Draft

Final Remediation Plan
Leonard's Conoco
1633 Route 66, Santa Rosa, New Mexico
Facility #29084, Release ID #755
WPID #4265

Prepared for

New Mexico Environment Department
Petroleum Storage Tank Bureau
Santa Fe, New Mexico

Prepared by

DBS&A
Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company

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DB22.1024

May 25, 2022

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DRAFT

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1. Introduction

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this final remediation plan (FRP) for remediation services at the Leonard's Conoco underground storage tank (UST) site (the site) in Santa Rosa, New Mexico. All activities proposed herein meet the requirements of Part 12 of the New Mexico Petroleum Storage Tank Regulations (PSTR).

1.1 Site Summary

The site is located at 1633 Route 66, Santa Rosa, New Mexico. The site is bordered by open space and railroad property to the north and commercial property to the east and west and Route 66 to the south (Figures 1 and 2).

The site has been active since a release from the UST system was confirmed in June 1991. Previous work at the site consisted of on-site investigations, including the completion of four groundwater monitor wells (MW-1 through MW-4). Original wells MW-1 and MW-2 were replaced by wells MW-1A and MW-2A, respectively, in 2001. MW-4 is presumed to have been destroyed; therefore, only three wells now exist at the site (MW-1A, MW-2A, and MW-3). Intermittent groundwater monitoring and reporting has been ongoing since the 1990s. The last sampling event occurred in March 2022.

DBS&A conducted the last groundwater monitoring event at the site in March 2022. Concentrations of contaminants of concern (COCs) in all sampled wells were below the New Mexico Water Quality Control Commission (NMWQCC) standards or laboratory reporting limits during this monitoring event with the exception of well MW-1A, which contained a benzene concentration of 94 micrograms per liter (µg/L). The dissolved-phase contamination is currently most likely confined to the immediate vicinity of MW-1A.

1.2 Geology and Hydrogeology

The site is located near the Pecos River in eastern New Mexico at an elevation of approximately 4,600 feet above mean sea level (feet msl). The subsurface is characterized by interbedded alluvial deposits consisting of silty sand, sandy clay, and medium- to coarse-grained sand. Groundwater fluctuates from approximately 12 to 15 feet below ground surface (feet bgs) and flows to the northwest with a gradient of approximately 0.015 foot per foot (ft/ft) (Figure 3).

1.3 Distribution of Contamination

Results of past and current field investigations showed that (1) residual soil contamination is limited in extent, (2) the groundwater flow direction remains to the northwest, and (3) groundwater contamination is present in a small area around monitor well MW-1A at concentrations above applicable standards. These aspects of the distribution of contamination are discussed in the following subsections.

1.3.1 Soil Contamination

The vadose zone contamination is most likely limited in extent, in close proximity to the former tank hold and MW-1A. Therefore, residual hydrocarbon contamination is most likely found in saturated soils, which consist of several variations of sandy clay, silt, and coarse-grained sand.

1.3.2 Dissolved-Phase Contamination

Concentrations of COCs in all sampled wells were below NMWQCC standards or laboratory reporting limits during the March 2022 sampling event with the exception of well MW-1A, which contained a benzene concentration of 94 µg/L (Figure 4). The dissolved-phase contamination is currently most likely confined to the immediate vicinity of MW-1A.

Baseline groundwater monitoring included analysis of inorganic constituents (dissolved iron and manganese), as levels of these constituents can have an effect on in situ soil amendment reactions. Dissolved iron concentrations were below the NMWQCC standard in all of the sampled wells. The highest dissolved manganese concentrations were detected in monitor well MW-1A and barely exceeded the NMWQCC standard.

2. Contractor Qualifications

DBS&A is a licensed contractor in the State of New Mexico and holds a GS-29 license (License #89947) for the remediation of soil and groundwater. DBS&A has selected Regenesis of San Clemente, California as the primary contractor to provide the amendment materials and to assist with design of the injection program. Boring for the amendment program will be completed using direct-push technology, with services provided by Vista GeoScience of Colorado Springs, Colorado. All work will be performed under the supervision of a professional engineer licensed in the State of New Mexico.

3. Remediation Goals/Cleanup Standards

The contaminant plume is stable in its current position and will be contained in the vicinity of monitor well MW-1A during remedial activities. NMWQCC groundwater standards that are applicable to the site for the primary COCs are provided in Table 1.

Table 1. Groundwater Cleanup Standards

Chemical	Groundwater Standard (µg/L)
Benzene	5
Toluene	1,000
Ethylbenzene	700
Xylenes	620
Naphthalene(s)	30

Source: New Mexico Water Quality Control Commission (NMWQCC) standard.

Gasoline-related COCs include benzene, toluene, ethylbenzene, and total xylenes (BTEX) and naphthalenes. Given site contaminant concentrations, as well as the primary location of contaminants within saturated silty sands, the selected method of remediation should provide the most cost-effective means of mitigating hydrocarbons at the site. Remediation goals selected to meet cleanup standards at groundwater and soil vapor points of exposure include the following:

- Remediation of the residual soil total petroleum hydrocarbons (TPH) to the extent practicable
- Remediation of groundwater using enhanced aerobic biodegradation processes to achieve NMWQCC standards for all COCs, including BTEX and naphthalenes

4. Description of Proposed Remediation Activities

The technology that will be used for destruction of residual hydrocarbons at the site is in situ amendment injection using a grid of soil borings. The proposed remediation activities are discussed in more detail in the following subsections.

4.1 Amendment Injection

To accelerate the remediation process and meet the goal of closure in four years, DBS&A proposes the application of amendments to enhance in situ bioremediation.

DBS&A worked with Regenesis® and Vista GeoScience (Vista) of Golden, Colorado to develop a site-specific treatment design to achieve the remedial goals with a practical and cost-effective approach. The selected injectate is PetroFix™, a micron-scale (1 to 2 microns) activated carbon emulsion that removes dissolved-phase hydrocarbon contaminants by adsorption to the carbon media, combined with inorganic electron acceptors (nitrate and sulfate) to facilitate anaerobic biodegradation. PetroFix™ can be economically applied under low pressure (less than 100 pounds per square inch [psi]), and coats permeable transport zones within the treated aquifer. Once injected, PetroFix™ carbon particles remain positionally stable within the aquifer and serve to continue capturing and immobilizing dissolved-phase constituents that may be supplied by residual source areas outside the treatment zone.

This carbon-based injectate was selected so that residual hydrocarbon mass will be captured if water levels rise into potential smear zone above the current water table, and so that the injectate can be applied under relatively low pressure. Some carbon-based injectates that are injected as a slurry can require higher-pressure application, resulting in fracturing of the soil formation. This can result in random and incomplete product distribution.

The site-specific application summary for PetroFix™ includes the following specifications (depths listed below assume water is present at approximately 15 feet bgs:

- The treatment area is surrounding monitor well MW-1A; 6 total injection points on a 6-foot spacing over a 6-foot vertical interval (approximately 13 to 19 feet bgs) will be used for the injections. PetroFix™ will be injected over an approximate 300-square-foot areal extent. DBS&A is targeting an interval from 1 foot above the current water table to the bottom of the well screen. Regenesis estimates a total product quantity of PetroFix™ of approximately 400 pounds, or approximately 64 pounds per injection point.
- Materials will be injected using direct-push technology in accordance with manufacturer instructions. DBS&A will coordinate with New Mexico One Call prior to proposed on-site activities to ensure that subsurface utilities are marked. DBS&A intends to subcontract with Vista, who will provide the direct-push and mixing equipment. Based on subsurface soils in the treatment zone, DBS&A anticipates using a bottom-up injection method for application

of the amendment. A mechanical mixing pump will be used to mix PetroFix™ materials with the manufacturer-specified quantities of water in a tank. Water will be obtained locally and stored in a water tank for daily use. A hydraulic piston pump mounted on a track-mounted GeoProbe rig will be used to inject materials into the subsurface through either GeoProbe tooling or the probe rods, depending on subsurface drilling conditions. Injection boreholes will be backfilled with bentonite and sealed at the surface with a quick-setting, high-early-strength concrete.

- Injection pressure is critical to this application, as it is the key to distributing amendment into the formation. Based on assumed dry and saturated unit weights of 100 and 125 pounds per cubic foot, respectively, and an assumed porosity of 20 percent (for an average sand), recommended maximum sustained injection pressures in the soil formation would be less than 100 psi. Pressure will be monitored between the injection pump and the probe rods to minimize surfacing of injected materials. The proposed piston pump will also keep injection flow rates on the order of 3 to 5 gallons per minute (gpm). During and after injection activities, nearby monitor wells will be periodically monitored for increasing contaminant vapor concentrations using a photoionization detector or equivalent organic vapor meter.
- Work areas will be secured from vehicular and pedestrian traffic during injection activities. Injectate boring locations will be marked during the pre-injection monitoring event.

During and after injection activities, nearby monitor wells will be periodically monitored for increasing contaminant vapor concentrations using a photoionization detector (PID), as well as for resurfacing of the amendment slurry. Amendments will be injected in an alternating star pattern to minimize resurfacing; if materials resurface, injection will pause until subsurface pressure decreases sufficiently to allow continued injection.

4.2 Utility Clearances

New Mexico One-Call will be contacted prior to commencement of subsurface activities. A private utility locate service will be hired to locate buried utilities on the property in addition to normal spotting in the right-of-way. More care is needed in regard to utility locating due to the close spacing of injection points. This will be a critical health and safety component of the amendment injection program.

4.3 Report Preparation and Submittal

Following implementation of the FRP, a report will be submitted. The report will conform to the requirements of 20.5.12.38.D NMAC and will include, but not be limited to, the following:

- Area/vicinity map
- Detailed site diagram with locations of underground utilities and other subsurface structures on or adjacent to the site's property boundaries, buildings, monitor wells, amendment injection points, water lines, and other relevant structures
- Summary of site conditions
- Any deviations from the specifications included in the FRP
- Tabulation of pertinent data including, but not limited to, contaminant concentrations and groundwater elevations
- Discussion of the data collection methods
- Laboratory results with chain of custody records and laboratory quality assurance/quality control (QA/QC) documentation
- Characterization of wastes, including handling and disposal, if applicable
- Summary and recommendations
- Familiarity statement by the DBS&A qualified representative

4.4 Health and Safety Requirements

DBS&A will update the current site-specific health and safety plan (HASP) for the proposed field activities at the site related to the amendment injection program and the remediation system pursuant to the requirements of CFR 1910.120. A copy of the HASP (Appendix B) will be kept on-site during all field activities.

In case of a change in site conditions that threatens public health, safety, and welfare or the environment, activities will be stopped immediately. The change in conditions will be evaluated and, if necessary, modifications will be made to the system and its operations to remedy the risk to the public or the environment.

5. Permits

Based on discussions with PSTB and Ground Water Quality Bureau (GWQB) staff, a discharge permit application will be required for the amendment injection program (Appendix C). The discharge permit will require GWQB Public Notice 1 requirements.

6. Notifications

DBS&A will provide public notice in accordance with 20.5.12.36.D.10 NMAC, as follows:

- Legal notice of the submission of the FRP will be published twice in the *Guadalupe County Communicator*, a newspaper of general circulation in Guadalupe County, on May 27 and June 3, 2022. The certified affidavit of publication for each legal notice will be provided to the PSTB project manager within 21 days of publication. The format for the legal notice will follow that dictated in 20.5.12.36.D.10.b-d NMAC.
- A notice containing the specified information listed in the regulation will be posted at the site on the fence facing Route 66.
- In accordance with the above-cited regulation, DBS&A will provide notice of submission of the FRP by certified mail to adjacent property owners. DBS&A intends to mail a total of 8 certified letters.

Proof from the newspaper of the text of the legal notice is provided in Appendix D.

7. Implementation Schedule

A schedule for implementing this FRP is provided in Appendix E. Implementation milestones include the following:

- Approval of the FRP
- Soil amendment injection
- Submittal of the injection report

8. Evaluation of Remedial Actions

Effectiveness of the amendment injection will be evaluated at the end of the first year of groundwater monitoring. A work plan for continued monitoring will be submitted under separate cover. This evaluation will provide NMED with the information necessary to determine whether the remedial approach undertaken is successfully achieving the remedial action objectives. Key elements of the report will include the following:

- Contaminant distribution map with contaminant concentrations from each well
- Groundwater maps showing intrinsic bioremediation parameters
- Summary and recommendations

In the event that the data collected suggest that the amendment injection is not reducing contaminant mass, DBS&A may propose additional amendment injections or an alternative approach to achieve remedial goals.

9. Statement of Familiarity

This FRP was prepared by DBS&A for the Leonard's Conoco site. I, the undersigned, am personally familiar with the information submitted in this FRP and the attached documents and attest that it is true and complete.

_____ _____

John R. Bunch, P.G.
Senior Scientist

Date

_____ _____

Gundar Peterson, P.E.
Vice President

Date

DRAFT

Figures

Source: Aerial image courtesy of ESRI ArcGIS Online and data partners, including imagery from agencies supplied via the Content Sharing Program

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Feet

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5/10/2022
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LEONARD'S CONOCO
SANTA ROSA, NEW MEXICO
Area Map

Figure 1

Source: Aerial image courtesy of Google Earth Pro., September 2014.

Explanation

- Monitor well
- Monitor well (destroyed)
- Monitor well (plugged and abandoned)
- Overhead electric pole

S:\PROJECTS\ES14.0052_NMED_EMERGENCY_RESPONSE\ES14.0052.10_LEONARD'S CONOCO\GIS\MXDS\SITE_MAPS\FIG02_SITE_MAP.MXD

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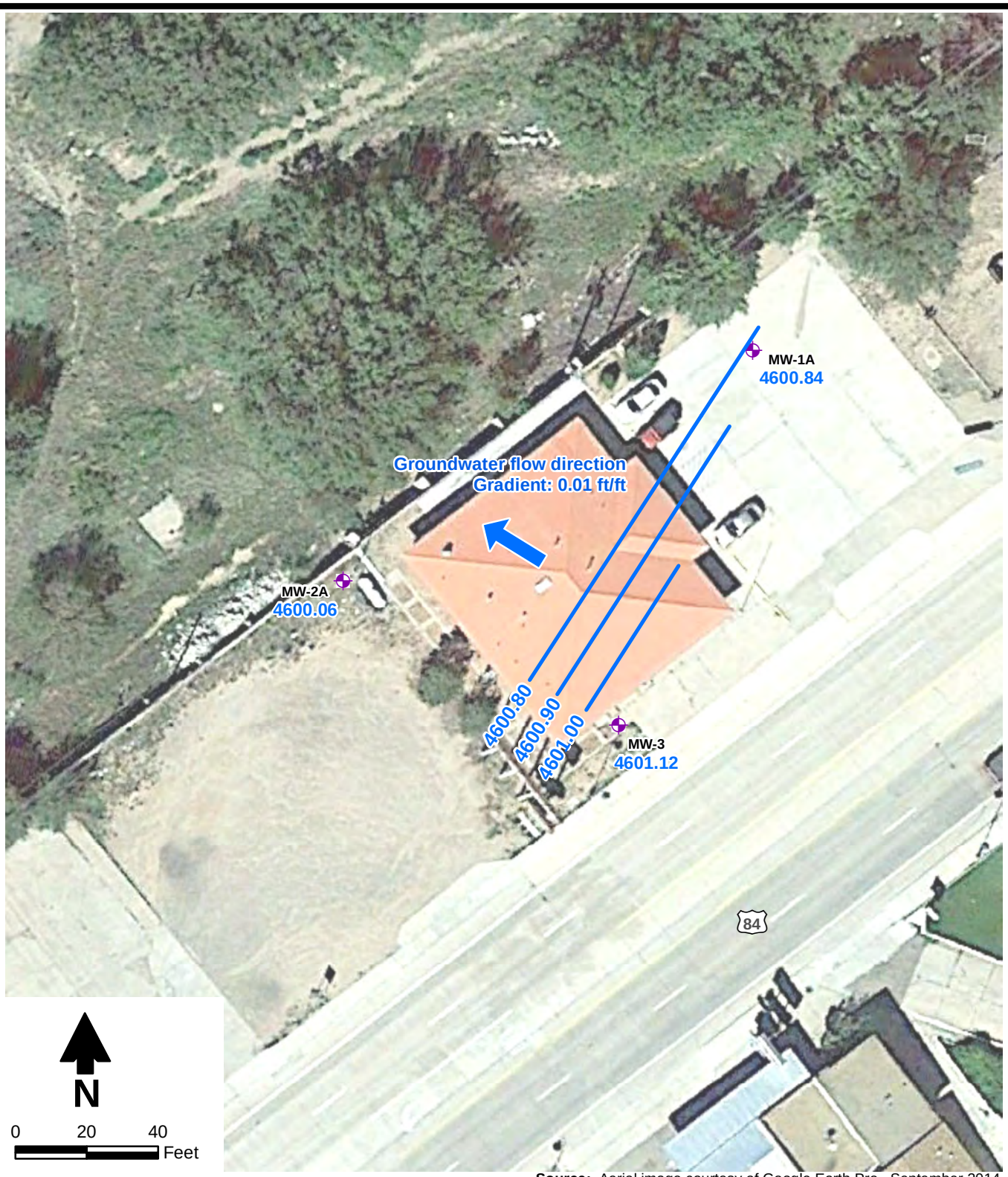
5/10/2022
DB22.1024

LEONARD'S CONOCO
SANTA ROSA, NEW MEXICO
Site Map

Figure 2



Source: Aerial image courtesy of Google Earth Pro., September 2014.

Explanation

- Monitor well
- Potentiometric surface elevation contour (ft msl) dashed where inferred

MW-1A Monitor well designation
4600.84 Potentiometric surface elevation (ft msl)

LEONARD'S CONOCO
SANTA ROSA, NEW MEXICO

Potentiometric Surface Elevations March 15, 2022

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Figure 3

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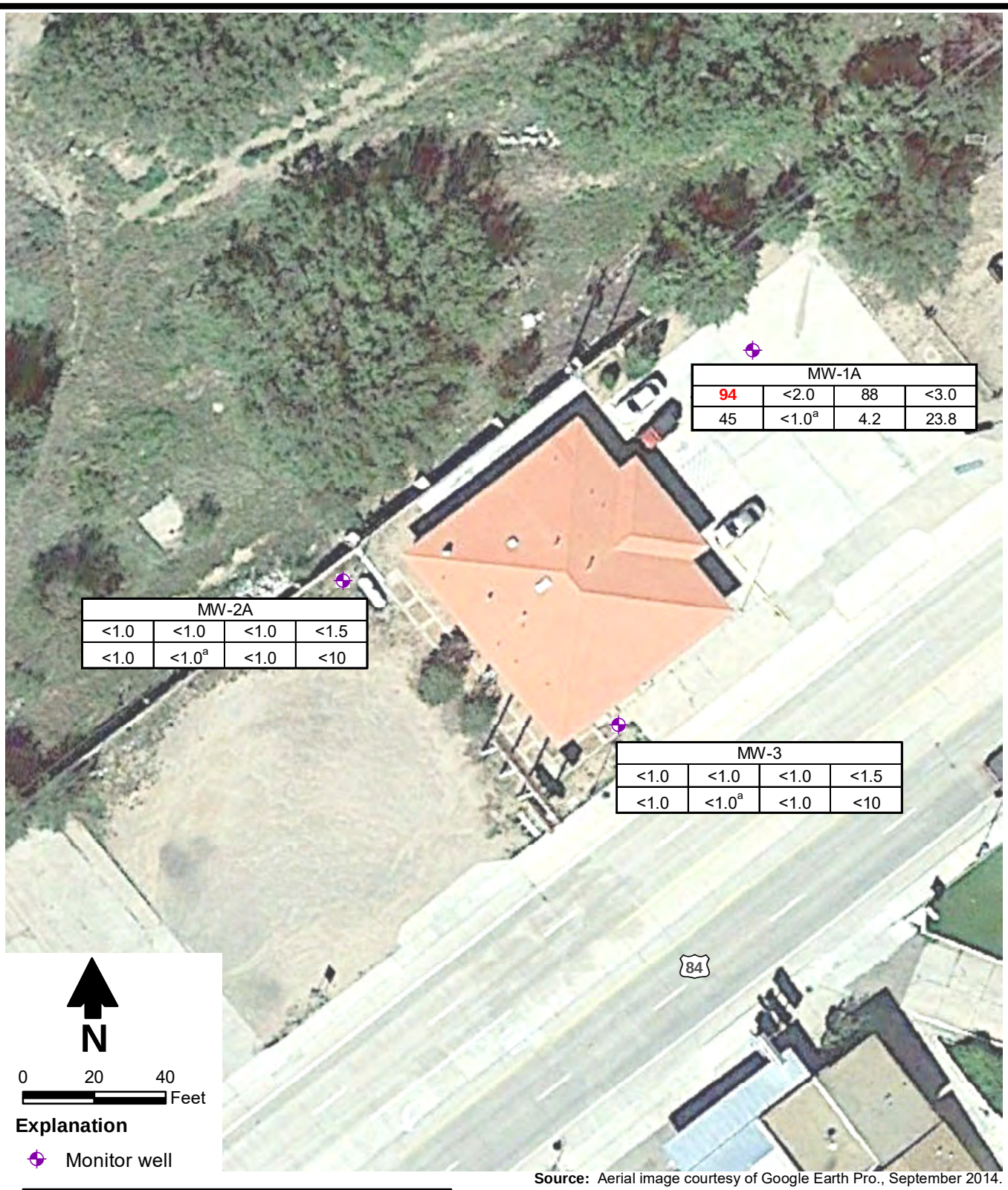

Source: Aerial image courtesy of Google Earth Pro., September 2014.

Location Designation			
Benzene	Toluene	Ethylbenzene	Total Xylenes
MTBE	EDB	EDC	Total Naphthalenes

Notes: 1. All concentrations reported in µg/L.
2. **Bold** indicates value that exceeds applicable standard.
3. [a] Laboratory reporting limit is equal to or greater than the applicable standard.

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5/4/2022 DB22.1024

LEONARD'S CONOCO
SANTA ROSA, NEW MEXICO

Distribution of Dissolved-Phase Contaminants March 15, 2022

Figure 4

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Appendix A

Product Information

DBS&A
Daniel B. Stephens & Associates, Inc.

PetroFix™ Specification Sheet

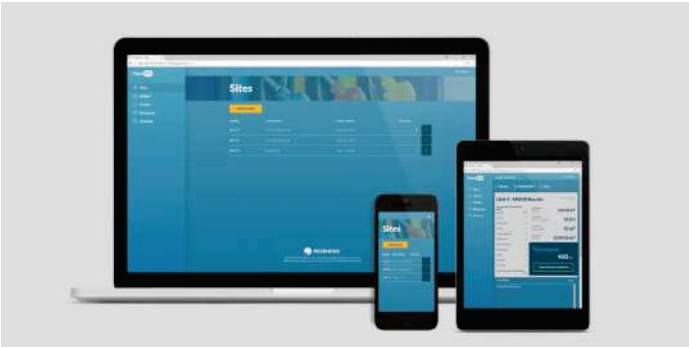
PetroFix Technical Description

PetroFix is a new remedial technology designed to treat petroleum fuel spills in soil and groundwater. A simple-to-use fluid that can be applied under low pressure into the subsurface or simply poured into open excavations, PetroFix offers a cost-effective solution for environmental practitioners and responsible parties to address petroleum hydrocarbon contaminants quickly and effectively.

PetroFix has a dual function; quickly removing hydrocarbons from the dissolved phase, by absorbing them onto the activated carbon particles, while added electron acceptors stimulate hydrocarbon biodegradation in-place. PetroFix does not require high pressure "fracking" for application and can be applied with ease using readily available equipment associated with direct push technology.

The remedial fluid is a highly concentrated water-based suspension consisting of micron-scale activated carbon and biostimulating electron acceptors. PetroFix has a viscosity higher than water and is black in appearance. Its environmentally-compatible formulation of micron-scale activated carbon (1-2 microns) is combined with both slow and quick-release inorganic electron acceptors. A blend of additional electron acceptors is included along with the PetroFix fluid. Practitioners can select between a sulfate and nitrate combination blend (recommended), or sulfate only for the additional electron acceptors required.

PetroFix Design Assistant



REGENESIS has developed a proprietary web-based design assistant called PetroFix Design Assistant™ that provides environmental professionals the ability to input their site parameters, determine the required product amount, and order the product through REGENESIS' customer service. The PetroFix Design Assistant includes defaults and warnings throughout the process to guide users toward effective designs that will offer best results.

To access the PetroFix Design Assistant, create an account and login at www.PetroFix.com

PetroFIX™ Remediation Fluid

PetroFix Fluid Chemical Composition	Properties
Activated Carbon - CAS 7440-44-0 > 30% Calcium Sulfate Dihydrate - CAS 10101-41-4 < 10%	**Appearance:** Black Fluid **Viscosity:** 1500-3500 cP (corn syrup-like) **pH:** 8-10

PetroFix Electron Acceptor Powder Chemical Composition	Properties
OPTION 1 - EA Blend (preferred) Sodium Nitrate - CAS 7631-99-4, 50% Ammonium Sulfate - CAS 7783-20-2, 50% OPTION 2 - EA Blend NF Potassium Sulfate - CAS 7778-80-5, 50% Ammonium Sulfate - CAS 7783-20-2, 50%	**Appearance:** White Powder

Storage and Handling Guidelines

Storage:

- Store away from incompatible materials
- Store in original closed container
- Store at temperatures between 40°F and 95°F
- Do not allow material to freeze or store in direct sunlight.
- Freezing and hot weather technical memo can be accessed at www.petrofix.com/resources or at this ***link*** here.
- Dispose of waste and residues in accordance with local authority requirements

Handling:

- Never add additives to solution prior to mixing with water
- Wear appropriate personal protective equipment
- Do not taste or ingest
- Observe good industrial hygiene practices
- Wash hands after handling

Applications

PetroFix is mixed with water on-site and easily applied onto the sub-surface using low pressure injections, or mixed in excavations. PetroFix is compatible with and can be used with ORC Advanced® to expedite rates of biodegradation. For more information about co-application with ORC Advanced, contact REGENESIS.

REGENESIS®

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Appendix B

Health and Safety Plan

DBS&A
Daniel B. Stephens & Associates, Inc.

