall be conducted during ice, snow or rain.

4.2.2 The contractor shall visually inspect each of the deployed liner panel for factory damage or imperfections. Each imperfection shall be marked and repaired.

4.2.3 The geomembrane shall be installed in accordance with the approved Liner Installation Plan, previously submitted by contractor and approved by NWP

4.2.4 Each deployed panel shall be identified by the manufacturer's roll number

4.2.5 The liner sheet shall be oriented in a manner that reduces stress on the seam. To this end, the liner shall be placed with seams oriented downslope where practicable. Horizontal seams shall be located at least 10 feet from the toe of the slope or areas of potential stress concentrations.

4.2.6 The panel layout shall minimize the number and length of field seams.

4.2.7 Only panels that are to be seamed together in one day shall be deployed. Some seams may be left open overnight to allow material to shrink before the seam is made.

4.2.8 Upon completion of installation, adequate anchorage and/or ballast shall be provided to prevent uplift by wind. The liner installer shall replace any liner material damaged by winds during installation.

4.2.9 Direct contact with the geomembrane shall be minimized. Scrub sheets shall be used under mechanical equipment and placed in high pedestrian traffic areas.

4.2.10 All tools and welding equipment shall be placed on a scrub sheet when not in use.

4.2.11 Cutting and patches shall be performed off the liner surface or on a scrub sheet.

4.2.12 The method of deployment of the geomembrane shall not cause scratches or crimps in the geomembrane and should not damage the subgrade. The method shall also follow the manufacturer's recommendations to minimize wrinkles, especially differential wrinkles between adjacent panels.

4.2.13 Once deployed each panel of geomembrane shall be inspected for indications of damage in the sheet continuity. Damaged areas shall be marked with water proof paint on the sheet. NWP shall be notified of ALL damaged areas and are to be patched or replaced.

4.2.14 Care shall be taken to ensure that the liner panels are positioned in a slacken condition so that they will:

A. Conform to the subgrade irregularities, with no "bridging" of the liner over depressions or corners in the underlying subgrade and

B. Not become taut when exposed to the temperature range expected in the area or when ponds are filled.

4.2.15 Slack shall be "locked in" in the liners on the side slopes and base and in the anchor trench. Hold down sandbags shall be placed along the bottom edge of the side slopes so that the open distance between sandbags shall not exceed 2 feet. The proper amount of slack for the side slopes shall be positioned above the stationary sandbags and distributed uniformly up to the slope.

4.2.16 With consideration of the actual liner temperature at the time that the slack is to be lock in, the contractor shall lock in adequate slack in each liner so that:

A. No major bridging or excessive tension shall occur at liner material temperature lower than 40-degree Fahrenheit. Major bridging is defined as the liner lifting 8-inches or more, off the subgrade at the toe of the slope and does not rest on the subgrade when the liner temperature exceeds 80-degree Fahrenheit

B. No permanent standing folds capable of folding over on themselves shall develop at temperatures higher than 90-degree Fahrenheit. If permanent standing fold occur, repair shall be made. Liner shall be cut to eliminate permanent standing folds higher than 12-inches.

4.3 GEOMEMBRANE SEAMING:

4.3.1 Field seams between panels shall be fusion welded by dual-hot-wedge welding method. Extrusion welded seams shall be used at panels corner intersection, pipe penetrations, at patches required after test samples are taken, and minor repairs where it is not practical to use hot-wedge seams. Hot-wedge and extrusion welding techniques, including surface and edge preparation, shall be as described in EPA/530-SW-91/051.

4.3.2 The Contractor shall provide certification that field seams meet the requirements of GRI Test Method GM 19.

4.3.3 Field seaming shall follow sheet placement as closely as possible, but with adequate time allowed for the adjacent sheets to equilibrate with respect to temperature.

4.3.4 The operator will keep constant visual contact with the temperature controls, as well as the completed seam being produced by the machine. Constant visual and "hands-on" inspection is also required.

4.3.5 The panels of geomembrane shall be overlapped by the minimum of the following dimensions:

- Three inches (73 mm) for extrusion welding
- Four inches (100 mm) for fusion welding

4.3.6 Clean the contact surfaces of the sheets to remove dirt and dust, moisture, debris, and foreign materials.

4.3.7 For extrusion welds, grinding/buffing shall be conducted to remove oxidized material at the seam locations. This shall be done in accordance with EPA/530-SW-91-051 and the following requirements:

A. The grinding shall not extend more than ¼ inch beyond the limit of the extrudate after seam completion.

B. Grinding shall be performed preferentially in perpendicular path across the seam.

C. The depth of grinding shall be less than 10% of the sheet thickness.

D. Grinding shall be performed just prior to extrusion welding.

E. The grinded area shall not be touched by hand or wiped with rag or paper. Excessive shavings shall be removed using the hot air gun, or Leister.

4.3.8 The area of a seam shall be trimmed in advance of seaming using the following procedure:

A. All trimming of seams shall be advanced and maintained at least 50 feet ahead of seaming operations when possible.

B. Trimming shall be accomplished using a shielded blade or hooked knife.

C. Whenever possible, the cutting of the geomembrane will be from the underside of the sheet in an upward motion.

4.3.9 Seam Samples and Trial Seams:

A. Preconstruction samples of field seams made using field construction techniques to be employed during seaming operation shall be prepared by the Contractor for testing and evaluation prior to the initiation of the liner installation. These pre-construction samples shall be welded at the site. Four weld test strips shall be produced, two by the extrusion welding method and two by the dual-hot-wedge welding method. Each weld test strip shall measure 6 feet long by 10 inches plus seam width wide and shall be made using the liner material delivered to the job site and approved under the Specification herein. At NWP discretion, the test strips may be tested by a third-party Quality Assurance laboratory.

B. Trial seams shall be made on scrap/fragment pieces of geomembrane to verify that the seaming conditions and equipment are adequate.

C. Trial seams shall be performed at the beginning of seaming period (start of the day, mid -day, and any time after equipment shutdown) for each seaming apparatus to be used following a substantial change in weather conditions, at any time the seaming procedure has changed, or upon request of NWP

D. Trial seams shall be perfomed under the same conditions under which the actual seaming will be conducted.

E. The sample size shall be 12 inches wide plus seam width and 30 inches long and with the seam centered lengthwise.

F. Six specimens, 1-inch wide each, shall be cut with a die by the seamer. Three specimens shall be tested in shear and three in peel using field tensiometer. The test specimens shall fail in the film-tearing bond. The passing criteria for a 60 mil HDPE liner extrusion weld, per GRI GM19, Minimum Shear Strength: 120 lbs. /in at 50% minimum elongation. Minimum Peel Strength of 78 lbs. /in, at maximum 25% peels on the weld width.

G. Interpretation of Results:

(1) If the destructive testing meets or exceeds the requirement above, the welding machine and the welder technician are approved for the work period.

(2) If the specimen fails the destructive evaluation, the entire process will be repeated.

(3) If the same welding machine and seamer fail the testing a second time, the welding machine and the seamer will not be accepted and cannot be used for seaming until the deficiencies are corrected and two consecutive successful trial seams are completed.

(4) The pre-weld testing shall be witness by NWP's QA representative, and the results shall be recorded by the person performing the tests and submitted to NWP.

4.3.10 HDPE Seaming:

A. Field seaming shall be conducted in dry conditions and in a manner that prevents dust, dirt, or other foreign material from being included in the seam.

B. All welding equipment shall be handled/operated in the manner that minimizes the potential for damage to the installed liner.

C. The extrusion welder shall be purged prior to beginning a seam until all potentially heat-degraded extruded material has been removed from the barrel.

D. Seams shall be extended to the end of the panels in the perimeter anchor trench.

E. Seaming of geomembrane within the anchor trench shall be accomplished by temporarily supporting the adjacent sheets so that horizontal seaming can be accomplished continuously to the end of the sheets.

F. All cross seams are to be patched with at least 12 inches-diameter patches where they intersect.

G. Each field seam shall be identified by writing the following information on the geomembrane near the seam with the waterproof paint:

- Date, starting time, and mark at starting point of weld
- Welder's name or identifying initials
- Completion time and mark at ending point of weld

4.4 GEOMEMBRANE PENETRATIONS

4.4.1 Panels around piping penetrations or other projections through the panel will be cut with rounded corners to prevent tear propagation and ballasted to prevent wind lift until the pipe boot can be installed.

4.4.2 Pipe boots shall be fabricated to a size that tightly fits the outside diameter of the penetrating pipe. The boot shall be made of the same type of geomembrane as that of the liner through which the penetration is being made

4.4.3 The skirt of the pipe boot that flare away from the pipe shall have at least 12 inches of geomembrane on all sides of the pipes. The skirt of the pipe boot shall be seamed to the base of geomembrane by extrusion welding. If the vacuum testing of the seam is impractical, a copper wire for a spark testing shall be inserted prior to welding. NWP's QA representative shall be notified and witness the placement of the copper wire.

4.4.4 Stainless steel pipe clamps shall be used to attach pipe boots to the penetrating pipes and shall be of an adequate size to allow for a cushion of compressive material to be placed between the inside surface of the clamp and that of the geomembrane portion of the boot.

4.5 GEOMEMBRANE REPAIR

4.5.1 Repair Areas

A. Repair areas shall be identified and marked with waterproof paint on the geomembrane by the contractor and recorded on the daily report prepared by the contractor.

B. Repair shall be identified by an identification number/code and shall be located on the as-built drawing.

4.5.2 Extent of Repair Area

A. Point Repairs

(1) A hole, tear, blister, scratch, undispersed raw material, or geomembrane contamination defines a point repair. This type of repair shall also be made after the removal of destructive test sample.

(2) The extent of the repair area is defined as the visible extent of damage or continuity of the liner plus minimum of 6 inches in all directions.

B. Seam Repairs

(1) Seam Repairs are defined as necessary repairs identified by visual, non-destructive, and/or destructive testing. occurring in a seam between the field panels. The extent of the repair is defined as the area between two passing destructive or non-destructive test locations.

(2) The following procedure shall apply whenever a sample failed a Quality Control or Quality Assurance test. The contractor has two options:

(a) The contractor can reconstruct the seam between the failed location and any adjacent passed test location in both directions from the failed sample location.

(b) The contractor can take additional samples from the failed seam at a 10-foot distance in both directions from the failed test location. If this additional tests pass, then the seam shall be reconstructed between the two passing locations. If the test fails, then this process can be repeated.

(3) In all cases, acceptable reconstructed seams shall be bounded by two-passed test locations.

4.5.3 Repair Procedure

A. Repair required areas with pieces of flat and unwrinkled geomembrane material free of defects and seams. The repair material shall be of the same type as the liner material.

B. All patches, cap strips, and replacement strips shall have comers rounded to a 3-inch minimum radius.

C. Each patch or cap strip shall be extrusion welded to the installed geomembrane around the entire perimeter of the patch or cap strip.

D. Each cap strip shall be centered over the weld or cut being repaired and extrusion welded to the existing geomembrane. In those instances where the weld area being capped contain patches, the geometry of the cap strip shall be varied as necessary to ensure that the cap strip extrusion weld is not less than 8 inches from any existing weld.

E. Each replacement strip shall be fusion welded by the dual-hot-wedge method. If the replacement strip is fusion welded, the selected width of the replacement strip shall ensure that the fusion weld is not less than 8 inches from existing weld.

4.6 GEOMEMBRANE LINER INSTALLATION ACCEPTANCE

4.6.1 The geomembrane liner installation shall be accepted when:

A. The installation is complete

B. All required Quality Control documentation has been received from the contractor.

C. All Quality Assurance testing is completed.

4.7 LEACHATE COLLECTION PIPING (PERFORATED PIPE)

4.7.1 Pipe supplied under this specification shall have IPS (Iron Pipe Size) OD unless otherwise specified.

4.7.2 The perforated piping shall have an OD of 6.625" and DR 17, unless otherwise specified on the plans. Hole size shall be 1/2". Three holes, at 120 degrees, on six-inch centers will be drilled in the pipe. To maintain accuracy and uniformity, the pipe is to be drilled by a machine designed for perforating HDPE pipe. No drilling by hand will be allowed.

4.7.3 The pipe shall be joined by butt fusion.

4.7.4 Pipe installation shall be according to the Project Drawings and manufacturer's best practice.

4.7.5 Cleanouts for leachate piping are shown in the Project Drawings.

4.8 LEACHATE TRANSPORT PIPING

4.8.1 Leachate transport piping shall be solid wall HDPE pipe. Pipe size shall be as specified on the plans. The DR rating shall be 17.

4.8.2 The pipe shall be joined by butt fusion.

4.9 LEACHATE DETECTION COLLECTION AND REMOVAL SYSTEM (LDCRS)

4.9.1 LDCRS shall be fabricated and installed as shown in contract drawing. 12" HDPE pipe SDR 17 shall be joined by butt fusion.

4.9.2 The incline part of the pipe is solid pipe, only the horizontal pipe in the sump shall be perforated, three 5/8" diameter holes at 120 degrees at 6" spacing.

4.10 MAN-HOLE IN SALT CELL 5 SUMP

4.10.1 Shall be fabricated and installed as shown in contract drawing. The 24" vertical perforated pipe, 12 and 6" horizontal stubs pipe shall be SDR 17 HDPE pipes, no leak proof testing required.

4.10.2 The 24" vertical pipe shall be perforated, six 5/8" diameter holes at 60 degrees at 9" spacing.

5.0 QUALITY ASSURANCE REQUIREMENTS

5.1 NWP QUALITY ASSURANCE NOTIFICATION

5.1.1 Field inspection notification to NWP is required a minimum of one (1) working day in advance for the following (NWP will attend the inspections at their discretion):

A. Inspection and acceptance of subgrade conditions. Refer to Specification EZ-262, Earth Work, and Sections 4.1.3 and 4.1.4 of this specification.

B. Inspection of seam welding and on-site non-destructive field seam testing. Refer to Sections 5.2, 5.3 ,5.4

5.2 CONFORMANCE TESTING

5.2.1 Geomembrane

A. The purpose of the manufacturer's in-pant Material Conformance Test Sampling is to verify that geomembrane material that is designated for NWP's project is confirmed as meeting the project specifications prior to shipment to the site, thus, barring a transportation accident, the geomembrane can be installed immediately once it arrives on site. Tests shall be done in accordance with GRI Test Method GM 13.

B. NWP will examine all results from conformance testing.

5.3 FIELD QUALITY CONTROL

5.3.1 The contractor shall visually inspect all field welds immediately following work.

5.3.2 All field welds shall be non-destructively tested over their full length for continuity for extrusion welds.

5.3.3 Vacuum Box testing shall not be performed when air temperature drops below 33-degree Fahrenheit or if there is frozen precipitation or ice on the geomembrane surface.

5.3.4 Non-destructive Testing

A. The Contractor shall nondestructively test all field seams over their full length using air pressure testing. Spark testing shall be used in localized areas of extrusion welds where vacuum box testing is impractical.

B. NWP shall be notified and witness all the nondestructive testing.

C. Testing shall be carried out as the seaming work progresses, not at the completion of all field seaming.

D. The Contractor shall record the location, date, time, test number, tester's name and the outcome of the test.

E. Vacuum Box Testing

(1) The equipment shall consist of the following:

(a) Vacuum box assembly consisting of a rigid housing, a transparent viewing window, a soft neoprene gasket attached to the bottom, port hole valve assembly, and a gauge to indicate chamber vacuum.

(b) A steel vacuum tank and pump assembly equipment with pressure control and pipe connections.

(c) A rubber pressure/vacuum hose with fittings and connections.

(d) A bucket and wide brush or spray assembly

(e) Soap

(2) Use the following procedure:

(a) Follow procedure described in ASTM D4437

(b) Energize the vacuum pump and reduce the tank pressure to about -5 psi.

(c) With the soap solution, wet a strip of weld seam that is 3 inches larger than the vacuum box assembly.

(d) Place the box over the wetted area

(e) Close the bleed valve and open the vacuum valve

(f) Make sure the leak tight seal is created

(g) For a period of 10 to 15 seconds, examine the seam through the viewing window for the presence of soap bubbles

(h) If bubbles are not present, close the vacuum valve and open the bleed valve, then move the box over the adjoining area with 3 inches minimum overlap and repeat the process.

(i) Any area where soap bubbles appear, indicates a leakage on the seam, and therefore must be marked and recorded, and must be repaired and retested

(j) Vacuum box testing log must be submitted at the end of the day.

F. Air-Pressure Testing

(1) The equipment shall consist of the following:

(a) An air pump equipped with pressure gauge capable of generating and sustaining a pressure of 30 psi.

(b) A rubber hose with fittings and connections.

(c) A sharp hollow needle or other approved pressure feed device.

(2) The following procedure shall be used:

(a) Seal both ends of the seam to be tested.

(b) Insert a needle or other approved pressure feed device that is connected to a pressure gauge into one end of the tunnel created by the double fusion weld.

(c) Energize the air pump to a minimum pressure of 30 psi, close valve, and sustain pressure for 5 minutes.

(d) At the end of 5 minutes, depressurize seam by placing a needle hole in the air space between the welds at the opposite end of the seam from the gauge. Observe the gauge.

(e) If the seam does not lose more than 3 psi during the 5-minute period and the pressure drops to 0 within 30 seconds of depressurization, seam is acceptable.

(f) If the pressure drops more than 3 psi during the test period, or does not drop to 0 during the 30 second depressurization period, repair the needle holes and retest seam by the same procedure or vacuum box test along the entire length of seam. If the seam does not loose more than 3 psi during the retest, seam is acceptable.

(g) If second air-pressure test fails, vacuum box test entire length of seam.

(i) If no bubbles appear in vacuum box, bottom or second seam will be considered defective, and upper seam is acceptable.

(ii) If bubbles appear in vacuum box, repair each defective area by extrusion welding and test again by vacuum box method.

(h) Mark, with waterproof paint, and repair needle holes.

G. Spark Testing:

(1) Provide equipment consisting of the following:

(a) A high voltage, low current source with the negative terminal for ground and a positive terminal for a voltage applicator. A voltage applicator may consist of a handle and a wire brush, conductive neoprene squeegee, or other suitable applicator.

(b) The range of high voltage source is typically 20,000 to 35,000 volts.

(c) The voltage required to cause a discharge (spark) between the positive electrode and the negative electrode wire is expressed by the formula $V= K\sqrt{D}$

Where:

V= Test Voltage K= Constant

D= Distance from the edge of extrusion bead on the lower panel to the conductive materials in millimeters

(d) If the voltage is not adequate due to under estimating D, a false positive test (a seam with a suspect area resulting in no spark and testing as a good seam) may result,

(e) The conductive material (fine copper wire) should be located 8 to 18 millimeters from the edge of extrusion Weld on the bottom HDPE liner to be a successful test.

(2) The following procedures shall be followed:

(a) ASTM D6365 Standard Practice for Nondestructive Testing of Geomembrane Seams Using the Spark Test

(b) Before or as the seam is welded, a fine copper wire is inserted in the lapped area of the patch 2 to 5 millimeters from the edge of the patch sheet

(c) Prior to testing, it is necessary to connect the copper wire installed in the field seam to the negative terminal of the voltage source or a separate ground

(d) Set the voltage source to a voltage needed for the expected distance. The technician should verify the test voltage is adequate using a trial seam with a simulated defect prior to testing and also verify that the test voltage will not damage the HDPE liner.

(e) Check that the seams and areas adjacent to the seams are dry prior to testing

(f) Place the voltage applicator connected to the positive terminal of the voltage source in contact with the HDPE liner at the seam.

(g) Move the voltage applicator along the seam at a uniform rate of 6 to 9 meter per minute. The voltage applicator must make intimate contact with the seam being inspected

(h) As the test progresses, the generation of a spark indicates a suspect area (leak) in the seam

(i) I. Mark the leaked area with waterproof paint and record it in the log. Repair the leak as soon as possible, and retest the area.

(j) j. Submit Spark Testing log at the end of the day to NWP representative.

5.3.5 Sampling Procedures for the Destructive Testing

A. The contractor shall cut a 12-inch wide by 36-inch-long sample with the seam centered lengthwise.

B. Two 1-inch-wide specimens shall be cut from each end of the sample and discarded

5.3.6 Destructive Testing.

A. Testing shall be carried out as the seaming work progress, not at the completion of all field seaming.

B. Random weld samples shall be cut from the installed welded geomembrane at a minimum frequency of one sample per 500 feet of weld per welding machine and a minimum of one test per machine per day.

C. All destructive testing samples shall be taken from non-critical areas (i.e. the berm above normal water levels or in the anchor trench) whenever possible.

D. Based upon visual observation and inspection, NWP shall determine additional sample times and locations.

E. The contractor shall indicate the location of all samples on the as-built drawing.

F. Holes in the geomembrane resulting from obtaining the seam samples shall be repaired in accordance with section 4.5 of the Specification.

G. The six specimens shall be tested for peel and shear strength.

(1) To be acceptable, all six specimens must pass.

(2) Any specimen that fails through the weld or by fusion at the weld/sheet interface is considered a failure.

(3) Results of the testing must meet the requirements of Section 4.3.9.F of this Specification.

H. If there is a sample failure, rerun the field seam test using new sample coupons from the same sample, if that test passes, NWP may assume that an error was made in the first test and accept the field seam. If the second test fails, the contractor may:

(1) Cap the seam between any two previously passing seam test location, or,

(2) Cut additional samples on each side of the failure location (10-foot minimum each way) and repeat sample procedure for each side. If both sides pass, cap the field seam between the two passing locations. If either fails, repeat the process of taking samples for testing. Each field seam shall be bounded by two passing test locations prior to acceptance.

5.3.7 Approvals

A. NWP or designated representative shall be notified to witness all non-destructive testing of field seams.

B. The contractor will sign a verification of field seam inspection.

C. At the completion of the liner installation, the contractor shall provide written verification that:

(1) Installation is complete.

(2) All field seams and repairs, and associated testing, as required by this specification, are adequate.

(3) All site requirements have been completed as specified.

5.3.8 Safety and Health

A. The Contractor shall have a documented and implemented safety and health program.

5.4 SUBMITTALS

5.4.1 Administrative submittals

A. Production dates for all geomembrane all geomembrane shall be manufactured of new, prime first-quality products designed and manufactures specifically to be chemically resistant to leachate.

B. Schedule of installation of the geomembrane. Revise and resubmit monthly.

C. A Liner Installation Plan that details the required procedures for proper installation of the geomembrane material. Following is the outline of the minimum required elements of the plan:

- Scaled drawing to show the liner panel layout at the corners, trenches, side slopes and bottom cell or pond.
- Transportation and off loading
- Inspection of delivered materials
- Storage of delivered materials
- On-site handling and deployment
- Subgrade acceptance
- Installation limit
- Seaming procedures
- Quality control testing
- General precaution to prevent damage

A. Safety and Health Program documentation.

5.4.2 Shop Drawings

A. Manufacturer's specifications and literature for the geomembrane and all products furnished and utilized to complete this project. Descriptions shall include name of manufacturer(s) and fabricator(s) and product trade name if any.