Health and Safety Plan
Amendment Injection
Leonard's Conoco
1633 Route 66, Santa Rosa, New Mexico

Prepared by

DBS&A
Daniel B. Stephens & Associates, Inc.
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DB22.1024

May 11, 2022

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Site Health and Safety Plan Summary

This summary is provided as a quick reference/overview only. The remainder of the site-specific health and safety plan (HASP) is integral to the safe conduct of site operations and must be applied in its entirety.

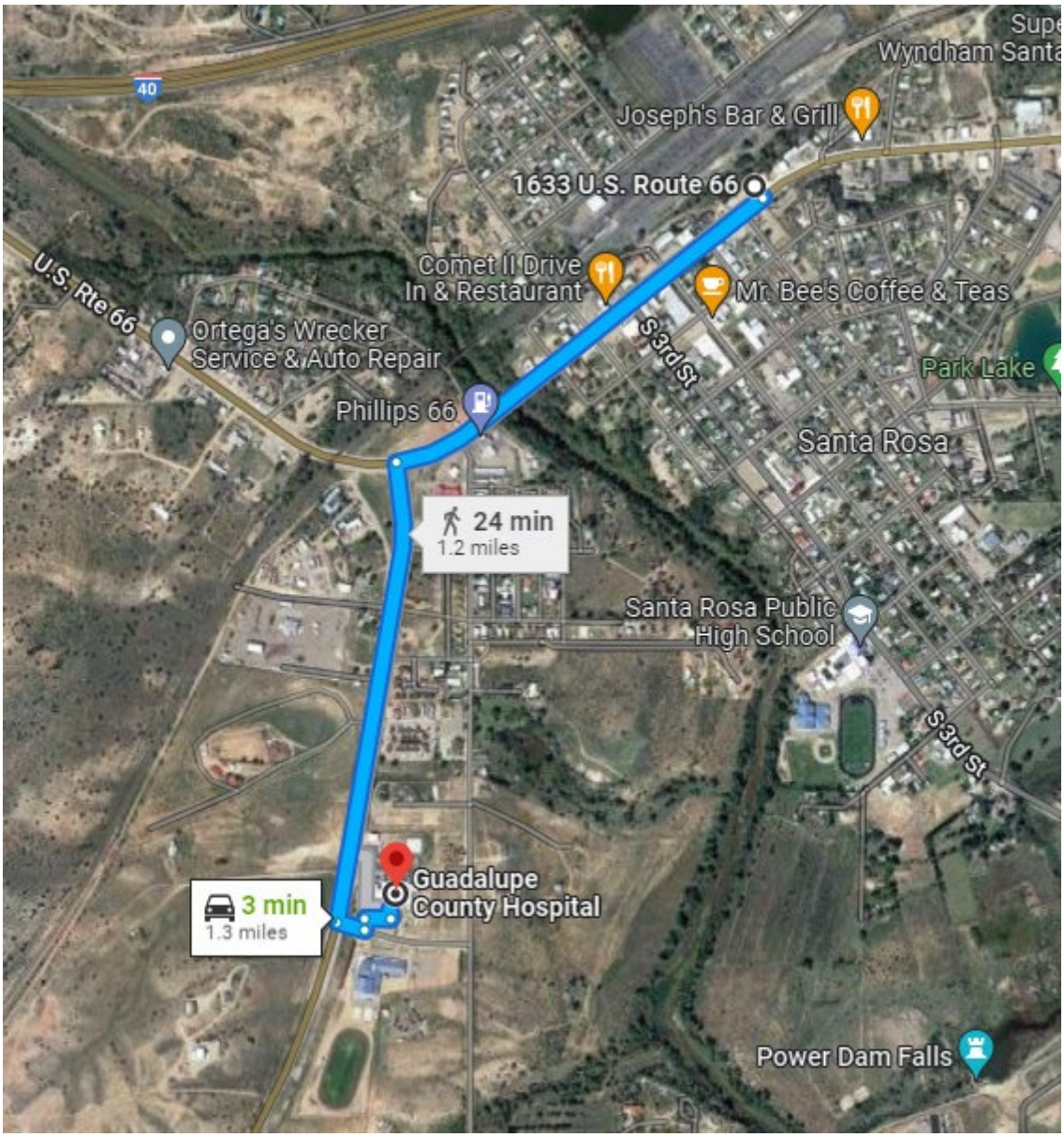
Emergency Numbers:

Location of Nearest Telephone:	DBS&A Vehicles
Emergency Numbers:	
Fire, Police, Ambulance:	911
Hospital:	Guadalupe County Hospital 575-472-3417
Poison Control Center:	800-222-1222
CHEMTREC (24-hour):	800-424-9300
National Response Center, Oil & Toxic Chemical Spills:	800-424-8802
DBS&A and Other Contacts	
DBS&A Project Manager:	John Bunch 505-822-9400
DBS&A H&S Committee Member:	Chad Johannesen 505-822-9400
GLA Corporate Program Administrator:	Russell Granfors (cell) 602-659-7131
Human Resources Manager:	Maria Robles, Ontario 909-626-2281
Client Contact:	Corey Dimond 505-470-4896
Regulatory Contact (if appropriate):	Corey Dimond, NMED

Other Contacts: _____

_____

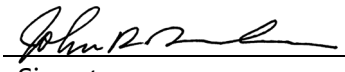
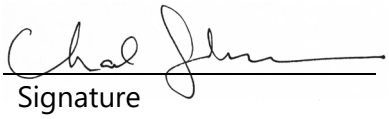
Figure 1. Hospital Route



Guadalupe County Hospital, 117 Camino De Vida St., Santa Rosa, NM.

Head south on Route 66 for approximately 0.5 miles to Mesalands Byway. Turn left on Mesalands Byway for approximately 0.5 miles, turn left onto Camino De Vita St., hospital on the left.

Approval of the Site Safety and Health Plan

Plan Prepared By:	John Bunch	Senior Scientist
	Name	Title
		May 11, 2022
	Signature	Date
Plan Approved By:	Chad Johannesen	Health and Safety Coordinator
	Name	Title
		May 11, 2022
	Signature	Date
	Name	Title
	Signature	Date
Plan Revised By:		
	Name	Title
	Signature	Date

Site-Specific Health and Safety Plan

Project Name: Leonard's Conoco Amendment Injection

Project Location: 1633 Route 66, Santa Rosa, New Mexico

DBS&A Project Manager: John Bunch

1. Introduction

This health and safety plan (HASP) establishes the responsibilities, requirements, and procedures for personnel of Daniel B. Stephens & Associates, Inc. (DBS&A), a wholly owned subsidiary of Geo-Logic Associates (GLA), while performing work at the above-named site. The HASP summary is an integral part of this HASP and must be attached for the plan to be considered complete.

The objective of this HASP is to establish a safe work environment for all site personnel, provide a uniform and concise plan of action in an emergency, and furnish the necessary guidance to adhere to these policies. This HASP meets the requirements set forth by the Occupational Safety and Health Administration (OSHA) in Title 29 of the Code of Federal Regulations (CFR), Part 1910.120 (Hazardous Waste Operations and Emergency Response) and 29 CFR, Part 1926 (Safety and Health Regulations for Construction) and CAL/OSHA in 8 CCR 5192(b)(4) (Site Specific Safety Plan). This HASP is designed to augment the health and safety policies and procedures established in the GLA Injury and Illness Prevention Plan (IIPP).

Safety is considered a priority during all field activities. Field personnel will not perform any task for which they have not received adequate training, or which they personally feel is unsafe.

1.1 Scope of Work and General Site Description

Remediation will be conducted by in situ amendment injection using a grid of soil borings. A hydraulic piston pump mounted on a track-mounted GeoProbe rig will be used to inject amendment materials into the subsurface through either GeoProbe tooling or the probe rods, depending on subsurface drilling conditions.

1.1.1 Site Status

☐ Active/Open ☐ Inactive/Open ☐ Inactive/Closed ☒ Unknown

1.1.2 Surroundings

The area around the site is commercial.

1.1.3 Climate

Average Wind Speed and Direction:

Humidity: ☐ Arid ☒ Semiarid ☐ Humid ☐ Tropical

Expected High Temperature (°F): 70

Expected Low Temperature (°F): 40

1.1.4 Locations of Resources Available to Onsite Personnel

Nearest telephone:	DBS&A personnel
Nearest water:	Potable water will be supplied
Nearest bathroom facilities:	Gas station
Nearest fire extinguisher:	DBS&A vehicles
Nearest first aid kit:	DBS&A vehicles
Warning/method signal for site evacuation:	Verbal

1.2 Chemicals in On-Site Media

Known chemicals at the site include gasoline and diesel contaminants.

A safety data sheet (SDS) for each chemical of concern is included in Attachment 4.

2. Organization and Safety Responsibilities

To meet its safety and health objectives, DBS&A has developed a line of reporting and tasked individuals with safety and health responsibilities. This information is presented below.

Project Manager: *John Bunch*

Acquaint field personnel with potential hazards and procedures to minimize the negative impact of those hazards. Make available proper personal protective equipment (PPE), adequate time and budget, and trained personnel to perform site work in a safe manner. Arrange for preparation of a HASP. Investigate and report to the Designated Health and Safety Officer (DSHO) each work-related illness or injury, near-misses, accidents, and damage to physical property.

Designated Health and Safety Officer: *On-site personnel*

Write or review and approve the HASP. Implement safety and health procedures that are stated in the HASP. Conduct periodic audits to confirm that the HASP is being followed.

Site Supervisor: *On-site personnel*

Ensure that site personnel have read and signed the master copy of this document (Attachment 1). Coordinate with the Site Safety and Health Officer (SSHO) regarding accident investigations, as necessary (See Accident Investigation Form in Attachment 1).

Site Safety and Health Officer: *On-site personnel*

Ensure that the guidelines, rules, and procedures in this document are followed for site work. Check that site personnel meet requirements regarding training, medical examinations, and fit testing. Be familiar with local emergency services. Conduct a tailgate safety and health meeting before work startup each day and when activities change. Additional meetings may be required for specific job tasks or site activities. Maintain and inspect PPE, monitor on-site hazards, and monitor the physical condition of site personnel. Perform daily inspections of work site activities. Maintain safety and health files, which will include training and medical certifications, tailgate meeting notes and rosters, inspection reports, or other safety and health documentation, as applicable. Shut down operations that pose a potential threat to site personnel.

Employees

Obey safety and health work practices issued by law and by GLA/DBS&A. Wear PPE as directed by this HASP. PPE requirements are found in Section 7. Use safety equipment as directed by this HASP.

Visitors

Follow the direction of the Site Supervisor or the SSHO. Read, understand, and sign the HASP. Do not enter the work zones unless the appropriate training has been obtained. Use PPE, as appropriate.

Subcontractors

Follow the guidelines, rules, and procedures in this document. Attend tailgate meetings and sign the meeting log included in Attachment 1 of this HASP following each meeting. Report recognized unsafe conditions and actions to the SSHO and/or the Project Manager. Provide SDSs for subcontractor-provided materials at the job site. Provide their own safety and health procedures addressing hazard recognition, evaluation and control practices/procedures for general and specific site hazards and activities unique to their operations.

3. General Hazard Review and Assessment

The hazard review for the site is based on DBS&A's experience conducting similar field operations at similar sites. Table 1 identifies the hazards associated with each task and provides a hazard ranking (from low to high) for each task. The controls (elimination, substitution, engineering, administrative, or PPE) that will be employed to protect worker safety are described in Table 2.

Table 1. Proposed Tasks and Hazard Assessment

Potential Hazards	Proposed Tasks				
	Amendment Injection	Groundwater Sampling			
Heavy equipment	X	X			
Excavation					
Hand tools	X	X			
Unstable ground					
Noise hazards	X				
Eye hazards	X	X			
Head hazards	X	X			
Dermal contact		X			
Slips, trips, and/or falls	X	X			
Heavy lifting	X	X			
Vehicle traffic					
Unauthorized site entry					
Buried utilities	X				
Overhead utilities	X				
Respiratory concerns					
Contaminated soil or liquids	X	X			
Explosive atmospheres					
Heat/cold stress	X	X			
Sunburn	X	X			
Electrical hazards	X				
Compressed air or gases					
Fire hazards (hot work)					
Chemical hazards (other than COCs)					
Insects and vermin	X	X			
Confined spaces					
Ionizing radiation					
Unexploded ordnance/munitions					
COVID-19	X	X			
HAZARD RANKING (Low, Medium, High)	Medium	Medium			

COCs = Contaminants of concern

Table 2. Controls for Potential Hazards

Potential Hazard	Controls to Eliminate or Manage Hazard
Heavy equipment	Wear reflective vest, keep eye contact with operator
Excavation	Stay back a safe distance, competent person should inspect excavation
Hand tools	Wear work gloves, use the tool for its intended purpose
Unstable ground	Be aware of your surroundings, wear slip resistant shoes
Noise hazards	Wear appropriate noise cancellation PPE
Eye hazards	Wear appropriate safety glasses, goggles, or face shield
Head hazards	Wear appropriate hard hat
Dermal contact	Wear long sleeve shirts, use caution handling contaminated liquids and soils
Slips, trips, and/or falls	Be aware of your surroundings, wear slip resistant shoes
Heavy lifting	Use proper lifting techniques, use dollies or other equipment to move heavy loads
Vehicle traffic	Wear reflective vests, be aware of traffic
Unauthorized site entry	Use barricades to restrict site access
Buried utilities	Call local commercial underground locating service, and/or private underground locating service
Overhead utilities	Use caution around overhead utilities, have utilities guarded if necessary
Respiratory concerns	Wear appropriate respiratory protection for the hazard, move upwind of dust creating work
Contaminated soil or liquids	Be cautious handling soils or liquids, wear appropriate gloves for the hazard
Explosive atmospheres	Do not smoke or use spark devices near locations, use gas monitoring equipment for testing
Heat/cold stress	Wear proper clothing, drink plenty of liquids, take breaks
Sunburn	Wear sunblock, wear large brim hats and proper clothing
Electrical hazards	Always inspect electrical equipment before use, never use electrical devices without training
Compressed air or gases	Stay clear of gas cylinders unless properly trained on their use and storage
Fire hazards (hot work)	Keep a fire extinguisher in work truck, obtain hot work permit if it is a site requirement
Chemical hazards (other than COCs)	Wear appropriate PPE, stay upwind of construction activities
Insects and vermin	Never approach a wild animal, be aware of insects when moving objects
Confined spaces	Never enter a confined space unless properly trained and with a trained person
Ionizing radiation	Use proper PPE and storage containers when contacting items that have radiation
Unexploded ordnance/ munitions	Be aware of your surroundings
COVID-19	Use precautions listed in Attachment 5

3.1 Sunburn and Temperature Hazards

Sunburn is perhaps the most common hazard for field site workers. Sunburn is caused by overexposure to ultraviolet (UV) radiation from the sun. Chronic overexposure to sunlight, especially the UV-B component, accelerates skin aging and increases the risk of skin cancer. The following guidelines can be used to avoid overexposure to UV rays from the sun:

- Wear protective clothing (long sleeves, hats with protective brims, and long pants) that provides the most coverage and is consistent with the job to be performed.
- Protect eyes with UV-absorbing tinted safety glasses.
- Use a commercial sunscreen with a skin protection factor (SPF) of at least 30 and protection against both UV-A and UV-B rays. Sunscreen should be applied 15 to 30 minutes before exposure and reapplied at 60- to 90-minute intervals. If possible, avoid exposure to the sun between 10:00 a.m. and 2:00 p.m., as rays are the most powerful during this period.

Heat stress is often the most critical hazard for field site workers. The effects can range from transient heat fatigue to serious illness and even death. Heat stress is caused by a number of interacting factors including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is fairly common during the summer and fall, preventive measures and alertness are especially important during these seasons. A comprehensive Heat Illness Prevention Plan is included in Attachment 3, in accordance with CAL/OSHA.

During cold weather, DBS&A personnel should wear multilayer, wind-resistant outfits and drink warm fluids. Warm shelter will be available during breaks.

3.2 Weather Hazards

In addition to the hazards of UV radiation from the sun and extreme ambient temperatures, general weather conditions may present a hazard to field workers. Rain and snow may result in muddy, slippery conditions that make foot and vehicle travel hazardous. Lightning and tornadoes, common summertime phenomena, can be extremely hazardous. In the event of adverse weather (e.g., high wind and airborne dust, lightning, extreme cold or heat, or rain) that could compromise worker's health and safety during outdoor activities, the SSHO will shut down operations. Additional safety measures for weather-related hazards are described in the IIPP.

If lightning is visible and the sound of thunder is heard less than 60 seconds after lightning is observed (10 miles), stop field operations and move to a sturdy, completely enclosed building. There are many apps for cell phones that will show immediate radar and tell you how many miles away lightning is from your location (e.g., Weather Bug). If a sturdy shelter is not available, get inside a hardtop automobile and keep the windows up. Automobiles offer excellent lightning protection.

In the event of a tornado, move to a pre-designated shelter. If an underground shelter is not available, move to an interior room or hallway on the lowest floor and get under a sturdy piece of furniture. Stay away from windows. If caught outside or in a vehicle, do not try to outrun a tornado in your car; instead, lie flat in a nearby ditch or depression. Remember that flying debris from tornadoes causes most deaths and injuries.

3.3 Biological Hazards

Venomous snakes and arthropods (e.g., insects, spiders, ticks, scorpions, and centipedes) create a hazard when their habitats are disturbed. Awareness and avoidance are the best defenses. Fieldwork shall be performed in a manner that minimizes disturbances of these creatures. Should a bite or sting occur, first aid shall be immediately applied and medical treatment sought as soon as possible.

The feces and urine of some desert rodents may be carriers of the hantavirus, and fleas on living or dead animals may carry bubonic plague. Both hantavirus and bubonic plague occur in the southwestern United States. Field workers should avoid all contact with rodent nests, droppings, or bodies. Professional medical treatment should be sought immediately if a worker suffers an animal bite of any kind.

The most common adverse reactions to plants from occupational exposures are skin injuries. These can result from simple mechanical trauma, photochemical response to psoralens, or sensitization to plant allergens. In the western United States, there are many plants that contain thorns, spines, and/or needles capable of injury.

Secondary to needle pricks from thorns and cactus needles, the most common trauma results from contact with plants in the poison ivy family (Anacardiaceae), including poison oak and poison sumac. The sensitizers in these plants are various unsaturated, long-chained substituted catechols. In healthy undisturbed plants, the sensitizer is contained in special channels. Contact

with the intact plant does not produce sensitization or dermatitis. Even slight damage can release the sensitizer, however, and the best prevention is avoiding contact with the plants.

If skin contact occurs, the dermatitis may be avoided by prompt removal of the allergen. About 10 minutes are required for the cutaneous penetration of the allergen. Wash with running water, but avoid soap. Soap removes protective skin oils and may cause or hasten penetration of the allergen. Avoid nonpolar solvents, such as alcohol, which may spread the allergen over a wider area. Early application of topical steroids minimizes the severity of the dermatitis. If the face or genitalia are involved, seek professional medical assistance immediately.

Important Note: Any individual with a known allergy to wasps and bees must notify the SSHO and/or PM/task leader prior to working at the project site. If an individual has a history of allergic reactions to insect bites or is subject to attacks of hay fever or asthma, or if they are not promptly relieved of symptoms after first aid is administered, a physician will be called or immediate emergency medical treatment will be sought. In a highly sensitive person, do not wait for symptoms to appear, as delay can be fatal.

3.4 Emergency Response

The HASP summary lists the names and telephone numbers of people and agencies that might be contacted in the event of an emergency. The emergency response (ER) plan is provided as Attachment 2. The ER plan includes instructions and procedures for emergency vehicular access, evacuation procedures for personnel, methods of containing a fire, and instructions on how to handle a variety of specific medical emergencies.

4. Code of Safe Practices

GLA's code of safe practices advocates exercising every reasonable precaution when performing work to prevent injuries and accidents, and to protect the safety and health of employees, the public, and the environment.

Employees have certain responsibilities for their own safety, as follows:

- Report to work rested, and physically and mentally fit to perform the job assignment.
- Working while under the influence of intoxicants, narcotics, or controlled substances is prohibited.

- Wear suitable clothing for the weather and the work.
- Wear PPE and follow established procedures for a particular job. Do not wear jewelry or loose-fitting clothing when operating or near equipment.
- Call to the supervisor's attention any behavior or condition that may cause injury or illness to others or damage to property.
- Labels on tools, materials, and chemical containers must be read before use, and the instructions for proper use, handling, and required PPE must be followed.
- Discontinue any operation that could lead to injury, illness, or property damage.
- Keep horseplay and other disruptive behavior away from the job.
- Promptly report to the Site Supervisor or SSHO any occupational injury, illness, or exposure to toxic material. If injured, get first aid. Small injuries can become serious if neglected.
- Promptly inform the Site Supervisor or SSHO whenever new substances, processes, procedures, or equipment that could present new safety and health hazards are brought into work areas or onto projects.
- Do not eat, smoke, chew tobacco, or chew gum in the work area.
- Do not allow visitors without adequate safety training or PPE into the work area.
- Work upwind of invasive field activities when it is possible to do so.
- Perform work in a manner that will minimize dust from becoming airborne (i.e., use water spray or wet technique when feasible).
- Avoid contact with objects or water unless the contact is necessary to the field operation.
- Be alert to any abnormal behavior of other personnel that may indicate distress, disorientation, or other ill effects.
- Be aware of the potential for biological hazards at the field site (e.g., poison oak, loose dogs, snakes, rodent droppings).
- Verify that vehicles have an ABC-rated fire extinguisher, a first-aid kit, and 16 ounces of eyewash fluid.

- Employees must not attempt to cross the path of a truck or a piece of heavy equipment unless eye contact is made with the operator and the "go ahead" signal is given. Employees must stay alert and keep clear of moving equipment.
- Monitor weather conditions, particularly wind direction, as they could affect potential exposure.
- Excavations and trenches have additional hazards that require special precautions prior to entering. Supervisors shall be competent in the identification of hazards and determination in protective systems.
- Operate a vehicle only if you are a licensed driver. Seatbelts must be worn when operating a company vehicle or when driving a private vehicle on company business.
- Drive company vehicles safely and professionally and care for them as you would other company property. Drive only vehicles that are safe and within maintenance specifications. Obey traffic regulations.
- Do not exceed speed limits for conditions.
- Practice defensive driving.
- Park in legal spaces; do not obstruct traffic.
- Lock vehicle when unattended.
- Contact the SSHO if contact with human blood occurs during the administration of first aid.

These general safety responsibilities also apply to subcontractors and visitors.

5. Air and Noise Monitoring

This section describes the measures that will be taken to protect workers from exposures to hazardous atmospheres and noise during the site activities.

5.1 Air Monitoring

Respiratory protection will be used in accordance with OSHA regulations in 29 CFR 1910.134 and the GLA Respiratory Protection Program Plan. All persons using respiratory protection must be medically cleared to do so and should be aware of the following important definitions:

- Assigned protection factor (APF) is the level of protection that a respirator or class of respirators is expected to provide to employees and is used to select the appropriate class of respirators. Level C PPE includes an air-purifying respirator (APR). A half-face APR has an APF of 10; a full-facepiece APR has an APF of 50.
- Maximum use concentration (MUC) is the maximum atmospheric concentration of a hazardous substance from which an employee can expect to be protected when wearing a respirator. The MUC is calculated by multiplying the occupational exposure limit by the APF. For example, in the case of benzene, OSHA has established a permissible exposure level (PEL) of 1 part per million (ppm) (for an 8-hour time-weighted average [TWA]), and a short-term exposure limit (STEL) of 5 ppm. Therefore, the MUC for benzene is 10 ppm for a half-face APR and 50 ppm for a full-facepiece APR. The half-face and full-facepiece APRs may be used for short periods of time (up to 15 minutes) in benzene concentrations up to 50 and 250 ppm, respectively (STEL x APF).

Table 1 identifies each of the tasks to be performed at the site. These tasks may include monitoring of organic vapors, particulates, combustible gases, and oxygen. Section 1.2 lists each of the contaminants of concern for the site. Table 3 lists the types of hazardous atmospheres that could be present at a site, the air monitoring equipment used for each, and the action levels to be used at this site. When in use, all meters will be calibrated daily in accordance with manufacturer's instructions.

Table 3. Air Monitoring Equipment, Action Levels, and Protective Measures

Hazard	Equipment	Action Levels in BZ	Action Response
Organic vapors	PID, FID	Background	Level D PPE
		OEL of most toxic contaminant sustained for 5 minutes	Use Level C respiratory protection; evaluate specific compounds.
		MUC for respiratory protection in use.	Stop work; upgrade to Level B
	Colorimetric (Drager) Tubes	Chemical specific:	Use Level C respiratory protection if compounds exceed OELs.
Particulates	Dust Monitor	Visible dust	Suppress with water
		<5 mg/m^3	Level D PPE
		>5 mg/m^3	Use Level C respiratory protection
Flammable/explosive atmosphere	Explosimeter	<10% scale reading	Proceed with work
		10 – 15% scale reading	Stop work
		>15% scale reading	Evacuate site
Oxygen-deficient atmosphere	Oxygen Meter	19.5 – 23.5%	Normal - continue work
		<19.5%	Evacuate - oxygen deficient
		>23.5%	Evacuate - fire hazard
Ionizing radiation	Gamma radiation meter	>0.1 millirem/hr	Radiation sources may be present
		>1 millirem/hr	Evacuate - radiation hazard

BZ = Breathing zone
PID = Photoionization detector
FID = Flame ionization detector
PPE = Personal protective equipment
OEL = Occupational exposure limit
MUC = Maximum use concentration
ppm = Parts per million
mg/m^3 = Milligrams per cubic meter
1,1-DCE = 1,1-Dichloroethene

5.1.1 Organic Vapors

The need for respiratory protection from toxic vapors is based on the most hazardous constituent that is likely to be present or known to be present, based on soil, soil gas, and/or groundwater sampling. Section 1.2 lists each of the volatile contaminants of concern for the site.

All personnel should be aware that the detection capabilities of photoionization detectors (PIDs) may be enhanced or dampened by high humidity or by the presence of certain gases, such as methane. Direct evidence of contamination, such as visible staining of soils or strong odors, should be used to further evaluate these quantitative instrument readings.

5.1.2 Combustible and Oxygen-Deficient Atmospheres

An instrument or instruments capable of detecting combustible gases and oxygen levels will be used during activities where these atmospheres may be encountered. The instrument(s) shall be placed as close to work activity as possible. The lower explosive limit (LEL) and the upper explosive limit (UEL) for chemicals are published in the NIOSH Pocket Guide. Work activities will be suspended when combustible gas measurements are at or between the LEL and the UEL.

Normal atmosphere contains between 20.8 and 21 percent oxygen. The atmosphere is oxygen-deficient if it contains less than 19.5 percent oxygen and oxygen-enriched if it contains more than 22 percent oxygen. Oxygen-deficient atmospheres may be created when oxygen is displaced by other gases or consumed by bacterial activities. Oxygen-enriched atmospheres can be created by certain chemical reactions and present a significant fire and explosion risk. Work activities will be suspended when readings indicate oxygen levels at or below 19.5 percent and at or above 22 percent.

5.1.3 Particulates

When respirable dust is considered a potential hazard (e.g., drilling or excavating operations), direct-reading personal dust monitors (e.g., Thermo Scientific pDR-1500 personal DataRAM) should be used to identify and quantify airborne dust concentrations that a worker is exposed to while working. NIOSH has established a recommended exposure limit (REL) for crystalline silica as respirable dust of 0.05 milligrams per cubic meter (mg/m^3). This value is 10-hour TWA concentration for a 40-hour workweek. NIOSH recommends the use of N95 or more efficient filters for protection against respirable dust. The MUC for crystalline silica as respirable dust is 0.5 mg/m^3 for a half-face APR and 2.5 mg/m^3 for a full-face APR. Supplied air respirators must be used if airborne concentrations of crystalline silica exceed 2.5 mg/m^3 (NIOSH Pocket Guide, 2013). Respirator cartridges and filters will be changed each day.

5.2 Noise Monitoring

All site personnel who are exposed to average noise levels of 85 A-weighted decibels (dBA) or greater during an 8-hour workday must participate in their company's Hearing Protection Program. Workers must use appropriate hearing protection whenever noise levels exceed 90 dBA. The GLA H&S Program Coordinator has used a noise meter to survey a variety of equipment that may be used during the site activities and found that work around heavy equipment is most likely to require hearing protection. Noise levels are highest near the engines and compressors, but generally do not exceed 85 dBA in the typical operator locations (e.g., behind the drill rig). However, impact noise, such as the tripping of a pneumatic or hydraulic hammer on a direct-push rig or driving casing on a dual-tube drill rig, can be considerably higher. When a noise meter is not available, the following rule of thumb should be used: if it seems loud or you cannot carry on a normal conversation, hearing protection should be worn.

6. Training and Medical Surveillance Requirements

This section refers to field personnel who work on or may work on hazardous waste sites regulated by OSHA. All field personnel must have successfully completed training and field experience requirements for hazardous waste site operations in accordance with the requirements of 29 CFR section 1910.120(e) and 8 CCR 5192(e).

6.1 Regular Site Personnel Exposed to Hazardous Substances

Site personnel whose job responsibilities cause them to be exposed to or to have the potential to be exposed to hazardous substances or health hazards are required to comply with 29 CFR 1910.120(e)(3)(I) or applicable state regulations. This regulation requires site personnel exposed to hazardous substances to complete 40 hours of off-site instruction and three days of field experience supervised by a trained supervisor.

6.2 Regular Site Personnel Potentially Exposed to Hazardous Substances Below Permissible Exposure Limits

Regular site personnel whose job responsibilities cause them to be potentially exposed to hazardous substances below permissible exposure limits (PELs) or health hazards are required to comply with 29 CFR 1910.120(e)(3)(iii) or applicable state regulations. This regulation requires that these personnel receive a minimum of 40 hours of off-site instruction and one day of field

experience supervised by a trained supervisor. The project SSHO or designated representative must ensure that these personnel will not be exposed above PELs. This decision will be made on the basis of review of previous monitoring in these work areas and possibly historical site background information.

6.3 Occasional Site Personnel Potentially Exposed to Hazardous Substances Below Permissible Exposure Limits

Occasional site personnel who visit the site for a specific limited task and whose exposure is designated by the SSHO to be under PELs are required to comply with 29 CFR 1910.120(e)(3)(ii) or applicable state regulations. This regulation requires that these personnel receive a minimum of 40 hours of off-site instruction and one day of field experience supervised by a trained supervisor.

In accordance with 29 CFR 1910.120(e)(3)(iv) or applicable state regulations, regular (as defined in Section 4.1.2) and occasional site personnel having completed an initial 24-hour classroom instruction must complete an additional 16 hours of off-site instruction and two days of field experience supervised by a trained supervisor before they are qualified to engage in activities that may expose them to hazardous substances above PELs.

6.4 Management and Supervisory Training

In accordance with 29 CFR 1910.120(e)(4) or applicable state regulations, individuals who manage or supervise personnel engaged in hazardous waste operations at the site must receive 40 hours of off-site instruction and three days of field experience supervised by a trained supervisor. In addition, management and supervisory personnel shall receive an additional 8 hours of specialized training that addresses the safety and health program, training requirements, personal protective and respiratory equipment program, health hazard monitoring procedures.

6.5 Refresher Training

Annual refresher training in accordance with 29CFR Section 1910.120(e)(8) or applicable state regulations shall be completed at least annually following the completion of the individual's 40-hour or 24-hour training course. Personnel will be required to attend the annual refresher training to maintain their qualifications for hazardous waste operation.

6.6 Documentation

Training must be properly documented and filed on-site for reference by the DSHO or designated representative. Personnel required to meet the training requirements must present evidence of this training for applicable projects. The Site Supervisor is responsible for checking before each activity to verify complete and current documentation. A copy of the training records documentation will be kept for a duration of no less than 3 years, and will be readily available or on-site, as applicable.

6.7 Site-Specific Training

In addition to the training requirements specified above, field personnel must participate in site-specific training. The training, conducted by the PM or SSHO, will include a review of the health and safety procedures specific to each individual's job responsibilities and tasks. The field team should review the HASP to ensure that each individual is familiar with the site and fully understands the health and safety procedures and guidelines they are required to implement for each assigned task. Specific attention should be given to the following items:

- Facility/site description and characterization
- Chemical and physical hazards
- Safety rules
- Emergency response/contingency plan and emergency contacts
- Protective measures and controls, including PPE, safety equipment, restrictions, and site communication
- Decontamination procedures
- Site control, work zones, security, access and exit points, and site communication plan

Project personnel will be required to adhere to safe work practices as defined by the SSHO.

6.8 Medical Surveillance Requirements

Field personnel are required to participate in the Medical Surveillance Program. All field personnel must have completed either a baseline or annual medical monitoring examination within 12 months of their assignment to the site. Only medically qualified personnel will be permitted to conduct field activities.

As part of the medical surveillance program, all personnel working at hazardous waste sites are required to undergo an annual physical examination. The content of the annual surveillance physical includes most of the baseline physical, laboratory, and diagnostic tests, but may also include additional tests in instances of actual or potential chemical exposure. It will be up to the attending physician to determine the need for additional tests. The physician shall summarize pertinent findings and submit copies of the summary to the employee.

6.9 Site-Specific Medical Monitoring

The risk of exposure to the types of chemical and physical hazards anticipated during field activities at the work site will not require field personnel to undergo specific tests prior to beginning field activities. Physical, diagnostic, and laboratory tests conducted as part of the baseline or periodic medical monitoring are expected to be adequate for the types and levels of potential chemical exposure. Follow-up testing will be conducted in the event of any exposures to airborne contaminants exceeding PELs.

Field personnel will be informed of the results of any personal monitoring/sampling conducted during field activities and any other information related to possible exposure. Any data or other documentation indicating possible employee exposure to chemical hazards exceeding PELs will be forwarded to the employee and, upon the employee's request, to his/her personal physician.

6.10 Exposure/Injury/Medical Support

Any employee who suffers an illness, injury, or chemical exposure during the course of field activities is required to see a physician. Depending upon the extent and type of exposure, illness, or injury, it may be critical to perform follow-up testing within 24 to 48 hours of initial medical examination. The physician responsible for conducting the employee medical surveillance examinations shall be notified and consulted to determine the type(s) of tests required to accurately monitor the employee. Workers may return to work only with the written approval of the attending physician.

6.11 Record Keeping

In addition to OSHA and Cal/OSHA record keeping requirements, the SSHO will maintain a file of any health and safety related events occurring at a site. Any exposure or potential exposure episodes are to be recorded, as well as those accidents or incidents that require the filing of an Illness, Injury and Unusual Occurrence Report (e.g., injuries, illnesses, accidental damage to

property, or "near miss" occurrences that could have resulted in personal injury). A copy of the Illness, Injury and Unusual Occurrence Report form is included as Appendix 1-4 of the Injury and Illness Prevention Plan (IIPP).

7. Protective Equipment

At a minimum, the following PPE shall be used by personnel while working at the site:

- Steel-toed/steel-shanked work boots
- Long pants
- Protective eyewear
- Hard hat (when needed)
- Chemical-resistant gloves (when needed)
- Hearing protection (when needed)

Level C PPE will include Level D equipment plus a full- or half-face APR with appropriate cartridges and pre-filters. Workers using respiratory protection should be familiar with guidelines to determine that the equipment being used for respiratory protection is providing adequate protection, as discussed in Section 6.1. Chemical-resistant coveralls and/or gloves will be worn whenever conditions require GLA field personnel to come in direct contact with potentially contaminated materials.

DBS&A will supply employees with PPE that meets requirements established by NIOSH or the American National Standards Institute (ANSI), and that meet current OSHA criteria. Employees will be trained in the selection, care, and use of PPE, as described in the IIPP.

7.1 Disposal of Contaminated Clothing or Equipment

All potentially contaminated clothing, Tyvek coveralls, gloves, paper towels, and other expendable items will be placed in garbage bags for disposal. Fresh Tyvek coveralls and work gloves should be donned at the start of each workday or when otherwise required.

7.2 Decontamination Procedures

Specific personnel decontamination procedures are based on the personal level of protection. When using Level D protection, a personnel decontamination system (PDS) is not required. However, because project personnel wearing Level D protection may need to upgrade to Level C if site conditions change, a PDS may be established based on specific site characteristics.

The decontamination stations for Level C decontamination may include (1) a segregated equipment drop for hand tools and monitoring equipment, (2) a wash and rinse for gloves and disposable booties (if worn), (3) a removal station for gloves and disposable booties (if worn), (4) a removal station for respiratory protection, hard hat, safety glasses, and Tyvek suits, and (5) a station to wash and rinse hands and face. Specific procedures and the sequence of events will be determined based on the potential hazards identified at the site. The stations listed are a guide to the selection of adequate decontamination procedures.

When a PDS is set up, the SSHO or his/her designee has the responsibility for operating the decontamination station. This person will make sure that all personnel enter and leave active work areas through the PDS, that all personnel decontaminate properly, and that disposable items are bagged. The SSHO will assist on-site workers in changing cartridges, masks, gloves, or other pieces of safety equipment, and monitor the length of work periods. Disposable items will be placed in plastic bags and properly disposed of. Non-disposable items will be properly cleaned and dried according to manufacturer's specifications and stored for future use.

8. Site Control

Barricades, caution tape, or other necessary means shall be used when necessary to prevent unauthorized access into the work area. The SSHO will establish the physical limits of the work areas at the site and instruct all personnel and visitors concerning the boundaries of the exclusion zones.

Traffic control plans may be required for all sites where work activities may impact traffic flow on adjacent roadways. These plans must be submitted to and approved by the local traffic control authority. The PM or their designee will be responsible for ensuring that the necessary site control measures and plans are prepared and implemented.

9. Confined Space Entry

Any confined spaces identified as the work progresses shall be properly marked and managed accordingly. GLA has developed and implemented a Confined Space Entry Program Plan that provides policies and procedures to be followed for confined space entries, including air monitoring, participant training and duties, and authorizing and permitting confined space entries.

If confined space entries become necessary, the SSHO will contact the PM and this site-specific HASP will be amended accordingly. The SSHO will ensure that entries are performed in accordance with the GLA Confined Space Entry Program Plan. If necessary, the SSHO will contact the local fire department to coordinate the entry and rescue requirements.

10. Spill Prevention

Minor spills of potentially contaminated soil, residual free product, or groundwater may occur during site work. The area beneath drill rig may be lined with plastic sheeting to control fluid leaks from the equipment. If a spill occurs, site personnel will use best judgment and available materials to contain and prevent it from spreading. All contained soil and liquids will be disposed of in compliance with federal, state, and local requirements.

11. Safety Meetings

A site safety or "tailgate" safety meeting will be held every day before the start of work for the project and before the start of each new activity. All personnel directly involved in the work are required to attend. This HASP and all pertinent health and safety issues will be discussed during the initial briefing or meetings. The tailgate meeting will also address specific issues regarding on-site health and safety, such as the proposed work and associated hazards, recent problems, and any accidents or incidents. All personnel will acknowledge their attendance by signing the safety meeting form (Attachment 1).

Attachment 1

Health and Safety Forms

DBS&A
Daniel B. Stephens & Associates, Inc.

Geo-Logic ASSOCIATES

Health and Safety Plan Acceptance Form

Instructions: This form is to be completed by each person prior to beginning work at the subject hazardous waste site. THIS FORM IS TO BE MAINTAINED IN THE PROJECT FILES.

Project _____

Job No. _____

Location _____

By my signature below, I acknowledge that I have read and understand the contents of the Health & Safety Plan for this project. I agree to perform my work in accordance with the plan.

Signature	Print Name	Company	Date

Geo-Logic ASSOCIATES

Tailgate Safety Meeting

Project ID:_____ Day: _____

Location:_____ Date: _____

Project Manager:_____ Team Leader: _____

Health & Safety Officer:_____ No. of Personnel Present: _____

Check Topics Discussed

Scheduled Activities:_____

Chemical/Physical Hazards
- ___ Contaminants of Concern
- ___ Safety Data Sheets
- ___ Overhead & Underground Utilities
- ___ Extraordinary Site Conditions
- ___ Lifting/Slips/Trips/Falls
- ___ Heat/Cold Stress (Inc. Sunburn)
- ___ Other:_____

First Aid
- ___ Facilities/Kits/Eyewashes

Personal Protective Equipment - Level D
- ___ Hard Hats/Hearing Protection
- ___ Steel-Toed Boots
- ___ Glasses/Goggles/Shields
- ___ Gloves
- ___ Contingency: Level C
- ___ Respirators & Tyvek/Saranex

Emergency Procedures/Site Safety
- ___ "Buddy System"
- ___ Communication
- ___ Facility-Specific Regulations
- ___ Rally Point

Vehicle/Heavy Equipment
- ___ Drill Rig "KILL" Switches
- ___ Operation & Inspection
- ___ Preventive Maintenance
- ___ Rotating Augers/Moving Parts

Sanitation & Hygiene
- ___ Drinking Water/Fluids
- ___ Restrooms
- ___ Personal Cleanliness

Housekeeping
- ___ Waste Containers
- ___ Waste Materials
- ___ Waste Water/Decon Water

Fire Prevention
- ___ Locations of Extinguishers
- ___ Smoking
- ___ Hot Work
- ___ Explosive & Flammable Liquids
- ___ Other:_____

Emergency Facilities

Name:_____

Address:_____

Tel. No.:_____

Safety Meeting Attendees:

Name	Signature	Name	Signature

Geo-Logic ASSOCIATES

Illnesses, Injury, and Unusual Occurrence Report

Date of Event: _____ Report Number: _____

1. Name of the Site: _____

2. Name of individual(s) injured, ill, or exposed:

_____

_____

3. Provide a brief, but concise description of the event:

_____

_____

4. Damaged Property:

_____

_____

5. Damage to equipment and the type of equipment:

_____

_____

6. Did this accident involve a motor vehicle? ☐ Yes ☐ No

Any motor vehicle accident, regardless of fault, which involves a company vehicle, rental vehicle, or personal vehicle, while the employee is acting in the course of employment must be accompanied by a police report, unless the police refuse to respond to the scene of the accident. In addition, draw a simple illustration of the scene on the reverse side of this form.

7. Action taken/additional employee training:

_____

8. Name and Signature: _____ Name (print)

_____ Signature

_____ Date completed

Geo-Logic ASSOCIATES

Diagram 1:

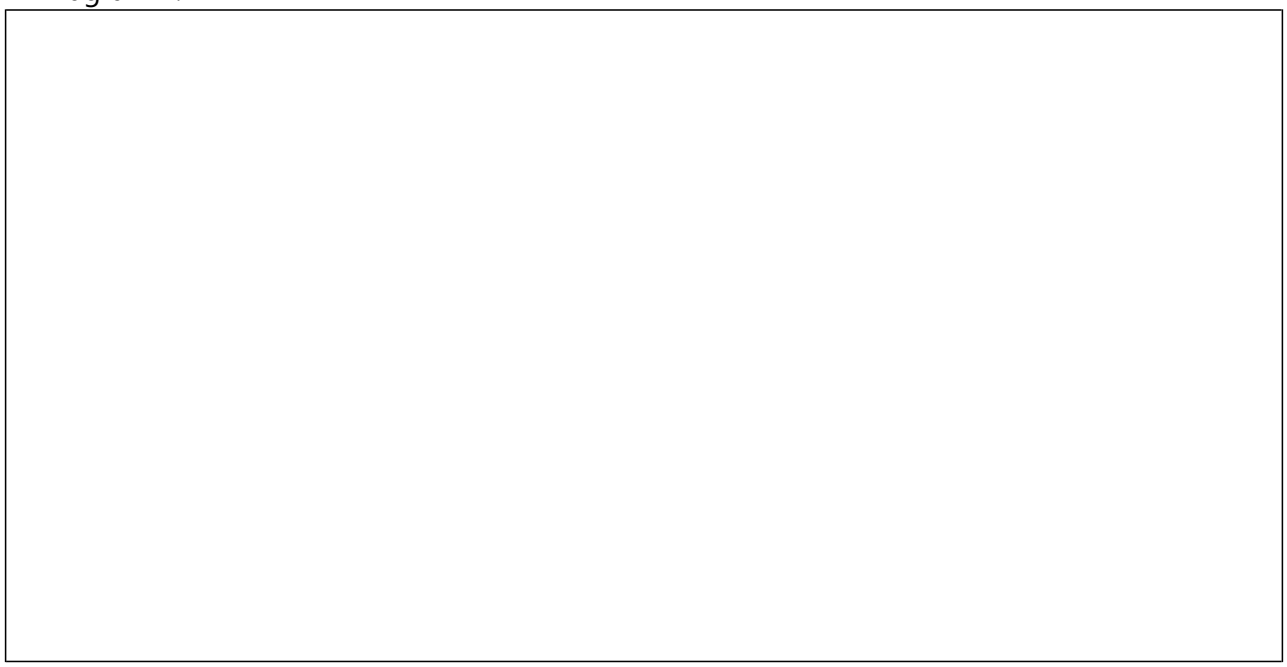
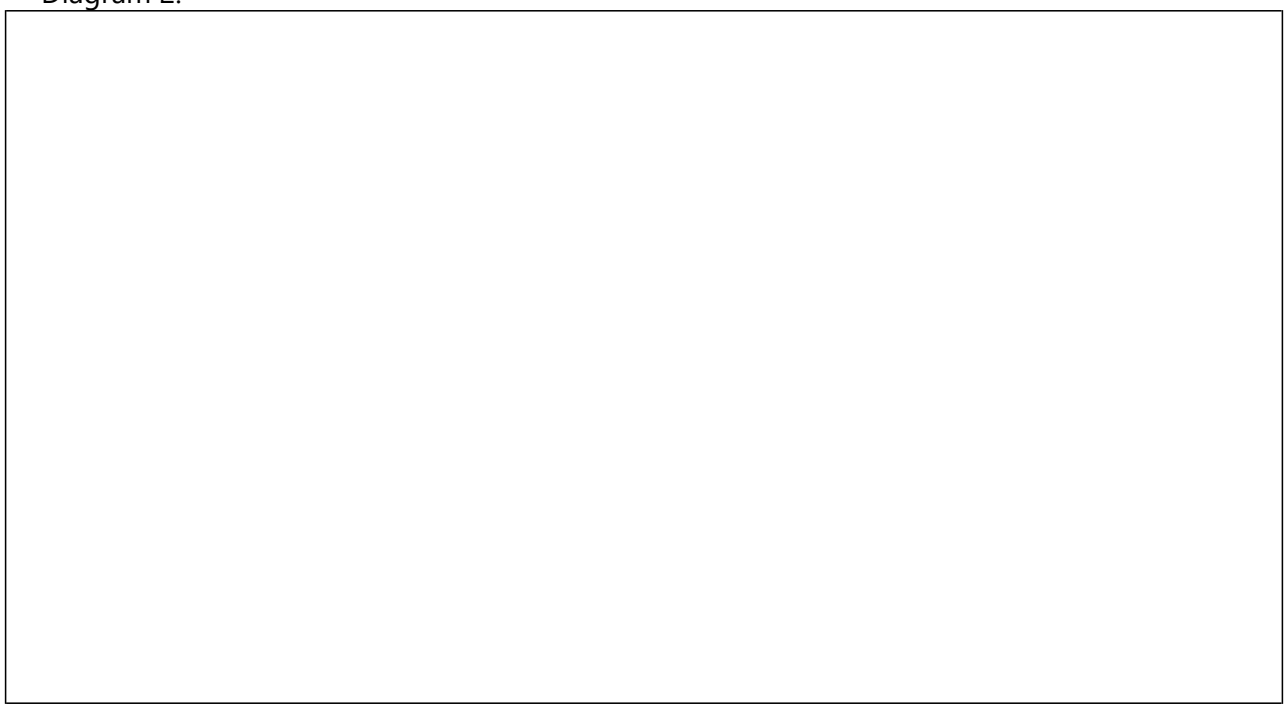


Diagram 2:



Geo-Logic ASSOCIATES

Health and Safety Inspection Checklist - Field Environment

SAFE WORK CONDITION/PRACTICE	CHECKED BY	COMMENTS
1. GLA field activities:		**( ) No field work being performed at this**
If yes, please describe briefly or attach scope:		**( ) Yes/Approximate days per month: ___**
		( ) Yes/Hazardous field work (Attach Scope)
2. Does GLA have sub-contractors on site?		**( ) No ( ) Yes**
If you answered "No" to questions 1 and 2, do not complete the rest of this form. Submit only this form.		
3. Does GLA Corporate IIPP address field		**( ) Yes ( ) No ( ) Don't Know?**
4. GLA Site Safety Plan (SSP) developed and on		**( ) Yes ( ) No ( ) Don't Know?**
5. Client SSP on site.		**( ) Yes ( ) No**
6. Are GLA activities addressed in the Client's SSP?		**( ) Yes ( ) No**
7. Sub-Contractor SSP on site.		**( ) Yes ( ) No**
8. Have all GLA team personnel reviewed the site IIPP/SSP and signed the acknowledgement		**( ) Yes ( ) No ( ) Don't Know?**
9. GLA safety training records on site?		**( ) Yes ( ) No**
10. GLA sub-contractor safety training records on		**( ) Yes ( ) No**
11. Records of Tailgate Safety Meetings on site?		**( ) Yes ( ) No**
12. Minimum PPE requirements met.		**( ) Yes ( ) No**
13. PPE provided, properly stored and used.		**( ) Yes ( ) No**
14. Cal/OSHA, Fed/OSHA posters posted?		**( ) Yes ( ) No Location:**
15. Emergency medical information displayed.		**( ) Yes ( ) No Location:**
16. Evacuation routes clearly marked.		**( ) Yes ( ) No Location:**
17. Evacuation route maps posted.		**( ) Yes ( ) No Location:**
18. Adequate employee CPR/First Aid Training.		**( ) Yes ( ) No**
19. MSDS available?		**( ) Yes ( ) No Location:**
20. Sanitation adequate.		**( ) Yes ( ) No**
21. Are any special hazard procedures being used?		**( ) Yes ( ) No Describe:**
22. Eyewash stations identified/tested.		**( ) Yes ( ) No Location:**
23. Fire extinguishers charged, identified, inspected.		**( ) Yes ( ) No Last Inspection Date: ___**

Person responsible for correction: _____ Copy provided: _____

Corrective action (specify in detail): _____
_____
_____

Signature of person responsible for correction: _____ Date: _____

Copy reviewed by management official: _____ Date: _____

Attachment 2

Emergency Response Plan

DBS&A
Daniel B. Stephens & Associates, Inc.

Emergency Response Plan

Purpose and Scope

The following emergency response plan (ER plan) has been developed to include instruction and procedures for emergency vehicular access, evacuation procedures for personnel, methods of containing a fire, and medical emergencies. All extraordinary conditions that require concise and timely action must be dealt with in a manner that minimizes the health and safety risks to the immediate site personnel and the general public.

General Response Considerations

All on-site personnel shall be familiar with the ER plan described herein. This section will be maintained in the field office.

Due to the nature of the site, the emergencies or extraordinary conditions that may arise are more than likely limited to personnel accidents requiring first aid, exposure to contaminated sediments, and potential fire near mechanical equipment. The following procedures shall be implemented in the event of an emergency:

- First aid or other appropriate initial action will be administered by those closest to the accident/event. This assistance will be coordinated by the Site Safety and Health Officer (SSHO) and will be conducted in a manner so that those rendering assistance are not placed in a situation of unacceptable risk. The primary concern is to avoid placing a greater number of workers in jeopardy.
- Personnel shall report all accidents and unusual events to the SSHO, the subcontractor health and safety representative, and the Project Manager (PM).

The SSHO and other on-site personnel are responsible for conducting the emergency response in an efficient, rapid, and safe manner. The SSHO will decide if off-site assistance and/or medical treatment is required and shall be responsible for alerting off-site authorities and arranging for their assistance. The SSHO, in coordination with the contractor health and safety representative, will provide an accident/incident report to the PM that includes the following:

- A description of the emergency (including date, time and duration)

- Date, time and names of all persons/agencies notified and their response
- A description of corrective actions implemented or other resolution of the incident

All workers at the site are responsible for conducting themselves in a mature, calm manner in the event of an accident/unusual event. All personnel must conduct themselves in a manner to avoid spreading the danger to themselves and to surrounding workers.