B. Product identification and supplier of polymer resin for geomembrane production.

C. The proposed panel layout, scaled drawing(s) for the geomembrane showing the installation layout, and seaming plan drawing(s) including the proposed size, number, position and sequence of sheet placement. Layouts shall be fully dimensioned. Seaming plan shall include the location of field seams and the approximate total length of fusion and extrusion welds.

D. Details of joining procedures, field testing, special construction details, anchoring details, temporary anchors, liner attachment to concrete structure, cap strips and replacement strips.

5.4.3 Geomembrane Samples

A. Product vendor material

B. Confirmation Test

C. Pre-construction field seam samples and results of associated tests

D. List of material properties and samples of geomembrane wit attached certified test results

5.4.4 Qualifications

Submit documented evidence of the ability and capacity of manufacturer, installer, and geomembrane testing agency to perform this work.

A. Manufacturer and Fabricator: Certification that the manufacturer has manufactured HDPE geomembranes for at least 5 years and has manufactured a minimum of 10 million square feet of similar HDPE geomembranes. Fabricators shall have at least 5 years of continuous documented experience in the fabrication of HDPE components for liner system applications.

B. Installer Certification of the following requirements shall be provided:

(1) Corporate Requirements: The contractor shall have successfully installed 2 million square feet of these types of geomembranes products specified in applications like this project.

(2) Field Staff Requirements: The Contractor shall provide the following persons to the project and submit resumes as verification of experience:

(a) Installation Supervisor: The installation Supervisor shall be onsite and be in responsible charge during all geomembrane installation (including site sub-grade acceptance, HDPE sheet layout, panel placement, seaming, testing, and repairs) and all other activities performed by the contractor. The Installation Supervisor shall have installed or supervised the installation of minimum of 5 million square feet of HDPE geomembrane.

(b) Master Seamer: All seaming shall be performed under the direction of Master Seamer. The Master Seamer may be the same person as the installation supervisor. The Master Seamer shall have welded a minimum of 2 million square feet of geomembrane using the same type of seaming apparatus as that proposed for this project.

(c) Seamer: All seamers shall have performed a minimum of 500,000 square feet of seaming HDPE geomembrane using the same type of seaming apparatus as that proposed for use on this project.

C. Independent Testing Agency: NWP and/or the contractor may choose to use an independent Quality Control Assurance (QCA) laboratory for geomembrane testing. The laboratory must provide records of equipment calibration, and documented standard procedures for performing specified testing. Test results shall be reviewed by a State of New Mexico Registered Professional Engineer.

Laboratory test equipment shall be certified and traceable to standards of National Institute of Standards and Traceability (NIST), or other recognized standard.

5.4.5 Quality Control Program Plan: Written description of the manufacturer's and installer's formal programs for quality control during manufacturing, fabricating, handling, storage, shipping, installation, seaming, testing, and repairing geomembrane.

5.4.6 Factory test results and manufacturer's certifications shall identify the lot number and roll number for each roll number for each roll delivered to the project site.

5.4.7 Certified destructive test results from an independent CQA testing laboratory, when applicable

5.4.8 Daily reports that include the following:

A. Record of deployment by type and panel number

B. Destructive testing by sample number, seam number, results (pass/fail), and location

C. Trial welds results.

5.4.9 Installer log and records

A. Production log

B. Seam and panel detail log

C. Geomembrane Seaming Log

D. Repair Log

E. Pressure Test Log

F. Vacuum Test Log

G. Spark Test Log

H. Trial Fusion Weld Log

I. Trial Extrusion Log

J. Destructive Test Log

K. Valid Calibration Records for tensiometer, pressure gages and thermometer

Information to be included in the logs, as appropriate, is to include:

1. Date
2. Panels deployed
3. Inspections
4. Seaming technicians
5. Ambient temperature
6. Weather condition
7. Field seams constructed
8. Any other site-specific conditions

5.4.10 As-Built Drawings: Submit reproducible drawings of record showing changes from approved installation drawings. These shall include the identity and location of each repair, cap strip, penetration, boot, and sample taken from the installed geomembrane for testing.

5.4.11 One copy of material and seam results.

5.4.12 Certification of "Subgrade Surface Acceptance" form for the liner sub-grade. See Attachment B

5.4.13 Certificate of warranty and Guarantee

A. Certificate of Warranty for the HDPE geomembrane material, seams, and installation. The geomembrane manufacturer shall warrant the HDPE material, on a prorated basis, against manufacturing defects and material degradation under outdoor exposure for a period of twenty years from the date of installation. The manufacturer shall furnish a written warranty covering the requirements of this paragraph.

B. The Contractor shall provide a written warranty covering the installation workmanship for a period of one year.

5.4.14 Documents shall be submitted in accordance with Attachment A, Document Submittal Requirements.

Specification Section	Description	Approval/Record	Due Prior To
1.1.1	Submit all geosynthetic product information and testing results on each roll of the liner, geonets, geofabrics, HDPE pipes.	A	S
3.1.1. B	Provide a minimum 20 years manufacturer's warranty in writing, contractor shall warranty installation workmanship for one year, from completion of work.		
3.1.1.C	Furnish Manufacturer's certification that the geomembrane was manufactured and tested in accordance with GRI Test Method GM 13		

Young, Avery, NMENV

From:	Young, Avery, NMENV
Sent:	Tuesday, January 14, 2020 4:02 PM
To:	Chavez, Rick - RES; Jones, Stewart - RES
Subject:	WIPP Comments with NMED Responses
Attachments:	20200114 WIPP comments with NMED Responses.docx

Hello,

Attached is a table with NMED responses to comments that were not immediately accepted by NMED. The comments remaining on the table are what we would like to discuss or we will not be accepting but we are happy to discuss further.

Thank you,

Avery Young, Environmental Scientist
New Mexico Environment Department
Ground Water Quality Bureau
1190 Saint Francis Dr, Santa Fe, NM 87505
505-827-2909
https://www.env.nm.gov/gwqb/
Avery.Young@state.nm.us

Comment Type	Page	Line/ Paragraph/ Condition	Comment / Recommended Changes	NMED Response
Water Usage/ Transport	I. Introduction 2 of 39 and III. Findings 6 of 39	Last bullet page 2 and paragraph 1 page 6	Recommend revising the last sentence in the last bullet of page 2 and the first paragraph on top of page 6 to read as follows: "This runoff does not contact the salt stockpiles or other waste materials at the Facility and may be used by the permittee for dust control, soil compaction, and other activities at the discretion of the Permittee." This will allow the Permittees to use the water for both construction and non-construction related activities.	No, we need to know what WIPP is using it for. Would you like to specify other uses that can be incorporated?
Editorial	Intro 3 of 39		Current language states the following "... covered with a minimum of three feet of earthen material." Recommend changing to "...covered with a minimum of two feet of earthen material." This is to be consistent with information in Attachment 3 of the Permit application submitted on December 3rd, 2018.	It says three feet in the application on page 12, and in the DBS&A 2008 report. Please clarify.
WIPP Geology	Intro 3 of 39		Recommend deleting the last paragraphs starting with "Groundwater below the facility most likely... " and the paragraph beginning with "The first Laterally..." Suggest a complete replacement to more accurately reflect the geology at the WIPP facility. Suggested new paragraphs/ wording is provided below and in the DRAFT DP-831 document as redline. "Natural groundwater occurs in the lower portion of the Dewey Lake Formation, south of the WIPP facility, at a depth of approximately 160 feet and might be affected by a discharge. This water is brackish with an average total dissolved solids concentration of 3,400 milligrams per liter. However, ground water in the lower Dewey Lake is not laterally continuous but tends to be perched, occurring only where the spatially variable cementation mineralogy changes from carbonate to sulfate (gypsum). Well WQSP-6A is the	We will correct what we have and possibly add some suggested language, but we want to keep it short.

			only location within the entire monitoring-well network where ground water was found in the lower Dewey Lake. A 1995 investigation of fluids seeping from the Exhaust Shaft sidewalls, approximately 50 to 80 feet below ground surface (bgs), led to the discovery of a perched water zone in the lower Santa Rosa and upper Dewey Lake Formations. This water was determined to be anthropogenic and in 1996, three monitoring wells (C-2505, C-2506, and C-2507) were drilled around the shaft to assess the hydraulic properties of the saturated stratigraphic horizons, including the identification of possible sources, and to determine water quality. The Dewey Lake Formation has a relatively low hydraulic conductivity. Total dissolved solid concentrations were all above 10,000 mg/L, classifying this water as saline and therefore non-potable. In 1997 twelve piezometers (PZ-1 through PZ-12) were installed around the WIPP facility to characterize the lateral extent of the perched water and flow direction. The shallow groundwater has a general flow direction of north to south. South of WIPP, there is the Mills ranch. Mills has wells producing natural water from the lower Dewey Lake. These wells were sampled by WIPP from 1986 through 1990 and also show the water to be saline and unfit for consumption. During the drilling of a Culebra monitoring well (C-2737) in February 2001, perched anthropogenic water was again encountered. Well C-2811 was subsequently installed in 2001 for further characterization. In 2007, three additional piezometers (PZ-13 through P-15) were installed for further characterization, as required by the 2006 modifications to the DP-831 conditions. During 2002, Daniel B. Stephens and Associates performed flow and transport modeling at the WIPP facility to identify sources of the perched water, to estimate the contributions from each source, and to calculate the water balance (Daniel B. Stephens, 2003). Unlined ponds and salt piles were determined to be the major contributors. The recommended abatement required lining of infiltration sources and in 2005, the ponds and salt piles were lined. In 2008, Daniel B Stephens and Associates performed another hydrologic assessment, this time to examine the effectiveness of the	

			liners in controlling infiltration. The installation of liners was determined to be effective in controlling the infiltration of rainfall, storm water, leachate from the ponds and salt piles (Daniel B. Stephens and Associates, 2008). The first laterally continuous water-bearing zone below the facility is within an approximately 30- foot-thick section of the Culebra Member of the Rustler Formation. Water in the Culebra Member is usually present in fractures and is confined by overlaying anhydrite and underlying clay and anhydrite beds. Water from the Culebra Member is not used as a water supply in the immediate WIPP facility vicinity; however, its nearest use is for livestock watering approximately seven miles southwest of the WIPP facility. The Culebra Member is monitored through a network of monitoring wells that are part of the facility's Water Quality Sampling Program."	
Sampling/ Sludge Measurement	IV 7 of 39	Condition 5	Measurement of the sludge thickness in Condition 5. The Permittee recommends using 1 sludge measurement location and sampling location versus 9 and 6 respectively pursuant to the existing Permit, which allows for utilization of the current site method to determine sludge thickness (i.e., the existing weir structure). Justification: We currently cannot safely perform the requested action as written in the draft Permit. The lagoons have only one point where personnel can walk out and sample the sludge without risking falling into the lagoon due to the slope of the berms. The 9 sample points or 6 sample locations are not reasonable from a safety/health standpoint. The Permittee has replaced liners in the past and visual data has shown that the sludge is evenly distributed on the liner.	No, GWQB does not accept this change for impoundments with domestic wastewater.
Sampling /Coring	IV 10 of 39 and 12 of 39	Condition 14 Condition 22	Coring has the potential to puncture the liner. The Permittee already has systems, process, or procedures in place that are protective of the liner and that include the appropriate precautions and safety limitations. Core sampling of salt is difficult and may cause puncturing of the liner. Salt is difficult to sample by coring especially underwater. The Permittee devised a method for measuring the salt in the Salt	What is the method?

			Storage Ponds that worked well in 2018 without using a coring device.	
Operation	IV 10 of 39	Condition 15 Condition 24 Condition 35	For Condition 15 consider changing "on a continuous basis" to "using an automated system." Recommend removing the words "average weekly" prior to leakage rate. The Permittee requests to establish the initial leakage rate after three removal events by the automated system. It is not known if this will occur within a one week time period.	We want to talk to you more about your leak detection systems and maybe using the average leakage rate for the existing leak detection system and the action leakage rate for the newly constructed systems.
Maintenance / Repair	IV 14 of 39	Condition 25	Consider revising the last sentence to read as follows to focus inspections on protection of the liners: "In the event of significant erosion that indicates liner damage or impending liner damage per the Permittee's inspection procedure, the permittee shall provide a plan and schedule for repair within 90 days of discovery."	What is the inspection procedure? NMED wants the soil cover maintained as well.
Reporting	IV 15 of 39	Condition 28	Consider changing the required report submittals as follows: • January 1st through June 30th – **due by August 31st** ; and • July 1st through December 31st **due by February 28th**. This change is requested to minimize impacts associated with the July 4th Holiday and the winter Holidays.	GWQB does not accept this change. We will discuss further during the phone conversation.
Sampling Analysis	IV 16 of 39	Condition 32	Since Effluent Lagoons A, B, and C are downstream of the Facultative Lagoon System, the Permittee proposes to only sample the influent to Settling Lagoon 1 & 2 (whichever is in operation) for TKN, NO3-N, TDS, Cl, and SO4 as our current Discharge Permit specifies. Sampling downstream Effluent Lagoons A, B, and C will not provide any additional information as this water has already been characterized by sampling Settling Lagoon 1 & 2.	The industrial input is into effluent lagoons B and C, so that is the sample point and it will be concentrated in those impoundments. How is the water managed between A, B, and C?

Sampling Analysis	IV 16 of 39	Condition 32	There is no listing of analytical methods in this Permit.	Condition 27 references analytical methods listed in our regulations.
Sampling Analysis	IV 18 of 39	Condition 38 Condition 39	Recommend deleting the 24-hour flow weighted composite and replacing with "a grab sample" (similar to other conditions). Recommend adding suggested language for analytes that have shown a natural background above the reporting limits and for existing conditions. Suggested language: "...unless the existing condition exceeds the standard or unless otherwise provided in Subsection E of Section 20.6.3.109 NMAC and unless natural background for the region shows values that exceed the standards."	Changed to grab, but no change with the additional sentence. It's about reporting limits, not about the standards.
Monitoring	IV 21 of 39	Condition 47	Recommend changing the word "calculated" to "measured". Recommend changing "weekly" to "three consecutive removal events."	Related to leak detection.
Reporting	IV 21 of 39 22 of 39	Condition 48 Condition 50	The Permittee requests to submit one cumulative report for all wells, which will include all pertinent reporting information as called out in this Permit condition. The Permittee requests an all-inclusive report rather than incrementally sending information.	Clarify the concern. there are two submittals: the proposal and the results. We can combine the results, well logs, and survey into one submittal, but the proposal is still separate. We would also like to discuss the submitted MW location proposal.
Sampling Locations / Monitoring	IV 25 of 39	Condition 55 Condition 56 Condition 57	It states that WQSP-6A is intended to monitor the shallowest water-bearing zone of the Dewey Lake Formation. This is incorrect. WQSP-6A monitors the natural Dewey Lake water, which is at the bottom of the Dewey Lake, approximately 160 feet below land surface. Naturally occurring groundwater is not always detected in the lower Dewey Lake. There is a water bearing zone due to a cementation change from a calcium carbonate to a sulfate (gypsum) cement. Water then perches on the sulfate cementation zone. This condition is not spatially consistent. That is why the Permittee only has one well in its network (WQSP-6A) with deep naturally occurring water. This well was added to the DP-831 sampling program in the last modification to determine if the anthropogenic water migrated both laterally and vertically into the deep natural Dewey Lake Formation water. PZ-16 (change to PZ-17) and PZ-17 (change to PZ-19) are not intended to monitor the Dewey Lake water, but any	Need to discuss during phone call.

			anthropogenic water perched on the Santa Rosa and Dewey Lake contact at the Facultative Lagoon and the Evaporation Pond H-19, respectively.	
Sampling Locations / Monitoring	IV 27 of 39	Condition 58	A potentiometric surface map cannot be developed for the naturally occurring Dewey Lake as identified in WQSP-6A. This is the only well with naturally occurring Dewey Lake water in the WIPP Monitoring Well network.	PZ-17 and PZ-19 are intended to be drilled in the Dewey Lake formation enabling WIPP to create a groundwater elevation contour map.
Investigation / Work Plan	IV 28 of 39	Condition 61	Please consider deleting this condition from the Fact Sheet and the Permit. Extensive investigations have already been conducted and as a result of those investigations, abatement efforts including lining of the site impoundments and extensive monitoring are being performed pursuant to DP-831. The Permittee is actively monitoring and has not observed any condition that indicates the remediation in place is not effective. Please see the 2003 and 2008 Daniel B Stevens reports. Furthermore, the WIPP Land Withdrawal Act restricts public access to the facility, which includes ground water usage for beneficial purposes. Further studies would provide no additional useful information.	This condition has not been deleted, but it has been revised. We will discuss further.
Sampling Locations / Monitoring	IV 28 of 39	Condition 62	The Permittee recommends adding text regarding the existing conditions and that address background for the region in regards to "newly exceeded". Please consider adding the following or similar text; "unless the existing condition exceeds the standard or unless otherwise provided in Subsection E of Section 20.6.3.109 NMAC and unless natural background for the region shows values that exceed the standards."	Why does this propose the two options (existing and natural background)? Discuss further.

Young, Avery, NMENV

From: Vajda, Josh - RES <Josh.Vajda@wipp.ws>
Sent: Monday, January 6, 2020 11:26 AM
To: Young, Avery, NMENV
Cc: Chavez, Rick - RES; Jones, Stewart - RES; Brown, Michael (Mike) - FedNet; Navarrete, Martin - FedNet; Ward, Anderson (Andy) - FedNet
Subject: [EXT] DP-831 DRAFT Permit Comments & Recommendations
Attachments: DP-831 Permit Comments & Recommendations.docx; DP-831 Prelim Draft DP_Permittee Redline_Strikeout Comments.docx; DP-831 Draft Fact Sheet_Permittee Redline_Strikeout Comments.docx

Avery,

Thank you for the opportunity to provide comments and recommendations on the DRAFT Permit. We appreciate all of your efforts in guiding us through this Permit renewal/modification process. We are providing you with three files:

- a comment summary table, in order by topic, with suggested edits and recommendations for the DRAFT Permit,
- a detailed redline/strikeout showing the exact recommendations for the DRAFT Permit, and
- a redline/strikeout of the Fact Sheet

If we can be of any further assistance, please don't hesitate to reach out. Thank you again for considering our comments and feedback.

Joshua Vajda

AECOM
Regulatory Environmental Services
Waste Isolation Pilot Plant
(575) 234-3214

Comment Type	Page	Line/ Paragraph/ Condition	Comment / Recommended Changes
Editorial	Cover Page		Please change "Kirk D. Lachman" to "Gregory Sosson" because Greg Sosson recently replaced Kirk Lachman as the Acting CBFO Manager.
Editorial	Cover Page		The Facility Contact Phone Number is incorrectly listed as the fax number. Please change the number to the following: (575) 234-8143.
Editorial	Cover Page		Under Facility Location, recommend deleting the word "approximately".
Water Usage/ Transport	I. Introduction 2 of 39, bullet 3 and III. Para 2 5 of 39		Recommend replacing the words "every two weeks..." with "in order to maintain at least 2 feet of freeboard." This is consistent with the discussion in the application page 3 of 42 which states "When the brine retention ponds reach their allowed capacity, then accumulated brine will be transferred to Storm Water Pond 4."
Water Usage/ Transport	I. Introduction 2 of 39 and III. Findings 6 of 39	Last bullet page 2 and paragraph 1 page 6	Recommend revising the last sentence in the last bullet of page 2 and the first paragraph on top of page 6 to read as follows: "This runoff does not contact the salt stockpiles or other waste materials at the Facility and may be used by the permittee for dust control, soil compaction, and other activities at the discretion of the Permittee." This will allow the Permittees to use the water for both construction and non-construction related activities.
Editorial	Intro 3 of 39		Recommend adding an "&" sign between "Site" and "Preliminary". The revised sentence would read as follows: "Site & Preliminary Design Validation..."
Editorial	Intro 3 of 39		Current language states the following "... covered with a minimum of three feet of earthen material." Recommend changing to "...covered with a minimum of two feet of earthen material." This is to be consistent with information in Attachment 3 of the Permit application submitted on December 3rd, 2018.
Editorial	Intro 3 of 39		Recommend deleting the word "approximately" after (NM-128) and before the number 26.
Editorial	Intro 3 of 39		Recommend deleting the word "principally" in the following sentence: "The WIPP facility is principally..." Disposal is the only use for the WIPP facility.
Editorial	Intro 3 of 39		Recommend adding "polyhalite" to the list.
WIPP Geology	Intro 3 of 39		Recommend deleting the last paragraphs starting with "Groundwater below the facility most likely... " and the paragraph beginning with "The first Laterally..."