Responsibilities

The SSHO shall have responsibility for directing response activities in the event of an emergency. He/she will:

- Assess the situation
- Determine required response measures
- Notify appropriate response teams
- Determine and direct on-site personnel during the emergency

The SSHO shall coordinate the response activities of on-site personnel with those of public agencies.

Public Response Agencies

The site-specific HASP includes a list of public response agencies to be contacted and who may, depending on the nature of the situation, assume authority for emergency response. The HASP presents local emergency numbers, including local hospitals (which include the poison control center), ambulance service, fire and police departments, and others. In addition, nationwide hotline numbers for emergency assistance are listed. These phone lists should be retained by all field personnel and posted by the phone in all field trailers.

The hospital location is outlined in the HASP. The SSHO will provide directions and/or maps to these facilities to all field personnel.

Prior to the initiation of all on-site work, the local police and fire department will be notified, if deemed necessary. This notification will take the form of a letter describing both on-site and off-site activities. If requested, a briefing will be held to further explain the type of activities and equipment that are associated with each project. Emergency procedures also will be discussed.

Accidents and Non-Routine Events

Several types of emergencies are outlined in the following subsections. These are not intended to cover all potential situations, and the corresponding response procedures should be followed using common sense. Every accident is a unique event that must be dealt with by trained personnel working in a calm, controlled manner. In the event of an accident/unusual event, the prime consideration is to provide the appropriate initial response to assist those in jeopardy without placing additional personnel at an unnecessary risk. Employees shall be instructed to report all injuries and illnesses to the SSHO.

Worker Injury

If a person working on the site is physically injured, appropriate first aid procedures shall be followed. Depending on the severity of the injury, emergency medical response may be sought. If the employee can be moved, he/she will be taken to the edge of the work area where contaminated clothing (if any) will be removed, and emergency first aid administered. If necessary, transportation to local emergency medical facility will be provided as soon as possible.

If a worker can only be moved by emergency medical personnel, the SSHO will decide what protective equipment, if any, is required to be worn by emergency personnel. Each work area will have extra equipment available for emergencies.

- *Eye Exposure:* If contaminated solid or liquid gets into the eyes, wash eyes immediately at the emergency eyewash station using water and lifting the lower and upper lids occasionally. Obtain medical attention immediately if symptoms warrant.
- *Skin Exposure:* If contaminated solid or liquid gets on the skin, wash skin immediately at the decontamination station using soap and water. Obtain medical attention immediately if symptoms warrant.
- *Inhalation:* If a person inhales large amounts of organic vapor, move him/her to fresh air at once. If breathing has stopped, perform cardiopulmonary resuscitation (CPR) per American Red Cross standard first aid instruction. Keep the affected person warm and at rest. Obtain medical attention as soon as possible.
- *Ingestion:* If contaminated solid or liquid is swallowed, medical attention shall be obtained immediately by consulting the Poison Control Center as outlined in the site-specific HASP.

Temperature-Related Problems

Adverse weather conditions are important considerations in planning and conducting site operations. Hot or cold weather can cause physical discomfort, loss of efficiency, and personal injury. One or more of the following control measures shall be employed to help control heat stress:

- Provide adequate non-alcoholic liquids to replace lost body fluids. Employees must replace water and salt lost through perspiration. Employees will be encouraged to drink more than the amount required to satisfy thirst, as thirst satisfaction is not an accurate indicator of adequate salt and fluid replacement.
- Replacement fluids can be a 0.1 percent salt solution, commercial mixes such as Gatorade™ or Quick Kick™, or a combination of these with fresh water.
- Establish a work regimen that will provide adequate rest periods for cooling down.
- Take rest breaks in a cool, shaded area during hot periods.
- Employees shall not be assigned other tasks during rest periods.
- Inform all employees of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress.

Adverse Weather

In addition to the hazards of UV radiation from the sun and extreme ambient temperatures, general weather conditions may present a hazard to field workers. Rain may result in muddy, slippery conditions that make foot and vehicle travel hazardous. Lightning and tornadoes, common summertime phenomena, can be extremely hazardous. In the event of adverse weather (e.g., high wind and airborne dust, lightning, extreme cold or heat, or rain) that could compromise worker's health and safety during outdoor activities, the SSHO will shut down operations. Safety precautions for lightning and tornadoes can be found in the health and safety manual.

Fires

The potential for fires involving hazardous chemicals must be addressed during the preliminary site-specific evaluation of all hazards. Personnel in each work group will be knowledgeable in

fire extinguishing techniques. They shall be instructed in proper use and maintenance of the appropriate fire extinguishers supplied at the work site.

Vehicle Accidents

Posted speed limits will be observed. All vehicles will be required to meet applicable state inspection standards. All drivers will be required to have a good driving record and must have all necessary licenses to operate their vehicle.

The phone numbers of the SSHO, the field office, and subcontractor health and safety representative will be carried in each vehicle at the site. These numbers may also be provided to all police, fire, rescue, and emergency agencies in the area.

Upon notification of an accident, the PM will make available any personnel and equipment at his or her disposal to aid in the cleanup. For example, the following equipment may be supplied:

- Sorbent materials to contain/control liquids
- Front-end loaders to pick up solids
- Dust-suppression materials to control dust
- Trucks to haul collected material
- Appropriate protective gear for cleanup workers

The supervision and operation of all emergency response personnel and equipment will be coordinated through the authorities at the scene of the accident.

Attachment 3

Heat Illness Prevention Plan

DBS&A
Daniel B. Stephens & Associates, Inc.

MODULE 6:

HEAT ILLNESS PREVENTION PROGRAM

GEO-LOGIC ASSOCIATES INJURY AND ILLNESS PREVENTION PROGRAM
MODULE 6 – HEAT ILLNESS PREVENTION PROGRAM

Table of Contents

MODULE 6. HEAT ILLNESS PREVENTION PROGRAM

This procedure has been created to assist in the avoidance and reduction of the risk of work related heat illnesses. Geo-Logic Associates' employees are commonly required to work outdoors in areas that often reach temperatures greater than 85 degrees Fahrenheit. Prolonged exposure to elevated temperatures can increase the risk of developing a heat illness if preventative measures to seek shade, increase rest periods, and maintain adequate hydration are not followed.

This module of the Geo-Logic Associates IIPP is intended to promote awareness of conditions that can lead to heat illnesses, provide a list of signs and symptoms associated with heat illness, provide guidelines for preventing heat illness, and outline heat illness training requirements for supervisory and non-supervisory employees.

6.1 Purpose

Heat related illness is a common work-related risk that Geo-Logic Associates' employees may encounter. Heat related illness may be brought on by performing moderate to heavy work in elevated temperatures, or when performing relatively low-intensity work in a hot environment. Geo-Logic Associates is required to provide its employees with sufficient shade, water, and rest periods to minimize the risk of heat related illness.

Employers with outdoor places of employment must consider the effects of elevated ambient temperatures and direct exposure to the sun as a workplace hazard. The procedures laid out in this Module of the IIPP are intended to reduce the risk of work related heat illnesses among Geo-Logic Associates' employees. These procedures provide the minimal steps applicable to most outdoor work settings and are essential to reducing the incidence of heat related illnesses. In working environments with a higher risk for heat illness (e.g., during a heat wave, or other severe working or environmental conditions), Geo-Logic Associates may need to exercise greater caution and take additional protective measures beyond what is listed in this document, as needed to protect their employees.

The elements reflected within this Module, and that should be incorporated into a Site Specific Health and Safety Plan, include the following:

- Preventing Heat Illness
- Identification of Heat Illness
- Communication procedures
- Response to Heat Illness
- Training

6.2 Preventing Heat Illness

6.2.1 Provision of Water

Water is a key preventive measure to minimize the risk of heat related illnesses. Geo-Logic Associates shall provide its employees with access to potable and suitably cool drinking water. Where the supply of water is not plumbed or otherwise continuously supplied, water shall be provided in sufficient quantity at the beginning of the work shift to provide one quart per employee per hour for drinking for the entire shift. Employees may begin the shift with smaller quantities of water if they have effective procedures for replenishment during the shift as needed to allow employees to drink one quart or more per hour. Geo-Logic Associates encourages its employees to drink water frequently throughout the day.

For all field projects, the following water supply procedures shall be adhered to by all Geo-Logic Associates' employees:

- Field employees will check their daily water supply at the daily tailgate safety meeting or at the start of the work day. If an employee's water supply is less than 2 gallons at the start of the day, water will be exchanged among field employees or will be purchased from local vendors before commencing field work, so that each employee has a minimum of 2 gallons of water at the start of the day. Work shifts that extend beyond eight hours require the availability of an additional quart per hour.
- At the start of each working day, field employees will determine their work areas and identify the nearest drinking water source. If potable water is not available the employee shall purchase or otherwise obtain a full day supply of water before commencing field work.
- The Project Manager will routinely remind field employees of the importance of maintaining their drinking water supply.
- Geo-Logic Associates will provide field employees with funding to purchase bottled water as needed throughout the project.
- The Project Manager will routinely remind field employees to keep cool water in their field vehicles at all times during the project.
- The Project Manager will periodically remind field employees to check their water supply, and to replenish it whenever an individual's supply is less than two gallons.

To encourage frequent drinking of potable water, the following steps will be taken:

- The Project Manager will periodically contact the field employees to discuss water consumption and remind them to take breaks.
- Water consumption will be discussed at tailgate safety meetings.

6.2.2 Access to Shade and Rest Periods

Access to rest and shade or other cooling measures are important preventive steps to minimize the risk of heat related illnesses. Employees feeling the effects of heat illness or believing a preventative recovery period is needed, shall be provided access to an area with shade that is either open to the air or provided with ventilation or cooling for a period of no less than five minutes. Such access to shade shall be permitted at all times.

To ensure access to shade at all times, the following steps will be taken:

- When working in the field, Geo-Logic Associates encourages its employees to take a 5-minute rest break in an area sheltered from the sun as often as needed or at least once every two hours. A 10-minute rest break will be necessary when the temperature equals or exceeds 95 degrees Fahrenheit.
- Employees are encouraged to use their local field offices or trailers, or shade trees to provide shade. Air conditioned buildings, trailers, or vehicles are also acceptable locations for a cool-down break.
- In periods of extreme heat and sun exposure, employees are encouraged to limit their field time and exertion and increase the frequency and duration of break periods.

To ensure that employees have access to a preventative recovery period, the following steps will be taken:

- Project Managers will be aware of daily weather conditions within the project work area, and will advise site workers of standard work-break procedures, and whether or not additional breaks are warranted.
- Tailgate safety meetings will discuss weather, work conditions, and cool-down rest
- Employees will be instructed to take a minimum 5-minute break for every two hours of work. Employees are encouraged to park their vehicles near live shade trees or use the vehicle ventilation system to achieve a comfortable temperature.
- While driving between work properties, employees will be encouraged to use their vehicle air conditioning or ventilation systems to create a comfortable recovery temperature.

6.2.3 High-Heat Procedures

When the temperature equals or exceeds 95°F high-heat procedures must be implemented.

- Effective communication between supervisors and workers must be present either by voice, observation, radio or cell phone. This communication is to be used to check on the well-being of workers or for workers to report signs or symptoms of heat illness.
- Supervisors must frequently observe workers with special attention to their alertness or presentation of signs or symptoms of heat illness.
- Supervisors must remind employees throughout the work shift to drink plenty of water and not to wait until they are thirsty.
- Supervisors must ensure that employees actually take 10-minute preventative cool-down rest period every 2 hours.
- Close supervision of new workers is required for the first 14 days of their assignment working under high heat conditions. This requirement may be waived if, at the time of hire, the worker indicates that he or she has been doing similar outdoor work for at least 10 of the past 30 days for 4 or more hours per day.

6.3 Types and Symptoms of Heat Illness

Heat illness and/or heat stress may result from the use of personal protective equipment, over-exertion, high ambient temperatures, or a combination of all three. Heat-related illness usually comes in stages: heat cramps, heat exhaustion, and heat stroke.

Heat cramps: Heat cramps are muscular pains and spasms due to heavy exertion. They usually involve the abdominal muscles or the legs. It is generally thought that the loss of water and salt from heavy sweating causes the cramps. Signs of Heat Cramps include: muscle cramping, spasms, or muscular pain.

Heat exhaustion: Heat exhaustion typically occurs when people exercise heavily or work in a warm, humid place where body fluids are lost through heavy sweating. Fluid loss causes blood flow to decrease in the vital organs, resulting in a form of shock. With heat exhaustion, sweat does not evaporate as it should, possibly because of high humidity or too many layers of clothing. As a result, the body is not cooled properly. Signs of Heat Exhaustion include:

- Cool, moist, pale skin (the skin may be red right after physical activity).
- Heavy sweating.
- Headache.
- Dizziness and weakness or exhaustion.
- Nausea or vomiting.
- The skin may or may not feel hot.

Heat stroke: Also known as sunstroke, heat stroke is life-threatening. The victim's temperature control system, which produces sweating to cool the body, stops working.

The body temperature can rise so high that brain damage and death may result if the body is not cooled quickly.

The signals of the late stage of a heat-related illness (often called heat stroke) include:

- Skin may still be moist or the victim may stop sweating and the skin may be red, hot and dry. Rapid, weak pulse.
- Vomiting.
- Decreased alertness level or complete loss of consciousness.
- High body temperature (sometimes as high as 105oF).

This late stage of a heat-related illness is life threatening. Call 9-1-1 or the local emergency number.

6.4 Response to Heat Illness

Response to heat illness includes three steps:

1. Contact Emergency Services

2. Provide General Care

3. Contact Geo-Logic Associates' Project Manager or Corporate Program Administrator.

Contact emergency services: Geo-Logic Associates provides its employees with cellular telephones that are to be used to contact emergency services in the event of accident, illness, or injury on the job site, including heat illness. The site-specific Health and Safety Plan is required to contain a map to the nearest hospital and directions from the project site to the nearest hospital. When contacting emergency services, the employee shall use this information to provide the directions to the site.

Provide general care: When working at remote locations, the response time of emergency responders may be lengthy, and as a result, employees should be prepared to provide general care for heat illness.

The American Red Cross provides the following general care for heat illness:

- Cool the body.
- Give fluids but not to an unconscious victim.
- Minimize shock by placing individual in a line position, in the shade with the legs slightly elevated.

In addition, the following American Red Cross care guidelines are provided specific heat illnesses:

For heat cramps or heat exhaustion: Move the person to a cooler place and have him or her rest in a comfortable position. If the person is fully awake and alert, give a half glass of cool water every 15 minutes. Do not let him or her drink too quickly. Do not give liquids with alcohol or caffeine in them, as they can make conditions worse. Remove or loosen tight clothing and apply cool, wet cloths such as towels or wet sheets. Call 911 or the local emergency number if the person refuses water, vomits or loses consciousness.

For heat stroke: Heat stroke is a life-threatening situation! Help is needed fast. Call 911 or your local EMS number. Move the person to a cooler place. Quickly cool the body. Wrap wet sheets around the body and fan it. If you have ice packs or cold packs, wrap them in a cloth and place them on each of the victim's wrists and ankles, in the armpits and on the neck to cool the large blood vessels. (Do not use rubbing alcohol because it closes the skin's pores and prevents heat loss.) Watch for signals of breathing problems and make sure the airway is clear. Keep the person lying down.

Contact Geo-Logic Associates managers: After emergency services are contacted and general care is administered, the employee shall contact his or her Project Manager or the Corporate Program Administrator to notify him or her of the situation.

6.5 Training

Training is critical to help reduce the risk of heat related illnesses and to assist with obtaining emergency assistance without delay.

6.6 General Training

Training in the following topics shall be provided to all supervisors (Project Managers) and non-supervisory employees:

1. The personal risk factors for heat illness;
    - Age
    - Degree of acclimatization
    - General health
    - Lack of water consumption
    - Alcohol consumption
    - Caffeine consumption
    - Use of prescription medications that affect the body's water retention
    - Other medical conditions that can affect physiological responses to heat

2. The environmental risk factors for heat illness;
   - Air temperature
   - Relative humidity
   - Radiant heat from the sun and other sources
   - Conductive heat sources such as the ground
   - Air movement
   - Workload severity and duration
   - Protective clothing and personal protective equipment worn by employees

3. Geo-Logic Associates' procedures for working in hot and high heat conditions.

4. The importance of frequent consumption of small quantities of water, up to 4 cups per hour, when the work environment is hot and employees are likely to be sweating more than usual in the performance of their duties;

5. The importance of acclimatization, especially during heat waves or with new employees

6. The different types of heat illness and the common signs and symptoms of heat illness;

7. The importance to employees of immediately reporting to the employer, directly or through the employee's Project Manager, symptoms or signs of heat illness in themselves, or in co-workers;

8. Geo-Logic Associates' procedures for responding to symptoms of possible heat illness, including how emergency medical services will be provided should they become necessary;

9. Geo-Logic Associates' procedures for contacting emergency medical services, and if necessary, for transporting employees to a point where they can be reached by an emergency medical service provider;

10. Geo-Logic Associates' procedures for ensuring that, in the event of an emergency, clear and precise directions to the work site can and will be provided as needed to emergency responders.

6.6.1 Supervisor/Project Manager Training

Prior to assignment to supervision of employees working in the heat, training on the following topics shall be provided:

- The information contained in this procedure

- Their responsibility to follow and implement the applicable provisions in this procedure.
- The procedures the Project Manager is to follow when an employee exhibits symptoms consistent with possible heat illness, including emergency response procedures.
- Initial and annual first-aid training by the American Red Cross or other accredited organization.
- How to monitor weather reports and how to respond to hot weather advisories.
- How to prepare a Site-Specific Health and Safety Plan to tailor this Heat Illness Prevention Plan to the specific concerns at his or her project site.
- How to review and sign the Site-Specific Health and Safety Plan to acknowledge that he or she understand its contents.
- How to brief the field employees on the contents of this document and Site-Specific Health and Safety Plan requirements for Heat Illness identification, prevention, and response.
- How to maintain records of the training.

6.6.2 Employee Training

To ensure employees are trained to understand heat related illness and injuries and the appropriate response, the following steps will be taken:

- All employees will receive heat illness prevention training prior to working outdoors, especially all newly-hired employees or employees who are new to the project.
- On hot days (≥80°F), and during a heat wave, the Project Manager or designee will hold short tailgate meetings to review this important information with all workers.
- All newly hired workers will be assigned a buddy or experienced coworker to ensure that they understood the training and follow the company procedures.
- The Project Manager or Site Supervisor will be trained prior to being assigned to supervise outdoor workers.
- Primary and secondary employers will ensure that all employee's (including temporary) working outdoors are trained in heat illness prevention and will keep records of the training

Attachment 4

Safety Data Sheets

DBS&A
Daniel B. Stephens & Associates, Inc.

PetroFix™ Specification Sheet

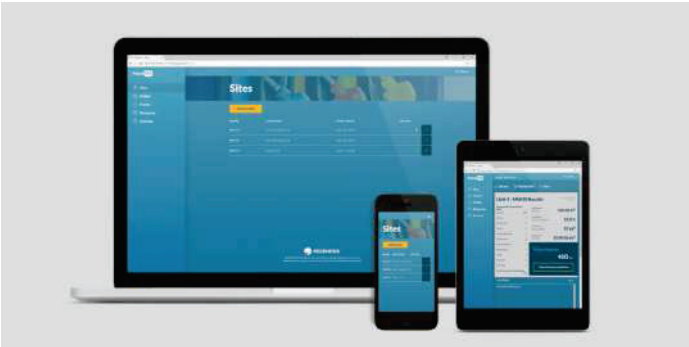
PetroFix Technical Description

PetroFix is a new remedial technology designed to treat petroleum fuel spills in soil and groundwater. A simple-to-use fluid that can be applied under low pressure into the subsurface or simply poured into open excavations, PetroFix offers a cost-effective solution for environmental practitioners and responsible parties to address petroleum hydrocarbon contaminants quickly and effectively.

PetroFix has a dual function; quickly removing hydrocarbons from the dissolved phase, by absorbing them onto the activated carbon particles, while added electron acceptors stimulate hydrocarbon biodegradation in-place. PetroFix does not require high pressure "fracking" for application and can be applied with ease using readily available equipment associated with direct push technology.

The remedial fluid is a highly concentrated water-based suspension consisting of micron-scale activated carbon and biostimulating electron acceptors. PetroFix has a viscosity higher than water and is black in appearance. Its environmentally-compatible formulation of micron-scale activated carbon (1-2 microns) is combined with both slow and quick-release inorganic electron acceptors. A blend of additional electron acceptors is included along with the PetroFix fluid. Practitioners can select between a sulfate and nitrate combination blend (recommended), or sulfate only for the additional electron acceptors required.

PetroFix Design Assistant



REGENESIS has developed a proprietary web-based design assistant called PetroFix Design Assistant™ that provides environmental professionals the ability to input their site parameters, determine the required product amount, and order the product through REGENESIS' customer service. The PetroFix Design Assistant includes defaults and warnings throughout the process to guide users toward effective designs that will offer best results.

To access the PetroFix Design Assistant, create an account and login at www.PetroFix.com

PetroFIX™ Remediation Fluid

PetroFix Fluid Chemical Composition	Properties
Activated Carbon - CAS 7440-44-0 > 30% Calcium Sulfate Dihydrate - CAS 10101-41-4 < 10%	**Appearance:** Black Fluid **Viscosity:** 1500-3500 cP (corn syrup-like) **pH:** 8-10

PetroFix Electron Acceptor Powder Chemical Composition	Properties
OPTION 1 - EA Blend (preferred) Sodium Nitrate - CAS 7631-99-4, 50% Ammonium Sulfate - CAS 7783-20-2, 50% OPTION 2 - EA Blend NF Potassium Sulfate - CAS 7778-80-5, 50% Ammonium Sulfate - CAS 7783-20-2, 50%	**Appearance:** White Powder

Storage and Handling Guidelines

Storage:

- Store away from incompatible materials
- Store in original closed container
- Store at temperatures between 40°F and 95°F
- Do not allow material to freeze or store in direct sunlight.
- Freezing and hot weather technical memo can be accessed at www.petrofix.com/resources or at this ***link*** here.
- Dispose of waste and residues in accordance with local authority requirements

Handling:

- Never add additives to solution prior to mixing with water
- Wear appropriate personal protective equipment
- Do not taste or ingest
- Observe good industrial hygiene practices
- Wash hands after handling

Applications

PetroFix is mixed with water on-site and easily applied onto the sub-surface using low pressure injections, or mixed in excavations. PetroFix is compatible with and can be used with ORC Advanced® to expedite rates of biodegradation. For more information about co-application with ORC Advanced, contact REGENESIS.

REGENESIS®

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Email: europe@regenesis.com
Tel: +44 (0) 1225 61 81 61

www.regenesis.com

SAFETY DATA SHEET

Version 5.8
Revision Date 12/28/2015
Print Date 05/13/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : BTEX/MTBE in Soil

Product Number : SQC025
Brand : Sigma-Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Carcinogenicity (Category 1A), H350
Specific target organ toxicity - single exposure (Category 1), H370
Specific target organ toxicity - repeated exposure, Inhalation (Category 2), H373

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H302 Harmful if swallowed.
H350 May cause cancer.
H370 Causes damage to organs.
H373 May cause damage to organs through prolonged or repeated exposure if inhaled.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.

P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.
P307 + P311	IF exposed: Call a POISON CENTER or doctor/ physician.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Hazardous components

Component		Classification	Concentration
Quartz			
CAS-No. EC-No.	14808-60-7 238-878-4	Carc. 2; STOT RE 2; H351, H373	>= 90 - <= 100 %
Methanol			
CAS-No. EC-No. Index-No. Registration number	67-56-1 200-659-6 603-001-00-X 01-2119433307-44-XXXX	Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301 + H311 + H331, H370	>= 10 - < 20 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, silicon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 4 °C
Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Quartz	14808-60-7	TWA	0.025 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Suspected human carcinogen		
		TWA	0.025 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Lung cancer Pulmonary fibrosis Suspected human carcinogen		
Methanol	67-56-1	TWA	200.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		

		STEL	250.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200.000000 ppm 260.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250.000000 ppm 325.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200.000000 ppm 260.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		STEL	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200 ppm 260 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250 ppm 325 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200 ppm 260 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		STEL	250 ppm 325 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
		TWA	200 ppm 260 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Methanol	67-56-1	Methanol	15.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			
		Methanol	15 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N99 (US) or type P2 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	No data available
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available

k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: 1 - Group 1: Carcinogenic to humans (Quartz)

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: Known to be human carcinogen (Quartz)

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Liver - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence (Methanol)
Stomach - Irregularities - Based on Human Evidence (Xylene)
Stomach - Irregularities - Based on Human Evidence (Toluene)
Stomach - Irregularities - Based on Human Evidence (Benzene)
Stomach - Irregularities - Based on Human Evidence (Ethylbenzene)
Heart - (Naphthalene)
Stomach - Irregularities - Based on Human Evidence (1,2-Dichlorobenzene)
Stomach - Irregularities - Based on Human Evidence (Mesitylene)
Central nervous system - (1,2,4-Trimethylbenzene)
Central nervous system - (tert-Butyl methyl ether)

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Quartz	14808-60-7	1994-04-01
Methanol	67-56-1	2007-07-01
Benzene	71-43-2	2007-07-01
1,4-Dichlorobenzene	106-46-7	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Quartz	14808-60-7	1994-04-01
Methanol	67-56-1	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Quartz	14808-60-7	1994-04-01
Methanol	67-56-1	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Benzene	71-43-2	2009-02-01
Ethylbenzene	100-41-4	2007-09-28
Naphthalene	91-20-3	1990-01-01
1,4-Dichlorobenzene	106-46-7	2007-09-28
Quartz	14808-60-7	2007-09-28

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive	CAS-No.	Revision Date
	67-56-1	2012-03-16

harm.

Methanol		
Toluene	108-88-3	2009-02-01
Benzene	71-43-2	2009-02-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Carc.	Carcinogenicity
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H302	Harmful if swallowed.
H350	May cause cancer.
H351	Suspected of causing cancer.
H370	Causes damage to organs.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.
STOT RE	Specific target organ toxicity - repeated exposure
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further 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. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.8 Revision Date: 12/28/2015 Print Date: 05/13/2016

SAFETY DATA SHEET

Version 5.7
Revision Date 06/02/2016
Print Date 07/04/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Diesel in Water

Product Number : QC1708
Brand : Sigma-Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Acute toxicity, Dermal (Category 3), H311
Eye irritation (Category 2A), H319
Carcinogenicity (Category 2), H351
Specific target organ toxicity - single exposure (Category 1), H370
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H370	Causes damage to organs.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P311	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P307 + P311	IF exposed: Call a POISON CENTER or doctor/ physician.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Repeated exposure may cause skin dryness or cracking.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Hazardous components

Component		Classification	Concentration
Methanol			
CAS-No. EC-No. Index-No. Registration number	67-56-1 200-659-6 603-001-00-X 01-2119433307-44-XXXX	Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301 + H311 + H331, H370	>= 30 - < 50 %
Acetone			
CAS-No. EC-No. Index-No. Registration number	67-64-1 200-662-2 606-001-00-8 01-2119471330-49-XXXX	Flam. Liq. 2; Eye Irrit. 2A; STOT SE 3; H225, H319, H336	>= 30 - < 50 %
Fuels, diesel, no. 2			
CAS-No. EC-No. Index-No.	68476-34-6 270-676-1 649-227-00-2	Flam. Liq. 4; Carc. 2; STOT SE 3; Asp. Tox. 1; Aquatic Acute 2; Aquatic Chronic 2; H227, H304, H336, H351, H411	>= 0.1 - < 1 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage temperature 4 °C
Storage class (TRGS 510): Flammable liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Methanol	67-56-1	TWA	200.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		STEL	250.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200.000000 ppm 260.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250.000000 ppm 325.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200.000000 ppm 260.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		

		STEL	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200 ppm 260 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250 ppm 325 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200 ppm 260 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		STEL	250 ppm 325 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
		TWA	200 ppm 260 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
Acetone	67-64-1	TWA	500.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Hematologic effects Upper Respiratory Tract irritation Eye irritation Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		TWA	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation 2015 Adoption Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		STEL	750.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Hematologic effects Upper Respiratory Tract irritation Eye irritation Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		

		STEL	500 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation 2015 Adoption Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		TWA	1,000.000000 ppm 2,400.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	250.000000 ppm 590.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		STEL	750 ppm 1,780 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	3,000 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	500 ppm 1,200 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
Fuels, diesel, no. 2	68476-34-6	TWA	100.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Dermatitis Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption varies		
		TWA	100.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Dermatitis Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption varies		
		TWA	100 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Dermatitis Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption varies		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Methanol	67-56-1	Methanol	15.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			
		Methanol	15 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			
Acetone	67-64-1	Acetone	50.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)

		End of shift (As soon as possible after exposure ceases)			
		Acetone	25 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing	No data available

	point	
f)	Initial boiling point and boiling range	56 °C (133 °F) at 1,013 hPa (760 mmHg)
g)	Flash point	-17 °C (1 °F) - closed cup - Solvent
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 13 %(V) Lower explosion limit: 2 %(V)
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Other decomposition products - No data available
Hazardous decomposition products formed under fire conditions. - Carbon oxides
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Kidney - Irregularities - Based on Human Evidence
Skin - Dermatitis - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence (Methanol)
Kidney - Irregularities - Based on Human Evidence (Acetone)
Skin - Dermatitis - Based on Human Evidence (Acetone)

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1992 Class: 3 (6.1) Packing group: II
Proper shipping name: Flammable liquids, toxic, n.o.s. (Methanol, Acetone)
Reportable Quantity (RQ): 201 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1992 Class: 3 (6.1) Packing group: II EMS-No: F-E, S-D
Proper shipping name: FLAMMABLE LIQUID, TOXIC, N.O.S. (Methanol, Acetone)

IATA
UN number: 1992 Class: 3 (6.1) Packing group: II
Proper shipping name: Flammable liquid, toxic, n.o.s. (Methanol, Acetone)

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01
Acetone	67-64-1	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01
Acetone	67-64-1	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01
Acetone	67-64-1	2007-03-01

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.	CAS-No.	Revision Date
Methanol	67-56-1	2012-03-16

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H227	Combustible liquid.
H301	Toxic if swallowed.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H304	May be fatal if swallowed and enters airways.
H311	Toxic in contact with skin.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H370	Causes damage to organs.
H411	Toxic to aquatic life with long lasting effects.
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further 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. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.7 Revision Date: 06/02/2016 Print Date: 07/04/2016

SAFETY DATA SHEET

Version 5.6
Revision Date 05/27/2016
Print Date 07/04/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Gasoline in Soil

Product Number : SQC008
Brand : Sigma-Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Germ cell mutagenicity (Category 1B), H340
Carcinogenicity (Category 1A), H350
Specific target organ toxicity - single exposure (Category 1), H370
Specific target organ toxicity - repeated exposure, Inhalation (Category 2), H373

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H302	Harmful if swallowed.
H340	May cause genetic defects.
H350	May cause cancer.
H370	Causes damage to organs.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.

P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P307 + P311	IF exposed: Call a POISON CENTER or doctor/ physician.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Hazardous components

Component		Classification	Concentration
Quartz			
CAS-No. EC-No.	14808-60-7 238-878-4	Carc. 2; STOT RE 2; H351, H373	>= 90 - <= 100 %
Methanol			
CAS-No. EC-No. Index-No. Registration number	67-56-1 200-659-6 603-001-00-X 01-2119433307-44-XXXX	Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301 + H311 + H331, H370	>= 10 - < 20 %
Low boiling point naphtha A			
CAS-No. EC-No. Index-No.	8006-61-9 232-349-1 649-261-00-8	Flam. Liq. 1; Muta. 1B; Carc. 1B; Asp. Tox. 1; H224, H304, H340, H350	>= 0.1 - < 1 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 4 °C
Storage class (TRGS 510): Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Quartz	14808-60-7	TWA	0.025 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Suspected human carcinogen		
		TWA	0.025 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Lung cancer Pulmonary fibrosis		

		Suspected human carcinogen		
Methanol	67-56-1	TWA	200.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		STEL	250.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200.000000 ppm 260.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250.000000 ppm 325.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200.000000 ppm 260.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		STEL	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200 ppm 260 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250 ppm 325 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		

		TWA	200 ppm 260 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		STEL	250 ppm 325 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
		TWA	200 ppm 260 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
		Potential Occupational Carcinogen A complex mixture of volatile hydrocarbons (paraffins, cycloparaffins & aromatics). See Appendix A		
Low boiling point naphtha A	8006-61-9	TWA	500.000000 ppm 2,000.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		STEL	500 ppm 1,500 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	300 ppm 900 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Methanol	67-56-1	Methanol	15.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			
		Methanol	15 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	No data available
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, silicon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	1 - Group 1: Carcinogenic to humans (Quartz)
IARC:	2B - Group 2B: Possibly carcinogenic to humans (Low boiling point naphtha A)
NTP:	Known to be human carcinogen (Quartz)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Liver - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence (Methanol)
Stomach - Irregularities - Based on Human Evidence (Low boiling point naphtha A)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Quartz	14808-60-7	1994-04-01
Methanol	67-56-1	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Quartz	14808-60-7	1994-04-01
Methanol	67-56-1	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Quartz	14808-60-7	1994-04-01
Methanol	67-56-1	2007-07-01
Low boiling point naphtha A	8006-61-9	1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Quartz	CAS-No. 14808-60-7	Revision Date 2007-09-28

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Methanol	CAS-No. 67-56-1	Revision Date 2012-03-16

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Asp. Tox.	Aspiration hazard
Carc.	Carcinogenicity
Flam. Liq.	Flammable liquids
H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H340	May cause genetic defects.
H350	May cause cancer.
H351	Suspected of causing cancer.
H370	Causes damage to organs.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.
Muta.	Germ cell mutagenicity
STOT RE	Specific target organ toxicity - repeated exposure
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further 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. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 05/27/2016 Print Date: 07/04/2016

SAFETY DATA SHEET

Version 5.6
Revision Date 01/26/2016
Print Date 07/04/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Gasoline in Water

Product Number : QC1798
Brand : Sigma-Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 3), H331
Acute toxicity, Dermal (Category 3), H311
Germ cell mutagenicity (Category 1B), H340
Carcinogenicity (Category 2), H351
Specific target organ toxicity - single exposure (Category 1), H370

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled
H340 May cause genetic defects.
H351 Suspected of causing cancer.
H370 Causes damage to organs.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and

	understood.
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. Rinse mouth.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P311	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/ physician.
P307 + P311	IF exposed: Call a POISON CENTER or doctor/ physician.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Hazardous components

Component		Classification	Concentration
Methanol			
CAS-No. EC-No. Index-No. Registration number	67-56-1 200-659-6 603-001-00-X 01-2119433307-44-XXXX	Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301 + H311 + H331, H370	>= 90 - <= 100 %
Gasoline			
CAS-No. EC-No. Index-No.	86290-81-5 289-220-8 649-378-00-4	Flam. Liq. 1; Muta. 1B; Carc. 1B; Asp. Tox. 1; Aquatic Acute 3; H224, H304, H340, H350, H402	>= 1 - < 5 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage temperature 4 °C
Storage class (TRGS 510): Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Methanol	67-56-1	TWA	200.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		STEL	250.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200.000000 ppm 260.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		ST	250.000000 ppm 325.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200.000000 ppm 260.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		STEL	250 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Headache Nausea Dizziness Eye damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Danger of cutaneous absorption		
		TWA	200 ppm 260 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		

		ST	250 ppm 325 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	200 ppm 260 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		STEL	250 ppm 325 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
		TWA	200 ppm 260 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
Gasoline	86290-81-5	TWA	300.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Confirmed animal carcinogen with unknown relevance to humans varies		
		STEL	500.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Confirmed animal carcinogen with unknown relevance to humans varies		
		TWA	500.000000 ppm 2,000.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	300 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Confirmed animal carcinogen with unknown relevance to humans varies		
		STEL	500 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Confirmed animal carcinogen with unknown relevance to humans varies		
		TWA	500 ppm 2,000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		TWA	400 ppm 1,600 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Methanol	67-56-1	Methanol	15.0000 mg/l	Urine	ACGIH - Biological Exposure Indices

					(BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			
		Methanol	15 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 30 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available

e)	Melting point/freezing point	No data available
f)	Initial boiling point and boiling range	64 - 65 °C (147 - 149 °F) at 1,013 hPa (760 mmHg)
g)	Flash point	11 °C (52 °F) - closed cup - Solvent
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 36 %(V) Lower explosion limit: 6 %(V)
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Gasoline)

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence (Methanol)

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1230 Class: 3 Packing group: II
Proper shipping name: Methanol, solution
Reportable Quantity (RQ):

Poison Inhalation Hazard: No

IMDG
UN number: 1230 Class: 3 (6.1) Packing group: II EMS-No: F-E, S-D
Proper shipping name: METHANOL, SOLUTION

IATA
UN number: 1230 Class: 3 (6.1) Packing group: II
Proper shipping name: Methanol, solution

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01
Gasoline	86290-81-5	2009-07-17

New Jersey Right To Know Components

	CAS-No.	Revision Date
Methanol	67-56-1	2007-07-01
Gasoline	86290-81-5	2009-07-17

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Gasoline	86290-81-5	2007-09-28
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.	67-56-1	2012-03-16

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Asp. Tox.	Aspiration hazard
Carc.	Carcinogenicity
Flam. Liq.	Flammable liquids
H224	Extremely flammable liquid and vapour.
H225	Highly flammable liquid and vapour.
H301	Toxic if swallowed.
H301 + H311 + H331	Toxic if swallowed, in contact with skin or if inhaled
H304	May be fatal if swallowed and enters airways.
H311	Toxic in contact with skin.
H331	Toxic if inhaled.
H340	May cause genetic defects.
H350	May cause cancer.
H351	Suspected of causing cancer.
H370	Causes damage to organs.
H402	Harmful to aquatic life.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further 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. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 01/26/2016 Print Date: 07/04/2016

SAFETY DATA SHEET

Version 5.7
Revision Date 05/28/2016
Print Date 07/04/2016

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Diesel in Soil

Product Number : SQC007
Brand : Sigma-Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1A), H350
Specific target organ toxicity - repeated exposure, Inhalation (Category 2), H373

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H350 May cause cancer.
H373 May cause damage to organs through prolonged or repeated exposure if inhaled.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Hazardous components

Component		Classification	Concentration
Quartz			
CAS-No. EC-No.	14808-60-7 238-878-4	Carc. 2; STOT RE 2; H351, H373	>= 90 - <= 100 %
Fuel oil no. 2			
CAS-No. EC-No. Index-No.	68476-30-2 270-671-4 649-225-00-1	Carc. 2; H351	>= 0.1 - < 1 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 4 °C
Storage class (TRGS 510): Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Quartz	14808-60-7	TWA	0.025 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Suspected human carcinogen		
		TWA	0.025 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Lung cancer Pulmonary fibrosis Suspected human carcinogen		
Fuel oil no. 2	68476-30-2	TWA	100.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Dermatitis Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption varies		
		TWA	100.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Dermatitis Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption varies		
		TWA	100 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Dermatitis Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption varies		

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	No data available
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available

r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - silicon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	1 - Group 1: Carcinogenic to humans (Quartz)
NTP:	Known to be human carcinogen (Quartz)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Quartz	14808-60-7	1994-04-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Quartz	14808-60-7	1994-04-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Quartz	14808-60-7	1994-04-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Quartz	CAS-No. 14808-60-7	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Carc.	Carcinogenicity
H350	May cause cancer.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.
STOT RE	Specific target organ toxicity - repeated exposure

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	0

Further 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. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.7 Revision Date: 05/28/2016 Print Date: 07/04/2016

Attachment 5

COVID-19 Field Procedures

DBS&A
Daniel B. Stephens & Associates, Inc.

Geo-Logic ASSOCIATES

Guidance for Field Personnel

Outlined below are guidelines for field staff to implement that will help to mitigate exposure to COVID-19 when engaged in fieldwork in the United States.

For all employee mobilization and project site work, the following mitigation measures shall be implemented:

- It is preferable for staff to travel to project work sites in a company owned vehicle or privately owned vehicle by themselves with Project Manager approval. A maximum of 2 individuals per vehicle is allowed as long as the individuals have talked with each other confirming that they are COVID-19 symptom-free and are comfortable riding together. If they are not comfortable traveling together then they will need to address this concern with the Project Manager.
- Vehicle surfaces shall be disinfected prior to entering the cab and when exiting the cab.
- When traveling by vehicle, ensure to wear gloves when refueling and sanitize hands once complete.
- Maintain a distance of 6 ft. between on-site workers whether it is in the field or in a meeting setting (video meetings and conference calls are preferable) – also when travelling and in public spaces.
- Avoid social greetings (e.g. shaking hands).
- Carry a supply of facial tissues, properly dispose of them in a receptacle after use and sanitize hands once complete.
- Make as few stops as possible during travels to limit exposure to public spaces.
- Avoid close contact with anyone experiencing flu-like symptoms.
- If you feel unwell or develop flu-like symptoms, contact your supervisor immediately and your Project Manager.
- If a subcontractor, client or client contractor exhibits flu-like symptoms, confirmed or presumptive to be COVID-19, remove yourself from the area. Notify your project manager/supervisor immediately of the potential exposure.
- The on-site trailer/facilities (at GLA controlled sites) shall be cleaned on a daily basis with surfaces disinfected several times a day on an ongoing basis. Personal sanitation and cleaning supplies shall be made available on site (i.e. hand sanitizer and sanitizing wipes) and used frequently to wipe down surfaces such as handles on doors, desks, fridges, microwaves, light switches, thermostats, surfaces in and on portable bathrooms and other equipment that they come in contact with.
- GLA employees will wear gloves while on site and wash and or/sanitize their hands upon removing them.
- Tools and equipment shall be disinfected often and at the end of use.
- Bring water, meals and snacks with you to avoid stopping at stores or restaurants. Dine in your vehicle or outside alone. Avoid using the project trailer or site facilities for eating.
- Meals shall be eaten alone or at a minimum distance of approximately 6 ft. and not in groups.
- Practice social distancing when conducting Daily Tailgate Safety Meetings/Pre-Work Assessments.

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- GLA staff shall avoid independent hotels, alternative accommodations and book rooms at reputable hotel chains. Verify with the hotel that appropriate protocols are in place to limit the potential exposure and spread of the virus.
- If an overnight stay is required in a hotel, disinfected wipes shall be available to clean common touched surfaces in the hotel room (i.e. light switches, remote control, doorknobs, thermostat, toilet handle etc.).
- Do not circulate sign in sheets but have one person document those in attendance on thesheet.
- Since access to running water for hand washing may be impracticable, obtain alcohol-based hand sanitizers and/or wipes prior to the site visit. Consider purchase of 5-gallon (or greater volume) water jugs to provide sufficient water for frequent handwashing.
- Instead of using a common drinking water source like a cooler, personnel should use individual water bottles.
- Several local and State governmental agencies are recommending face covering or facemasks to reduce the spread and exposure to COVID-19. Field employees should carry disposable or reusable face masks that can be used for this purpose. If facemasks are not available, a scarf, bandana, or other cloth face covering is sufficient. The CDC is currently not recommending the use of N95 respirators to prevent the spread of COVID-19. Nevertheless, employees should wear minimum N95 respirators if required by the work and if available.
- Any trash collected from the jobsite must be changed frequently by someone wearing nitrile, latex, or vinyl gloves.
- Any portable jobsite toilets should be cleaned by the leasing company at least twice per week and disinfected on the inside. Make sure that hand sanitizer dispensers are always filled, and if not, notify the responsible party. Frequently touched items (i.e. door pulls and toilet seats) will also require disinfecting.
- GLA staff should carry the essentials services letter explaining why they are considered an essential employee.

Appendix C

UIC Permit

DBS&A
Daniel B. Stephens & Associates, Inc.

April 6, 2022

Jason Herman
New Mexico Environment Department
Ground Water Quality Bureau
1190 St. Francis Drive
Santa Fe, NM 87502

Re: Leonard's Conoco UST Site, Santa Rosa, NM
Underground Injection Control General Discharge Permit

Dear Mr. Herman:

On behalf of the New Mexico Environment Department (NMED) Petroleum Storage Tank Bureau (PSTB), responsible party, Daniel B. Stephens & Associates, Inc. (DBS&A) submits the attached Underground Injection Control General Discharge Permit for the subject property.

Please contact us with any questions or comments at 505-822-9400.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

John R. Bunch, P.G.
Senior Scientist

JRB/PF/rpf
Attachment

Daniel B. Stephens & Associates, Inc.
6020 Academy NE, Suite 100 505-822-9400
Albuquerque, NM 87109 FAX 505-822-8877

NEW MEXICO ENVIRONMENT DEPARTMENT GROUND WATER QUALITY BUREAU

UNDERGROUND INJECTION CONTROL

GENERAL DISCHARGE PERMIT

Certified Mail- Return Receipt Requested

Facility Name:	**Leonard's Conoco**
Facility Location:	**1633 Route 66, Santa Rosa, NM** **Section, Township, Range** **Guadalupe**
Legally Responsible Party:	**New Mexico Environment Department Petroleum Storage Tank Bureau** **2905 Rodeo Park Drive East, Building 1, Santa Fe, NM** **(505) 470-4830**
Remediation Oversight Agency Contact:	**New Mexico Environment Department Petroleum Storage Tank Bureau** **Coury Dorn** **(505) 470-4830**
Remediation or Injection Plan Identification:	**Leonard's Conoco**
Permitting Action:	**New DP-**
PPS Contact	
EFFECTIVE DATE:	**TERM ENDS:**

Michelle Hunter
Chief, Ground Water Quality Bureau

[Subsection H of 20.6.2.3109 NMAC, NMSA 1978, § 74-6-5.I]

I. UIC GENERAL DISCHARGE PERMIT

The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) issues this Underground Injection Control General Discharge Permit (UIC Permit) for the subsurface emplacement of additive fluids through a Class V UIC injection well for the purpose of facilitating vadose zone or groundwater remediation. The GWQB issues this UIC Permit to New Mexico Environment Department Petroleum Storage Tank Bureau (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.

In issuing this UIC Permit, the GWQB has determined that the requirements of Subsection C of 20.6.2.3109 NMAC have been met. The activities authorized by this UIC Permit are principally governed by Leonard's Conoco Injection Plan (Injection Plan), under the authority of NM State Lead Program, with oversight by the Petroleum Storage Tank Bureau. Compliance with this UIC Permit requires compliance with the terms, requirements, and conditions of the Injection Plan. The term of this UIC Permit shall be no longer than five years from the effective date of this UIC Permit.

The injection activities, the location of the injection site, the type of injection and quantities of additives being used are briefly described as follows:

Injection Activities (summary: including injection well type, number of wells, and injection frequency)

Copy of the Injection Plan Attached (required): ☒
Summary of Injection Plan: Injection of micro-scale activated carbon and biostimulating electron acceptors are planned to treat residual dissolved-phase hydrocarbon contamination at this Petroleum Storage Tank Bureau release site. Chemicals will be mixed at the site in a 55-gallon drum and injected into the groundwater using direct-push technology. Steel rods will be driven into the ground using a GeoProbe track-mounted drill rig, and a hydraulic piston pump mounted on the GeoProbe rig will push materials into the subsurface through custom tooling. The amendment material is manufactured by Regenesis, who has participated in remedial action at more than 21,000 sites worldwide, and will consist of PetroFix (micro-scale activated carbon). The Regenesis design summary is attached.

Injection Site Information

Depth to most shallow groundwater (required): 15 ft

Existing concentration of total dissolved solids (TDS) in groundwater (required): 3,140 mg/L

Location (required): 1633 Route 66, Santa Rosa, NM

County (required): Guadalupe

Latitude: 34.563691°

Longitude: -104.410707°

Map Showing Area of Injection Sites Attached (required): ☒

Additives Being Used (including volumes, manufacturer, and mixing ratios)

Petrofix is manufactured by Regenesis
1,496 gallons total, 9 lb/yd3

Anticipated Precipitation, Dissolution, Adsorption, and Desorption Products

The amendment contains soluble sulfate and nitrate salts for biostimulation and solid colloidal activated carbon for the adsorption and removal of petroleum hydrocarbons from the groundwater. No significant precipitation or desorption effects from the amendment are expected.

Public Notice Posting Locations

2 inch by 3 inch Newspaper Ad required for Renewal applications.
Newspaper: Guadalupe County Communicator

3 inch by 4 inch Newspaper Ad required for New, Modification, and Renewal/Modification applications.
Newspaper: Guadalupe County Communicator

2 feet by 3 feet sign posted for 30 days in a location conspicuous to the public at or near the facility required for New, Modification, and Renewal/Modification applications.
Sign Location: On the property fence line facing Route 66

8.5 inch by 11 inch or larger posted off-site location conspicuous to the public (e.g. public library). Required for New, Modification, and Renewal/Modification applications.
Flyer Location: Moise Memorial Library, 208 S. 5th St., Santa Rosa, NM 88435

This UIC Permit consists of the complete and accurate completion of this UIC Permit form as determined by the GWQB.
Issuance of this UIC 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.

Signatures

Signature must be that of the person listed as the legally responsible party on this application.

I, the applicant, attest under penalty of law to the truth of the information and supporting documentation contained in this application for an Underground Injection Control General Discharge Permit.

Applicant's Signature

Signature: Lorena Goerger Digitally signed by Lorena Goerger Date: 2022.04.05 13:35:47 -06'00' Date: 04/05/2022

Printed Name: Lorena Goerger Title: Program Manager, PSTB

Applicant Note that Submissions Must Include:

1- One electronic copy of the application delivered to the GWQB via email or other format

2- Two hardcopies of the application delivered to: Ground Water Quality Bureau
Harold Runnels Building
1190 Saint Francis Drive
P.O. Box 5469
Santa Fe, NM 87502-5469

3- Payment by check or electronic transfer of one application fee of $100.00

II. FINDINGS

In issuing this UIC Permit, GWQB finds:

1. The Permittee is injecting fluids so that such injections will move directly or indirectly into groundwater within the meaning of Section 20.6.2.3104 NMAC.
2. The Permittee is injecting fluids so that such fluids will move into groundwater 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 Permittee is using a Class V UIC well as described in 20.6.2.5002(B)(5)(d)(ii) NMAC for in situ groundwater remediation by injecting a fluid that facilitates vadose zone or groundwater remediation.
4. The Permittee is injecting fluids into groundwater in order to achieve the remediation goals identified in the Injection Plan.

III. AUTHORIZATION TO DISCHARGE

The Permittee is authorized to inject chemical additives into groundwater in accordance with this UIC Permit and the Injection Plan under the oversight of Petroleum Storage Tank Bureau.

[20.6.2.3104 NMAC, Subsection C of 20.6.2.3106 NMAC, Subsection C of 20.6.2.3109 NMAC]

IV. CONDITIONS

The conditions of this UIC Permit shall be complied with by the Permittee and are enforceable by GWQB.

1. The Permittee shall perform remediation activities in accordance with the Injection Plan and shall notify GWQB of any changes prior to making them.

   [20.6.2.3107 NMAC]

2. The Permittee shall monitor the injection activities and their effects on groundwater quality as required by the Injection Plan and shall provide GWQB with electronic copies of the required reporting and any pertinent documentation of activities at the site.

   [20.6.2.3107.A NMAC, 20.6.2.3109.A NMAC]

3. If the GWQB or the Permittee identifies any failure of the Injection Plan or this UIC Permit to comply with 20.6.2 NMAC not specifically noted herein, GWQB may require the Permittee to submit a corrective action plan and a schedule for completion of corrective actions to address the failure.

   Additionally, the GWQB may require the Permittee to submit a proposed modification to the Injection Plan, this UIC Permit, or both.