			Suggest a complete replacement to more accurately reflect the geology at the WIPP facility. Suggested new paragraphs/ wording is provided below and in the DRAFT DP-831 document as redline. "Natural groundwater occurs in the lower portion of the Dewey Lake Formation, south of the WIPP facility, at a depth of approximately 160 feet and might be affected by a discharge. This water is brackish with an average total dissolved solids concentration of 3,400 milligrams per liter. However, ground water in the lower Dewey Lake is not laterally continuous but tends to be perched, occurring only where the spatially variable cementation mineralogy changes from carbonate to sulfate (gypsum). Well WQSP-6A is the only location within the entire monitoring-well network where ground water was found in the lower Dewey Lake. A 1995 investigation of fluids seeping from the Exhaust Shaft sidewalls, approximately 50 to 80 feet below ground surface (bgs), led to the discovery of a perched water zone in the lower Santa Rosa and upper Dewey Lake Formations. This water was determined to be anthropogenic and in 1996, three monitoring wells (C-2505, C-2506, and C-2507) were drilled around the shaft to assess the hydraulic properties of the saturated stratigraphic horizons, including the identification of possible sources, and to determine water quality. The Dewey Lake Formation has a relatively low hydraulic conductivity. Total dissolved solid concentrations were all above 10,000 mg/L, classifying this water as saline and therefore non-potable. In 1997 twelve piezometers (PZ-1 through PZ-12) were installed around the WIPP facility to characterize the lateral extent of the perched water and flow direction. The shallow groundwater has a general flow direction of north to south. South of WIPP, there is the Mills ranch. Mills has wells producing natural water from the lower Dewey Lake. These wells were sampled by WIPP from 1986 through 1990 and also show the water to be saline and unfit for consumption. During the drilling of a Culebra monitoring well (C-2737) in February 2001, perched anthropogenic water was again encountered. Well C-2811 was subsequently installed in 2001 for further characterization. In 2007, three additional piezometers (PZ-13 through P-15) were installed for further characterization, as required by the 2006 modifications to the DP-831 conditions. During 2002, Daniel B. Stephens and Associates performed flow and transport modeling at the WIPP facility to identify sources of the perched water, to estimate the contributions from each source, and to calculate the water balance (Daniel B. Stephens, 2003). Unlined ponds and salt piles were determined to be the major contributors. The recommended abatement required lining of infiltration sources and in 2005, the ponds and salt piles were lined. In 2008, Daniel B Stephens and Associates performed another hydrologic assessment, this time to examine the effectiveness of the liners in controlling infiltration. The installation of liners was determined to be effective in controlling the infiltration of

			rainfall, storm water, leachate from the ponds and salt piles (Daniel B. Stephens and Associates, 2008). The first laterally continuous water-bearing zone below the facility is within an approximately 30- foot-thick section of the Culebra Member of the Rustler Formation. Water in the Culebra Member is usually present in fractures and is confined by overlaying anhydrite and underlying clay and anhydrite beds. Water from the Culebra Member is not used as a water supply in the immediate WIPP facility vicinity; however, its nearest use is for livestock watering approximately seven miles southwest of the WIPP facility. The Culebra Member is monitored through a network of monitoring wells that are part of the facility's Water Quality Sampling Program."
Sampling/ Sludge Measurement	IV 7 of 39	Condition 5	Measurement of the sludge thickness in Condition 5. The Permittee recommends using 1 sludge measurement location and sampling location versus 9 and 6 respectively pursuant to the existing Permit, which allows for utilization of the current site method to determine sludge thickness (i.e., the existing weir structure). Justification: We currently cannot safely perform the requested action as written in the draft Permit. The lagoons have only one point where personnel can walk out and sample the sludge without risking falling into the lagoon due to the slope of the berms. The 9 sample points or 6 sample locations are not reasonable from a safety/health standpoint. The Permittee has replaced liners in the past and visual data has shown that the sludge is evenly distributed on the liner.
Sampling /Coring	IV 10 of 39 and 12 of 39	Condition 14 Condition 22	Coring has the potential to puncture the liner. The Permittee already has systems, process, or procedures in place that are protective of the liner and that include the appropriate precautions and safety limitations. Core sampling of salt is difficult and may cause puncturing of the liner. Salt is difficult to sample by coring especially underwater. The Permittee devised a method for measuring the salt in the Salt Storage Ponds that worked well in 2018 without using a coring device.
Operation	IV 10 of 39	Condition 15 Condition 24 Condition 35	For Condition 15 consider changing "on a continuous basis" to "using an automated system." Recommend removing the words "average weekly" prior to leakage rate. The Permittee requests to establish the initial leakage rate after three removal events by the automated system. It is not known if this will occur within a one week time period.
Maintenance / Repair	IV 14 of 39	Condition 25	Consider revising the last sentence to read as follows to focus inspections on protection of the liners: "In the event of significant erosion that indicates liner damage or impending liner damage per the Permittee's inspection

			procedure, the permittee shall provide a plan and schedule for repair within 90 days of discovery."
Reporting	IV 15 of 39	Condition 28	Consider changing the required report submittals as follows: • January 1st through June 30th – **due by August 31st** ; and • July 1st through December 31st **due by February 28th**. This change is requested to minimize impacts associated with the July 4th Holiday and the winter Holidays.
Sampling Analysis	IV 16 of 39	Condition 32	Since Effluent Lagoons A, B, and C are downstream of the Facultative Lagoon System, the Permittee proposes to only sample the influent to Settling Lagoon 1 & 2 (whichever is in operation) for TKN, NO3-N, TDS, Cl, and SO4 as our current Discharge Permit specifies. Sampling downstream Effluent Lagoons A, B, and C will not provide any additional information as this water has already been characterized by sampling Settling Lagoon 1 & 2.
Sampling Analysis	IV 16 of 39	Condition 32	There is no listing of analytical methods in this Permit.
Sampling Analysis	IV 18 of 39	Condition 38 Condition 39	Recommend deleting the 24-hour flow weighted composite and replacing with "a grab sample" (similar to other conditions). Recommend adding suggested language for analytes that have shown a natural background above the reporting limits and for existing conditions. Suggested language: "...unless the existing condition exceeds the standard or unless otherwise provided in Subsection E of Section 20.6.3.109 NMAC and unless natural background for the region shows values that exceed the standards."
Monitoring	IV 21 of 39	Condition 47	Recommend changing the word "calculated" to "measured". Recommend changing "weekly" to "three consecutive removal events."
Reporting	IV 21 of 39 22 of 39	Condition 48 Condition 50	The Permittee requests to submit one cumulative report for all wells, which will include all pertinent reporting information as called out in this Permit condition. The Permittee requests an all-inclusive report rather than incrementally sending information.
Sampling Locations / Monitoring	IV. 22 of 39	Condition 49 Condition 51	Condition 49 provides the nomenclature for the new wells. Please change "PZ-16" to "PZ-17" and "PZ-17" to "PZ-19." This correlates with the well location plan that was created before the draft DP-831 was released. The numbers in our plan coincide with an east to west numbering system with PZ-19 named according to H-19 nomenclature. Condition 51 provides the nomenclature for the new wells. Please change "PZ-18" to "PZ-16" and "PZ-19" to "PZ-18." This correlates with the well location plan that was created before the draft DP-831 was released. The numbers in our plan coincide with an east to west numbering system with PZ-19 named according to H-19 nomenclature.

Sampling /Monitoring	IV 23 of 39	Condition 52 Condition 55 Condition 56 Condition 57	Recommend removing dissolved oxygen, turbidity, and oxidation-reduction potential (redox). Performing dissolved oxygen would be appropriate if making a determination if algae growth was in the well or water. These wells have been pumped and sampled for many years, the pump does not come in contact with potential silt in the well sump. Success has been established over the years by measuring temperature, specific conductance, and pH to establish that the samples are formation water and not water from the borehole annulus.
Reporting	IV 23 of 39	Condition 52	For Well Installation: The Permittee requests that the time frame for submittal of the groundwater analytical results (including the laboratory QA/QC summary report) be changed to 120 days instead of 45 days from the well completion date. Laboratory turnaround is typically 60 days. This will allow time for sample prep, sample analysis, data quality checks and data reporting.
Sampling Locations / Monitoring	IV 25 of 39 26 of 39	Condition 55 Condition 56 Condition 57	Recommend the following language to describe the drawdown: "The drawdown will be minimized such that it will maintain depression of the water level, but not exceed one liter per minute."
Sampling Locations / Monitoring	IV 25 of 39	Condition 55 Condition 56 Condition 57	It states that WQSP-6A is intended to monitor the shallowest water-bearing zone of the Dewey Lake Formation. This is incorrect. WQSP-6A monitors the natural Dewey Lake water, which is at the bottom of the Dewey Lake, approximately 160 feet below land surface. Naturally occurring groundwater is not always detected in the lower Dewey Lake. There is a water bearing zone due to a cementation change from a calcium carbonate to a sulfate (gypsum) cement. Water then perches on the sulfate cementation zone. This condition is not spatially consistent. That is why the Permittee only has one well in its network (WQSP-6A) with deep naturally occurring water. This well was added to the DP-831 sampling program in the last modification to determine if the anthropogenic water migrated both laterally and vertically into the deep natural Dewey Lake Formation water. PZ-16 (change to PZ-17) and PZ-17 (change to PZ-19) are not intended to monitor the Dewey Lake water, but any anthropogenic water perched on the Santa Rosa and Dewey Lake contact at the Facultative Lagoon and the Evaporation Pond H-19, respectively.
Sampling Locations / Monitoring	IV 27 of 39	Condition 58	A potentiometric surface map cannot be developed for the naturally occurring Dewey Lake as identified in WQSP-6A. This is the only well with naturally occurring Dewey Lake water in the WIPP Monitoring Well network.
Investigation / Work Plan	IV 28 of 39	Condition 61	Please consider deleting this condition from the Fact Sheet and the Permit. Extensive investigations have already been conducted and as a result of those investigations, abatement efforts including lining of the site impoundments and extensive monitoring are being performed pursuant to DP-831. The

			Permittee is actively monitoring and has not observed any condition that indicates the remediation in place is not effective. Please see the 2003 and 2008 Daniel B Stevens reports. Furthermore, the WIPP Land Withdrawal Act restricts public access to the facility, which includes ground water usage for beneficial purposes. Further studies would provide no additional useful information.
Sampling Locations / Monitoring	IV 28 of 39	Condition 62	The Permittee recommends adding text regarding the existing conditions and that address background for the region in regards to "newly exceeded". Please consider adding the following or similar text; "unless the existing condition exceeds the standard or unless otherwise provided in Subsection E of Section 20.6.3.109 NMAC and unless natural background for the region shows values that exceed the standards."

FACT SHEET
Ground Water Discharge Permit DP-831 (draft)
November 2019

Facility Name:	Waste Isolation Pilot Plant (WIPP)
Facility Location:	Highway 128, approximately 26 miles southeast of Carlsbad Carlsbad, NM Sections 20, 21, 28 and 29, Township 22S, Range 31E
County:	Eddy County
Applicant/Permittee:	Kirk D. Lachman, Acting Manager U.S. Department of Energy, Carlsbad Field Office P.O. Box 3090 Carlsbad, NM 88221
Proposed Permitting Action:	Discharge Permit Renewal and Modification
Regulatory Authority:	Water Quality Control Commission's Ground and Surface Water Protection Regulations, 20.6.2 NMAC
Issuing Agency:	Ground Water Quality Bureau (GWQB) of the New Mexico Environment Department (NMED)
GWQB Contact:	Avery Young PO Box 5469, Santa Fe, NM 87502-5469 Phone: (505) 827-2909 Email: avery.young@state.nm.us

The Ground Water Quality Bureau has prepared this Fact Sheet as required by Subsection I of 20.6.2.3108 NMAC because the proposed discharge is at a federal facility and is not comprised solely of domestic liquid waste.

The original Discharge Permit was issued on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998 and on January 24, 2000, renewed on April 29, 2003, modified on December 22, 2003 and on December 29, 2006, renewed and modified on July 23, 2008, and last renewed on July 29, 2014. The application (i.e., discharge plan) consists of the materials submitted by the permittee dated December 3, 2018 and materials contained in the administrative record prior to issuance of this draft Discharge Permit and draft Fact Sheet.

The draft Discharge Permit that accompanies this draft Fact Sheet is for a renewal and modification. The modification consists of the addition of one new salt storage cell and four new impoundments: Salt Cell 5, Salt Storage Pond 5, Brine Salt Storage Pone 4, Brine Retention Pond East, and Brine Retention Pond West. Additional changes made to the Discharge Permit issued to the Waste Isolation Pilot Plant (WIPP or Facility) on July 29, 2014 are described below.

Comment Period / Request for Hearing

NMED will allow at least thirty days during which time written comments may be submitted and a public hearing may be requested. NMED will allow for these activities after publishing notice of the availability of this Draft Permit and Fact Sheet. Requests for public hearing shall be in writing and shall set forth the reasons why a hearing should be held. A hearing will be held if the NMED Secretary determines that there is substantial public interest. To obtain a copy of the Draft Permit, to submit a comment, or to request a hearing on this matter, contact the GWQB Contact listed at the beginning of this Fact Sheet.

Regulatory Framework

The Ground and Surface Water Protection Regulations, 20.6.2 NMAC, establish the regulatory framework for controlling discharges onto or below the surface of the ground through the issuance of groundwater discharge permits. The purpose of the regulations pertaining to groundwater discharge permits, as stated in Section 20.6.2.3101 NMAC, is "to protect all ground water of the state of New Mexico which has an existing concentration of 10,000 mg/l or less of total dissolved solids, for present and potential future use as domestic and agricultural water supply, and to protect those segments of surface waters which are gaining because of ground water inflow, for uses designated" in the Standards for Interstate and Intrastate Surface Waters, 20.6.4 NMAC. (See the New Mexico Commission of Public Records website to view 20.6.2 and 20.6.4 NMAC: http://www.srca.nm.gov/chapter-6-water-quality/.)

The regulations establish groundwater standards as identified in Section 20.6.2.3103 NMAC.

Persons proposing to discharge effluent or leachate in such a manner that it could move directly or indirectly into groundwater must obtain and comply with a discharge permit (20.6.2.3104 NMAC). In order to obtain a discharge permit, an applicant must submit an application (or "discharge plan" – 20.6.2.7 NMAC) proposing methods/techniques to be used or processes expected to naturally occur to ensure that the discharge of water contaminants does not result in the contamination of ground or surface water (20.6.2.3106 NMAC).

In reviewing and approving an application, NMED must ensure that the discharge plan will not result in a hazard to public health, undue risk to property, exceedance of the groundwater standards at any place of withdrawal of water for present or reasonably foreseeable future use, or violation of a stream standard (Subsections C and H of 20.6.3109 NMAC). "Hazard to public health" is defined in Section 20.6.2.7 NMAC and pertains to the exceedance of the groundwater standards in a drinking water supply.

Subsection B of 20.6.2.3109 NMAC directs the NMED Secretary to "approve, approve with conditions, or deny" a discharge permit application, after the administrative record is complete and all required information is available. This regulation authorizing permit approval "with conditions" provides the fundamental authority for including conditions in discharge permits.

General Facility Information

The WIPP is principally a mined geologic repository for the disposal of transuranic (TRU) waste. The underground repository is located 2,150 feet below land surface in the bedded salt of the Salado Formation. WIPP first began accepting waste in March 1999. In addition to this groundwater Discharge Permit, WIPP is also regulated by the NMED Hazardous Waste Bureau under the New Mexico Hazardous Waste Act and New Mexico's Hazardous Waste Regulations.

The WIPP facility is geologically situated in the southeast portion of New Mexico within the Delaware Basin, which is part of the larger Permian Basin. The geologic formations below the facility that are pertinent to this Discharge Permit, from deepest to shallowest, include: the Salado Formation, the Rustler Formation, the Dewey Lake Formation, and, in the northeastern portion of the facility, the Santa Rosa Formation. The Salado Formation, which is first encountered at a depth of 850 feet and is 2,000 feet thick, consists predominately of halite, with some carbonates, anhydrites, and clay seams. The Rustler Formation ranges from 350 to 500 feet thick and consists of carbonates, anhydrites, and halites. The Dewey Lake Formation is approximately 500 feet thick and consists almost entirely of mudstone, claystone, siltstone, and interbedded sandstone, and is frequently referred to as the Dewey Lake Redbeds Formation.

Groundwater below the facility most likely to be affected by this discharge is at a depth of approximately 30 to 160 feet, is located in the upper portion of the Dewey Lake Formation, and has an average total dissolved solids concentration of approximately 3,400 milligrams per liter. WIPP discovered the presence of shallow groundwater in March 2001 and determined that the probable sources of this shallow groundwater were the unlined impoundments constructed to capture stormwater runoff at the facility and runoff from the above-ground salt piles. This shallow groundwater has been found to be contaminated with total dissolved solids, sulfate, and chloride. After the discovery of the anthropogenically created shallow groundwater, all impoundments at the facility were lined and a network of monitoring wells was installed. The shallow groundwater has a flow direction of north to south. Natural, non-anthropogenic, groundwater occurs in the Dewey Lake Formation south of the WIPP facility at a depth of 160 feet. The Dewey Lake Formation has a relatively low hydraulic conductivity.

The first laterally continuous water-bearing zone below the facility is within an approximately 30-foot-thick section of the Culebra Member of the Rustler Formation. Water in the Culebra Member is usually present in fractures and is confined by overlaying gypsum or anhydrite and underlying clay and anhydrite beds. Water from the Culebra Member is not used as a water supply in the immediate WIPP facility vicinity; however, its nearest use is approximately seven miles southwest of the WIPP facility, where it is used for livestock watering. The Culebra Member is monitored through a series of monitoring wells that are part of the facility's Water Quality Sampling Program.

Description of the Proposed Discharge

The activities that produce the discharge and the quantity, quality, and flow characteristics of the proposed discharges at WIPP are briefly described as follows:

The source and disposition locations of proposed discharges at WIPP include the following: domestic wastewater to a facultative (treatment) lagoon system for; industrial, non-hazardous wastewater to evaporative impoundments; stormwater emanating generally from the Facility to evaporative impoundments, and stormwater emanating from the salt piles to evaporative impoundments.

Up to 23,000 gallons per day (gpd) of domestic wastewater may be discharged to seven synthetically lined impoundments (Facultative Lagoon System) comprised of Settling Lagoons 1 and 2, Polishing Lagoons 1 and 2, and Effluent Lagoons A, B, and C for disposal by evaporation and removal of precipitated domestic waste solids.

Non-domestic wastewater may be discharged at the Facility in the following ways:

- Up to 27,000 gpd of industrial wastewaters from the following sources: wastewater from two compressed air systems, brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous wastewaters. These industrial wastewaters are discharged to the Effluent Lagoons B and C of the Facultative Lagoon System for disposal by evaporation.

- Up to 50,000 gpd of industrial wastewaters from the following sources: brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous wastewaters. These industrial wastewaters are discharged to a separate synthetically lined impoundment for disposal by evaporation (Evaporation Pond H-19).

- Up to 2,210 gpd of brine produced from the operation of the to be constructed Salt Reduction System within the Safety Significant Confinement Ventilation System (SSCVS) will be discharged to two double synthetically lined impoundments, each with a leak detection system (Brine Retention Ponds East and West, collectively Brine Ponds). One brine retention pond will be in service while the other brine retention pond is closed for evaporation and removal of precipitated salt every two weeks. After two weeks, any remaining brine in the closed Brine Pond will be transferred to Brine Salt Storage Pond 4 for disposal by evaporation.

- Salt and other subsurface materials mined during construction of the Facility, as well as currently mined salt, are stored at the surface in four stockpiles. The stockpiles currently storing salt, or that will be used in the future as salt is mined from the Facility's underground panels, are referred to as Salt Cells 2, 3, and 5. Stormwater runoff in contact with Salt Cells 2 and 3 is collected in two double synthetically-lined stormwater impoundments, each with a leak detection system (Salt Storage Ponds 2 and 3). The total storage capacity of Salt Storage Ponds 2 and 3 is 21,737,254 gallons. Stormwater runoff in contact with Salt Cell 5 will be collected in a double synthetically-lined stormwater impoundment with a leak detection system (Salt Storage Pond 5). The storage capacity of Salt Storage Pond 5 will be 6,355,404 gallons. Salt Cell 1 no longer receives salt and is capped with synthetic material and an earthen cover. Stormwater runoff in contact with this stockpile is collected in synthetically-lined diversion ditches directed to a synthetically-lined impoundment (Salt Storage Pond 1). The storage capacity of Salt Storage Pond 1 is 3,301,634 gallons. The storage capacity of each salt storage pond is more than sufficient to contain a 24-hour, 100-year (5.84-inch rainfall) storm event.

- Stormwater runoff from the SSCVS area is collected in a double synthetically-lined stormwater impoundment with a leak detection system (Brine Salt Storage Pond 4). The storage capacity of Brine Salt Storage Pond 4 is 8,668,722 gallons. The capacity of the Brine Salt Storage Pond 4 is more than sufficient to contain a 24-hour, 100-year (5.84-inch rainfall) storm event.

- Additional stormwater runoff from the Facility's paved areas and roofs is collected in three synthetically-lined impoundments (Storm Water Ponds 1, 2, and 3). This runoff does not contact the salt stockpiles or other waste materials at the Facility and may be used by the permittee for dust control, soil compaction, and other construction activities.

The modification consists of the addition of one new salt storage cell and four new impoundments: Salt Cell 5, Salt Storage Pond 5, Brine Salt Storage Pond 4, Brine Retention Pond East, and Brine Retention Pond West.

Basis for Draft Permit Conditions

The conditions in this Draft Permit are organized into the following Sections: Operational Plan, Monitoring and Reporting, Additional Studies Required, Contingency, Closure, and General Requirements. The Draft Permit conditions conform to the requirements of the regulations and are generally consistent with similar conditions in other groundwater discharge permits issued by the Department.

1. Operational Plan Conditions (pages 6-15 in the Draft Permit)

Conditions in this Section require the permittee to properly operate and maintain the disposal systems, to restrict access to the systems via fencing so that unauthorized persons cannot damage a system or be exposed to unsafe conditions, and to post appropriate cautionary signs.

This Section contains operating conditions typically required for discharge systems composed of lined treatment impoundments for domestic wastewater and lined evaporative impoundments for industrial wastewater and stormwater. These conditions include requirements to appropriately maintain the synthetic impoundment liners, to maintain a specific freeboard within impoundments to prevent overtopping, to measure the thickness of settled solids within impoundments and to remove those solids if storage capacity is diminished to a specific limit. Proper operation and maintenance of the discharge system is critical for the Discharge Permit to achieve the performance criteria established in Subsection C of 20.6.2.3109 NMAC.

This Section requires the Permittee to monitor leak detection systems associated with specific salt storage ponds and impoundments that are proposed to be built during the term of the Discharge Permit. This requirement addresses the 20.6.2.3107 NMAC requirement that a discharge plan include procedures for detecting failure of the discharge system. To accomplish this, the Permittee must establish an average leakage rate for the primary liners and determine if there is a deviation of 20% above that leakage rate. If a deviation occurs, the Contingency Section specifies verification and remedial actions to be followed by the Permittee.

This Section also requires the Permittee to conduct regular maintenance of the earthen covers on Salt Cell 1 and the Site & Preliminary Design Validation (SPDV) Material Pile. Both piles consist of salt excavated during the construction of the Facility. Both piles are no longer active, i.e., they no longer receive salt; therefore, they have been covered in order to prevent stormwater infiltration and destabilization of the piles.

The Draft Permit does not contain discharge quality limitations because all discharges are contained in evaporative disposal systems.

2. Monitoring and Reporting Conditions (pages 15 – 28 in the Draft Permit)

Conditions in this Section require the Permittee to monitor and report on various aspects of the discharge system and groundwater to demonstrate that operations are compliant with the Discharge Permit limits and that the Discharge Permit is achieving the expected results. Monitoring and reporting requirements are authorized by Subsection A of 20.6.2.3107 NMAC. A discharge permit may not be approved without provisions for flow measurement and sampling, pursuant to Subsection H of 20.6.2.3109 NMAC.

The facility subsections require monitoring of the quantity and quality of the discharges, specifically, the discharge volumes to the impoundments, the chemical characterization of the impounded fluids, and the volume of liquid pumped from the leak detection systems.

Once during the Discharge Permit term, the Permittee is required to evaluate industrial wastewater for a comprehensive list of chemical constituents pursuant to 20.6.2.3103 NMAC. This comprehensive analysis pertains to the industrial waste discharges having varied origins, including brine, purge waters from sampling and developing monitoring wells, and miscellaneous industrial non-hazardous wastewaters.

The Groundwater Monitoring and Reporting subsection requires monitoring groundwater downgradient of the following potential contaminant sources: impoundments containing stormwater runoff in contact with salt piles, the domestic wastewater impoundment system, capped salt piles, uncapped salt piles, and impoundments containing industrial discharges. This Section requires groundwater monitoring of two saturated zones, the shallow anthropogenic groundwater measured at approximately 30 feet below ground surface and the shallowest non-anthropogenic water-bearing zone in the Dewey Lake Formation measured at approximately 160 feet below ground surface.

The Permittee is required to sample for total dissolved solids, chloride, and sulfate in groundwater monitoring wells designated to monitor salt piles and impoundments containing stormwater runoff in contact with salt piles. The Permittee is required to sample for nitrate as nitrogen and total Kjeldahl nitrogen in the groundwater monitoring well designated to monitor the domestic wastewater impoundment system. The Permittee is required to sample for uranium and combined radium-226 and radium-228 in the groundwater monitoring wells designated to monitor all domestic and non-domestic discharge locations at the Facility. The sampling requirements for uranium and radium-226/radium-228 are included because these constituents can be indicative of radioactive materials originating from the Facility and because these constituents are the only radioactive constituents for which New Mexico has groundwater protection standards.

Monitoring wells WQSP-6A, PZ-16, and PZ-17 are intended to monitor the shallowest non-anthropogenic water-bearing zone in the Dewey Lake Formation, which occurs in the subsurface at the southern end of the Facility. All other monitoring wells are intended to monitor the shallow anthropogenic groundwater.

This subsection requires the installation of four new groundwater monitoring wells to monitor groundwater associated with newly authorized impoundments, to replace an improperly located well, and to monitor previously unmonitored locations. One monitoring well is required to be installed downgradient of the Facultative Lagoon System to replace an improperly located well. One monitoring well is required to be installed downgradient of Evaporation Pond H-19 because the impoundment is comprised of a single, 40-mil synthetic liner; therefore, a monitoring well is required downgradient to monitor the integrity of the liner. One monitoring well is required to be installed downgradient of the proposed Brine Salt Storage Pond 4 to monitor that impoundment system. One well is required to be installed downgradient of the proposed Salt Storage Pond 5 in order to monitor that impoundment system.

This Section requires the submittal of semi-annual monitoring reports that include the following: the chemical analytical results of domestic effluent and non-domestic wastewater; discharge volumes; record of solids (salt) removal and disposal; leak detection system measurements; the submittal of DOE's "Waste Isolation Pilot Plant Annual Site Environmental Report"; groundwater characterization data; groundwater depth measurements; and groundwater elevation contour maps.

3. Additional Studies Required (page 28 in the Draft Permit)

This Section requires the Permittee to submit for NMED approval a workplan to investigate the shallow anthropogenic groundwater beneath the site, which contains concentrations of total dissolved solids, chloride, and sulfate above the standards of 20.6.2.3103 NMAC. Contingency Condition 26 of WIPP's previous Discharge Permit dated July 29, 2014 requires a response to exceedances to the standards of 20.6.2.3103 NAMC Facility records identify the probable source of this groundwater as unlined stormwater impoundments from the time of initial construction of the Facility to the time the impoundments were lined in 2005. The purpose of the site investigation is to determine the sources, composition, and extent of this contaminated shallow groundwater, and to evaluate possible impacts to naturally occurring downgradient groundwater in the Dewey Lake Formation.

This requirement is consistent with Section 20.6.2.3107 NMAC, which allows the Secretary to require a system of monitoring and reporting to verify that the permit is achieving the expected results and to require reporting of other information. The site investigation will provide additional information necessary to prevent further contamination and to determine whether to require corrective action.

4. Contingency Plan Conditions (pages 28 -32 in the Draft Permit)

Conditions in this Section require the Permittee to implement specified actions, or to propose corrective actions for NMED's approval, in the case of failure of any aspect of the discharge system. The conditions, which reflect standard language used in other industrial discharge permits, address the exceedance of groundwater standards, damage to impoundment liners, lack of required freeboard in impoundments, and monitoring well deficiencies (e.g., improper construction, improper location for monitoring the intended source, insufficient water for sampling). Contingency plans are authorized by Subsection A(10) of 20.6.2.3107 NMAC. The Permittee is required to report and address unauthorized discharges in accordance with 20.6.2.1203 NMAC.

5. Closure Conditions (pages 32 – 35 in the Draft Permit)

Conditions in this Section prescribe measures and timeframes for closing part, or all, of the Facility so that discharges can no longer occur and so that the exceedance of groundwater standards does not occur after the cessation of the operation. NMED understands that the Permittee does not plan to close the Facility during the term of this Discharge Permit, however general closure conditions are always included in discharge permits. Closure requirements are authorized by Subsection A(11) of 20.6.2.3107 NMAC, which also stipulates that closure requirements survive the termination or expiration of the Discharge Permit.

Groundwater monitoring is required after a discharge ceases and all means of transferring liquid to a discharge impoundment are sealed. This period after "closure" is commonly referred to as "post-closure" and generally continues until a minimum of eight consecutive quarters of groundwater sampling and analysis confirm no exceedance of standards. This two-year period allows for the potential movement of contaminants through the vadose zone and is consistent with the time period established in remediation programs for demonstrating that remediation is complete, e.g., 20.6.2.4103 NMAC (abatement plans) and 20.5.119.1929 NMAC (petroleum storage tank systems).

This Section includes a condition for properly closing the Facility in accordance with the WIPP Land Withdrawal Act, WIPP's Hazardous Waste Facility Permit (NM4890139088-TSDF), and the WIPP Land Management Plan's requirements for disposition of salt. In particular, the condition requires removal of all salt stockpiles from the land surface at the Facility so that the salt does not remain as a potential source of a contaminant discharge to groundwater.

6. General Terms and Conditions (pages 35 – 39 in the Draft Permit)

This Section's general terms and conditions are standard conditions in all discharge permits.

The Permittee is required to maintain certain records and provide them if requested to NMED, as authorized by Subsections A and D of 20.6.2.3107 NMAC. The Permittee is required to notify NMED of proposed changes to the volume, location, or character of the discharge, as this may require a "discharge permit modification" as defined in Subsection D of 20.6.2.7 NMAC and is consistent with the notification requirement in Subsection C of 20.6.2.3107 NMAC.

This Section identifies the Permittee's obligations, pursuant to the Ground and Surface Water Protection Regulations, regarding the transfer of the discharge permit, permit fees, and submittal construction plans and specifications. The Section also cites New Mexico Water Quality Act provisions allowing for inspections, civil and criminal penalties, and the duty to comply with other laws.

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GROUND WATER QUALITY BUREAU (GWQB) DISCHARGE PERMIT RENEWAL/MODIFICATION

Issued under 20.6.2 NMAC

Preliminary Draft: November 26, 2019

Facility Name:	Waste Isolation Pilot Plant (WIPP)
GWQB Discharge Permit Number:	DP-831
GWQB TEMPO AI Number:	318
Permittee Name/Responsible Party:	Kirk D. Lachman, Acting Manager
Mailing Address:	U.S. Department of Energy, Carlsbad Field Office P.O. Box 3090 Carlsbad, NM 88221
Facility Contact:	Mike Proctor, Facility Operator
Facility Contact Telephone Number:	(575) 834-7027
Facility Location:	Highway 128, approximately 26 miles southeast of Carlsbad Sections 20, 21, 28, and 29, Township 22S, Range 31E
County:	Eddy County
Permitting Action:	Renewal and Modification
Permit Effective Date:	XXXXXX
Permit Expiration Date:	XXXXXXX
NMED Permit Contact:	Avery Young
NMED Contact Telephone Number:	(505) 827-2909
E-mail Address:	avery.young@state.nm.us

MICHELLE HUNTER
Chief, Ground Water Quality Bureau
New Mexico Environment Department

Date

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GROUND WATER DISCHARGE PERMIT RENEWAL and MODIFICATION
Waste Isolation Pilot Plant (WIPP), DP-831

I. INTRODUCTION

The New Mexico Environment Department (NMED) issues this Discharge Permit Renewal and Modification (Discharge Permit), DP-831, to the U.S. Department of Energy (DOE) (permittee) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978 §§74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge of water contaminants from the Waste Isolation Pilot Plant (WIPP or facility) into ground and surface water, so as to protect ground and surface water for present and potential future use as domestic and agricultural water supply and other uses, and to protect public health. In issuing this Discharge Permit, NMED has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been met. Pursuant to Section 20.6.2.3104 NMAC, it is the responsibility of the permittee to comply with the terms and conditions of this Discharge Permit; failure may result in an enforcement action(s) by NMED (20.6.2.1220 NMAC).

The activities that produce the discharge, the location of the discharge, and the quantity, quality and flow characteristics of the discharge are briefly described as follows:

Domestic wastewater is discharged to a synthetically lined impoundment system for treatment and disposal by evaporation at a rate of up to 23,000 gallons per day (gpd). The system consists of seven synthetically lined impoundments (Facultative Lagoon System) comprised of Settling Lagoons 1 and 2, Polishing Lagoons 1 and 2, and Effluent Lagoons A, B, and C.

Non-domestic wastewater may be discharged at the facility in the following ways:

- Up to 27,000 gpd of industrial wastewaters from the following sources: wastewater from two compressed air systems, brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous wastewaters. These industrial wastewaters are discharged to the Effluent Lagoons B and C of the Facultative Lagoon System for disposal by evaporation.

- Up to 50,000 gpd of industrial wastewaters from the following sources: brine, purge waters from sampling and developing Facility monitoring wells, and other miscellaneous industrial non-hazardous wastewaters. These industrial wastewaters are discharged to a separate synthetically lined impoundment for disposal by evaporation (Evaporation Pond H-19).

- Up to 2,210 gpd of brine produced from the operations of the to be constructed Salt Reduction System within the Safety Significant Confinement Ventilation System (SSCVS) will be discharged to two double synthetically lined impoundments, each with a leak detection system (Brine Retention Ponds East and West, collectively Brine Ponds). One brine retention pond will be in service while the other brine retention pond is closed for evaporation and removal of precipitated salt every two weeks. After two weeks, any remaining brine in the closed Brine Pond will be transferred to Brine Salt Storage Pond 4 for disposal by evaporation.

- Salt and other subsurface materials mined during construction of the Facility, as well as currently mined salt, are stored at the surface in four stockpiles. The stockpiles currently storing salt, or that will be used in the future as salt is mined from the Facility's underground panels, are referred to as Salt Cells 2, 3, and 5. Stormwater runoff in contact with Salt Cells 2 and 3 is collected in two double synthetically-lined stormwater impoundments, each with a leak detection system (Salt Storage Ponds 2 and 3). The total storage capacity of Salt Storage Ponds 2 and 3 is 21,737,254 gallons. Stormwater runoff in contact with Salt Cell 5 will be collected in a double synthetically-lined stormwater impoundment with a leak detection system (Salt Storage Pond 5). The storage capacity of Salt Storage Pond 5 will be 6,355,404 gallons. Salt Cell 1 no longer receives salt and is capped with synthetic material and an earthen cover. Stormwater runoff in contact with this stockpile is collected in synthetically-lined diversion ditches directed to a synthetically-lined impoundment (Salt Storage Pond 1). The storage capacity of Salt Storage Pond 1 is 3,301,634 gallons. The storage capacity of each salt storage pond is more than sufficient to contain a 24-hour, 100-year (5.84-inch rainfall) storm event.

- Stormwater runoff from the SSCVS area is collected in a double synthetically lined storm water impoundment with a leak detection system (Brine Salt Storage Pond 4). The storage capacity of Brine Salt Storage Pond 4 is 8,668,722 gallons. The capacity of the Brine Salt Storage Pond 4 is more than sufficient to contain a 24-hour, 100-year (5.84-inch rainfall) storm event.

- Additional stormwater runoff from the Facility's paved areas and roofs is collected in three synthetically-lined impoundments (Storm Water Ponds 1, 2, and 3). This runoff does not contact the salt stockpiles or other waste materials at the Facility and may be used by the permittee for dust control, soil compaction, and other construction activities.

Salt and other subsurface materials mined during construction of the facility, as well as currently mined salt, are stored on the surface in four stockpiles (Salt Cells 1, 2, 3, and 5). Salt Cell 1 is closed with a 60-mil HDPE synthetic liner cover and two feet of native soil, as well as a 60-mil HDPE synthetically lined drainage system for stormwater runoff collection. Salt Cells 2 and 3 were constructed with six inches of prepared subgrade, a 60-mil HDPE liner, a 200-mil Geonet drainage layer, an eight-ounce geotextile fabric, and the fabric is then covered with two feet of screened native soil. Each salt cell is sloped toward the center, which contains a collection trench and pipe for conveyance of water to Salt Storage Ponds 2 and 3. Salt Cell 5 will be constructed with a 60-mil HDPE liner on the bottom with a protective layer of native soil on top to protect the liner. A HDPE pipe will be installed to collect and transmit by gravity the leachate and stormwater runoff water from Salt Cell 5 to Salt Storage Pond 5.

The Site Preliminary Design Validation (SPDV) material pile was constructed as the shafts were excavated when construction first began at the WIPP site. The SPDV material pile was closed in the year 2000 with a geosynthetic liner cover installed on 6 inches of bedding material and covered with a minimum of three feet of earthen material.

The modification consists of the addition of one new salt storage cell and four new impoundments: Salt Cell 5, Salt Storage Pond 5, Brine Salt Storage Pond 4, Brine Retention Pond East, and Brine Retention Pond West.

The discharge contains water contaminants that may be elevated above the standards of Section 20.6.2.3103 NMAC.

The facility is located near the Jal Highway (NM-128), approximately 26 miles southeast of Carlsbad, in Sections 20, 21, 28, and 29, Township 22S, Range 31E, Eddy County.

The WIPP facility is principally a mined geologic repository for the disposal of transuranic (TRU) waste. The underground repository is located 2,150 feet below land surface in the bedded salt of the Salado Formation. WIPP first began accepting waste in March 1999. In addition to this groundwater Discharge Permit, the WIPP is also regulated by the NMED Hazardous Waste Bureau under the New Mexico Hazardous Waste Act and New Mexico's Hazardous Waste Regulations.

The WIPP facility is geologically situated in the southeast portion of New Mexico within the Delaware Basin, which is part of the larger Permian Basin. The geologic formations below the facility that are pertinent to this Discharge Permit, from deepest to shallowest, include: the Salado Formation, the Rustler Formation, the Dewey Lake Formation, and, in the northeastern portion of the facility, the Santa Rosa Formation. The Salado Formation, which is first encountered at a depth of 850 feet and is 2,000 feet thick, consists predominately of halite, with some carbonates, anhydrites, and clay seams. The Rustler Formation ranges from 350 to 500 feet thick and consists of carbonates, anhydrites, and halites. The Dewey Lake Formation is approximately 500 feet thick and consists almost entirely of mudstone, claystone, siltstone, and interbedded sandstone, and is frequently referred to as the Dewey Lake Redbeds Formation.

Groundwater below the facility most likely to be affected by a discharge is at a depth of approximately 30 to 160 feet, is located in the upper portion of the Dewey Lake Formation and has an average total dissolved solids concentration of approximately 3,400 milligrams per liter. WIPP discovered the presence of shallow groundwater in March 2001 and determined that the probable sources of this shallow groundwater were the unlined impoundments constructed to capture stormwater runoff at the facility and runoff from the above-ground salt piles. This shallow groundwater has been found to be contaminated with total dissolved solids, sulfate, and chloride. After the discovery of the anthropogenically created shallow groundwater, all impoundments at the facility were lined and a network of monitoring wells was installed. The shallow groundwater has a flow direction of north to south. Natural, non-anthropogenic, groundwater occurs in the Dewey Lake Formation south of the WIPP facility at a depth of 160 feet. The Dewey Lake Formation has a relatively low hydraulic conductivity.

The first laterally continuous water-bearing zone below the facility is within an approximately 30-foot-thick section of the Culebra Member of the Rustler Formation. Water in the Culebra Member is usually present in fractures and is confined by overlaying gypsum or anhydrite and underlying clay and anhydrite beds. Water from the Culebra Member is not used as a water supply in the immediate WIPP facility vicinity; however, its nearest use is approximately seven miles southwest of the WIPP facility, where it is used for livestock watering. The Culebra Member is monitored through a series of monitoring wells that are part of the facility's Water Quality Sampling Program.

The original Discharge Permit was issued on January 16, 1992, amended on August 28, 1995, renewed on July 3, 1997, amended on June 12, 1998 and on January 24, 2000, renewed on April 29, 2003, modified on December 22, 2003 and on December 29, 2006, renewed and modified on July 23, 2008, and last renewed on July 29, 2014. The application (i.e., discharge plan) consists of the materials submitted by the permittee dated December 3, 2018 and materials contained in the administrative record prior to issuance of this Discharge Permit.

The discharge shall be managed in accordance with all conditions and requirements of this Discharge Permit.

Pursuant to Section 20.6.2.3109 NMAC, NMED reserves the right to require a Discharge Permit Modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated or the standards of Section 20.6.2.3103 NMAC are being or may be violated. This may include a determination that structural controls and/or management practices approved under this Discharge Permit are not protective of groundwater quality, and that more stringent requirements to protect groundwater quality may be required by NMED. The permittee may be required to implement abatement of water pollution and remediate groundwater quality.

Issuance of this Discharge Permit does not relieve the permittee of the responsibility to comply with the WQA, WQCC Regulations, and any other applicable federal, state and/or local laws and regulations, such as zoning requirements and nuisance ordinances.

The following acronyms and abbreviations may be used in this Discharge Permit.

Abbreviation	Explanation	Abbreviation	Explanation
BOD_5	biochemical oxygen demand (5-day)	NMED	New Mexico Environment Department
CFR	Code of Federal Regulations	NMSA	New Mexico Statutes Annotated
CFU	Colony Forming Unit	NO_3-N	nitrate-nitrogen
Cl	chloride	NTU	nephelometric turbidity units
EPA	United States Environmental Protection Agency	TDS	total dissolved solids
gpd	gallons per day	TKN	total Kjeldahl nitrogen
LAA	land application area	total nitrogen	= TKN + NO_3-N
LADS	land application data sheet(s)	TRC	total residual chlorine
mg/L	milligrams per liter	TSS	total suspended solids

Abbreviation	Explanation		Abbreviation	Explanation
mL	milliliters		WQA	New Mexico Water Quality Act
MPN	Most Probable Number		WQCC	Water Quality Control Commission
NMAC	New Mexico Administrative Code		WWTF	Wastewater Treatment Facility

II. FINDINGS

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In issuing this Discharge Permit, NMED finds the following.

1. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move directly or indirectly into groundwater within the meaning of Section 20.6.2.3104 NMAC.

2. The permittee is discharging effluent or leachate from the facility so that such effluent or leachate may move into groundwater of the State of New Mexico that has an existing concentration of 10,000 mg/L or less of TDS within the meaning of Subsection A of 20.6.2.3101 NMAC.

3. The discharge from the facility is not subject to any of the exemptions of Section 20.6.2.3105 NMAC.

III. AUTHORIZATION TO DISCHARGE

Pursuant to 20.6.2.3104 NMAC, it is the responsibility of the permittee to ensure that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein.

The permittee is authorized to discharge up to 23,000 gpd of domestic wastewater to a synthetically-lined facultative impoundment system for disposal by evaporation. The Facultative Lagoon System is authorized to accept up to 27,000 gpd of non-hazardous industrial wastewater from two compressed air systems at the facility, brine, purge waters from sampling and developing wells, and miscellaneous industrial non-hazardous wastewater for disposal by evaporation. Up to 50,000 gpd of brine, purge waters, and miscellaneous non-hazardous process waters is authorized to be discharged into to the Evaporation Pond H-19. Up to 2,210 gpd of brine is authorized to be discharged from a 3,000-gallon holding tank to Brine Retention Ponds East and West for disposal by evaporation, and every two weeks the remaining brine in the Brine Ponds is authorized to be transferred to the Brine Salt Storage Pond 4.

The permittee is authorized to stockpile mined salt in four salt cells: Salt Pile 1 is closed with a cover; Salt Cells 2, 3 and 5 have authorized footprints of 6.2 acres, 5.2 acres, and 5.1 acres, respectively. The permittee is authorized to collect storm water runoff from these salt cells in three double synthetically lined impoundments with leak detection systems (Salt Storage Pond 2, Salt Storage Pond 3, and Salt Storage Pond 5) and one synthetically lined impoundment with a drainage system (Salt Storage Pond 1) for disposal by evaporation. The permittee is also authorized to collect storm water runoff from the facility's paved areas and roofs in Storm Water Ponds 1, 2, and 3, as well as Brine Salt Storage Pond 4. This runoff is not in contact with the salt stockpiles at the facility, and runoff from Storm Water Ponds 1, 2, and 3 may be used for dust control, soil compaction, and other construction activities.

This Discharge Permit sets forth requirements for the discharge and disposal of domestic and non-domestic wastewater. Conditions in the Operational Plan, the Monitoring and Reporting, and the Closure Plan sections are categorized as follows:

- **Part A. Generally Applicable to All Discharges;**
- **Part B. Applicable to the Facultative Lagoon System;**
- **Part C. Applicable to the Evaporation Pond H-19, Brine Retention Pond East, Brine Retention Pond West, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3;**
- **Part D. Applicable to the Impoundments Containing Storm Water Runoff in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, 3, and 5) and to Salt Stockpiles (Salt Cells 1, 2, 3, and 5);**
- **Part E. Applicable to Ground Water Monitoring.**

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

IV. CONDITIONS

NMED issues this Discharge Permit for the discharge of water contaminants subject to the following conditions.

OPERATIONAL PLAN

Part A. Generally Applicable to All Discharges

#	**Operating Conditions Applicable to All Discharges**
1.	The permittee shall implement the following operational plan to ensure compliance with Title 20, Chapter 6, Parts 2 and 4 NMAC. [Subsection C of 20.6.2.3109 NMAC]
2.	The permittee shall operate in a manner such that standards and requirements of Sections 20.6.2.3101 and 20.6.2.3103 NMAC are not violated. [20.6.2.3101 NMAC, 20.6.2.3103 NMAC, Subsection C of 20.6.2.3109 NMAC]

#	Operating Conditions Applicable to All Discharges
3.	The permittee shall maintain the impoundment liners in such a manner as to avoid conditions that could affect the liner or the structural integrity of the impoundments. Such conditions include or may be characterized by the following: • erosion damage; • animal burrows or other damage; • the presence of vegetation including aquatic plants, weeds, woody shrubs or trees growing within five feet of the top inside edge of a sub-grade impoundment, within five feet of the toe of the outside berm of an above-grade impoundment, or within the impoundment itself; • the presence of large debris or large quantities of debris in the impoundment; • evidence of seepage; or • evidence of berm subsidence. Vegetation growing around the impoundments shall be routinely controlled by mechanical removal in a manner that is protective of the impoundment liner. The permittee shall visually inspect the impoundments and surrounding berms on a monthly basis to ensure proper maintenance. In the event that inspection reveals any evidence of damage that threatens the structural integrity of an impoundment berm or liner, or that may result in an unauthorized discharge, the permittee shall enact the contingency plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
4.	The permittee shall preserve a minimum of one foot of freeboard between the liquid level in all the impoundments and the elevation of the top of the impoundment liner, except the Brine Retention Ponds East and West shall maintain two feet of freeboard. In the event that the permittee determines that the specified freeboard cannot be preserved in the impoundments, the permittee shall enact the contingency plan set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

Part B. Applicable to the Facultative Lagoon System

#	Facultative Lagoon System - Operational Actions with Implementation Deadlines
5.	Within two years following the effective date of this Discharge Permit (**by DATE**), the permittee shall measure the thickness of the settled solids in the seven impoundments that are part of the Facultative Lagoon System and report the results of the solids thickness measurements to NMED. The permittee shall measure the thickness of settled solids in each impoundment in accordance with the following procedure.