   [20.6.2.3107.A NMAC, 20.6.2.3109.E NMAC]

4. ADDITIONAL MONITORING REQUIREMENTS – (RESERVED)

5. TERMINATION – Within 30 days of completion of activities authorized by this UIC Permit the Permittee shall submit a closure report and a request to terminate the UIC Permit to the GWQB for its approval. The closure report shall identify how the injection well(s) was (were) closed in accordance with the Injection Plan. The Permittee shall provide Petroleum Staorage Tank Bureau with a copy of this closure report.

   [20.6.2.5005 NMAC, 19.27.4 NMAC]

6. INSPECTION and ENTRY – The Permittee shall allow a representative of the NMED to inspect the facility and its operations subject to this UIC Permit and the WQCC regulations. The GWQB representative 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 the GWQB representative 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 UIC Permit and the WQCC regulations.

   Nothing in this UIC Permit shall be construed as limiting in any way the inspection and entry authority of GWQB under the WQA, the WQCC Regulations, or any other local, state, or federal regulations.

   [20.6.2.3107.D NMAC, NMSA 1978, §§ 74-6-9.B and 74-6-9.E]

7. MODIFICATIONS and/or AMENDMENTS – In the event the Permittee proposes a change to the injection plan that would result in a change in the volume injected; the location of the injections; or the concentration of the additives being injected by the facility, the Permittee shall notify GWQB prior to implementing such changes. The Permittee shall obtain approval (which may require modification of this UIC Permit) by GWQB prior to implementing such changes.

   [20.6.2.3107.C NMAC, 20.6.2.3109.E and G NMAC]

8. COMPLIANCE with OTHER LAWS – Nothing in this UIC 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.

   [NMSA 1978, § 74-6-5.L]

9. PERMIT FEES – Payment of permit fees is due at the time of UIC Permit approval. Permit fees shall be paid in a single payment remitted to GWQB no later than 30 days after the UIC Permit effective date.

   Permit fees are associated with issuance of this UIC Permit. Nothing in this UIC Permit shall be construed as relieving the Permittee of the obligation to pay all permit fees assessed by GWQB. A Permittee that ceases injecting or does not commence injecting during the term of the UIC Permit shall pay all permit fees assessed by GWQB. An approved UIC Permit shall be suspended or terminated if the facility fails to remit a payment by its due date.

   [20.6.2.3114.F NMAC, NMSA 1978, § 74-6-5.K]

Work Plan

DBS&A
Daniel B. Stephens & Associates, Inc.

January 25, 2022

Ms. Lorena Goerger
New Mexico Environment Department
Petroleum Storage Tank Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505

Re: Work Plan for Injection Program and Two Groundwater Monitoring Events
Leonard's Conoco Site, 1633 Route 66, Santa Rosa, New Mexico
Facility #29084, Release ID #755
Contract No. 22-667-3200-0006

Dear Ms. Goerger:

Daniel B. Stephens & Associates, Inc. (DBS&A) is pleased to submit the attached work plan and cost estimate for completion of an injection program and two groundwater monitoring events at the subject site. All activities will be completed in accordance with DBS&A standard operating procedures.

Please contact us at (505) 822-9400 if you have any questions or require additional information.

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

John R. Bunch, P.G.
Senior Scientist

Gundar Peterson, P.E.
Vice President

JRB/GP/rpf
Attachment

Daniel B. Stephens & Associates, Inc.
6020 Academy Rd. NE, Suite 100 505-822-9400
Albuquerque, NM 87109 FAX 505-822-8877

DBS&A
Daniel B. Stephens & Associates, Inc.

Work Plan for Injection Program and Two Groundwater Monitoring Events

Leonard's Conoco Underground Storage Tank Site
1633 Route 66, Santa Rosa, New Mexico
Facility ID #29084, Release ID #755
Contract No. 22-667-3200-0006

1. Introduction

At the request of the New Mexico Environment Department (NMED) Petroleum Storage Tank Bureau (PSTB), Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this work plan and cost estimate for completion of an amendment injection program and two groundwater monitoring events at the Leonard's Conoco underground storage tank (UST) site (the site) in Santa Rosa, New Mexico (Figure 1). The work plan was prepared with direction from the NMED PSTB project manager and in accordance with the New Mexico Petroleum Storage Tank Regulations (20.5.119 New Mexico Administrative Code [NMAC]).

2. Background

The site has been active since a release from the UST system was confirmed in June 1991. Previous work at the site consisted of on-site investigations, including the completion of four groundwater monitor wells (MW-1 through MW-4). Original wells MW-1 and MW-2 were replaced by wells MW-1A and MW-2A, respectively, in 2001. MW-4 is presumed to have been destroyed; therefore, only three wells now exist at the site (MW-1A, MW-2A, and MW-3). Intermittent groundwater monitoring and reporting has been ongoing since the 1990s. The last sampling event occurred in May 2021.

The subsurface is characterized by interbedded alluvial deposits consisting of silty sand, sandy clay, and medium- to coarse-grained sand. Groundwater fluctuates from approximately 12 to 15 feet below ground surface (feet bgs) and flows to the northwest with a gradient of approximately 0.015 foot per foot (ft/ft).

Results of the May 2021 sampling event indicated that the concentrations of contaminants of concern (COCs) in all sampled wells were below either the NMWQCC standards or laboratory reporting limits, with the exception of well MW-1A, where a benzene concentration of 120 micrograms per liter (µg/L) and a total naphthalenes concentration of 30 µg/L were detected. The dissolved-phase contamination is currently most likely confined to the immediate vicinity of MW-1A.

3. Scope of Work

The scope of work includes completing one pre-injection groundwater monitoring event, one amendment injection event, and one post-injection groundwater monitoring event. The firm-fixed price for completing the scope of work is provided in Section 4. Activities that will be performed to accomplish the scope of work are outlined in the following subsections. For the purposes of the scope of work detailed in this work plan, it is assumed that all of the monitor wells to be sampled are still in existence, able to be located, in satisfactory condition, and will contain sufficient water for sampling.

3.1 Task 1: Project Planning

Project planning includes the following items:

- Develop this work plan and cost estimate
- Update the site-specific health and safety plan (HASP)
- Coordinate site access
- Obtain subcontractor agreements
- Call for utility locates
- Schedule the project

To ensure a focus on project objectives, an authorized representative of DBS&A will monitor compliance with the approved work plan.

Prior to the performance of fieldwork, the site-specific HASP will be updated to address health and safety issues associated with the proposed project activities, including amendment injection-related safety issues and the coronavirus disease (COVID-19) pandemic.

As this is a State Lead site, DBS&A understands that we do not represent the State of New Mexico in dealings with property owners. DBS&A therefore assumes that access with the current site property owner has already been negotiated by PSTB for the activities issued with the original request for quotes (RFQ).

Once the project is scheduled, the property owner(s) and the NMED PSTB project manager will be notified four days prior to commencement of field activities. After completion of field activities, DBS&A will ensure that locations where project activities occurred are restored as close as possible to their original condition.

3.2 Task 2: Pre-Injection Groundwater Monitoring Event

Prior to implementing the amendment injection activities, one groundwater monitoring event will be conducted according to the procedures and protocols outlined in this section.

Fluid levels will be gauged in each of the three existing site wells (MW-1A, MW-2A, and MW-3) using an electronic interface probe to determine if light nonaqueous-phase liquid (LNAPL) is present and to determine the depth to water. Wells containing a measurable LNAPL thickness will be hand-bailed to recover the LNAPL. The interface probe will be decontaminated using a non-phosphate detergent solution and distilled water rinse prior to collecting each measurement.

Monitor wells that do not contain LNAPL will be purged using a new dedicated, disposable bailer. DBS&A will attempt to sample wells from the least contaminated to the most contaminated well, based on data from the previous sampling event. A minimum of three casing volumes will be removed from each well prior to sampling to ensure that a representative sample of groundwater is obtained. If a well is purged dry, it will be sampled once the well has recharged. During purging, groundwater field parameters, including dissolved oxygen, oxidation/reduction potential, electrical conductivity, pH, and temperature, will be measured using a YSI Professional or equivalent device and recorded in the field notes.

Purge and decontamination water will be disposed of on the ground within the site boundaries, preferably on an impervious surface and near the well of origin. Purge water must not contain LNAPL, must not endanger public health or safety, and must not enter a surface water body or tributary, including an arroyo. Any purged fluids containing LNAPL will be containerized for future disposal at a licensed facility.

Once purged, the wells will be sampled for laboratory analysis. To minimize volatilization and ensure sample integrity, new dedicated, disposable polyethylene bottom-emptying devices will be used to transfer groundwater samples from the bailers to the appropriate containers. Samples collected for volatile organic compound (VOC) analysis will be transferred from bailers into laboratory-prepared 40-milliliter (mL) glass sample bottles that contain mercuric chloride as a preservative. The groundwater samples will be labeled and preserved on ice in an insulated cooler for delivery to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico for analysis.

Groundwater samples will be analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX), methyl tertiary-butyl ether (MTBE), 1,2-dichloroethane (EDC), 1,2-dibromoethane (EDB), and total naphthalenes using U.S. Environmental Protection Agency (EPA) method 8260B (full list). To assist with performance monitoring following implementation of the groundwater treatment program, samples will also be collected for analysis of dissolved iron and manganese using EPA method 6010C, sulfate and nitrate using EPA method 300.0, pH using SM 4500, and total dissolved solids (TDS) using SM 2540C (modified). Most of these additional analyses are assumed to be a condition of the NMED Groundwater Quality Bureau (GWQB) discharge permit.

Following completion of the groundwater monitoring event and upon receipt of laboratory analytical reports, DBS&A will prepare and submit to the NMED PSTB project manager a one-page letter report. The report will be submitted to the PSTB in both electronic and hard copy formats, and will summarize the analytical data. The laboratory report, chain of custody documentation, and field notes will be provided as attachments. Maps and tables discussing current site conditions will be provided in the final remediation plan (FRP) and FRP implementation reports.

3.3 Task 3: Underground Injection Control Discharge Permit

Prior to purchase of amendment injection materials, DBS&A will obtain a discharge permit from the NMED GWQB. DBS&A will submit a groundwater discharge permit application and provide maps, figures, logs, tables, and other data necessary to ensure the application is administratively and technically complete. DBS&A will pay the application filing fee, and will pay for the initial public notice required by the NMED GWQB. To complete public notice, DBS&A will post a sign at the facility, post a flyer off-site at a location approved by GWQB, mail a public notice flyer to property owners within one-third mile, and post notice in a GWQB-approved newspaper. For similar activities on other sites, DBS&A and our clients have successfully obtained temporary

permission to discharge for a one-time amendment injection event after completion of the initial public notice required by the GWQB.

3.4 Task 4: Develop Final Remediation Plan

3.4.1 FRP Preparation and Submission

DBS&A will prepare an FRP in accordance with 20.5.119.1923 NMAC. The FRP will be prepared under the supervision of a New Mexico licensed professional engineer. Per the scope of work defined in the RFQ, the FRP will minimally include the following:

- A site history summary, which includes current soil and groundwater conditions
- Site maps identifying roads, buildings, utilities, existing monitoring wells, groundwater contours, dissolved-phase contaminant distribution, and planned injection locations
- A discussion of the planned injection strategy, including the description of the planned injectate, rationale for the selected injectate, the injection process, target injection depth intervals, and calculations supporting planned injection point spacing and volumes
- An implementation schedule
- A discussion of planned observations and monitoring during injection
- Copies of required discharge permits and anticipated public and agency notifications
- Copies of sub-contractor/injection contractor's data sheets
- A HASP

The basis for design of the amendment injection program is presented in this work plan, which was based on the site investigation data issued with the RFQ. If PSTB requests additional site investigation activities based on information presented here, that information will also be incorporated into the FRP.

3.4.2 FRP Public Notice

DBS&A will provide public notice in accordance with 20.5.12.36.D.10 NMAC. Two legal notices will be published of the submission or planned submission of the FRP in a newspaper of general circulation in Guadalupe County. DBS&A will provide the PSTB with a certified affidavit of publication for each legal notice within 21 days after the FRP is submitted. The format for the legal notice will follow that dictated in 20.5.12.36.D.10.b-d NMAC. A notice will be posted at the

site containing the specified information listed in the regulation. DBS&A will also provide notice via certified mail to the owner and adjacent property owners within seven days of submission of the FRP in accordance with the above-cited regulation.

3.5 Task 5: FRP Implementation

DBS&A worked with Regenesis® and Vista GeoScience (Vista) of Golden, Colorado to develop a site-specific treatment design to achieve the remedial goals with a practical and cost-effective approach. The selected injectate is PetroFix™, a micron-scale (1 to 2 microns) activated carbon emulsion that removes dissolved-phase hydrocarbon contaminants by adsorption to the carbon media, combined with inorganic electron acceptors (nitrate and sulfate) to facilitate anaerobic biodegradation. PetroFix™ can be economically applied under low pressure (less than 100 pounds per square inch [psi]), and coats permeable transport zones within the treated aquifer. Once injected, PetroFix™ carbon particles remain positionally stable within the aquifer and serve to continue capturing and immobilizing dissolved-phase constituents that may be supplied by residual source areas outside the treatment zone.

This carbon-based injectate was selected so that residual hydrocarbon mass will be captured if water levels rise into potential smear zone above the current water table, and so that the injectate can be applied under relatively low pressure. Some carbon-based injectates that are injected as a slurry can require higher-pressure application, resulting in fracturing of the soil formation. This can result in random and incomplete product distribution.

The site-specific application summary for PetroFix™ includes the following specifications (depths listed below assume water is present at approximately 15 feet bgs:

- The treatment area is surrounding monitor well MW-1-A; 6 total injection points on a 6-foot spacing over a 6-foot vertical interval (approximately 13 to 19 feet bgs) will be used for the injections. PetroFix™ will be injected over an approximate 300-square-foot areal extent (Figure 2). DBS&A is targeting an interval from 1 foot above the current water table to the bottom of the well screen. Regenesis estimates a total product quantity of PetroFix™ of approximately 400 pounds, or approximately 64 pounds per injection point.
- Materials will be injected using direct-push technology in accordance with manufacturer instructions. DBS&A will coordinate with New Mexico One Call prior to proposed on-site activities to ensure that subsurface utilities are marked. DBS&A intends to subcontract with Vista, who will provide the direct-push and mixing equipment. Based on subsurface soils in the treatment zone, DBS&A anticipates using a top-down injection method for application

of the amendment. A mechanical mixing pump will be used to mix PetroFix™ materials with the manufacturer-specified quantities of water in a tank. Water will be obtained locally and stored in a water tank for daily use. A hydraulic piston pump mounted on a track-mounted GeoProbe rig will be used to inject materials into the subsurface through either GeoProbe tooling or the probe rods, depending on subsurface drilling conditions. Injection boreholes will be backfilled with bentonite and sealed at the surface with a quick-setting, high-early-strength concrete.

- Injection pressure is critical to this application, as it is the key to distributing amendment into the formation. Based on assumed dry and saturated unit weights of 100 and 125 pounds per cubic foot, respectively, and an assumed porosity of 20 percent (for an average sand), recommended maximum sustained injection pressures in the soil formation would be less than 100 psi. Pressure will be monitored between the injection pump and the probe rods to minimize surfacing of injected materials. The proposed piston pump will also keep injection flow rates on the order of 3 to 5 gallons per minute (gpm). During and after injection activities, nearby monitor wells will be periodically monitored for increasing contaminant vapor concentrations using a photoionization detector or equivalent organic vapor meter.
- Work areas will be secured from vehicular and pedestrian traffic during injection activities. Injectate boring locations will be marked during the pre-injection monitoring event.

Following completion of the amendment injection, a letter report detailing injection activities with photographic documentation will be submitted to the NMED PSTB.

3.6 Task 6: Post-Injection Groundwater Monitoring

Post-injection groundwater monitoring will be conducted as described in Section 3.2, with the exception of the laboratory analyses. Samples will be only be analyzed for VOCs using EPA method 8260B. A letter report that includes the analytical summary and laboratory results will be submitted to the NMED PSTB.

4. Cost Estimate

The cost to complete the scope of work as described in Section 3 is provided in Table 1. Tasks 1 through 5 will be invoiced upon submittal and acceptance of the amendment injection letter

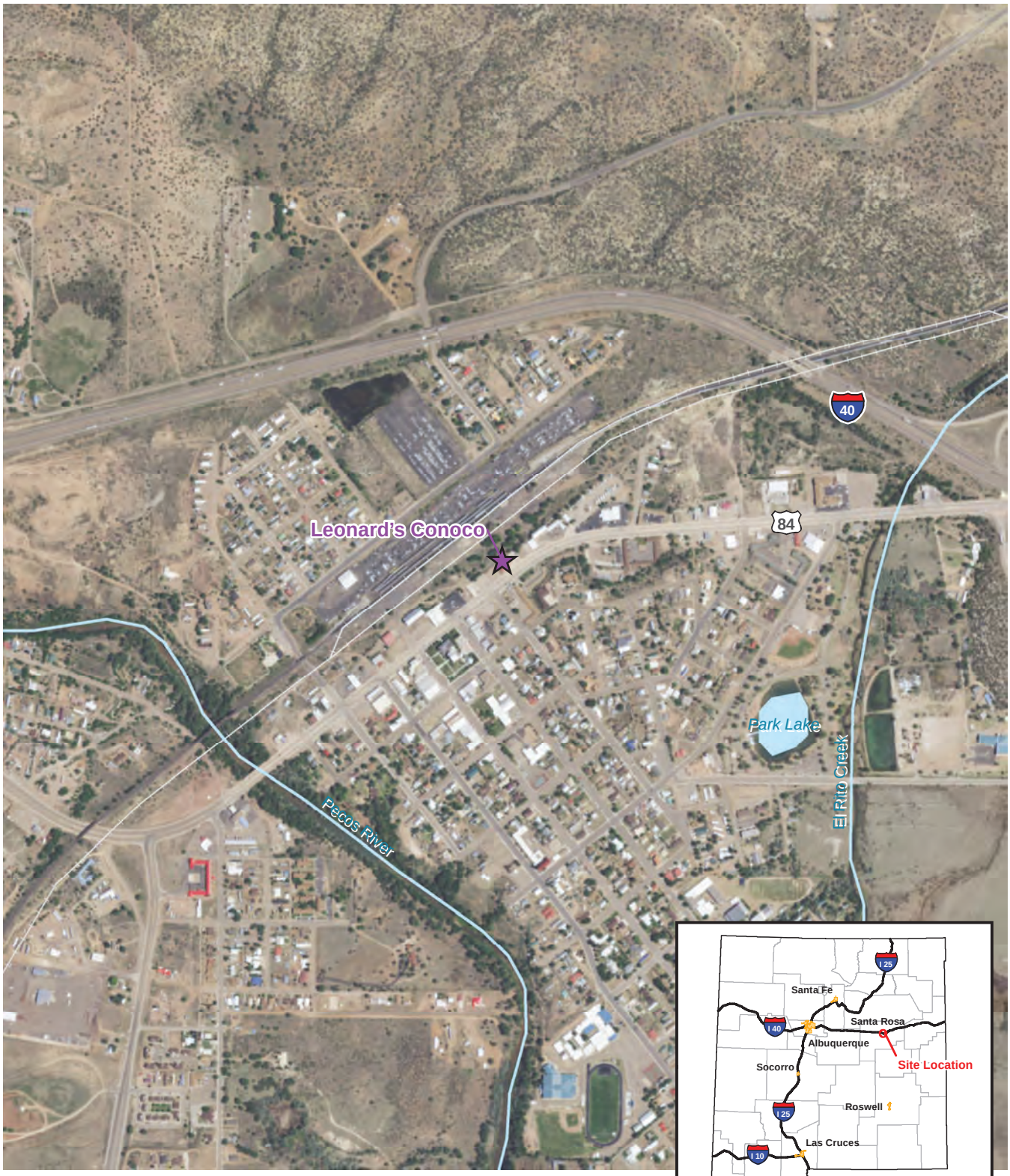
report. Task 6 will be invoiced upon submittal and acceptance of the groundwater monitoring report.

Table 1. Cost Estimate

Task	Task Description	Cost	Tax [a]	Total Cost
1, 2	Project planning and pre-injection groundwater monitoring	$3,295.00	$259.48	$3,554.48
3	Obtain GWQB underground injection control (UIC) discharge permit	$4,950.00	$389.81	$5,339.81
4	Prepare final FRP	$4,340.00	$341.78	$4,681.78
5	Implement FRP and prepare report documenting injection activities	$30,879.35	$2,431.75	$33,311.10
6	Post-injection groundwater monitoring	$3,295.00	$259.48	$3,554.48
	Total	$46,759.35	$3,682.30	$50,441.65

[a] New Mexico gross receipts tax (7.875 percent)

Figures



Source: Aerial image courtesy of ESRI ArcGIS Online and data partners, including imagery from agencies supplied via the Content Sharing Program

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LEONARD'S CONOCO
SANTA ROSA, NEW MEXICO
Area Map

Daniel B. Stephens & Associates, Inc.
2/15/2017 JN ES14.0052.10

Figure 1

Source: Aerial image courtesy of Google Earth Pro., September 2014.

Explanation

- Monitor well
- Monitor well (destroyed)
- Monitor well (plugged and abandoned)
- Proposed injection points
- Overhead electric line

LEONARD'S CONOCO
SANTA ROSA, NEW MEXICO
Site Map

Daniel B. Stephens & Associates, Inc.
10/20/2021
JN ES14.0052.10
Figure 2

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Petrofix Application Summary

DBS&A
Daniel B. Stephens & Associates, Inc.

Expert Environmental Support Services for Site Investigation & Remediation

October 20, 2021

John Bunch
CLIENT: Daniel B. Stephens & Associates, Inc.
6020 Academy Road NE, Suite 100
Albuquerque, New Mexico 87109
FAX: 0 · PHONE: (505) 822-9400
E-Mail: jbunch@geo-logic.com

RE: Vista Quote #: 21275.01 REV2; Direct Push PetroFix Injections
Site Address: 1633 U.S. Rte 66, Santa Rosa, NM 88435

John:

Attached the cost estimate for direct-push drilling services at your site in Santa Rosa, NM. This estimate includes a Geoprobe Dual-Technology track mounted DPT/Auger combo drilling rig, Clean Inject Injection Trailer, 40 hour HAZWOPER trained technicians, all consumables and ancillary equipment necessary.

VISTA will inject a total of 400 pounds of Regenesis' PetroFix, 20 pounds of electron acceptor, and 1,455 gallons of potable water evenly at 6 injection locations between 10 and 20 feet bgs. Vista plans to use 3 foot retractable screen injection tooling using a bottom up approach. Should this approach be unsuccessfull, VISTA will also bring a number of other injection tooling options to find what works best. Vista plans to inject at 3 locations simultaneously keeping pressures under 100 psi. As a safe estimate, VISTA created this cost estimate assuming flow rates of 3 gpm per location. VISTA anticipates actual flow rates to be 5-10 gpm.

Please review this entire document carefully for all item quote and check quantities and number of items stated. If this proposal, terms and conditions are satisfactory, please signify your acceptance by having an authorized person sign below and provide copy to VISTA. If the CLIENT wishes to provide their own subcontract, this entire proposal must be included at a referenced attachment with all assumptions and terms included.

We appreciate the opportunity to provide this proposal for our professional services. Please contact us if you have any questions.

Sincerely,

Peter Wethington
pwethington@vistageoscience.com

THE UNDERSIGNED SIGNATORY REPRESENTS AND WARRANTS THEY HAVE AUTHORITY TO ENTER INTO THIS AGREEMENT.

ACCEPTED BY (SIGN): _____ **DATE:** _____

PRINTED NAME: _____ **TITLE:** _____

Please see Assumptions, Quoted Prices, Standard Terms & Conditions on the following pages.

October 20, 2021

Vista Quote #: 21275.01 REV2; Direct Push PetroFix Injections

ASSUMPTIONS INCLUDED WITH PROPOSAL:

In order to assist the client in assuring all steps necessary to successfully and safely complete this project are addressed, please note the following assumptions made when preparing this proposal. If you have any questions or need our assistance in addressing any of the following, please advise us prior to proceeding with the project.

CLIENT will review and approve all drilling & injection locations, as well as mark locations on the pavement or ground surface prior to VISTA potholing, coring, or drilling at a location.

The anticipated work can be completed using Level D Personal Protection Equipment (PPE).

Proposal assumes the work will be completed during normal, daytime working hours.

Proposal assumes any permits not specified in this proposal will be obtained by the client.

Site Lithology is conducive to direct push probing, and we will be able to push to the depths specified. Where solid stem auger is proposed, the proposal assumes that the rigs proposed can achieve the required depths. If an alternative drilling method is required, costs for this have not been included.

The operator will call probe refusal. If the client's onsite representative insists on pushing beyond the operator's recommendation, the client is responsible for any resulting tool damage.

Proposal assumes additional charges may apply due to rig refusal, frozen ground, or unanticipated slower penetration rates due to site conditions.

Additional estimated time for pre-probing or pre-augering hole is NOT included in this proposal, unless othewise stated.

Boreholes will be abandoned with hydrated bentonite chips and patched with like materials (concrete or asphalt).

VISTA will not be responsible for any damage to pavements or landscaped areas resulting from our crews' operation of the track rig unless from negligence. The client recognizes that some damage may occur due to turning, leveling, and other normal operating procedures including stabilizing the rig to prevent movement during probing.

VISTA will containerize and leave all investigation derived waste (IDW) onsite. Management and dispposal of the waste is the responsibility of the CLIENT or OWNER.

CLIENT will provide a site specific health and safety plan, and provide monitoring, as required per CFR 1910.120.

Please see Standard Terms & Conditions on Following Page

Vista GeoScience

Rocky Mountain Region Ph: 303-277-1694
Gulf Coast Region Ph: 281-310-5560
www.VistaGeoScience.com

Date: October 20, 2021
Vista Rep: Peter Wethington
pwethington@vistageoscience.com

Vista Quote No.: 21275.01 REV2

For: John Bunch, Daniel B. Stephens & Associates, Inc.