#	**Facultative Lagoon System - Operational Actions with Implementation Deadlines**
	a) The total surface area of the treatment impoundment shall be divided into nine equal sub-areas. b) A settled solids measurement device (core sampler) shall be utilized to obtain one measurement (to the nearest half-foot) per sub-area. c) The nine measurements shall be averaged. In the event the average solids accumulation exceeds one-third of the maximum allowable liquid depth in the impoundments, the permittee shall propose a plan for the removal and disposal of the solids. The solids removal and disposal plan shall be submitted to NMED for approval within two years and two months following the effective date of this Discharge Permit (by **DATE**) and shall include the following information. a) A method for removal of the solids to a depth of less than six inches throughout the treatment impoundment in a manner that is protective of the impoundment liner. b) A description of how the solids will be contained, transported, and disposed of in accordance with all local, state, and federal regulations, including 40 CFR Part 503. c) A schedule for completion of the solids removal and disposal project. The permittee shall initiate implementation of the plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

#	**Facultative Lagoon System - Operating Conditions**
6.	The permittee shall maintain fences around the Facultative Lagoon System to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
7.	The permittee shall maintain signs indicating that the wastewater at the facility is not potable. Signs shall be posted at the Facultative Lagoon System's entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish remain visible and legible. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
8.	The permittee shall utilize operators, certified by the State of New Mexico at the appropriate level, to operate the domestic wastewater collection, treatment and disposal systems. The operations and maintenance of all or any part of the wastewater system shall be performed by, or under the direct supervision of, a certified operator. [Subsection C of 20.6.2.3109 NMAC, 20.7.4 NMAC]

Part C. Applicable to the Evaporation Pond H-19, Brine Retention Pond East, Brine Retention Pond West, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operational Actions with Implementation Deadlines**
9.	Prior to discharging to the proposed Brine Retention Pond East, the Brine Retention Pond West, or the Brine Salt Storage Pond 4, the permittee shall submit written notification to NMED stating the date the discharge(s) is to commence. [Subsection C of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
10.	Prior to discharging to Brine Retention Pond East, Brine Retention Pond West, or Brine Salt Storage Pond 4, the permittee shall complete construction of the Ponds in accordance with the final construction plans and specifications submitted to NMED as part of the Discharge Permit application received on December 3, 2018. The permittee shall notify NMED prior to the commencement of construction to allow NMED personnel to be onsite for inspection during construction. The permittee shall submit record drawings that bear the seal and signature of a licensed New Mexico professional engineer (pursuant to the New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority) for the constructed Brine Retention Pond East, Brine Retention Pond West, and Brine Salt Storage Pond 4 to NMED within 30 days of completion. [Subsections A and C of 20.6.2.1202 NMAC, Subsection C of 20.6.2.3109 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
11.	Within 90 days following the effective date of this Discharge Permit **(by DATE)**, the permittee shall install fences around Stormwater Ponds 1, 2 and 3 to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates and shall be maintained throughout the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
12.	Prior to discharging to Brine Salt Storage Pond 4, the permittee shall install fences around said impoundment to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates and shall be maintained throughout the term of this Discharge Permit. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
13.	Prior to discharging to Brine Salt Storage Pond 4, the permittee shall post signs indicating that the wastewater in the impoundment is not potable. Signs shall be posted at the facility entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish and shall remain visible and legible for the term of this Discharge Permit.

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operational Actions with Implementation Deadlines**
	[Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
14.	Within two years following the effective date of this Discharge Permit **(by DATE)**, the permittee shall measure the thickness of the settled solids in Evaporation Pond H-19 and report the results of the solids thickness measurements to NMED. The permittee shall measure the thickness of settled solids in accordance with the following procedure. a) The total surface area of the impoundment shall be divided into nine equal sub-areas. b) A settled solids measurement device (core sampler) shall be utilized to obtain one measurement (to the nearest half-foot) per sub-area. c) The nine measurements shall be averaged. In the event the average solids accumulation exceeds one-third of the maximum liquid depth in the impoundment, the permittee shall propose a plan for the removal and disposal of the solids. The solids removal and disposal plan shall be submitted to NMED for approval within two years and two months following the effective date of this Discharge Permit **(by DATE)** and shall include the following information. a) A method for removal of the solids to a depth of less than six inches throughout the treatment impoundment in a manner that is protective of the impoundment liner. b) A description of how the solids will be contained, transported, and disposed of in accordance with all local, state, and federal regulations. c) A schedule for completion of the solids removal and disposal project. The permittee shall initiate implementation of the plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operating Conditions**
15.	The permittee shall establish an average leakage rate for the primary liners installed in Brine Salt Storage Pond 4 and Brine Retention Ponds East and West. The average weekly leakage rate shall be determined by averaging the volume discharged from the leak detection sump(s) during the first two weeks following the initial date of discharge to the impoundment(s). The leak detection, collection and removal systems for Brine Salt Storage Pond 4 and Brine Retention Ponds East and West shall be monitored by checking the liquid level in the sump(s) for the impoundment's secondary liner on a continuous basis to determine if the rate of removal has deviated from the average leakage rate for the respective primary liner. If there is a deviation of 20% above the average leakage rate, the permittee shall

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Operating Conditions**
	sample the liquid in the sump(s) within 15 days and analyze the sample for TDS, Cl, SO_4, and pH. In the event that the analytical results of the liquid present in the leak detection sump(s) indicate that the composition of the liquid is consistent with the contents of the evaporative impoundment(s), the permittee shall submit a corrective action plan to NMED which evaluates the primary liner leakage rate and proposes options for reducing the leakage. The plan shall be submitted for NMED approval within 60 days of the receipt of the analytical results. If the composition of the liquid present in the leak detection sump(s) is not consistent with the contents of the evaporative impoundment(s), the permittee shall determine the source of the deviation and fix the issue. In the event that the leak detection system is modified or the method used to monitor the liquid level in the impoundment's sump(s) is modified, the permittee shall submit a revised methodology for NMED approval. [20.6.2.3107 NMAC]
16.	The permittee shall maintain fences around Evaporation Pond H-19 to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
17.	The permittee shall maintain signs indicating that the wastewater in Evaporation Pond H-19 is not potable. Signs shall be posted at the impoundment entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish and shall remain visible and legible. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]

Part D. Applicable to the Impoundments Containing Storm Water Runoff in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, 3, and 5) and to Salt Stockpiles (Salt Cells 1, 2, 3, and 5)

#	**Salt Storage Ponds and Salt Stockpiles - Operational Actions with Implementation Deadlines**
18.	Prior to discharging to Salt Storage Pond 5, the permittee shall submit written notification to NMED stating the date the discharge is to commence. [Subsection C of 20.6.2.3107 NMAC]

#	**Salt Storage Ponds and Salt Stockpiles - Operational Actions with Implementation Deadlines**
19.	Prior to discharging to Salt Storage Pond 5 and prior to utilizing Salt Cell 5, the permittee shall complete construction in accordance with the final construction plans and specifications submitted to NMED as part of the Discharge Permit application received on December 3, 2018. The permittee shall notify NMED prior to construction to allow NMED personnel to be onsite for inspection during construction. The permittee shall submit record final drawings that bear the seal and signature of a licensed New Mexico professional engineer (pursuant to the New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority) for the constructed Salt Storage Pond 5 and Salt Cell 5 to NMED within 30 days of completion. [Subsections A and C of 20.6.2.1202 NMAC, Subsection C of 20.6.2.3109 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
20.	Within 90 days following the effective date of this Discharge Permit **(by DATE)**, the permittee shall install fences around Salt Storage Ponds 1, 2 and 3 to control access by the general public and animals. The fences shall consist of a minimum of six-foot chain link or field fencing and locking gates. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
21.	Within 120 days following the effective date of this Discharge Permit **(by DATE)**, the permittee shall post signs indicating that the wastewater in Salt Storage Ponds 1, 2 and 3 is not potable. Signs shall be posted at the facility entrance and other areas where there is potential for public contact with wastewater. All signs shall be printed in English and Spanish and shall remain visible and legible. [Subsections B and C of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.D]
22.	Within two years following the effective date of this Discharge Permit **(by DATE)**, the permittee shall measure the thickness of the settled solids in Salt Storage Pond 1, 2, and 3 and report the results of the solids thickness measurements to NMED. The permittee shall measure the thickness of settled solids in each Salt Storage Pond in accordance with the following procedure. a) The total surface area of the impoundment shall be divided into nine equal sub-areas. b) A settled solids measurement device (core sampler) shall be utilized to obtain one measurement (to the nearest half-foot) per sub-area. c) The nine measurements shall be averaged. In the event the average solids accumulation exceeds one-third of the maximum liquid depth in the impoundments, the permittee shall propose a plan for the removal and disposal of the solids. The solids removal and disposal plan shall be submitted to NMED for

#	**Salt Storage Ponds and Salt Stockpiles - Operational Actions with Implementation Deadlines**
	approval within two years and two months following the effective date of this Discharge Permit (**by DATE**) and shall include the following information. a) A method for removal of the solids to a depth of less than six inches throughout the treatment impoundment in a manner that is protective of the impoundment liner. b) A description of how the solids will be contained, transported, and disposed of in accordance with all local, state, and federal regulations. c) A schedule for completion of the solids removal and disposal project. The permittee shall initiate implementation of the plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]

#	**Salt Storage Ponds and Salt Stockpiles - Operating Conditions**
23.	The permittee shall establish an average leakage rate for the primary liners installed in Salt Storage Ponds 2 and 3. The average bi-monthly leakage rate shall be determined by averaging the volume removed from the leak detection sump(s) from three removal events. The permittee shall analyze the measured volumes of liquid removed from the leak detection system sump(s) for Salt Storage Ponds 2 and 3 on a bi-monthly basis (i.e., every other month) to determine if the rate of removal has deviated above the average leakage rate for the respective primary liner. If there is a deviation of 20% above the average leakage rate, the permittee shall sample the liquid in the sump(s) within 15 days and analyze the sample for TDS, Cl, SO_4, and pH. In the event that the analytical results of the liquid present in the leak detection sump(s) indicate that the composition of the liquid is consistent with the contents of the evaporative impoundment(s), the permittee shall submit a corrective action plan to NMED which evaluates the primary liner leakage rate and proposes options for reducing the leakage. The plan shall be submitted for NMED approval within 60 days of the receipt of the analytical results. If the composition of the liquid present in the leak detection sump(s) is not consistent with the contents of the evaporative impoundment(s), the permittee shall determine the source of the deviation and fix the issue. In the event that the leak detection system is modified or the method used to monitor the liquid level in the impoundment's sump(s) is modified, the permittee shall submit a revised methodology for NMED approval. [20.6.2.3107 NMAC]
24.	The permittee shall establish an average leakage rate for the primary liner installed in Salt Storage Pond 5. The average weekly leakage rate shall be determined by averaging the

#	Salt Storage Ponds and Salt Stockpiles - Operating Conditions
	volume discharged from the leak detection sump during the first two weeks following the initial date of discharge to the impoundment. The leak detection, collection and removal systems for Salt Storage Pond 5 shall be monitored by checking the liquid level in the sump for the impoundment's secondary liner on a continuous basis to determine if the rate of removal has deviated above the average leakage rate for the respective primary liner. If there is a deviation of 20% above the average leakage rate, the permittee shall sample the liquid in the sump within 15 days and analyze the sample for TDS, Cl, SO_4, and pH. In the event that the analytical results of the liquid present in the leak detection sump indicate that the liquid is consistent with the contents of the evaporative impoundment, the permittee shall submit a corrective action plan to NMED which evaluates the primary liner leakage rate and proposes options for reducing the leakage. The plan shall be submitted for NMED approval within 60 days of the receipt of the analytical results. If the liquid present in the leak detection sump is not consistent with the contents of the evaporative impoundment, the permittee shall determine the source of the deviation and fix the issue. In the event that the leak detection system is modified or the method used to monitor the liquid level in the impoundment's sump is modified, the permittee shall submit a revised methodology for NMED approval. [20.6.2.3107 NMAC]
25.	The permittee shall conduct regular maintenance of the earthen cover on the Salt Cell 1 and the SPDV material pile. Inspections shall be conducted monthly and after storm events of 2 inches or greater in a 24-hour period to evaluate the integrity of the cover, including erosional impact and vegetation success. General observations and minor cover repairs shall be reported to NMED in the subsequent semi-annual report. In the event of significant erosion, such as the formation of gullies, rills, or areas where ponding is occurring, or vegetative failure, the permittee shall provide a plan and schedule for repair within 90 days of discovery. [20.6.2.3107 NMAC]

MONITORING AND REPORTING

Part A. Generally Applicable to Monitoring

#	Monitoring and Reporting Conditions
26.	The permittee shall conduct monitoring, reporting, and the other requirements listed below in accordance with the monitoring requirements of this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
27.	METHODOLOGY – Unless otherwise specified by this Discharge Permit, or approved in writing by NMED, the permittee shall use sampling and analytical techniques that conform with the references listed in Subsection B of 20.6.2.3107 NMAC. [Subsection B of 20.6.2.3107 NMAC]
28.	Semi-annual monitoring shall be performed during the following periods and reports submitted to NMED as follows: • January 1st through June 30th – due by August 1st; and • July 1st through December 31st – due by February 1st. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
29.	The permittee shall submit its "Waste Isolation Pilot Plant Annual Site Environmental Report" to NMED with the next semi-annual monitoring report following its publication. [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Lagoon System

#	Facultative Lagoon System - Monitoring and Reporting Conditions
30.	The permittee shall estimate the monthly volume of domestic wastewater discharged to the Facultative Lagoon System by obtaining readings on a monthly basis from a totalizing flow meter that measures total domestic water usage. The permittee shall submit the monthly meter readings and calculated monthly and average daily water usage volumes shall to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
31.	The permittee shall measure the total monthly volume and record the origin of all industrial wastewater discharged to Effluent Lagoons B and C. Discharge volumes to Effluent Lagoons B and C shall be calculated by a time/volume method or volumetric measurement of the transport container(s). The monthly discharge volumes and other volumetric

#	**Facultative Lagoon System - Monitoring and Reporting Conditions**
	calculations each month shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
32.	The permittee shall collect composite wastewater samples on a semi-annual basis (once every six months) from Effluent Lagoons A, B, and C. The composite samples shall consist of a minimum of six equal aliquots collected around the entire perimeter of the evaporative impoundment and thoroughly mixed. The composite samples shall be analyzed for: • TKN; • NO_3-N; • TDS; • Cl; and • SO_4. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. NMED may require comprehensive laboratory analyses of the industrial wastewater discharged to Effluent Lagoons B and C prior to discharge when NMED determines that additional information is needed. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]

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Part C. Applicable to the Evaporation Pond H-19, Brine Retention Pond East, Brine Retention Pond West, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions**
33.	The permittee shall measure the total monthly volume and record the origin of all wastewater discharged to Evaporation Pond H-19. Discharge volumes to Evaporation Pond H-19 shall be calculated by a time/volume method or volumetric measurement of the transport container(s). The monthly discharge volumes and other volumetric calculations each month shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
34.	The permittee shall measure the total monthly volume of brine received by Brine Retention Ponds East and West. Discharge volumes to Brine Retention Ponds East and West shall be

#	Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions
	calculated by a time/volume method or volumetric measurement of the transport container(s). NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. The monthly discharge volumes and other volumetric calculations each month shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
35.	The permittee shall measure the total weekly volume of liquid pumped from the leak detection sumps for Brine Storage Pond 4 and Brine Retention Ponds East and West. The total volume of liquid pumped shall be calculated by a totalizing flow meter. The weekly volumes shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
36.	The permittee shall collect a composite wastewater sample annually after storm events of two inches or greater in a 24-hour period from Storm Water Ponds 1, 2, and 3. The composite sample shall consist of a minimum of six equal aliquots collected at equal distances around the perimeter of the evaporative impoundment and thoroughly mixed. The composite sample shall be analyzed for: • SO_4; • TDS; and • Cl. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
37.	The permittee shall collect a composite wastewater sample on a semi-annual basis (once every six months) from Evaporation Pond H-19 and from Brine Salt Storage Pond 4, once it becomes operational. The composite sample shall consist of a minimum of six equal aliquots collected at equal distances around the perimeter of the evaporative impoundment and thoroughly mixed. The composite sample shall be analyzed for: • SO_4; • TDS; and • Cl. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results, including the

#	Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions
	laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. NMED may require comprehensive laboratory analyses of such wastewater prior to discharge when NMED determines that additional information is needed. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
38.	During the first year following the effective date of the Discharge Permit, the permittee shall collect a 24-hour flow weighted composite sample (except as noted for pH) of wastewater from Evaporation Pond H-19 and analyze the sample for the following inorganic contaminants (dissolved fraction, except as noted): • aluminum (CAS 7429-90-5) • antimony (CAS 7440-36-0) • arsenic (CAS 7440-38-2) • barium CAS 7440-39-3 • beryllium (CAS 7440-41-7) • boron (CAS 7440-42-8) • cadmium (CAS 7440-43-9) • chromium (CAS 7440-47-3) • cobalt (CAS 7440-48-4) • copper (CAS 7440-50-8) • cyanide CAS 57-12-5) • fluoride (CAS 16984-48-8) • iron (CAS 7439-89-6) • lead (CAS 7439-92-1) • manganese (CAS 7439-96-5) • molybdenum (CAS 7439-98-7) • total mercury (nonfiltered) (CAS 7439-97-6) • pH (instantaneous) • nickel (CAS 7440-02-0) • radioactivity: combined radium-226 & radium-228 (CAS 15262-20-1) • selenium (CAS 7782-49-2) • silver (CAS 7440-224) • sulfate (CAS 14808-79-8) • thallium (CAS 7440-28-0) • uranium (CAS 7440-61-1) • zinc (CAS 7440-66-6) Samples shall be properly collected, prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Reporting limits shall be less than the corresponding numerical groundwater standards identified in 20.6.2.3103 NMAC. A summary of detected concentrations compared with the corresponding groundwater standards, and a copy of the laboratory report, including the analytical results and Quality Control/Quality Assurance information, shall be submitted to NMED in the next monitoring report. [Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions**
39.	During the first year following the effective date of the Discharge Permit, the permittee shall collect a grab sample of wastewater from Evaporation Pond H-19 and analyze the non-filtered sample for the following organic contaminants: • atrazine (CAS 1912-24-9) • benzene (CAS 71-43-2) • benzo-a-pyrene (CAS 50-32-8) • carbon tetrachloride (CAS 56-23-5) • chloroform (CAS 67-66-3) • 1,2-dichlorobenzene (CAS 95-50-1) • 1,4-dichlorobenzene (CAS 106-46-7) • 1,1-dichloroethane (CAS 75-34-3) • 1,2-dichloroethane (EDC, CAS 107-06-2) • 1,1-dichloroethene (1,1-DCE, CAS 75-35-4) • cis-1,2-dichloroethene (CAS 156-59-2) • trans-1,2-dichloroethene (CAS 156-60-5) • 1,2-dichloropropane (PDC, CAS 78-87-5) • ethylbenzene (CAS 100-41-4) • ethylene dibromide (EDB, CAS 106-93-4) • methylene chloride (CAS 75-09-2) • <u>PAHs</u>: total naphthalene (CAS 91-20-3) plus monomethylnaphthalenes • Phenols • polychlorinated biphenyls (PCBs, CAS 1336-36-3) • pentachlorophenol (CAS 87-86-5) • toluene (CAS 108-88-3) • styrene (CAS 100-42-5) • 1,1,2,2-tetrachloroethane (CAS 79-34-5) • tetrachloroethene (PCE, CAS 127-18-4) • 1,2,4-trichlorobenzene (CAS 120-82-1) • 1,1,1-trichloroethane (1,1,1-TCA, CAS 71-55-6) • 1,1,2-trichloroethane (CAS 79-00-5) • trichloroethene (TCE, CAS 79-01-6) • vinyl chloride (CAS 75-01-4) • total xylenes (CAS 1330-20-7) Samples shall be properly collected, prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Reporting limits shall be less than the corresponding numerical groundwater standards identified in 20.6.2.3103 NMAC. The reporting limit for 1,4-dioxane shall be less than the Tap Water Screening Level for 1,4-dioxane identified in the *NMED Risk Assessment Guidance for Site Assessments and Investigations*, Table A-1 (available on the NMED Hazardous Waste Bureau's website under Guidance Documents). A summary of detected concentrations compared with the corresponding groundwater standards, and a copy of the laboratory report, including the analytical results and Quality Control/Quality Assurance information, shall be submitted to NMED in the next monitoring report.

#	**Evaporation Pond H-19, Brine Ponds, Brine Salt Storage Pond 4, and Storm Water Ponds 1, 2, and 3 - Monitoring and Reporting Conditions**
	[Subsection A of 20.6.2.3107 NMAC, Subsections C and H of 20.6.2.3109 NMAC]
40.	The permittee shall measure the water depth in Storm Water Ponds 1, 2, and 3 and Brine Salt Storage Pond 4 monthly to the nearest tenth of a foot (0.1 ft). The approximate monthly volume of water shall be calculated and submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC and Subsection H of 20.6.2.3109 NMAC]
41.	The permittee shall collect at least one sample quarterly rotating between Brine Retention Pond East and Brine Retention Pond West of the liquid present and analyze the sample for every constituent listed in Subsection A of 20.6.2.3103 NMAC. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. After four consecutive quarterly sampling events, the permittee may request to reduce the sampling frequency and analyte list set forth in this Discharge Permit. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
42.	The permittee shall submit any analytical results from Brine Retention Ponds East and West submitted to the Hazardous Waste Bureau. [Subsection A of 20.6.2.3107 NMAC]
43.	The permittee shall submit a copy of all records of solids (salt) removal from the Brine Retention Basins East and West and the associated disposal documentation to NMED in the associated semi-annual monitoring report. [Subsection A of 20.6.2.3107 NMAC]

Part D. Applicable to the Impoundments Containing Storm Water Runoff in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, 3, and 5) and to Salt Stockpiles (Salt Cells 1, 2, 3, and 5)

#	**Salt Storage Ponds and Salt Stockpiles - Monitoring and Reporting Conditions**
44.	The permittee shall collect a composite wastewater sample after a storm event of 2 inches or greater in a 24-hour period from Salt Storage Ponds 1, 2, 3, and 5. This sampling shall occur only once per year. The composite sample shall consist of a minimum of six equal aliquots collected at equal distances around the perimeter of the evaporative impoundment and thoroughly mixed. The composite sample shall be analyzed for:

	• SO_4; • TDS; and • Cl. Samples shall be properly prepared, preserved, transported and analyzed in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
45.	The permittee shall measure the water depth monthly to the nearest tenth of a foot (0.1 ft) in the Salt Storage Ponds 1, 2, 3, and 5. The approximate volume of water shall be calculated and submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
46.	The permittee shall measure the total bi-monthly volume of liquid pumped from the leak detection sumps for Salt Storage Ponds 2 and 3. The total volume of liquid pumped shall be calculated by a volumetric measurement of the container(s) filled. The bi-monthly volumetric calculations shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]
47.	The permittee shall measure the weekly volume of liquid pumped from the leak detection sumps for Salt Storage Pond 5. The total volume of liquid pumped shall be calculated by a totalizing flow meter. The weekly volumes shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC, Subsection H of 20.6.2.3109 NMAC]

Part E. Groundwater Monitoring and Reporting

#	Groundwater Monitoring Actions with Implementation Deadlines
48.	Within 30 days following the effective date of this Discharge Permit **(by DATE)**, the permittee shall submit a written monitoring well location proposal for review and approval by NMED. The proposal shall designate the locations of the monitoring wells required to be installed by Condition 49 of this Discharge Permit. The proposal shall include, at a minimum, the following information. a) A map showing the proposed locations of the monitoring wells from the boundary of the source the wells are intended to monitor. b) A detailed written description of the proposed locations for the monitoring wells including the distance (in feet) and direction of the monitoring wells from the edge of

#	**Groundwater Monitoring Actions with Implementation Deadlines**
	the source it is intended to monitor. Examples include: 35 feet north-northwest of the northern berm of the synthetically lined impoundment; 45 feet due south of the leachfield; 30 feet southeast of the re-use area 150 degrees from north. c) A statement describing the groundwater flow direction beneath the facility, and documentation and/or data supporting the determination. All monitoring well locations shall be approved by NMED prior to installation. [Subsection A of 20.6.2.3107 NMAC]
49.	Within 60 days following the effective date of this Discharge Permit (**by DATE**), the permittee shall install the following new monitoring wells: • One monitoring well (PZ-16) located 20 to 50 feet hydrologically downgradient of the Facultative Lagoon System in the shallowest water-bearing zone of the Dewey Lake Formation and intended to monitor the Facultative Lagoon System. • One monitoring well (PZ-17) located 20 to 50 feet hydrologically downgradient of Evaporation Pond H-19 in the shallowest water-bearing zone of the Dewey Lake Formation and intended to monitor Evaporation Pond H-19. The well shall be completed in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011 or alternative methods submitted for approval. Construction and lithologic logs shall be submitted to NMED within 30 days of well completion. [Subsection A of 20.6.2.3107 NMAC]
50.	Prior to discharging to Brine Salt Storage Pond 4 and Salt Storage Pond 5, the permittee shall submit a written monitoring well location proposal for review and approval by NMED. The proposal shall designate the locations of the monitoring wells required to be installed by Condition 51 of this Discharge Permit. The proposal shall include, at a minimum, the following information. a) A map showing the proposed location of each monitoring well from the boundary of the source it is intended to monitor. b) A written description of the specific location proposed for the monitoring wells including the distance (in feet) and direction of each monitoring well from the edge of the source it is intended to monitor. Examples include: 35 feet north-northwest of the northern berm of the synthetically lined impoundment; 45 feet due south of the leachfield; 30 feet southeast of the re-use area 150 degrees from north. c) A statement describing the groundwater flow direction beneath the facility, and documentation and/or data supporting the determination. All monitoring well locations shall be approved by NMED prior to installation. [Subsection A of 20.6.2.3107 NMAC]

#	Groundwater Monitoring Actions with Implementation Deadlines
51.	Prior to discharging to Brine Salt Storage Pond 4, Salt Storage Pond 5, and Brine Retentions Ponds East and West, the permittee shall install the following new monitoring wells. a) One monitoring well (PZ-18) located 20 to 50 feet hydrologically downgradient of Brine Salt Storage Pond 4 in the shallow groundwater. b) One monitoring well (PZ-19) located 20 to 50 feet hydrologically downgradient of Salt Storage Pond 5 in the shallow groundwater. The wells shall be completed in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011 or alternative methods submitted for approval. Construction and lithologic logs shall be submitted to NMED within 30 days of well completion. [Subsection A of 20.6.2.3107 NMAC]
52.	Following the installation of the monitoring wells required by Condition 51 of this Discharge Permit, the permittee shall sample groundwater in the wells and analyze the samples for temperature, pH, specific conductance (field measured); and for SO_4, TDS, and Cl. Groundwater sample collection, preservation, transport and analysis shall be performed according to the following procedure. a) Measure the depth to groundwater from the top of the well casing to the nearest hundredth of a foot. b) The pump intake shall be placed in the following manner: fully submerged, within the screened interval, and at least two feet above the base of the screen. c) The drawdown rate shall not exceed 0.3 feet on the startup and stabilize within the first few minutes. d) Allow field-measured dissolved oxygen, turbidity, Oxidation-Reduction Potential, temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, temperature, Oxidation-Reduction Potential, and specific conductance are within ± 10% of the last three consecutive readings, and turbidity is within ± 5 NTUs. e) Obtain samples from the well for analysis. f) Properly prepare, preserve and transport samples. g) Analyze samples in accordance with the methods authorized in this Discharge Permit. A well completion report including the Office of the State Engineer permit, depth-to-most-shallow groundwater measurements, groundwater analytical results (including the laboratory QA/QC summary report), and a facility layout map showing the location and number of each well, shall be submitted to NMED within 45 days of the installation of the monitoring wells.

#	Groundwater Monitoring Actions with Implementation Deadlines
	[Subsection A of 20.6.2.3107 NMAC]
53.	Within 120 days following the effective date of this Discharge Permit (**by DATE**), the permittee shall survey all newly constructed monitoring wells in the Dewey Lake water-bearing zone and in the shallow groundwater to a U.S. Geological Survey (USGS) or other permanent benchmark. Survey data shall include northing, easting and elevation to the nearest hundredth of a foot and shall be in accordance with the "Minimum Standards for Surveying in New Mexico" (12.8.2 NMAC). A survey elevation shall be established at the top-of-casing, with a permanent marking indicating the point of survey. The survey shall bear the seal and signature of a licensed New Mexico professional surveyor (pursuant to the New Mexico Engineering and Surveying Practice Act and the rules promulgated under that authority). Depth-to-most-shallow groundwater shall be measured to the nearest hundredth of a foot in all surveyed wells and referenced to mean sea level, and the data shall be used to develop a groundwater elevation contour map showing the location of all monitoring wells and the direction and gradient of groundwater flow at the facility. The data and groundwater elevation contour map shall be submitted to NMED within 30 days of survey completion. [Subsection A of 20.6.2.3107 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]

#	Groundwater Monitoring Conditions
54.	The permittee shall measure the depth to groundwater to the nearest hundredth of a foot (0.01 ft) quarterly in the following piezometers/monitoring wells: • PZ-1, PZ-2, PZ-3, PZ-4, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-17, PZ-18, and PZ-19 • C-2505, C-2506, C-2507, C-2811, and WQSP-6A Depth-to-groundwater measurements shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
55.	Within the first year of the permit term, the permittee shall perform sampling in the following piezometers/monitoring wells and analyze the samples for temperature, pH, specific conductance (field measured); Uranium and combined Radium-226 and Radium-228: • PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-17, PZ-18, and PZ-19

#	Groundwater Monitoring Conditions
	• C-2507, C-2811, and WQSP-6A Monitoring wells WQSP-6A, PZ-16, and PZ-17 are intended to monitor the shallowest water-bearing zone of the Dewey Lake Formation, which occurs in the subsurface at the southern end of the facility. All other monitoring wells are intended to monitor the shallow groundwater. Groundwater sample collection, preservation, transport and analysis shall be performed according to the following low-flow sampling procedure: a) The pump intake shall be placed in the following manner: fully submerged, within the screened interval, and at least two feet above the base of the screen. b) The drawdown rate shall not exceed 0.3 feet on the startup and stabilize within the first few minutes. c) Allow field-measured dissolved oxygen, turbidity, Oxidation-Reduction Potential, temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, temperature, Oxidation-Reduction Potential, and specific conductance are within ± 10% of the last three consecutive readings, and turbidity is within ± 5 NTUs. d) Obtain samples from the well for analysis. e) Properly prepare, preserve and transport samples. f) Analyze samples in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED in the next semi-annual monitoring report following sampling. [Subsection A of 20.6.2.3107 NMAC]
56.	The permittee shall perform semi-annual groundwater sampling in the following piezometers/monitoring wells and analyze the samples for temperature, pH, specific conductance (field measured); and for SO_4, TDS, and Cl: • PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-16, PZ-17, PZ-18, and PZ-19 , • C-2507, C-2811, and WQSP-6A Monitoring wells WQSP-6A, PZ-16, and PZ-17 are intended to monitor the shallowest water-bearing zone of the Dewey Lake Formation, which occurs in the subsurface at the southern end of the facility. All other monitoring wells are intended to monitor the shallow groundwater. Groundwater sample collection, preservation, transport and analysis shall be performed

#	Groundwater Monitoring Conditions
	according to the following low-flow sampling procedure: a) The pump intake shall be placed in the following manner: fully submerged, within the screened interval, and at least two feet above the base of the screen. b) The drawdown rate shall not exceed 0.3 feet on the startup and stabilize within the first few minutes. c) Allow field-measured dissolved oxygen, turbidity, Oxidation-Reduction Potential, temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, temperature, Oxidation-Reduction Potential, and specific conductance are within ± 10% of the last three consecutive readings, and turbidity is within ± 5 NTUs. d) Obtain samples from the well for analysis. e) Properly prepare, preserve and transport samples. f) Analyze samples in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
57.	The permittee shall perform semi-annual groundwater sampling in the following monitoring wells and analyze the samples for TKN and NO_3-N. • PZ-16, located south of the Facultative Lagoon System and intended to be located hydrologically downgradient of the Facultative Lagoon System in a water bearing zone of the Dewey Lake Formation. Groundwater sample collection, preservation, transport and analysis shall be performed according to the following procedure, or as otherwise approved by NMED. Groundwater sample collection, preservation, transport and analysis shall be performed according to the following low-flow sampling procedure: a) The pump intake shall be placed in the following manner: fully submerged, within the screened interval, and at least two feet above the base of the screen. b) The drawdown rate shall not exceed 0.3 feet on the startup and stabilize within the first few minutes. c) Allow field-measured dissolved oxygen, turbidity, Oxidation-Reduction Potential, temperature, pH, and specific conductance to stabilize prior to sample collection. The system is considered stable when pH is within ± 0.5 pH units, temperature, Oxidation-Reduction Potential, and specific conductance are within ± 10% of the last three consecutive readings, and turbidity is within ± 5 NTUs. d) Obtain samples from the well for analysis.

#	**Groundwater Monitoring Conditions**
	e) Properly prepare, preserve and transport samples. f) Analyze samples in accordance with the methods authorized in this Discharge Permit. Analytical results, including the laboratory QA/QC summary report, and a facility layout map showing the location and number of each well shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
58.	The permittee shall develop a groundwater elevation contour map for the shallow groundwater and for the Dewey Lake Formation water-bearing zone on a quarterly basis. The permittee shall use the top of casing elevation data from the monitoring well surveys and quarterly depth-to-groundwater measurements, referenced to mean sea level, obtained from the groundwater monitoring wells required by this Discharge Permit. The groundwater elevation contour maps shall depict the groundwater flow direction based on the groundwater elevation contours. Groundwater elevations between monitoring well locations shall be estimated using common interpolation methods. A contour interval appropriate to the data shall be used, but the interval shall, in no case, be greater than two feet. Groundwater elevation contour maps shall depict the groundwater flow direction, using arrows, based on the orientation of the groundwater elevation contours, and the location and identification of each monitoring well and contaminant source, e.g., surface impoundment. The groundwater elevation contour maps shall be submitted to NMED in the semi-annual monitoring reports. [Subsection A of 20.6.2.3107 NMAC]
59.	A single table in a paper and electronic format (i.e., EXCEL spreadsheet) of water level measurements and water quality data with only those constituents analyzed and water levels measured during a single event shown in columns shall be submitted to NMED in the semi-annual monitoring reports. The table shall include the following tabulated field measurements: temperature, pH, and electrical conductivity corrected to 25 degrees Celsius. The monitoring sites shall be shown in rows on the table, and the second column shall contain the date of the sampling event. Values exceeding standards shall be bolded. Any constituent not analyzed for at a particular site shall be shown as "NA", any site not sampled shall be shown as "NS" with an associated reason, and any site not measured for water levels shall be shown as "NM" with an associated reason. [Subsection A of 20.6.2.3107 NMAC]
60.	A single table that includes all available groundwater data to date shall be submitted annually to NMED in the semi-annual monitoring reports due February 1st. For each monitoring well, the name of the well shall be entered in the far-left column in a row by itself. Sampling events, beginning with the earliest event first, shall be entered in

#	Groundwater Monitoring Conditions
	subsequent rows with the sampling date in the second column and the corresponding analytical data in columns further to the right. Each new sampling event shall be added as an additional row to the existing spreadsheet with the corresponding date of the sampling event noted in the second column next to the monitoring well name. [Subsection A of 20.6.2.3107 NMAC]

ADDITIONAL STUDIES REQUIRED

#	Terms and Conditions
61.	The permittee's groundwater monitoring data and reports document that the shallow groundwater beneath the site is contaminated with TDS, chloride, and sulfate above the standards of 20.6.2.3103 NMAC. These data indicate that the contaminated groundwater is anthropogenic, having resulted from the leaking of impoundments at the facility. Within six months following the effective date of this Discharge Permit (by **DATE**), the permittee shall submit for NMED approval a site investigation workplan. The workplan shall include an implementation schedule to determine the existing groundwater contaminant sources, chemical composition, lateral and vertical extent of the shallow contaminated groundwater, and any potential impacts to the downgradient and naturally occurring groundwater in the Dewey Lake Formation. The site investigation shall be implemented upon NMED approval of the workplan and a report shall be submitted upon completion of the investigation. Based on the findings of the completed investigation report, applicable contingency plan conditions under this Discharge Permit may be enacted. [20.6.2.3107 NMAC, 20.6.2.4103 NMAC]

CONTINGENCY PLAN

#	Terms and Conditions
62.	In the event that groundwater monitoring indicates that a groundwater quality standard identified in Section 20.6.2.3103 NMAC is newly exceeded, the permittee shall collect a confirmatory sample from the monitoring well within 15 days of receipt of the initial sampling results to confirm the initial sampling results. Within 60 days of confirmation of groundwater contamination, the permittee shall submit to NMED a Corrective Action Plan that proposes, at a minimum, source control measures and an implementation schedule. The Plan shall be enacted as approved by NMED.

#	Terms and Conditions
	Once invoked (whether during the term of this Discharge Permit, or after the term of this Discharge Permit and prior to the completion of the Discharge Permit closure plan requirements), this condition shall apply until the permittee has fulfilled the requirements of this condition and groundwater monitoring confirms for a minimum of eight (8) consecutive quarterly samples that the standards of Section 20.6.2.3103 NMAC are not exceeded in groundwater. If the groundwater standard continues to be violated 180 days after the confirmation of groundwater contamination, the permittee may be required to abate water pollution consistent with the requirements and provisions of Section 20.6.2.4101, Section 20.6.2.4103, Subsections C and E of 20.6.2.4106, Section 20.6.2.4107, Section 20.6.2.4108 and Section 20.6.2.4112 NMAC. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]
63.	In the event that information available to NMED indicates that a groundwater monitoring well or piezometer is not constructed in a manner consistent with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011; contains insufficient water to effectively monitor groundwater quality; or is not completed in a manner that is protective of groundwater quality, the permittee shall install a replacement well(s) within 120 days following notification from NMED. The permittee shall survey the replacement monitoring well(s)/piezometer(s) within 150 days following notification from NMED. Replacement well locations shall be approved by NMED prior to installation and completed in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. The permittee shall submit construction and lithologic logs, survey data and a groundwater elevation contour map to NMED within 60 days following well completion. Upon completion of the replacement monitoring well, the monitoring well requiring replacement shall be properly plugged and abandoned. Well plugging, abandonment and documentation of the abandonment procedures shall be completed in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011, and all applicable local, state, and federal regulations. The well abandonment documentation shall be submitted to NMED within 60 days of completion of well plugging activities. [Subsection A of 20.6.2.3107 NMAC]
64.	In the event that groundwater flow information obtained pursuant to this Discharge Permit indicates that a monitoring well/piezometer is not located hydrologically downgradient of

#	Terms and Conditions
	the discharge location it is intended to monitor, the permittee shall install a replacement well within 120 days following notification from NMED. The permittee shall survey the replacement monitoring well within 150 days following notification from NMED. Replacement well locations shall be approved by NMED prior to installation and completed in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. The permittee shall submit construction and lithologic logs, survey data and a groundwater elevation contour map within 30 days following well completion. [Subsection A of 20.6.2.3107 NMAC]
65.	In the event that an inspection reveals significant damage likely to affect the structural integrity of a lined impoundment or its ability to contain contaminants, the permittee shall propose the repair or replacement of the impoundment liner by submitting a Corrective Action Plan to NMED for approval. The Plan shall be submitted to NMED within 30 days after discovery by the permittee or following notification from NMED that significant liner damage is evident. The Corrective Action Plan shall include a schedule for completion of corrective actions and the permittee shall initiate implementation of the Plan following approval by NMED. [Subsection A of 20.6.2.3107 NMAC, Subsection C of 20.6.2.3109 NMAC]
66.	In the event that the analytical results of the liquid present in the leak detection sump(s) indicate that the liquid is consistent with the contents of the evaporative impoundment(s), the permittee shall submit a corrective action plan to NMED which evaluates the primary liner leakage rate and proposes options for stopping or reducing the leakage. The plan shall be submitted for NMED approval within 60 days of the receipt of the analytical results. [20.6.2.3107 NMAC, 20.6.2.3109 NMAC]
67.	In the event that the required freeboard cannot be preserved in an impoundment, the permittee shall take actions authorized by this Discharge Permit and all applicable local, state, and federal regulations to restore the required freeboard. In the event that the required freeboard cannot be restored within a period of 72 hours following discovery, the permittee shall propose actions to be immediately implemented to restore of the required freeboard by submitting a short-term Corrective Action Plan to NMED for approval. Examples of short-term corrective actions include the pumping and hauling of excess wastewater from the impoundment or reducing the volume of wastewater discharged to the impoundment. The Plan shall include a schedule for completion of corrective actions and shall be submitted within 15 days following the date

#	Terms and Conditions
	when the freeboard deficiency was initially discovered. The permittee shall initiate implementation of the Plan following approval by NMED. In the event that the short-term corrective actions failed to restore the required freeboard, the permittee shall propose permanent corrective actions in a long-term Corrective Action Plan submitted to NMED within 90 days following failure of the short-term Corrective Action Plan. Examples include the installation of an additional storage impoundment, or a significant/permanent reduction in the volume of wastewater discharged to the impoundment. The Plan shall include a schedule for completion of corrective actions and implementation of the Plan shall be initiated following approval by NMED. [Subsection A of 20.6.2.3107 NMAC]
68.	In the event that a release (commonly known as a "spill") occurs that is not authorized under this Discharge Permit, the permittee shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in Section 20.6.2.1203 NMAC and summarized below. Within <u>24 hours</u> following discovery of the unauthorized discharge, the permittee shall verbally notify NMED and provide the following information. a) The name, address, and telephone number of the person or persons in charge of the facility, as well as of the owner and/or operator of the facility. b) The name and address of the facility. c) The date, time, location, and duration of the unauthorized discharge. d) The source and cause of unauthorized discharge. e) A description of the unauthorized discharge, including its estimated chemical composition. f) The estimated volume of the unauthorized discharge. g) Any actions taken to mitigate immediate damage from the unauthorized discharge. Within <u>one week</u> following discovery of the unauthorized discharge, the permittee shall submit written notification to NMED with the information listed above and any pertinent updates. Within <u>15 days</u> following discovery of the unauthorized discharge, the permittee shall submit a corrective action report/plan to NMED describing any corrective actions taken and/or to be taken relative to the unauthorized discharge that includes the following information. a) A description of proposed actions to mitigate damage from the unauthorized discharge. b) A description of proposed actions to prevent future unauthorized discharges of this nature. c) A schedule for completion of proposed actions.

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	In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of Section 20.6.2.4103 NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to Paragraph (1) of Subsection A of 20.6.2.1203 NMAC, the permittee may be required to abate water pollution pursuant to Sections 20.6.2.4000 through 20.6.2.4115 NMAC. Nothing in this condition shall be construed as relieving the permittee of the obligation to comply with all requirements of Section 20.6.2.1203 NMAC. [20.6.2.1203 NMAC]
69.	In the event that NMED or the permittee identifies any failures of the discharge plan or this Discharge Permit not specifically noted herein, NMED may require the permittee to submit a Corrective Action Plan and a schedule for completion of corrective actions to address the failure(s). Additionally, NMED may require a Discharge Permit modification to achieve compliance with 20.6.2 NMAC. [Subsection A of 20.6.2.3107 NMAC, Subsection E of 20.6.2.3109 NMAC]

CLOSURE PLAN

Part A. Generally Applicable to All Discharges

#	Terms and Conditions
70.	The permittee shall close the facility covered under this Discharge Permit, either wholly or in part, in accordance with the closure plan in the March 10, 2005 Discharge Permit application. Where that closure plan references the closure plans in the WIPP Hazardous Waste Facility Permit and the WIPP Land Management Plan, the permittee shall use the most up-to-date version of the plans [Subsection A of 20.6.2.3107 NMAC]
71.	For the purpose of post-closure monitoring, after closure of all authorized units is complete the permittee shall continue groundwater monitoring until the monitoring confirms for a minimum of eight (8) consecutive quarterly groundwater sampling events that the standards of Section 20.6.2.3103 NMAC are not exceeded. Total dissolved solids and chloride shall meet pre-discharge conditions. If during post-closure monitoring results show that a groundwater quality standard in Section 20.6.2.3103 NMAC is exceeded, the permittee shall implement the contingency plan required by this Discharge Permit.