6020 Academy Road NE, Suite 100 · Albuquerque, New Mexico 87109 · Phone: (505) 822-9400 · Fax: 0

Project Overview for: Direct Push PetroFix Injections

Services: Geoprobe Dual-Technology Track Rig, Clean-Inject Remediation System, and 3 person crew.
Pre-clearing of boring locations (pothole/hand auger) not included in this quote. Additional charges will apply for these services.
Mix 400 pounds of Regenesis' PetroFix, 20 pounds of electron acceptor, and 1,455 gallons of potable water.
Evenly distribute the 1,496 gallon slurry at 6 injection locations between 10 and 20 feet bgs.
Abandon each boring location with bentonite chips and patch to match existing surface.
Complete a 811 One Call utility locate prior to mobilizing to the site.
To better understand product distribution, VISTA recommends collecting confirmation soil samples after the first few injection locations are completed.

Address/Location: 1633 U.S. Rte 66, Santa Rosa, NM 88435
Estimated Start Date: TBD Estimated Duration (days): 2.5
Site Description/Notes:

Environmental Drilling & Labor Estimate:	**QTY**	**PRICE**	**TOTAL**
Geoprobe DPT/Auger Rig, Clean-Inject Pump Rig, Level D, per day (8 hours)	1	4995.00	$4,995.00
Geoprobe DPT/Auger Rig, Clean-Inject Pump Rig, Level D, per day (>5 hours)	1	3600.00	$3,600.00
Lump Sum Site Setup and Restoration	1	1500.00	$1,500.00
Subtotal Environmental Sampling Services:			**$10,095**

Rentals / Other Services:	**QTY**	**PRICE**	**TOTAL**
Injection/Remediation Summary Report	1	500.00	$500.00
Water Procurement and Permitting, lump sum	1	1200.00	$1,200.00
Subtotal Rentals / Other Services:			**$1,700**

Expendable Items/Materials Estimate:	**QTY**	**PRICE**	**TOTAL**
PetroFix & Electron Acceptor, per pound	400	5.29	$2,116.00
PetroFix & Electron Acceptor, per pound	400	0.79	$316.00
Granular or Chip Bentonite, per 50# bag	15	12.00	$180.00
Subtotal Expendable Items:			**$2,612**

Mobilization and Travel Expense Estimate:	**QTY**	**PRICE**	**TOTAL**
Lump Sum Mobilization/Pre-Project Setup	1	7,000.00	$7,000.00
Per Diem, per person, per day	12	50.00	$600.00
Lodging, per person, per day	12	120.00	$1,440.00
Subtotal Mobilization Expenses:			**$9,040**

Total Estimated Project Cost:		**$23,447**
5% New Mexico Sales/Service Tax	5%	$1,172.35
Total Estimated Project Cost w/ Tax / Project Management:		**$24,619.35**

Quotation valid for 90 days and subject to Vista GeoScience's Terms & Conditions, as attached.

3 SCOPE OF WORK

Based on the treatment design proposed in Section 2, the proposed scope of work (SOW) to complete the tasks is as follows:

3.1 Mobilization

Mobilization includes delivery to the job site or moving between job sites, equipment, tools, materials, supplies, PPE, miscellaneous articles, and personnel sufficient to commence and sustain temporary DPT sampling and subsurface logging activities to meet the project schedule.

VISTA proposes to mobilize the following equipment/systems to complete the require tasks:

- ☒ Geoprobe 7000 series track mounted DPT/Auger combo rig.
- ☒ DT22 or DT32 Continuous Core System for collection of RDC soil samples.
- ☐ Water & Soil Sampling Materials:
  - ☐ SP-16 Screen Point Water Sampling Tools for Water Sampling
  - ☐ Materials for Temporary ¾" PVC Water Sampling Wells
  - ☐ Materials for Temporary Water Sampling Tubing Implants
- ☒ Clean-Inject Electric Remediation System Trailer
  - ☒ 1200 psi, 35gpm Wanner Positive Displacement Pump setup
  - ☐ 1200 psi, 70gpm Wanner Positive Displacement Pump setup
- ☐ Chem Grout Injection Trailer (Dual 100-gallon mix tanks)
  - ☐ Three Stage Moyno Slurry Injection Pump, up to 350 psi, 25 gpm
  - ☐ Additional D-35 or DP-800 pump for fracturing if necessary
- ☒ Injection Trailer
  - ☐ Grundfos Stainless Steel Centrifugal Injection Pumps (25 gpm, 125 psi)
  - ☒ Multi-Port Injection Manifold with Valves,
  - ☒ Pressure & Digital Flow Monitoring Digital Pressure & Flow Monitoring
- ☒ Injection Tooling
  - ☒ Multi-Port Discrete Interval Jetting Injection Probe
  - ☒ Retractable Injection Screens (1' – 5' screen length options)
- ☒ Digital Pressure & Flow Monitoring
- ☒ Analog Pressure & Flow Monitoring

3.1 Utility Locates, Clearing, Daylighting

VISTA will notify the Utility Notification Center of New Mexico at least 72-hours prior to our field work to obtain locates for public underground facilities, even if VISTA is a subcontractor on the job.

When locates are obtained through UNCNM, the various underground facility owners are only responsible for marking their lines from the property line to the meter. Any underground utilities that exist beyond or behind the meter are considered "private" utilities and may include irrigation/sprinkler lines or water, sewer, phone and/or electric lines from the metered building to an auxiliary building on a property. Private utilities may be located by ordering private utility locates and/or by exposing the proposed excavation areas by potholing ("daylighting"). VISTA can assist in providing private utility locates or daylighting services. Unless specifically noted below, this proposal does not include private utility locates or daylighting services. VISTA maintains the right to refuse to excavate and/or drill in any location that may be reasonably deemed unsafe to dig. VISTA will not be responsible for any utility repairs.

☒ Proposal includes 811 Utility Notification
☐ Proposal includes 811 Utility Notification and private utility locates.
☐ Proposal includes hand augering drill locations to 5 feet before drilling.
☐ Proposal includes potholing and/or utility daylighting using a hydro-vac system.

3.2 Investigation Derived Waste (IDW):

☐ Proposal includes daylighting services and assumes debris is impacted by contaminants such that disposal at an appropriate landfill or waste facility will be required. Proposed Disposal Location:

- ☐ ACI Services. Waste Treatment Facility [waste must be excluded waste as defined under 40 CFR 261.4(b) (10) Petroleum Contaminated Media & Debris from Underground Storage Tanks] CLIENT, as generator, will be required to sign necessary manifests.
- ☐ Other:

☒ CLIENT, as generator, is responsible for all sampling, analysis, and profiling. Costs for transportation and disposal are extra and not included in this proposal unless otherwise noted.

3.3 Traffic Control

Sufficient work area must be provided for our direct-push rig, injection equipment, generator and other equipment if our crews are to safely and efficiently provide the requested services. Additional charges may apply if we are required to move equipment to accommodate site owner imposed restrictions or to compensate for heavy traffic conditions. We can assist you in providing traffic control. Unless specifically noted below, this proposal does not include traffic control services.

☒ Proposal does not include traffic control.
☐ Proposal includes traffic control.

3.4 Pavement Coring / Street Permits

Removal and patching of any concrete, asphalt, or other surface materials will be necessary if located in the intended work area. VISTA can provide coring and patching services if requested. Unless specifically noted below, this proposal does not include coring or patching services. Please note that even if we provide pavement patching services, we cannot guarantee against future settlement or damage to the patched areas due to conditions beyond our control such as poor surrounding pavement conditions,

drainage and heavy traffic. Our proposal does not include street cut permits, degradation fees or any related services unless specifically noted below.

☐ Proposal does not include pavement coring, patching services, or street cut permitting.
☒ Proposal includes pavement coring and patching (subject to the limitations noted above)
☐ Proposal includes street cut permitting, including the following specific tasks and estimated fees:

3.5 Equipment Storage & Frost Protection

If the project is anticipated to take more than one (1) day and is located more than 50 miles from VISTA's office, it may be necessary to store equipment in a secure location overnight. Also, if the project occurs during freezing weather, equipment must be protected from freezing. If the injection equipment cannot be stored inside a heated garage, a 120V/30A power supply must be available to operate space heaters inside the injection equipment. Our proposal anticipates the following.

☐ No equipment storage or frost protection will be required.
☒ Proposal assumes an onsite storage location will be provided by the client but no frost protection is necessary due to the anticipated weather conditions.
☐ Proposal assumes client will provide a secure location to store our equipment at night and a power supply of at least 120V/30A.
☒ VISTA will provide any necessary storage and frost protection and the associated costs are included in our proposal.

3.6 Water Supply

Sufficient clean water is necessary to mix most dry injectates. At many sites, a water spigot or nearby fire-hydrant is available. If necessary, VISTA can transport water to the site. If a water spigot is provided, the spigot must have a flow rate of at least 10 gpm and be located within 100 ft. of the injection equipment. If a fire-hydrant is available, permits and a backflow preventer connected to a hydrant meter must be provided. VISTA can obtain the necessary permits, backflow preventer and hydrant meter if requested. This proposal includes the following services.

☐ Proposal assumes a water spigot will be provided by the client within 100 ft. of our injection equipment and with a flow rate of at least 10 gpm.
☐ Proposal assumes a fire hydrant, backflow preventer, hydrant meter and all necessary permits will be provided by the client.
☒ Proposal assumes a fire hydrant, backflow preventer, hydrant meter and all necessary permits will be obtained by VISTA.
☐ Proposal assumes VISTA will transport water to the site.

3.7 Reagent Containment, Surfacing & Site Cleanup

Depending on the site conditions, injectate surfacing may occur. This may be the result of specific subsurface soil and groundwater conditions, nearby utility corridors, the pavement condition in the area of the injection, and the amount and flow rates of chemicals injected into the ground. In some circumstances we can lower the injection rates to minimize injectate surfacing but in many cases lowering the injection rates will only make the problem worse. Our proposal is based on the assumption that injection rates of at least 10 gpm can be maintained without injectate surfacing. If lower injection rates are required to prevent injectate surfacing, additional charges may apply. VISTA is not responsible for cleanup of injectates that surface at the site or enter nearby monitoring wells, utility corridors, nearby

properties buildings or other pathways. Also, depending on the magnitude of the proposed injection, a large number of injectate containers and other waste can be generated during the project. Unless specifically noted below, our proposal assumes no cleanup of injectate or other waste. Containment is recommended for hazardous chemicals, such as strong oxidants. Even though non-hazardous reagents may not require containment for surface spills, if a release occurs, they may still result in a nuisance or illegal discharge, especially if they enter a public right of way or storm drain, and containment may be recommended. Vista will provides costs for this service only if requested.

☐ Proposal assumes cleanup of any surfaced injectate, empty injectate containers and other waste will be provided by others.
☒ Proposal assumes VISTA will provide cleanup of surfaced injectate, where accessible
☐ VISTA will provide a vacuum trailer continuously during the project.
☐ Proposal assumes VISTA will provide cleanup of injectate in impacted monitoring wells.
☒ Proposal assumes VISTA will provide disposal of all empty injectate containers and other waste.
☐ Proposal includes costs for containment for pump systems, liquid storage, and mixing tanks
☒ Proposal assumes reagents are non-hazardous and containment is not requested

3.8 Deliverables Summary Reports

Following completion of the proposed scope of work, VISTA will prepare a basic summary report of the injection activities (injection locations and depths, injected quantities, breakthrough and pumping pressures, etc.).

3.9 Other Project Assumptions

In order to assist the CLIENT in assuring all steps necessary to successfully and safely complete this project are addressed, please note the following assumptions made when preparing this proposal. If you have any questions or need our assistance in addressing any of the following, please advise VISTA prior to proceeding with the project.

☒ Client will review and approve all drilling and injection locations, as well as mark locations on the pavement or ground surface prior to VISTA potholing, coring, or drilling at a location.

☒ The anticipated work can be completed using Level D Personal Protection Equipment (PPE).

☒ Proposal assumes the work will be completed during normal, daytime working hours.

☒ Proposal assumes any permits not specified in this proposal will be obtained by the client.

☒ Site Lithology is conducive to direct push probing, and we will be able to push to the depths specified. The operator will call probe refusal. If the CLIENT's onsite representative insists on pushing beyond the operator's recommendation, the client is responsible for any resulting tool damage.

☒ Proposal assumes additional charges may apply due to rig refusal, frozen ground, or unanticipated slower penetration rates.

☐ Additional estimated time for pre-probing or pre-augering hole is included in this proposal.

☒ Boreholes will be abandoned with hydrated bentonite chips or crumbles and patched with like materials (concrete or asphalt).

☒ VISTA will not be responsible for any damage to pavements or landscaped areas resulting from our crews' operation of the track rig unless from negligence. The client recognizes that some damage may occur due to turning, leveling, and other normal operating procedures including stabilizing the rig to prevent movement during probing.

☐ Time and materials costs are included for repair to anticipated damaged pavements or landscaped areas resulting from our crews' operation of the track rig.

Decontamination of Tooling:

☐ All probe rod will be decontaminated between all boreholes.

☐ Only probe rod that is retrieved wet will be decontaminated between boreholes.

☒ Tooling will not be contaminated between boreholes, but will be decontaminated before leaving site.

7 PROPOSED EQUIPMENT

7.1 Clean-Inject™ Slurry Mixing and Pump System

Clean-Inject™ is a patent-pending Remediation System which is capable of injecting Powdered Activated Carbon or other powdered reagents mixed with water into the subsurface at narrow and precise targeted intervals to remediate impacted soil and groundwater. The positive displacement pump can generate up to 1200 psi at 35 gpm, which allows effective and highly targeted jetting of the reagents into any type of lithology. This system allows precise placement of all types of reagents, reduces surfacing issues, and significantly improves treatment performance by insuring the most contact of reagent and contaminants.

A new digital flow rate and pressure monitoring system assists in monitoring the subsurface behavior of the injections as they proceed, allowing the operator to make real time field adjustment when issues are observed.

The system also allows the use of super sacks of reagent, and pumps the reagent directly into the mixing tanks which removes the handling of 50 pound sacks of reagent, eliminates powder dust plumes on the site, and makes the operation cleaner, safer and more efficient.

All hosing and tools can be locked up in system trailer at night and the trailer can be kept heated overnight in freezing weather, allowing for quicker startups in the morning. Power on site will need to be provided. Specifications of the system are as follows:

Table 2. Clean-Inject System Specifications

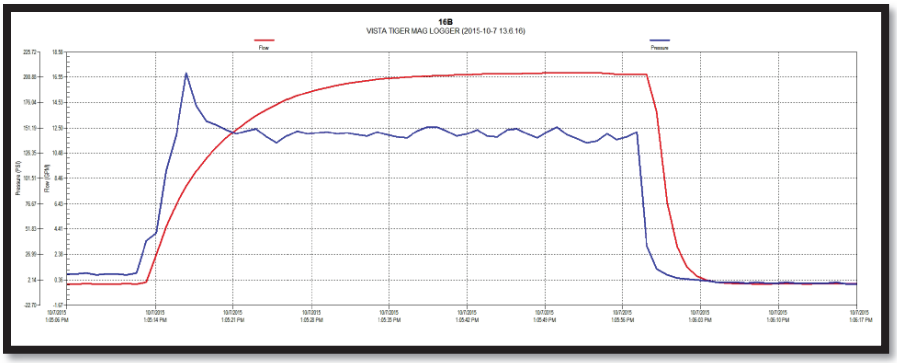
System design	Clean-Inject®
Injection flow rate	Up to 35 gallons per minute
Injection pressure	Up to 1,200 psi
Pump type	5 diaphragms, positive displacement
Injection pump horsepower required	30 hp, variable frequency drive; 0-1150 rpm
Pump compatibility	Stainless steel with Viton diaphragms
Blended injectate measuring	Float system
Mixing tank	200 to 300 gallons, stainless steel
Bulk carbon handling	1,000 lb. supersacks
Powder weighing system	Load cell, 5000 lb. capacity, 0.1 lb. accuracy
Mixing tank additive provisions	18" manway + liquid additive (oxidizers, nutrients)
On-board fresh water storage	500-gallon
Fresh water transfer rate	50 – 80 gpm
Fresh water inlet	3/4" threaded water supply or 2" camlock
Fresh water filtration	Y strainer, mesh straining element
Bulk powder transfer system	Double diaphragm
Dust suppression system	CleanInject® proprietary, e-type, passive vent
Water supply requirements	≥ 10 gpm (recommended)
Power requirements	70 kva, 460 volts, 3-phase
On-board compressed air supply	7.5-10 hp screw or reciprocating compressor
On-board fresh water wash down	50-80 gpm
Operating environment	All conditions: rain, freezing, wind, snow

7.2 Top Down Injection Tooling

Specialized injection tooling that allows for continuous top-down injection will be used to provide precise targeted injection at specified intervals. This is a significant improvement over common bottom up methods that are often applied and is required when using slurried solids such as BOS200 since it remains relatively immobile once emplaced. Bottom up injection methods may be required where drilling and soil conditions become too difficult for the specialized tooling.

7.3 Pressure & Flow Monitoring

Pressure and flow rates are digitally monitored and recorded manually on log forms along with volume and weight totals for each injection interval. The operator can observe the pressure and flow graphs while injecting which identifies the subsurface injection behaviors and helps reduce surfacing issues.



CLIENT: Daniel B. Stephens & Associates, Inc.
RE: Vista Quote #: 21275.01 REV2; Direct Push PetroFix Injections

STANDARD TERMS AND CONDITIONS FOR FIELD SERVICES AGREEMENTS

Definitions: Vista GeoScience LLC (VISTA), a Colorado Corporation, is the company providing contracted consulting, field and/or laboratory services according to this price quotation and agreement. The named customer in the quotation is referred to as the CLIENT in these here terms and conditions. The owner of the propoery or site is refered to as the OWNER. Acceptance of this price quotation is considered acceptance of these terms and conditions.

Quotation: Unless otherwise stated in the quote, this a time and materials estimate. Actual quantities used will be invoiced according to the unit price rate in the quote and quantities provided and used. Acceptance of this quotation and notice to proceed includes acceptance of VISTA's Terms and Conditions by the CLIENT. A deposit or mobilization advance payment may be required for some projects depending on credit terms with the CLIENT. Pricing in this quotation is valid for 90 days.

Insurance: VISTA carries a $5,000,000 liability insurance policy which includes **general, pollution and professional liability** at those limits. Workers compensation insurance and liability insurance certificates can provided upon request naming the CLIENT or property owner as additionally insured. A certificate of insurance can be provided upon request.

Utilities: VISTA will not drill on a location without a completed and current utility locate. Call the national Utility Notification Center (UNC) at 811 to obtain public utility clearance. Most services requires at least 48 hrs notice prior to the date of drilling, and longer times are generally required to arrange for on-site appointments, which may be required. If the property includes private utilities, on private property may require a private locater. Unless noted in the proposal, VISTA is not responsible for private locates. If provided drilling locations, VISTA will obtain clearance and/or meet with utility locators for a fee. When calling in locates, add VISTA's name to the ticket. Vista is not responsible for damage due to improperly or unlocated utilities or subsurface obstructions. Locates can be called in under VISTA's name with the contact person being the CLIENT's field contact for providing site information or conducting on site locates. Any unanticipated time for VISTA to meet with utility locators on site will be invoiced to CLIENT at standard rates.

Licensing, Test Holes & Monitoring Wells: John Fontana, owner of Vista GeoSciencel, is an NGWA certified well driller (CWD). Vista is licensed/authorized to drill test holes or install monitor wells in CO, KS, NE, NM, OK, SD, and UT. VIsta may also be authorized to drill test holes or install monitor wells in states were licensing is not required for the type of dequipment we use or the type of boring being drilled. In any case, Vista will always use best practices as a where other reporting rules apply, including pluggin and abandoning test holes in states where licensing may not be required. If VISTA is contracted by the CLIENT to work on sites in other states, the CLIENT must inform VISTA if additional licensing is required.

Daily Reports and Notifications: VISTA will provide the clients on-site representative daily field reports of all activities, time and materials used on the site including notification of any drilling issues, lost tooling or damages occurred during the day. The client will be required to sign the daily report, and can comment on any information provided on the report if so desired, and a copy of the report is provided at the end of the day or shift. Crews also maintain field notes which are available upon request after the project is completed.

Health & Safety: For environmental site services, VISTA employee's will have current OSHA certifications required for Hazardous Waste Operations (HAZWOPER) according to CFR 1910.120 and can provide current certification documents and required medical monitoring documents. VISTA maintains a general health and safety plan (HASP) and standard operating procedures (SOP) for its typical operations. A site specific HASP is required for HAZWOPER operations and is the responsibility of the site owner, or site owners representative, to provide a site specific HASP and monitoring. VISTA can provide a site specific HASP if the client is able to provide VISTA with all required information regarding site specific and operational hazards for an additional charge, if not already included in this price quote and agreement. VISTA's on site staff will hold daily "tailgate" safety meetings at the start of each work day on site in cooperation with the CLIENT's on site staff and will document such meetings.

Right to Stop Work: VISTA employee's and the CLIENT's on site representative have the right top call a STOP WORK order if any party feels that any task or operation is a health or safety risk or that damage to any equipment or property may occur.

USDOT & FMCSA Regulations: VISTA is classified as a USDOT (#1725329) interstate carrier and follows all US Department of Transportation Regulations and the Federal Motor Carriers Association Rules and operates under US DOT number 1725929. All commercial vehicle operators are trained on the commercial driving rules and those driving vehicles over 26,000 lbs GVW have a commercial drivers license. Most VISTA drivers have air-brake and tanker endorsements, but not Hazardous Materials endorsement. Therefore, VISTA is not permitted to transport hazardous cargo over DOT limits. It is understood by both that crews operating on sites mobilized away from our home office may be required to take 24 hour rest periods to continue operation of commercial vehicles on public roads according to FMCSA rules. Per diem and/or standby charges may apply.

Site Conditions, Tool & Equipment Damages: VISTA does not charge for normal wear and tear of tooling or equipment or breakage of work tooling or equipment. However, if site conditions are such that abnormal breakage occurs to tooling or other equipment, charges for such damage will be included in the invoice for replacement of such tooling and equipment. VISTA's on site representative will notify the CLIENT's on site representative if such damage is anticipated based on initial work on the site, or it if occurs on the site, and such damage will be noted with site conditions on the Daily Field Services Report.

Investigation Derived Waste (IDW): Any IDW gernerated from proposed drilling or remediation activities is the property and responsibility of the OWNWER, or OWNER's representative (CLIENT), and will be containerized and left on site for proper characterization and disposal by the CLIENT or OWNER, per State and Federal regulations, unless otherwise stated in this cost proposal. VISTA will not take possession of any IDW.

Invoicing & Payment Terms: Invoices are sent either after project completions, at the end of a task or PO order, or at two week intervals on longer projects. Payment is due in Net 30 days from invoice date unless otherwise stipulated in this quote or an overriding contract or agreement. A mobilization advance payment/deposit may be required for some projects depending on credit terms with the client. Late payments will accrue interest at 2.0% per month finance charges accruing from the original invoice date. Any additional cost incurred on past due invoices will be added to the amount due including but not limited to collection agency fees, attorney fees and court fees. CLIENT will follow all State prompt payment laws regarding payment for work completed.

Vista Quote #: 21275.01 REV2; Direct Push PetroFix Injections

NOTES REGARDING COLORADO (DNR-DWR-BOE) WELL CONSTRUCTION RULES:

The following information is provided for convenience based on the recently revised Rules and Regulations for Water Well Construction, Pump Installation, Cistern Installation, and Monitoring and Observation Hole/Well Construction (2 CCR 402-2) in effect as of September 1, 2016.

Unless otherwise stated in this proposal, Vista GeoScience assume the CLIENT is responsible for filing all Notice of Intent forms, Permits, Well Construction and Abandonment forms as required by these rules. Note that most borings installed by direct-push our light augers are defined as Monitoring/Observation Holes, and require a Notice of Intent if temporary (<18 months) or a Permit if they are permanent (>18 months). Since Vista does not drill into confined bedrock aquifers, all supervision, notices, permits and state reports can be signed by an "Authorized Individual" (Professional Geologist or Registered Professional Engineer). Upon request, Vista can perform these duties for an additional fee.

The 2016 Rules are currently posted on the BOE Rulemaking Webpage. The web page includes documents highlighting some of the changes from the previous version of the rules: http://water.state.co.us/groundwater/BOE/Pages/BOERules.aspx

The revised Rules generated the need to revise many of the forms related to construction, pump installation, testing and abandonment. The following forms have been revised and will be available on the Division of Water Resources website: http://water.state.co.us/DWRDocs/Forms/Pages/FormsHome.aspx

The Denver (DWR) Office can no longer receive incoming faxes. You may scan and email permit applications and completed forms to dwrpermitsonline@state.co.us. Some forms are available as fillable Adobe Acrobat pdf documents; when completed these can be attached to an email and sent to: dwrpermitsonline@state.co.us.

Requests for Well Construction Variances can be made by visiting the Variances, Waivers, and Notifications Webpage, http://water.state.co.us/groundwater/BOE/Pages/VariancesWaivers.aspx .

Notice of Intent: In accordance with Rule 6.3 of the Water Well Construction Rules (2 CCR 402-2) (Rules) and the requirement of the State Engineer, Notice of Intent (Notice) must be provided before drilling any Test Hole that penetrates a confining layer and any Monitoring and Observation Hole or Dewatering Well. Notice is accomplished by submitting Form GWS-51(Monitoring and Observation Holes), or Form GWS-62 (Dewatering Wells), to the Division of Water Resources at least three (3) days and no more than ninety (90) days prior to construction.
All Monitoring and Observation Holes and Dewatering Wells must be constructed within 90 days of the receipt of the Notice by the State Engineer's office. Multiple Notices may be filed for projects that require the installation of wells over more than one 90-day period.
There is no limit to the number of boreholes that may be drilled in a section for which the notice is submitted. Drillers must not drill more boreholes than indicated on the Notice of Intent. Notice must be provided for each section in which a borehole will be drilled.

Test Hole: Pursuant to Section 37-91-102(15.7), C.R.S., a Test Hole is a ground penetration for the purpose of geotechnical, geophysical, or geologic investigation or collecting soil or rock samples. Test Holes that penetrate through a confining layer must submit proper Notice of Intent before drilling and may only be constructed by a licensed contractor. Test Holes must be plugged, sealed, and abandoned upon completion of the intended purposes of the test hole in accordance with the Water Well Construction Rules (2 CCR 402-2). An abandonment Report (Form GWS-9) must be submitted within sixty (60) days after abandoning any Test Hole that penetrates through a confining layer. Any borehole constructed or used for environmental groundwater investigations, or repeated groundwater observations, measurements, or samplings is a monitoring and observation hole or well, not a test hole, and may only be constructed under a notice of intent or well permit.