#	Terms and Conditions
	Following notification from NMED that post-closure monitoring may cease, the permittee shall plug and abandon all monitoring wells and piezometers in accordance with the attachment titled *Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions*, Revision 1.1, March 2011. [Subsection A of 20.6.2.3107 NMAC]

Part B. Applicable to the Facultative Lagoon System

#	Terms and Conditions
72.	In the event the Facultative Lagoon System is proposed to be permanently closed, the permittee shall perform the following closure measures: Within <u>60 days</u> of ceasing to discharge to the Facultative Lagoon System impoundments, the line leading to the impoundments shall be plugged so that a discharge can no longer occur. Within <u>60 days</u> of ceasing to discharge to the Facultative Lagoon System impoundments, wastewater shall be evaporated or removed from the impoundments and any other wastewater system components and it shall be disposed of in accordance with all local, state, and federal regulations. Within <u>90 days</u> of ceasing to discharge to the Facultative Lagoon System impoundments, the permittee shall submit a sludge removal and disposal plan to NMED for approval. The permittee shall initiate implementation of the plan within 30 days following approval by NMED. The sludge removal and disposal plan shall include the following: a) The estimated volume and dry weight of sludge to be removed and disposed, including measurements and calculations b) Analytical results for samples of the sludge taken from the impoundment for TKN, NO_3-N, percent total solids, hazardous constituents, and any other parameters tested (reported in mg/kg, dry weight basis). c) The method(s) of sludge *removal* from the impoundments. d) The method(s) of *disposal* for all of the sludge removed from the impoundments. The method(s) shall comply with all local, state and federal regulations, including 40 CFR Part 503. *Note: A proposal that includes the surface disposal of sludge may be subject to Ground Water Discharge Permitting requirements pursuant to 20.6.2.3104 NMAC that are separate from the requirements of this Discharge Permit.* e) A schedule for completion of sludge removal and disposal not to exceed two years from the date discharge to the impoundments ceased. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures:

#	Terms and Conditions
	a) Remove all lines leading to and from the Facultative Lagoon System impoundments, or permanently plug and abandon them in place. b) Remove or demolish any other wastewater system components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liners. d) Fill the impoundments with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [Subsection A of 20.6.2.3107 NMAC, 40 CFR Part 503]

Part C. Applicable to the Evaporation Pond H-19, Brine Retention Pond East, Brine Retention Pond West, Storm Water Ponds 1, 2, and 3, and Brine Salt Storage Pond 4

#	Terms and Conditions
73.	Upon cessation of operation, the permittee shall close Evaporation Pond H-19 and Storm Water Ponds 1, 2, and 3. Remaining liquids in Storm Water Ponds shall be removed and/or evaporated, and remaining liquids in Evaporation Pond H-19 shall be evaporated. All sludge shall be sampled to determine if it contains hazardous constituents and then managed and/or disposed of in accordance with applicable regulations. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove or plug all piping and other ancillary components b) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liners. d) Fill the impoundments with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [Subsection A of 20.6.2.3107 NMAC]

Part D. Applicable to the Impoundments Containing Storm Water Runoff in Contact with Salt Stockpiles (Salt Storage Ponds 1, 2, 3, and 5) and to Salt Stockpiles (Salt Cells 1, 2, 3, and 5)

#	Terms and Conditions
74.	Upon cessation of operation, all mined salt at the facility shall be removed from the site. The permittee is permitted to use the mined salt as backfill in shafts and as interior fill

	material in berms and permanent markers after closure. All mined salt remaining after backfilling and after construction of surface structures shall be removed from the site. The permittee shall submit a plan and schedule for salt removal to NMED for approval within 120 days prior to the facility closure. The WIPP Land Management Plan reflects the Land Withdrawal Act's requirements for disposition of the salt. The WIPP's Hazardous Waste Facility Permit also addresses closure activities that include closure of the salt storage areas in accordance with the provisions of the WIPP Land Management Plan. The salt storage area shall be reclaimed in the manner described in these documents. [Subsection A of 20.6.2.3107 NMAC]
75.	Upon cessation of operation, the permittee shall close Salt Storage Ponds 1, 2, 3, and 5. Remaining liquids in each impoundment shall be evaporated. All sludge shall be sampled to determine if it contains hazardous constituents and then managed and/or disposed of in accordance with applicable regulations. Within <u>one year</u> following completion of the sludge removal and disposal, the permittee shall complete the following closure measures: a) Remove or plug all piping and other ancillary components. b) Remove or demolish any other components and re-grade area with suitable fill to blend with surface topography, promote positive drainage and prevent ponding. c) Perforate or remove the impoundment liners. d) Fill the impoundments with suitable fill. e) Re-grade the impoundment site to blend with surface topography, promote positive drainage and prevent ponding. [Subsection A of 20.6.2.3107 NMAC]

GENERAL TERMS AND CONDITIONS

#	Terms and Conditions
76.	RECORD KEEPING - The permittee shall maintain a written record of: • information and data used to complete the application for this Discharge Permit; • any releases (commonly known as "spills") not authorized under this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC; • the operation, maintenance, and repair of all facilities/equipment used to treat, store or dispose of wastewater; • facility record drawings (plans and specifications) showing the actual construction of the facility and bear the seal and signature of a licensed New Mexico professional engineer; • copies of monitoring reports completed and/or submitted to NMED pursuant to this Discharge Permit;

#	**Terms and Conditions**

	• the volume of wastewater or other wastes discharged pursuant to this Discharge Permit;
	• groundwater quality and wastewater quality data collected pursuant to this Discharge Permit;
	• copies of construction records (well log) for all groundwater monitoring wells required to be sampled pursuant to this Discharge Permit;
	• the maintenance, repair, replacement or calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit; and
	• data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit, including:
	  o the dates, location and times of sampling or field measurements;
	  o the name and job title of the individuals who performed each sample collection or field measurement;
	  o the sample analysis date of each sample
	  o the name and address of the laboratory, and the name of the signatory authority for the laboratory analysis;
	  o the analytical technique or method used to analyze each sample or collect each field measurement;
	  o the results of each analysis or field measurement, including raw data;
	  o the results of any split, spiked, duplicate or repeat sample; and
	  o a copy of the laboratory analysis chain-of-custody as well as a description of the quality assurance and quality control procedures used.
	
	The written record shall be maintained by the permittee at a location accessible during a facility inspection by NMED for a period of at least five years from the date of application, report, collection or measurement and shall be made available to the department upon request.
	
	[Subsections A and D of 20.6.2.3107 NMAC]

77.	INSPECTION and ENTRY – The permittee shall allow inspection by NMED of the facility and its operations that are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC. The permittee shall allow NMED to have access to and reproduce for their use any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge Permit and the WQCC regulations.

#	Terms and Conditions
	Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED under the WQA, the WQCC Regulations, or any other local, state or federal regulations. [Subsection D of 20.6.2.3107 NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]
78.	DUTY to PROVIDE INFORMATION - The permittee shall, upon NMED's request, allow for NMED's inspection/duplication of records required by this Discharge Permit and/or furnish to NMED copies of such records. [Subsection D of 20.6.2.3107 NMAC]
79.	MODIFICATIONS and/or AMENDMENTS – In the event the permittee proposes a change to the facility or the facility's discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the facility, the permittee shall notify NMED prior to implementing such changes. The permittee shall obtain approval (which may require modification of this Discharge Permit) by NMED prior to implementing such changes. [Subsection C of 20.6.2.3107 NMAC, Subsections E and G of 20.6.2.3109 NMAC]
80.	PLANS and SPECIFICATIONS – In the event the permittee is proposing to construct a wastewater system or change a process unit of an existing system such that the quantity or quality of the discharge will change substantially from that authorized by this Discharge Permit, the permittee shall submit construction plans and specifications to NMED for the proposed system or process unit prior to the commencement of construction. In the event the permittee implements changes to the wastewater system authorized by this Discharge Permit that result in only a minor effect on the character of the discharge, the permittee shall report such changes (including the submission of record drawings, where applicable) as of January 1 and June 30 of each year to NMED. [Subsections A and C of 20.6.2.1202 NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
81.	CIVIL PENALTIES - Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or facilities, or any refusal or failure to provide NMED with records or information, may subject the permittee to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10(C) and 74-6-10.1, civil penalties of up to $15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to $10,000

#	**Terms and Conditions**
	per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the permittee waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10 and 74-6-10.1]
82.	CRIMINAL PENALTIES – No person shall: • make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained under the WQA; • falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained under the WQA; or • fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation. Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth-degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is guilty of a third-degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental impact is guilty of a third-degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily injury to any other person is guilty of a second-degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. [20.6.2.1220 NMAC, NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]
83.	COMPLIANCE with OTHER LAWS - Nothing in this Discharge Permit shall be construed in any way as relieving the permittee of the obligation to comply with any other applicable federal, state, and/or local laws, regulations, zoning requirements, nuisance ordinances, permits or orders. [NMSA 1978, § 74-6-5.L]
84.	RIGHT to APPEAL - The permittee may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC within thirty days of the receipt of postal notice of this Discharge Permit and shall include a statement of the issues to be raised and the relief sought. Unless a timely petition for review is made, the decision of NMED shall be final and not subject to judicial review.

#	Terms and Conditions
	[20.6.2.3112 NMAC, NMSA 1978, § 74-6-5.O]
85.	TRANSFER of DISCHARGE PERMIT - Prior to the transfer of any ownership, control, or possession of this facility or any portion thereof, the permittee shall: • notify the proposed transferee in writing of the existence of this Discharge Permit; • include a copy of this Discharge Permit with the notice; and • deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee. Until both ownership and possession of the facility have been transferred to the transferee, the permittee shall continue to be responsible for any discharge from the facility. [20.6.2.3111 NMAC]
86.	PERMIT FEES - Payment of permit fees is due at the time of Discharge Permit approval. Permit fees shall be paid in a single payment or shall be paid in equal installments on a yearly basis over the term of the Discharge Permit. Single payments shall be remitted to NMED no later than 30 days following the effective date of the Discharge Permit. Initial installment payments shall be remitted to NMED no later than 30 days following the effective date of the Discharge Permit; subsequent installment payments shall be remitted to NMED no later than the anniversary of the effective date of the Discharge Permit. Permit fees are associated with <u>issuance</u> of this Discharge Permit. Nothing in this Discharge Permit shall be construed as relieving the permittee of the obligation to pay all permit fees assessed by NMED. A permittee that ceases discharging or does not commence discharging from the facility during the term of the Discharge Permit shall pay all permit fees assessed by NMED. An approved Discharge Permit shall be suspended or terminated if the facility fails to remit an installment payment by its due date. [Subsection F of 20.6.2.3114 NMAC, NMSA 1978, § 74-6-5.K]

New Mexico Environment Department Ground Water Quality Bureau

Discharge Permit Summary

Facility Information

Facility Name	Waste Isolation Pilot Plant (WIPP)
Discharge Permit Number	DP-831
Legally Responsible Party	Kirk D. Lachman, Acting Manager U.S. Department of Energy, Carlsbad Field Office P.O. Box 3090 Carlsbad, NM 88221 (575) 234-7300

Treatment, Disposal and Site Information

Primary Waste Type	Domestic and Industrial
Facility Type	Federal Agency - U.S. Department of Energy

Evaporative Impoundment Locations

Domestic Wastewater

Type	Designation	Description & Comments
Settling Impoundment	Settling Lagoon 1	Primary treatment; 60-mil HDPE synthetically lined; permitted one foot of freeboard; capacity of 963,214 gallons.
Settling Impoundment	Settling Lagoon 2	Primary treatment; 60-mil HDPE synthetically lined; permitted one foot of freeboard; capacity of 963,214 gallons.
Polishing Impoundment	Polishing Lagoon 1	Passive secondary treatment; 60-mil HDPE synthetically lined; permitted one foot of freeboard; capacity of 414,901 gallons.
Polishing Impoundment	Polishing Lagoon 2	Passive secondary treatment; 60-mil HDPE synthetically lined; permitted one foot of freeboard; capacity of 141,901 gallons.
Evaporation Impoundment	Effluent Lagoon A	Effluent storage; 30-mil LLDP synthetically lined; disposal by evaporation; permitted one foot of freeboard; capacity of 566,610 gallons.
Evaporation Impoundment	Effluent Lagoon B	Effluent storage; 30-mil LLDP synthetically lined; disposal by evaporation; permitted discharges are domestic waste, brine, purge waters, and miscellaneous industrial non-hazardous wastewater; permitted one foot of freeboard; capacity of 846,257 gallons.
Evaporation Impoundment	Effluent Lagoon C	Effluent Storage; 30-mil HDPE synthetically lined; disposal by evaporation; permitted discharges are domestic waste, brine, purge waters, and miscellaneous industrial non-hazardous wastewater; permitted one foot of freeboard; capacity of 846,257 gallons.

Storm Water Control

Type	Designation	Description & Comments
Storm Water Impoundment	Storm Water Pond 1	Constructed using a 60-mil HDPE synthetic liner; receives clean non-contact storm water from paved areas, roofs, air conditioner condensate, and water from domestic water lines; disposal by evaporation; permitted one foot of freeboard; capacity of 626,076 gallons.
Storm Water Impoundment	Storm Water Pond 2	Constructed using a 60-mil HDPE synthetic liner; receives clean non-contact storm after from the facilities paved areas, roofs, air conditioner condensate, and draining domestic water lines; disposal by evaporation; permitted one foot of freeboard; capacity of 2,268,330 gallons.
Storm Water Impoundment	Storm Water Pond 3	Constructed using a 60-mil HDPE synthetic liner; receives clean non-contact storm after from the facilities paved areas, roofs, air conditioner condensate, and draining domestic water lines; disposal by evaporation; permitted one foot of freeboard; capacity of 7,211,967 gallons.

Non-Domestic Wastewater

Type	Designation	Description & Comments
Evaporation Impoundment	Evaporation Pond H-19	Constructed using a 36-mil Hypalon synthetic liner; permitted discharges are brine, purge waters, and miscellaneous industrial non-hazardous wastewater; disposal by evaporation; permitted one foot of freeboard; capacity of 346,085 gallons.
Evaporation Impoundment	Salt Storage Pond 1	Constructed using a 60-mil HDPE synthetic liner; disposal by evaporation; permitted one foot of freeboard; capacity of 3,301634 gallons.
Evaporation Impoundment	Salt Storage Pond 2/3	Constructed using 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system; disposal by evaporation;, permitted one foot of freeboard; capacity of 21,737,254 gallons
Evaporation Impoundment	Salt Storage Pond 5	To be constructed, 60-mil HDPE liner, 200-mil geonet drainage layer, and a second 60-mil HDPE liner with a leak detection system; disposal by evaporation; permitted two feet of freeboard; capacity of 6,355,404 gallons.
Evaporation Impoundment	Brine Salt Storage Pond 4	To be constructed, 60-mil HDPE geomembrane double liner with a leak detection system; permitted discharges are clean non-contact stormwater from the facilities paved areas, roofs, air conditioner condensate, draining domestic water lines, and brine from Brine Retention Ponds East and West; Disposal by evaporation; permitted one foot of freeboard; capacity of 8,668,722 gallons.

Retention Basin	Brine Retention Pond East	To be constructed, 60-mil HDPE geomembrane double liner with a leak detection system and an epoxy coated concrete bottom; disposal by evaporation; permitted two feet of freeboard; capacity of 46,094 gallons.
Retention Basin	Brine Retention Pond West	To be constructed, 60-mil HDPE geomembrane double liner with a leak detection system and an epoxy coated concrete bottom; disposal by evaporation; permitted two feet of freeboard; capacity of 46,094 gallons.
Holding tank	Brine Holding Tank	To be constructed, 3,000-gallon fiberglass reinforced plastic holding tank for brine prior to being discharged to either Brine Retention Pond East or West.

Salt Storage Locations

Type	Designation	Description & Comments
Salt Pile	Salt Cell 1	Inactive; approximately 18.8 acres; graded to 2% slope covered with sand and 60 mil HDPE liner and with 2 feet of native soil; seeded; run-off collects in Salt Storage Pond 1.
Salt Pile	Salt Cell 2	Active; 6.2 acres; run-off area of 326,350 sq. ft.; constructed using of six-inch prepared subgrade, 60-mil HDPE liner, 200-mil drainage layer, eight oz. geotextile fabric covered with 2 feet of native soil; runoff collects in Salt Storage Ponds 2 and/or 3.
Salt Pile	Salt Cell 3	Active; 5.2 acres; run-off area of 272,850 sq. ft.; constructed using of six-inch prepared subgrade, 60-mil HDPE liner, 200-mil drainage layer, eight oz. geotextile fabric covered with 2 feet of native soil; runoff collects in Salt Storage Ponds 2 and/or 3.
Salt Pile	Salt Cell 5	To be constructed; 5.09 acres; run-off area of 221,841 sq. ft.; 60-mil HDPE geomembrane liner with a protective native soil layer; runoff collects in Salt Storage Pond 5.
Salt Pile	Site Preliminary Design Validation Pile	Closed in 2000; covered with a geosynthetic liner, 6 inches of bedding material, and three feet of soil; Seeded.

Flow Metering Locations

Type	Designation	Description & Comments
Totalizing Flow Meter	Ultrasonic Flow Meter	Located at the facility Pump House – water supply; estimates domestic wastewater discharged to the facultative sewage impoundment system.

Primary Measurement Device		To be installed. Measures brine discharged to Brine Retention Ponds East and West from the New Filter Building.

Ground Water Monitoring Locations

Type	Designation	Description & Comments
Monitoring Wells	C-2505, C-2506, PZ-2, PZ-3, PZ-4	Quarterly depth to water measurement; all wells drilled in the Shallow Subsurface Water.
Monitoring Wells	C-2507, C-2811, PZ-1, PZ-5, PZ-6, PZ-7, PZ-9, PZ-10, PZ-11, PZ-12, PZ-13, PZ-14, PZ-15, PZ-18, PZ-19	Quarterly depth to water measurement; semi-annual collection of field parameters for temperature, pH, and specific conductance; semi-annual monitoring for SO4, Cl, TDS, Uranium, and combined Radium-226 and Radium-228; all wells drilled in the Shallow Subsurface Water.
Monitoring Well	PZ-16	Quarterly depth to water measurement; semi-annual collection of field parameters for temperature, pH, and specific conductance; semi-annual monitoring for SO_4, Cl, TDS, TKN and NO_3-N; well drilled in the shallowest, water bearing zone of the Dewey Lake Formation and intended to monitor the Facultative Lagoon System.
Monitoring Wells	PZ-17 and WQSP-6A	Quarterly depth to water measurement; semi-annual collection of field parameters for temperature, pH, and specific conductance; semi-annual monitoring for SO4, Cl, and TDS; both wells drilled in the shallowest, water bearing zone of the Dewey Lake Formation and PZ-17 is intended to monitor Evaporation Pond H-19.

Depth-to-Ground Water 100 feet
Total Dissolved Solids (TDS) 3,400 mg/L

Permit Information

Original Permit Issued	January 16, 1992
Permit Amended	August 28, 1995
Permit Renewal	July 3, 1997
Permit Amended	June 12, 1998
Permit Amended	January 24, 2000
Permit Renewal	April 29, 2003
Permit Modification	December 22, 2003
Permit Modification	December 29, 2006
Permit Renewal and Modification	July 23, 2008
Permit Renewal	July 29, 2014

Current Action	**Permit Renewal and Modification**
Application Received	December 3, 2018
Public Notice Published	[not yet published]

New Mexico Environment Department
Ground Water Quality Bureau
20.6.2.3103 STANDARDS FOR GROUND WATER

This table lists the numeric ground water standards in 20.6.2.3103 NMAC, effective as of December 21, 2018. It does not list the "toxic pollutants" for which Subsection A of 20.6.2.3103 NMAC establishes a narrative standard. The list of "toxic pollutants" can be found in Subsection T of 20.6.2.7 NMAC. The standards with an asterisk (*) take effect on July 1, 2020 for past and current water discharges occurring as of July 1, 2017. For full details, please refer to the Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

Contaminant (Abbreviation) (CAS Number)	Standard
Numerical Standards (mg/l unless otherwise noted)	
Antimony (Sb) (CAS 7440-36-0)	0.006
Arsenic (As) (CAS 7440-38-2)	0.01*
Barium (Ba) (CAS 7440-39-3)	2.0
Beryllium (Be) (CAS 7440-41-7)	0.004
Cadmium (Cd) (CAS 7440-43-9)	0.005*
Chromium (Cr) (CAS 7440-47-3)	0.05
Cyanide (CN) (CAS 57-12-5)	0.2
Fluoride (F) (CAS 16984-48-8)	1.6
Lead (Pb) (CAS 7439-92-1)	0.015*
Total Mercury (Hg) (CAS 7439-97-6)	0.002
Nitrate (NO_3 as N) (CAS 14797-55-8)	10.0
Nitrite (NO_2 as N) (CAS 10102-44-0)	1.0
Selenium (Se) (CAS 7782-49-2)	0.05
Silver (Ag) (CAS 7440-224)	0.05
Thallium (Tl) (CAS 7440-28-0)	0.002
Uranium (U) (CAS 7440-61-1)	0.03
Radioactivity: Combined Radium-226 (CAS 13982-63-3) and Radium-228 (CAS 15262-20-1)	5 pCi/l*
Benzene (CAS 71-43-2)	0.005*
Polychlorinated biphenyls (PCB's) (CAS 1336-36-3)	0.0005*
Toluene (CAS 108-88-3)	1.0
Carbon Tetrachloride (CAS 56-23-5)	0.005*
1,2-dichloroethane (EDC) (CAS 107-06-2)	0.005*
1,1-dichloroethylene (1,1-DCE) (CAS 75-35-4)	0.007
tetrachloroethylene (PCE) (CAS 127-18-4)	0.005*
trichloroethylene (TCE) (CAS 79-01-6)	0.005*
ethylbenzene (CAS 100-41-4)	0.7*
total xylenes (CAS 1330-20-7)	0.62
methylene chloride (CAS 75-09-2)	0.005*
chloroform (CAS 67-66-3)	0.1
1,1-dichloroethane (CAS 75-34-3)	0.025
ethylene dibromide (EDB) (CAS 106-93-4)	0.00005*
1,1,1-trichloroethane (CAS 71-55-6)	0.2
1,1,2-trichloroethane (CAS 79-00-5)	0.005*
1,1,2,2-tetrachloroethane (CAS 79-34-5)	0.01
vinyl chloride (CAS 75-01-4)	0.002
PAHs: total naphthalene (CAS 91-20-3) plus monomethylnaphthalenes	0.03
benzo-a-pyrene (CAS 50-32-8)	0.0002*
cis-1,2-dichloroethene (CAS 156-59-2)	0.07
trans-1,2-dichloroethene (CAS 156-60-5)	0.1
1,2-dichloropropane (PDC) (CAS 78-87-5)	0.005

Discharge Permit Summary

Permit Issued (Effective Date)	[effective date]
Permitted Discharge Volume	Domestic – 23,000 gallons per day Non-Domestic – 9,586,995 gallons per day

NMED Contact Information

Mailing Address	Ground Water Quality Bureau P.O. Box 5469 Santa Fe, New Mexico 87502-5469
GWQB Telephone Number	(505) 827-2900
NMED Lead Staff	Avery Young
Lead Staff Telephone Number	(505) 827-2909
Lead Staff Email	avery.young@state.nm.us

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New Mexico Environment Department
Ground Water Quality Bureau
20.6.2.3103 STANDARDS FOR GROUND WATER

This table lists the numeric ground water standards in 20.6.2.3103 NMAC, effective as of December 21, 2018. It does not list the "toxic pollutants" for which Subsection A of 20.6.2.3103 NMAC establishes a narrative standard. The list of "toxic pollutants" can be found in Subsection T of 20.6.2.7 NMAC. The standards with an asterisk (*) take effect on July 1, 2020 for past and current water discharges occurring as of July 1, 2017. For full details, please refer to the Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

Contaminant (Abbreviation) (CAS Number)	Standard
Numerical Standards (mg/l unless otherwise noted)	
Antimony (Sb) (CAS 7440-36-0)	0.006
Arsenic (As) (CAS 7440-38-2)	0.01*
Barium (Ba) (CAS 7440-39-3)	2.0
Beryllium (Be) (CAS 7440-41-7)	0.004
Cadmium (Cd) (CAS 7440-43-9)	0.005*
Chromium (Cr) (CAS 7440-47-3)	0.05
Cyanide (CN) (CAS 57-12-5)	0.2
Fluoride (F) (CAS 16984-48-8)	1.6
Lead (Pb) (CAS 7439-92-1)	0.015*
Total Mercury (Hg) (CAS 7439-97-6)	0.002
Nitrate (NO_3 as N) (CAS 14797-55-8)	10.0
Nitrite (NO_2 as N) (CAS 10102-44-0)	1.0
Selenium (Se) (CAS 7782-49-2)	0.05
Silver (Ag) (CAS 7440-224)	0.05
Thallium (Tl) (CAS 7440-28-0)	0.002
Uranium (U) (CAS 7440-61-1)	0.03
Radioactivity: Combined Radium-226 (CAS 13982-63-3) and Radium-228 (CAS 15262-20-1)	5 pCi/l*
Benzene (CAS 71-43-2)	0.005*
Polychlorinated biphenyls (PCB's) (CAS 1336-36-3)	0.0005*
Toluene (CAS 108-88-3)	1.0
Carbon Tetrachloride (CAS 56-23-5)	0.005*
1,2-dichloroethane (EDC) (CAS 107-06-2)	0.005*
1,1-dichloroethylene (1,1-DCE) (CAS 75-35-4)	0.007
tetrachloroethylene (PCE) (CAS 127-18-4)	0.005*
trichloroethylene (TCE) (CAS 79-01-6)	0.005*
ethylbenzene (CAS 100-41-4)	0.7*
total xylenes (CAS 1330-20-7)	0.62
methylene chloride (CAS 75-09-2)	0.005*
chloroform (CAS 67-66-3)	0.1
1,1-dichloroethane (CAS 75-34-3)	0.025
ethylene dibromide (EDB) (CAS 106-93-4)	0.00005*
1,1,1-trichloroethane (CAS 71-55-6)	0.2
1,1,2-trichloroethane (CAS 79-00-5)	0.005*
1,1,2,2-tetrachloroethane (CAS 79-34-5)	0.01
vinyl chloride (CAS 75-01-4)	0.002
PAHs: total naphthalene (CAS 91-20-3) plus monomethylnaphthalenes	0.03
benzo-a-pyrene (CAS 50-32-8)	0.0002*
cis-1,2-dichloroethene (CAS 156-59-2)	0.07
trans-1,2-dichloroethene (CAS 156-60-5)	0.1
1,2-dichloropropane (PDC) (CAS 78-87-5)	0.005

styrene (CAS 100-42-5)	0.1
1,2-dichlorobenzene (CAS 95-50-1)	0.6
1,4-dichlorobenzene (CAS 106-46-7)	0.075
1,2,4-trichlorobenzene (CAS 120-82-1)	0.07
pentachlorophenol (CAS 87-86-5)	0.001
atrazine (CAS 1912-24-9)	0.003
Other Standards for Domestic Water Supply	
Chloride (Cl) (CAS 16887-00-6)	250
Copper (Cu) (CAS 7440-50-80	1.0
Iron (Fe) (CAS 7439-89-6)	1.0
Manganese (Mn) (CAS 7439-96-5)	0.2
Phenols	0.005
Sulfate (SO_4) (CAS 14808-79-8)	600
Total Dissolved Solids (TDS)	1000
Zinc (Zn) (CAS 7440-66-6)	10
pH	6-9
Methyl tertiary-butyl ether (MTBE) (CAS 1634-04-4)	0.1
Standards for Irrigation Use	
Aluminum (Al) (CAS 7429-90-5)	5.0
Boron (B) (CAS 7440-42-8)	0.75
Cobalt (Co) (CAS 7440-48-4)	0.05
Molybdenum (Mo) (CAS 7439-98-7)	1.0
Nickel (Ni) (CAS 7440-02-0)	0.2

Ground Water Discharge Permit Monitoring Well Construction and Abandonment Conditions

These conditions identify construction and abandonment requirements for installation of water table monitoring wells under ground water Discharge Permits issued by the NMED's Ground Water Quality Bureau (GWQB). Proposed locations of monitoring wells required under Discharge Permits and requests to use alternate installation and/or construction methods for water table monitoring wells shall be submitted to the GWQB for approval prior to drilling and construction.

General Drilling Specifications:

1. All well drilling activities shall be performed by an individual with a current and valid well driller license issued by the State of New Mexico in accordance with 19.27.4 NMAC.
2. Drilling methods that allow for accurate determinations of water table locations shall be employed. All drill bits, drill rods, and down-hole tools shall be thoroughly cleaned immediately prior to the start of drilling. The borehole diameter shall be drilled a minimum of 4 inches larger than the casing diameter to allow for the emplacement of sand and sealant.
3. After completion, the well shall be allowed to stabilize for a minimum of 12 hours before development is initiated.
4. The well shall be developed so that formation water flows freely through the screen and is not turbid, and all sediment and drilling disturbances are removed from the well.

Well Specifications (see attached monitoring well schematic):

5. Schedule 40 (or heavier) polyvinyl chloride (PVC) pipe, stainless steel pipe, carbon steel pipe, or pipe of an alternate appropriate material that has been approved for use by NMED shall be used as casing. The casing shall have an inside diameter not less than 2 inches. The casing material selected for use shall be compatible with the anticipated chemistry of the ground water and appropriate for the contaminants of interest at the facility. The casing material and thickness selected for use shall have sufficient collapse strength to withstand the pressure exerted by grouts used as annular seals and thermal properties sufficient to withstand the heat generated by the hydration of cement-based grouts. Casing sections shall be joined using welded, threaded, or mechanically locking joints; the method selected shall provide sufficient joint strength for the specific well installation. The casing shall extend from the top of the screen to at least one foot above ground surface. The top of the casing shall be fitted with a removable cap, and the exposed casing shall be protected by a locking steel well shroud. The shroud shall be large enough in diameter to allow easy access for removal of the cap. Alternatively, monitoring wells may be completed below grade. In this case, the casing shall extend from the top of the screen to 6 to 12 inches below the ground surface; the monitoring wells shall be sealed with locking, expandable well plugs; a flush-mount, watertight well vault that is rated to withstand traffic loads shall be emplaced around the wellhead; and the cover shall be secured with at least one bolt. The vault cover shall indicate that the wellhead of a monitoring well is contained within the vault.
6. A 20-foot section (maximum) of continuous-slot, machine slotted, or other manufactured PVC or stainless steel well screen or well screen of an alternate appropriate material that has been approved for use by NMED shall be installed across the water table. Screens created by cutting slots into solid casing with saws or other tools shall not be used. The screen material selected for use shall be compatible with the anticipated chemistry of the ground water and appropriate for the contaminants of interest at the facility. Screen sections shall be joined using welded, threaded, or mechanically locking joints; the method selected shall provide sufficient joint strength for the specific well installation and shall not introduce constituents that may reasonably be considered contaminants of interest at the facility. A cap shall be attached to the bottom of the well screen; sumps (i.e., casing attached to the bottom of a well screen) shall not be installed. The bottom of the screen shall be installed no more than 15 feet below the water table; the top of the well screen shall be positioned not

less than 5 feet above the water table. The well screen slots shall be appropriately sized for the formation materials and shall be selected to retain 90 percent of the filter pack.

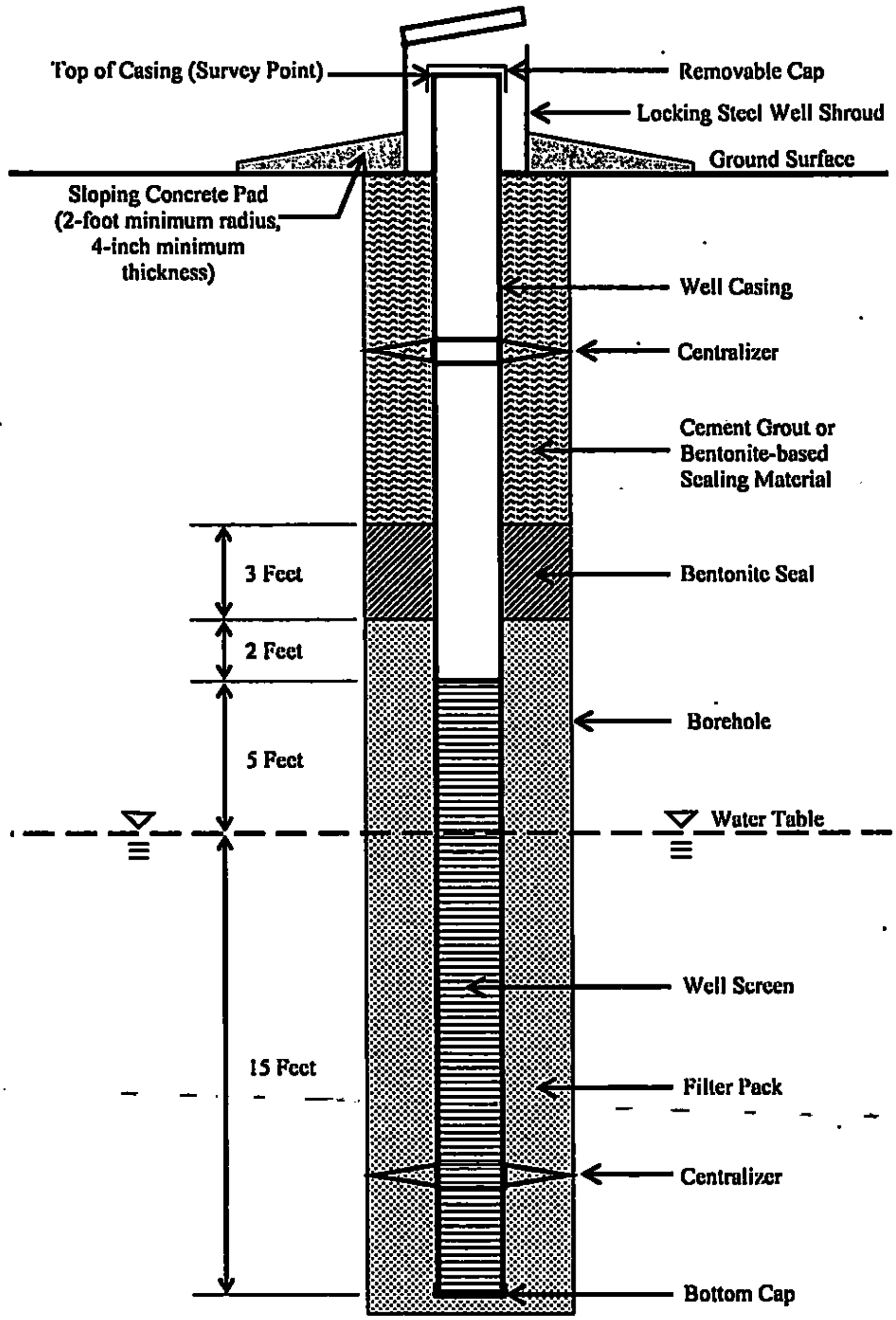
7. Casing and well screen shall be centered in the borehole by placing centralizers near the top and bottom of the well screen.
8. A filter pack shall be installed around the screen by filling the annular space from the bottom of the screen to 2 feet above the top of the screen with clean silica sand. The filter pack shall be properly sized to prevent fine particles in the formation from entering the well. For wells deeper than 30 feet, the sand shall be emplaced by a tremmie pipe. The well shall be surged or bailed to settle the filter pack and additional sand added, if necessary, before the bentonite seal is emplaced.
9. A bentonite seal shall be constructed immediately above the filter pack by emplacing bentonite chips or pellets (3/8-inch in size or smaller) in a manner that prevents bridging of the chips/pellets in the annular space. The bentonite seal shall be 3 feet in thickness and hydrated with clean water. Adequate time shall be allowed for expansion of the bentonite seal before installation of the annular space seal.
10. The annular space above the bentonite seal shall be sealed with cement grout or a bentonite-based sealing material acceptable to the State Engineer pursuant to 19.27.4 NMAC. A tremmie pipe shall be used when placing sealing materials at depths greater than 20 feet below the ground surface. Annular space seals shall extend from the top of the bentonite seal to the ground surface (for wells completed above grade) or to a level 3 to 6 inches below the top of casing (for wells completed below grade).
11. A concrete pad (2-foot minimum radius, 4-inch minimum thickness) shall be poured around the shroud or well vault and wellhead. The concrete and surrounding soil shall be sloped to direct rainfall and runoff away from the wellhead.

Abandonment:

12. Approval for abandonment of monitoring wells used for ground water monitoring in accordance with Discharge Permit requirements shall be obtained from NMED prior to abandonment.
13. Well abandonment shall be accomplished by removing the well casing and placing neat cement grout, bentonite-based plugging material, or other sealing material approved by the State Engineer for wells that encounter water pursuant to 19.27.4 NMAC from the bottom of the borehole to the ground surface using a tremmie pipe. If the casing cannot be removed, neat cement grout, bentonite-based plugging material, or other sealing material approved by the State Engineer shall be placed in the well using a tremmie pipe from the bottom of the well to the ground surface.
14. After abandonment, written notification describing the well abandonment shall be submitted to the NMED. Written notification of well abandonment shall consist of a copy of the well plugging record submitted to the State Engineer in accordance with 19.27.4 NMAC, or alternate documentation containing the information to be provided in a well plugging record required by the State Engineer as specified in 19.27.4 NMAC.

Deviation from Monitoring Well Construction and Abandonment Requirements: Requests to construct water table monitoring wells or other types of monitoring wells for ground water monitoring under ground water Discharge Permits in a manner that deviates from these requirements shall be submitted in writing to the GWQB. Each request shall state the rationale for the proposed deviation from these requirements and provide detailed evidence supporting the request. The GWQB will approve or deny requests to deviate from these requirements in writing.

MONITORING WELL SCHEMATIC
(Not to Scale)



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NEW MEXICO
ENVIRONMENT DEPARTMENT

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MICHELLE LUJAN GRISHAM
Governor

HOWIE C. MORALES
Lieutenant Governor

JAMES C. KENNEY
Cabinet Secretary

JENNIFER J. PRUETT
Deputy Secretary

March 12, 2019

Dear Permittee,

The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) wishes to notify you of recent amendments to the Ground and Surface Water Protection Regulations (20.6.2 NMAC). As a holder of a groundwater discharge permit, New Mexico's Water Quality Control Commission's amendments to the referenced regulations took effect on December 21, 2018, and these amendments may influence your current or future discharge permit.

Changes to the Ground Water Standards

The most significant changes for entities with discharge permits are the changes to the groundwater numerical standards at 20.6.2.3103 NMAC and the addition of several regulated contaminants. The numerical standards were revised to be consistent with the federal drinking water Maximum Contaminant Levels, resulting in both more and less stringent constituent specific standards. Please be aware that some of the revised standards will not take effect until July 1, 2020, as are identified in the regulations. Groundwater protection standards were adopted for 13 previously unregulated contaminants.

Furthermore, 13 additional contaminants were added to the list of "toxic pollutants" (See the definitions section at 20.6.2.7 NMAC). A minor change resulted in the toxic pollutants narrative standard being moved from the definitions section into the standards section at 20.6.2.3103 NMAC. A list showing the changes to the standards is enclosed for your reference.

Because of these changes to the standards, all general references in your current discharge permit to the standards of 20.6.2.3103 NMAC refer to the new standards, including the new contaminants. When your groundwater discharge permit is renewed or modified, it may contain specific requirements to sample for specific additional contaminants.

Other Changes to the Regulations

Other significant changes to the regulations include:

- NMED must prepare a fact sheet to accompany draft permits for federal facilities, unless the permit pertains to only domestic waste. (See 20.6.2.3108.I)
- NMED must issue a response to significant comments received on draft permits. (See 20.6.2.3109.B)
- Injection wells and surface impoundments constructed to recharge an aquifer are not exempt from the requirement to obtain a Discharge Permit. (See 20.6.2.5006)
- Revised requirements pertain to the content of petitions for a variance from the regulations, and to the duration and review of variances. (See 20.6.2.1210)

This letter does not attempt to identify or characterize all the changes to the regulations. You can find links to the amendments that were published in the New Mexico Register, to a clean version of the amended regulations, and to the Water Quality Control Commission's Order and Statement of Reasons for adopting the amendments at the GWQB's website at:

https://www.env.nm.gov/gwqb/gw-regulations/

Thank you for your ongoing cooperation. If you have any questions you may contact the reviewer assigned to your discharge permit and with whom you are accustomed to working, or you may contact me at 505-827-2962 or at steve.pullen@state.nm.us.

Sincerely,

Steve Pullen
Manager, Pollution Prevention Section

Encl: 20.6.2.3103 Revised Groundwater Standards

New Mexico Environment Department
Ground Water Quality Bureau
20.6.2.3103 STANDARDS FOR GROUND WATER

Revised groundwater standards adopted by the New Mexico Water Quality Control Commission became effective on December 21, 2018. Some standards were changed, and new standards were adopted for additional contaminants. Designations for each contaminant now include the Chemical Abstracts Service (CAS) number for clearer identification. The following table summarizes the additions and changes to the numeric standards in Section 20.6.2.3103 NMAC. Bold type highlights the standards that have changed and identifies the contaminants that are new to the numeric standards (previous standard listed as "none"). The second table lists contaminants that were added to the "toxic pollutants" identified in Subsection T of 20.6.2.7 NMAC. For full details, please refer to the Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

Contaminant (Abbreviation) (CAS Number)	Previous Standard	Current Standard
Numerical Standards (mg/l unless otherwise noted)		
Antimony (Sb) (CAS 7440-36-0)	None	0.006
Arsenic (As) (CAS 7440-38-2)	0.1*	0.01*
Barium (Ba) (CAS 7440-39-3)	1.0	2.0
Beryllium (Be) (CAS 7440-41-7)	None	0.004
Cadmium (Cd) (CAS 7440-43-9)	0.01*	0.005*
Chromium (Cr) (CAS 7440-47-3)	0.05	0.05
Cyanide (CN) (CAS 57-12-5)	0.2	0.2
Fluoride (F) (CAS 16984-48-8)	1.6	1.6
Lead (Pb) (CAS 7439-92-1)	0.05*	0.015*
Total Mercury (Hg) (CAS 7439-97-6)	0.002	0.002
Nitrate (NO_3 as N) (CAS 14797-55-8)	10.0	10.0
Nitrite (NO_2 as N) (CAS 10102-44-0)	None	1.0
Selenium (Se) (CAS 7782-49-2)	0.05	0.05
Silver (Ag) (CAS 7440-224)	0.05	0.05
Thallium (Tl) (CAS 7440-28-0)	None	0.002
Uranium (U) (CAS 7440-61-1)	0.03	0.03
Radioactivity: Combined Radium-226 (CAS 13982-63-3) and Radium-228 (CAS 15262-20-1)	30 pCi/l*	5 pCi/l*
Benzene (CAS 71-43-2)	0.01*	0.005*
Polychlorinated biphenyls (PCB's) (CAS 1336-36-3)	0.001*	0.0005*
Toluene (CAS 108-88-3)	0.75	1.0
Carbon Tetrachloride (CAS 56-23-5)	0.01*	0.005*
1,2-dichloroethane (EDC) (CAS 107-06-2)	0.01*	0.005*
1,1-dichloroethylene (1,1-DCE) (CAS 75-35-4)	0.005	0.007
tetrachloroethylene (PCE) (CAS 127-18-4)	0.02*	0.005*
trichloroethylene (TCE) (CAS 79-01-6)	0.1*	0.005*
ethylbenzene (CAS 100-41-4)	0.75*	0.7*
total xylenes (CAS 1330-20-7)	0.62	0.62
methylene chloride (CAS 75-09-2)	0.1*	0.005*
chloroform (CAS 67-66-3)	0.1	0.1
1,1-dichloroethane (CAS 75-34-3)	0.025	0.025
ethylene dibromide (EDB) (CAS 106-93-4)	0.0001*	0.00005*
1,1,1-trichloroethane (CAS 71-55-6)	0.06	0.2
1,1,2-trichloroethane (CAS 79-00-5)	0.01*	0.005*
1,1,2,2-tetrachloroethane (CAS 79-34-5)	0.01	0.01
vinyl chloride (CAS 75-01-4)	0.001	0.002

PAHs: total naphthalene (CAS 91-20-3) plus monomethylnaphthalenes	0.03	0.03
benzo-a-pyrene (CAS 50-32-8)	0.0007*	0.0002*
cis-1,2-dichloroethene (CAS 156-59-2)	None	0.07
trans-1,2-dichloroethene (CAS 156-60-5)	None	0.1
1,2-dichloropropane (PDC) (CAS 78-87-5)	None	0.005
styrene (CAS 100-42-5)	None	0.1
1,2-dichlorobenzene (CAS 95-50-1)	None	0.6
1,4-dichlorobenzene (CAS 106-46-7)	None	0.075
1,2,4-trichlorobenzene (CAS 120-82-1)	None	0.07
pentachlorophenol (CAS 87-86-5)	None	0.001
atrazine (CAS 1912-24-9)	None	0.003
Other Standards for Domestic Water Supply		
Chloride (Cl) (CAS 16887-00-6)	250	250
Copper (Cu) (CAS 7440-50-80	1.0	1.0
Iron (Fe) (CAS 7439-89-6)	1.0	1.0
Manganese (Mn) (CAS 7439-96-5)	0.2	0.2
Phenols	0.005	0.005
Sulfate (SO_4) (CAS 14808-79-8)	600	600
Total Dissolved Solids (TDS) TDS	1000	1000
Zinc (Zn) (CAS 7440-66-6)	10	10
pH	6-9	6-9
Methyl tertiary-butyl ether (MTBE) (CAS 1634-04-4)	None	0.1
Standards for Irrigation Use		
Aluminum (Al) (CAS 7429-90-5)	5.0	5.0
Boron (B) (CAS 7440-42-8)	0.75	0.75
Cobalt (Co) (CAS 7440-48-4)	0.05	0.05
Molybdenum (Mo) (CAS 7439-98-7)	1.0	1.0
Nickel (Ni) (CAS 7440-02-0)	0.2	0.2

*For purposes of application of the amended numeric standards for arsenic, cadmium, lead, combined radium-226 & radium-228; benzene, PCBs, carbon tetrachloride, EDC, PCE, TCE, ethylbenzene, methylene chloride, EDB, 1,1,2-trichloroethane and benzo-a-pyrene, to past and current water discharges (as of July 1, 2017), the new standards will not become effective until July 1, 2020.

The following table lists contaminants that were added to the "toxic pollutants" identified in Subsection T of 20.6.2.7 NMAC. Narrative standards apply to the full list of toxic pollutants, as described in Subsection A of 20.6.2.3103 NMAC.

Toxic Pollutants Added as of December 21, 2018	
styrene (ethenylbenzene)	1,4-dioxane (1,4-D)
1,2-dichlorobenzene (ortho-dichlorobenzene)	sulfolane (thiolane 1,1-dioxide)
1,4-dichlorobenzene (para-dichlorobenzene)	perfluorohexane sulfonic acid (PFHxS)
1,2,4-trichlorobenzene	perfluorooctane sulfonate (PFOS)
pentachlorophenol (PCP)	perfluorooctanoic acid (PFOA)
1,2-dichloropropane (propylene dichloride, PDC)	atrazine
	prometon