Monitoring and Observation Hole (Temporary): Pursuant to Rule 5.2.31 of the Water Well Construction Rules (2 CCR 402-2) (Rules) and the requirements of the State Engineer, Monitoring and Observation Holes are temporary wells constructed after proper Notice of Intent and in accordance with the Rules' standards for construction. A Well Construction Report (Form GWS-31) referencing the acknowledged monitoring hole notice number must be submitted within sixty (60) days after constructing the hole.
Within eighteen (18) months of construction, Monitoring and Observation Holes must either be converted to a well by obtaining a permit for a Monitoring Well, Recovery Well, or Dewatering system or abandoned in accordance with the Rules. If abandoned, a Well Abandonment Report (Form GWS-9) must be submitted within sixty (60) days after abandoning the hole.

Monitoring and Observation Well (Permanent): Monitoring and Observation Wells, pursuant to Section 37-91-102(10.5), C.R.S., are ground penetrations for the purpose of "locating such well, pumping equipment or aquifer testing, monitoring ground water, or collection of water quality samples".
A Monitoring and Observation Well may be converted from an existing Monitoring and Observation Hole or by constructing the well after obtaining a permit. Monitoring and Observation Well permits are issued pursuant to 37-92-602, C.R.S., and may be obtained by submitting a Monitoring and Observation Well Permit Application (Form GWS-46).
Monitoring and Observation Wells converted from Monitoring and Observation Holes may only be permitted for the uses allowed for exempt monitoring wells in 37-92-602(1)(f), or 37-90-105(4)(a), C.R.S. or may be converted, by permit, to a Recovery Well or Dewatering System.
Monitoring and Observation Wells must be constructed either in compliance with or with an approved variance to the Water Well Construction Rules (2 CCR 402-2) (Rules). A Well Construction Report (Form GWS-31) must be submitted within sixty (60) days of completing the well. When the well is abandoned, the abandonment must be performed in accordance with the Rules, including the submission of a Well Abandonment Report (Form GWS-9) within sixty (60) days after abandoning the well.

RCRA and CERCLA Wells: Base on a memorandum (Guideline 2009-1) by the Colorado DNR-DWR, wells constructed under RCRA still require the same notice and permits as all other wells. However, wells constructed under CERCLA (Superfund) or both, are exempt from filing a notice or permit.

Please see Standard Terms & Conditions on Following Page

8 STATEMENT OF QUALIFICATIONS

(Attachment)

Vista GeoScience

Expert Environmental Support Services for
Advanced Site Characterization &
Optimized In-Situ Remediation

Statement of Qualifications

Rocky Mountain Region
PH: (303) 277-1694

Vista GeoScience
www.VistaGeoScience.com

Gulf Coast Region
PH: (281) 310-5560

Table of Contents

1 SUMMARY LIST OF CAPABILITIES

As leaders in the industry, the staff at Vista GeoScience has successfully served our client's evolving needs for environmental site characterization and remediation services since 1986. As the demands, costs, and challenges of your environmental investigation and remediation projects increase, we strive to continuously adapt and improve the diverse knowledge, skills, and abilities of our team to compliment the latest technologies and methods we use on your projects. This enables us to provide you with the most effective services available to make your job run smoother, on time, and on budget. In other words, *your* project goals become *our* project goals.

1.1 Dual-Technology Direct Push & Auger Combo Drilling Rigs

- **Geoprobe® Models** – 7822DT, 7730DT, 7720DT, 6610DT, 54DT & Limited Access Probes
- **Continuous Soil Coring using Dual-Tube Systems**
- **Screen-Point Groundwater Sampling** & Pneumatic Slug Testing
- **Monitor Well** Installation and Abandonment
- **Soil Gas** Active Sampling, Profiling and Monitoring Installations
- **Solid Stem and Hollow Stem Augering**

1.2 High Resolution Site Characterization (HRSC) & Subsurface Imaging Systems

- **4WD Carrier** Vehicles
- **Optical Interface Profiler** (OIP-UV and OIP-G) for NAPL Fluorescence Sensing with HPT and EC
- **Membrane Interface Probe** (MiHPT) **–** Combined Membrane Interface Probe (MIP) with HPT and EC
- **Hydraulic Profiling Tool** (HPT)
- **Electrical Conductivity** (EC)
- **HPT-GWP & HPT-GWS** – Groundwater Profiler/Sampler (discrete sampling with HPT)
- **3-D Data Visualization** with Data Interpretation and Conceptual Site Modeling

1.3 Soil Gas Specialists:

- **Active Soil or Passive Soil Gas** Sample Collection, Single or Nested Monitor Wells
- **Gas Migration Surveys** (methane or natural gas)
- **Landfill Tier-2 NMOC** Gas Sampling & Testing (Method 25C)
- **Hydra-Vac** (Potholing and Utility Daylighting)

1.4 Optimized In-Situ Remediation Design Support:

- **ISCO, ISCR, and ISBR Injections** – Low & High Volume Applications, Liquids, & Slurries
- ***Clean-Inject* Remediation System & Surgical Injection Tooling**
- **Environmental Hydraulic Fracturing:** Treatment Injections and SVE Systems.
- **Remedial Design Characterization** (RDC) Support Services
- **Collaborative** Treatment Selection and Design.
- **Optimized and Adaptive Field Applications**
- **Approved Installer** for all types of in-situ remediation products.

1.5 Specialized Laboratory Services: (Through our Partners)

- **Certified Mobile Laboratories**
- **TO-17 VOC analysis** of Sorbent Tubes for low level Air or Soil Gas
- **Passive Soil Gas Analysis** of VOCs (TO-17/8260)

2 SAFETY TRAINING AND OTHER PROGRAMS

2.1 General Company and Staff Qualifications

- Corporate and staff experienced since 1986
- Operated the first Direct Push, Mobile Laboratory Environmental and In-Situ Injection Services in the Rocky Mountain Region.
- Previously Operated as or DBA: Direct Geochemical, Global Environmental Consultants Inc., TEG Rocky Mountain, ESN Rocky Mountain.
- Small Business Enterprise classification under NAICS #562910
- Denver Certified Small Business Enterprise (SBE)
- All Field Staff are OSHA 1910.120 HAZWOPER 40HR certified
- Medical Monitoring compliant with OSHA 1910.120 HAZWOPER 40HR certified
- Respirator Fitness and Fit Testing compliant with OSHA 1910.134
- Fully compliant with all US-DOT regulations,
- Most staff and rig operators hold a Class A CDL.
- USDOT# 1725329
- USDOT Medical Clearance 29 CFR 391.41 - 391.49
- Comprehensive 3rd party (DISA) Drug and Alcohol Testing Program
- Background checks and annual MVR Review

2.2 3rd Party Auditing Services & Memberships

- PICS
- ISNetworld
- Avetta
- NCMS
- DISA (drug and alcohol)
- Gold Shovel Standard Certified

2.3 Training Programs

- Vista H&S Plan & Program Orientation
- Driller Safety Plan
- PEC (SafeLand, SafeGulf) Certification
- Loss Prevetion System (LPS) Certification
- DISA Drug & Alcohol Supervisor Training
- Class A Commercial Driver's License, FMCSA training
- USDOT/TSI Driver's Guide to Hours of Service
- USDOT/TSI Driver's Guide to Inspection Requirements
- Various Railroad Training
- Forklift Safety
- Hearing Conservation
- Personal Protective Equipment (PPE)
- Hazard Communication
- Confined Space Awareness
- First Aid, Bloodborne Pathogens
- Asbestos Awareness

3 LICENSES, CERTIFICATIONS, MEMBERSHIPS

3.1 Professional Geologists

John Fontana, President & CEO, is an AIPG Certified Professional Geologist (CPG) and NGWA Certified Well Driller.

3.2 Drilling Licenses/Bonds

- Nebraska #39414 (driller & pump installer)
- Kansas #727
- South Dakota #718,
- Oklahoma DPC-#0788, OP-#1758
- New Mexico WD-#1790
- Texas #55014M
- Utah #

3.3 City Contractor Licenses/Bonds

Vista holds numerous local city and county licenses for work in right of way areas.

3.4 Member RPI Group

Vista GeoScience is an Approved Installer of BOS200®, BOS 100®, and Trap & Treat® Remediation Products.

3.5 Interstate Technology Regulatory Council (ITRC)

Industry Affiliate Partner and Guidance Document Participant

3.6 Remediation Patents; U.S. Patent No's 5570973, 5626437, 5773067

Where hydraulic fracturing is required for emplacement of treatments in tight soils or bedrock formations, the referenced patents may apply. Vista GeoScience holds a master licensed to hydraulic fracturing services for in-situ remediation and can legally indemnify the site owner and prime contractors against any legal action regarding these patents. At the current time, Vista GeoScience is the only licensed holder of this patent in the region. A copy of the license and patent documents is available upon request.

4 INSURANCE

Vista maintains $6,000,0000 coverage in General, Pollution and Professional, Liability Insurance. Sample certificates are attached upon request and will be mailed, faxed or e-mailed directly to the client or site owner from our insurance company as requested.

5 KEY TECHNICAL STAFF SUMMARY

Vista maintains a diverse, well qualified trained staff of scientists, professional geologists, engineers, and technicians, including several veterans with previous military experience. Following is a list of senior and key staff in Vista's environmental field services division along with a brief resume of their related experience:

5.1 John Fontana, CPG, CWD, President & CEO

John is an AIPG Certified Professional Geologist and NGWA Certified Well Driller with over 35 years of experience, and over 25 years of experience in the operations and management of environmental soil and ground water investigation and in situ remediation services. John manages the largest fleet of Geoprobe® drilling rigs, HRSC, and custom remedial injection equipment in the Rocky Mountain region and was among the first to implement these technologies in the region. He oversees the development of new methods, tools and procedures for the application of site investigation and in-situ remediation technologies while assisting with the design of complex remediation projects. He has authored over 100 presentations and papers on these subjects including presenting full day workshops at the Battelle International Conferences on Remediation of Chlorinated and Recalcitrant Compounds. He is also experienced in HRSC log interpretation, statistical analysis of environmental and geochemical data including forensic and fingerprinting techniques, and 3D data modeling and visualization techniques. John has also been served as an expert witness in cases involving fugitive migration of natural gas and was recently appointed to serve as a member of EPA's Science Advisory Board (SAB) - Hydraulic Fracturing Research Advisory Panel. As an active member on two ITRC teams, he contributed to writing guidance on Implementing Advance Site Characterization Technologies and In-Siu Remediation Injection Strategies.

Education: BS Geology, Oceanography & Physics, Humboldt State University, Arcata, CA, 1981.

Professional Certifications & Licenses:

- AIPG Certified Professional Geologist CPG #11985
- NGWA Certified Well Driller CWD #122070
- Authorized Individual for installing monitoring wells and test holes in the State of Colorado.
- Licensed water well driller in: Kansas (#727), Nebraska (#39414), New Mexico (WD-1790), Oklahoma (DPC #0788, OP #1758), South Dakota (#718), Utah (#923).

Safety Training & Certificates:

- Geoprobe Direct Imaging System Training (MIP, HPT, MiHpt, LL-MIP, EC, OIP, etc.)
- OSHA HAZWOPER 40 hour, 8 hour refresher, Supervisor training
- PEC Basic Orientation, Loss Prevention System (LPS) Certification, H_2S, CPR & First Aid

Previous Experience:

- ESN Rocky Mountain (TEG Rocky Mountain); Vice President; 1996-2006
- Direct Geochemical Inc.; President - Geochemist 1986-1996
- Detex/GC Company; Geologist and Analytical Geochemist, 1984-1986
- Analex & GX Consultants; Consulting Geologist, Mudlogger 1981-1984

Professional Affiliations

- American Institute of Professional Geologists (AIPG)
- American Assoc. of Petroleum Geologist (AAPG); Div. of Environmental Geosciences Charter Member & Energy Minerals Div. Member
- Colorado Hazardous Waste Management Society (CHWMS) (served as President, Treasurer)
- Colorado Ground Water Assoc. (CGWA)
- Colorado Water Well Contractors Assoc. (CWWCA)
- National Ground Water Assoc. (NGWA) Assoc. of Ground Water Scientist & Engineers Div.
- Rocky Mountain Assoc. of Geologist (RMAG)
- Rocky Mountain Assoc. of Environmental Professionals (RMAEP)
- Solid Waste Assoc. of North America (SWANA) (Rocky Mountain Chapter)
- Society of American Military Engineers (SAME) (Denver Metro Post)
- American Assoc. of Petroleum Geochemical Explorationists, Former Secretary and Treasurer

5.2 Peter Wethington – Field Operations Manager; Remediation Specialist, Subsurface Imaging Specialist, Environmental Engineering Geologist

Peter joined Vista GeoScience after graduating from the Colorado School of Mines with a B.S. in Geological Engineering in the spring of 2017. During his time here, Peter has become highly specialized in the design and implementation of remediation injections. He gained extensive hands-on experience and in-depth knowledge of Subsurface Imaging Systems, Direct Push and Auger drilling, well installations, and brings dynamic teamwork when it comes to assessing projects. Peter is a highly skilled mechanic making it essential to keeping projects on their forecasted timelines. He is able to reduce any unforseen drilling system downtimes by overseeing proper maintenance of equipment and is reliably skilled when it comes to 'on- the-fly' field fixes. In addition to his exceptional service in the field, he manages Vista's field operations, interprets data to create site specific designs and project summary reports, while promoting client-based teamwork from proposal phase to closure.

Education: BS Geological Engineering, Colorado School of Mines, Golden, CO

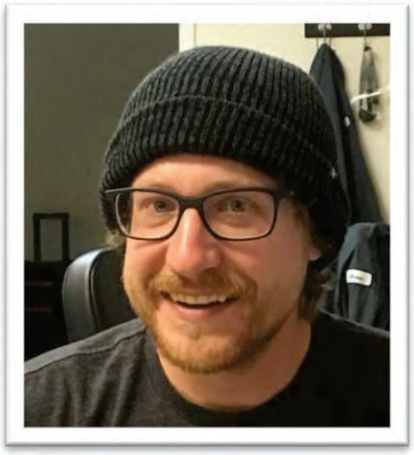
Certifications and Safety Training

- OSHA HAZWOPER 40 and 8 hour
- CPR and First Aid
- H2S awareness
- PEC Basic Oridentation, Safeland, Safegulf
- Loss Prevention System (LPS) Certification
- Kinder Morgan safety training
- BNSF contractor, Railroad Security Awareness
- Roadway worker protection
- Fork lift safety/operation training
- Class A Commercial Driver's License
- Railroad Contractor Saftey training for all North American railways
- Gold Shovel Certification
- Fork lift safety/operation training

Field Experience

- In-Situ injection of Slurries, Oxidants, and Biologic Reagents, DHC and many more
- Geoprobe Direct Imaging System Experience (MIP, HPT, MiHpt, LL-MIP, EC, OIP, etc.),
- Direct-Push Drilling, Hollow Stem Auger Drilling
- Hydro-Vac Utility Clearance
- Dual-Tube Coring & Soil Sampling
- Discrete groundwater sampling using Screen-Point Samplers
- Monitoring well installation/abandonment
- Soil Gas Sampling, Sub-slab, Tier-2 Landfill Surveys
- Hydraulic Fracturing and Permeability Enhancement

5.3 Theodore Stockwell – Field Operations Manager; Environmental Geologist/Direct Imaging Specialist



Ted Stockwell arrived at Vista Geoscience in 2016 bringing previous experience as a Wellsite Geologist, Geospatial Operator, and has brought remarkable skills and knowledge in Geotechnical Engineering. Since joining Vista Geoscience, Ted has become highly proficient at operating our High Resolution Site Characterization systems, Direct Push drilling services, Solid and Hollow Stem Augering, Soil Gas Sampling services, and Remedial In Situ Injection projects. Having completed numerous Phase II Landfill sampling projects in ID, MT, WY, CO, AR, TX and NM, Ted is highly experienced in sampling landfills in unique geographical conditions. He has not only led injection events utilizing different pumps with a variety of remediation products, but has also led multiple HRSC (MiHPT, MIP, OIP) projects. Ted's intense knowledge on and off the field now lends support in team building efforts with clients through project planning, project oversight, and client satisfaction with overall jobs.

Education: BS Cum Laude Geology; Northern Illinois University, DeKalb, IL

Geoprobe Direct Image Training - Certified On:

- Membrane Interface Probe (MIP), Low Level MIP, MiHpt Combined Tool
- Hydraulic Profiling Tool (HPT), Electrical Conductivity (EC),
- Optical Image Profiler (OiHPT-UV) (LNAPL Fluorescence Tool)
- FID, PID and XSD Detectors, Instrumentation and Tool Troubleshooting

Certifications and Safety Training

- Class A Commercial Driver's License
- OSHA HAZWOPER 40
- PEC Basic Oridentation, Safeland, Safegulf
- Loss Prevention System (LPS) Certification
- ISNetworld Kinder Morgan safety training
- Site Supervser Training
- H2S awareness
- Class A CDL
- CPR and First Aid
- Gold Shovel Certification
- Fork lift safety/operation training

Field Experience

- Direct-Push Drilling, Hollow Stem Auger Drilling
- Hydro-Vac Utility Clearance
- Dual-Tube Coring & Soil Sampling
- Discrete groundwater sampling using Screen-Point Samplers
- Monitoring well installation/abandonment
- Soil Gas Sampling, Sub-slab, Tier-2 Landfill Surveys,
- Hi-Resolution Site Characterization (OiHPT, MiHPT, LL-MiHPT, HPT/EC)
- In-Situ injection of Slurries, Oxidants, and Biologic Reagents, DHC

5.4 David Fontana – Environmental Scientist, Direct Imaging Specialist, H&S Proctor

Mr. Fontana has been working with Vista GeoScience since his graduation from Colorado State University, where he studied Biological Sciences. While working with Vista GeoScience, he has become highly proficient in Direct-Push Drilling and Auger technologies including soil, groundwater and soil gas sampling technologies, . In-Situ remediation technologies and techniques, and has successfully completed remediation projects utilizing PersulfOX, Advanced Oxygen Release Compound (ORC-Advanced), BOS 200, Emulsified Vegetable Oil (EVO), and 3DME, among others. Mr. Fontana is also experienced and certified with Geoprobe Direct Imaging technologies including the Membrane Interface Probe, Optical Image Profiler. Hydraulic Profile Tool, and Electrical Conductivity, Macro Core, and Dual Tube sampling technologies. As Vista GeoSciences' Health and Safety Proctor, Mr. Fontana is familiar with all MSDS's for the products and chemicals that Vista GeoScience uses, and is also aware of other products offered by our remediation vendors. As a Field Service Technician, he also has valuable experience in well installation and abandonment, and is one of Vista Geoscience's most experienced Tier II Landfill Gas Sampling Technicians.

Education: BS Biological Sciences, Colorado State University, Fort Collins, CO

Geoprobe Direct Image Training - Certified On:

- Membrane Interface Probe (MIP), Low Level MIP, MiHpt Combined Tool
- Hydraulic Profiling Tool (HPT), Electrical Conductivity (EC),
- Optical Image Profiler (OiHPT-UV) (LNAPL Fluorescence Tool)
- FID, PID and XSD Detectors, Instrumentation and Tool Troubleshooting

Safety Training & Certificates:

- Class A CDL with Tanker Endorsement
- OSHA HAZWOPER 40 hour, 8 hour refresher, Supervisor training
- CPR and First Aid trained ans certified
- PEC Basic Orientation, Safeland, Safegulf
- ISNetworld Kinder Morgan safety training
- Loss Prevention System (LPS) Certification
- Forklift Operator Certified
- GeoProbe Operator Training
- Railroad contractor saftey training for all North American railways

Field Experience

- Direct-Push Drilling, Hollow Stem Auger Drilling
- Hydro-Vac Utility Clearance
- Dual-Tube Coring & Soil Sampling
- Discrete groundwater sampling using Screen-Point Samplers
- Monitoring well installation/abandonment
- Soil Gas Sampling, Sub-slab, Tier-2 Landfill Surveys,
- Hi-Resolution Site Characterization (OiHPT, MiHPT, LL-MiHPT, HPT/EC)
- In-Situ injection of Slurries, Oxidants, and Biologic Reagents, DHC

6 IN-SITU REMEDIATION TECHNOLOGIES OVERVIEW

An Experienced Provider

Due to the recent invention of many in-situ treatment chemicals and bio-amendments, *In-Situ Remediation* methods have replaced Ex-Situ methods at many sites. These methods include *In-Situ Chemical Oxidation (ISCO), In-Situ Chemical Reduction (ISCR), In-Situ Bio-Remediation (ISBR), Surfactant Flushing*, or a combination of multiple methods. *Vista GeoScience* conducted the first chemical injections in the Rocky Mountain region in the early 1990's and has conducted in-situ projects from coast to coast ever since. Most recently, Vista acquired the *Clean-Inject*® mixing and injection system which has improved slurry reagent injections in most types of lithology with precise high-pressure placement, greatly increasing the effectiveness of all in-situ treatments. Working closely with our clients and vendors, we also provide expertise in characterizing the site specifically for in-situ remediation and design of the remediation program.

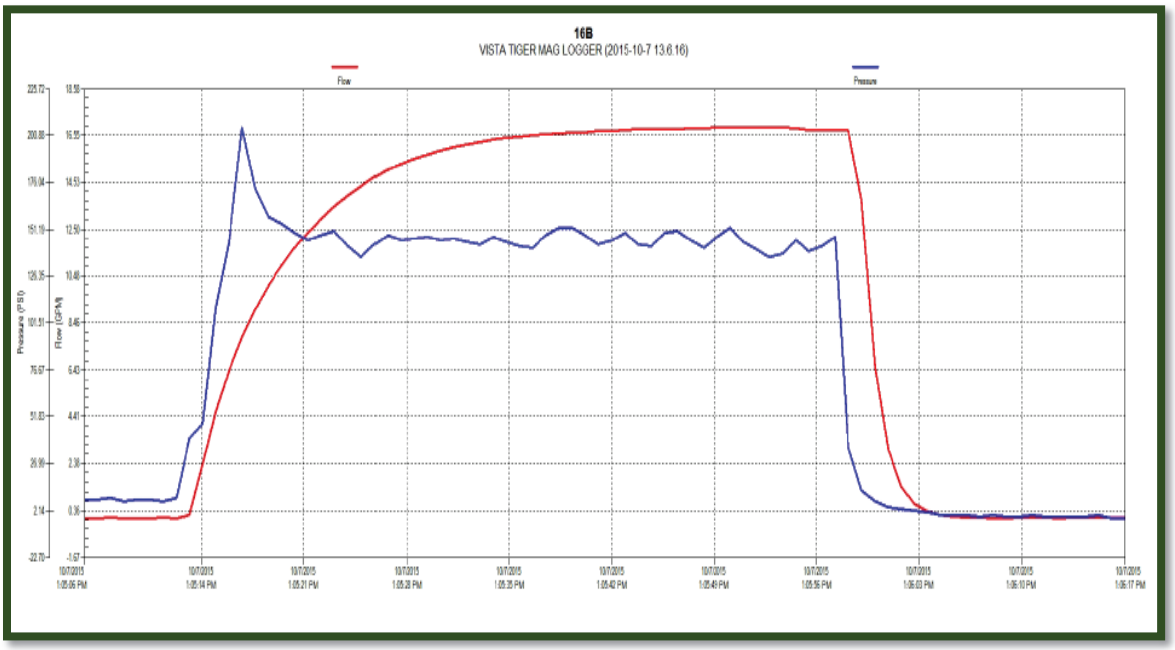
Vista does not sell or endorse any specific remediation product, but is experienced with the delivery and injection of all types of products and the different systems required to apply them including: *activated carbon, persulfates, permanganates, oxygen supplements, emulsified oils, lactates, nutrients, peroxides, iron (ZVI) slurries, and bacteria augmentation*, just to name a few.

Custom Mixing, Pumping, and Delivery Systems

Vista found out early on in the injection business that a wide variety of product types and site conditions requires a wide variety of injection system designs. Pump and mixing system design vary greatly depending on the volume required, injection pressures, corrosivity or reactivity of the product, viscosity, etc. Therefore, we offer many types of pumps with pressure ratings ranging from 150 to 2000psi, and flow rates from 2 to 50 gallons per minute. Any number of portable mixing tanks can be arranged on support trucks and trailers, or setup on the site itself, depending on the access and logistical requirements at a given site. Our systems are designed to be flexible and can accommodate the varied site conditions and access issues we may encounter.

Vista has re-designed injection tooling and application methods resulting in improved vertical and lateral distribution of the treatment compounds, resulting in better contact with the contaminants. It's a Contact Sport! A wide variety of Direct-Push Technology (DPT) delivery systems are available to inject at depths up to 150'. In tight soils or bedrock formations where hydraulic fracturing is required, we use DPT or open boreholes with Straddle-Packer Technologies and *hold* a *license to provide these patented methods*. Our experienced staff can advise you on the advantages of *Bottom-Up or Top-Down methods*, helping to determine which will provide the best product contact and what parameters are critical to the success of the application. In cases where re-injection is anticipated, we may also recommend installing *permanent injection wells*, discrete or nested, PVC or steel construction.

Real-Time Pressure and Flow monitoring instruments are included on all injection systems to monitor performance and subsurface behaviors of the injection.



7 CLEAN-INJECT™ REMEDIATION SYSTEMS

Self-Contained Slurry Mixing and High Pressure Injection System

Our ***Clean-Inject® System*** provides a self-contained powerful mixing and injection system for many types of powdered reagents, such as activated carbons, oxidants, and other materials that require suspended slurry and precise injection methods in order to optimize their performance. Super sacks of reagents can be used and are pumped directly into the mixing tank eliminating unnecessary exposure to personnel and the surrounding property.

When combined with our **Surgical Injection Tooling**, this cost saving system allows precise placement of most slurry material at narrow depth intervals. High pressure and high flow rate pumps can overcome formations of all types from tight clays and claystone bedrocks to loose unconsolidated sands and gravels that are common problems for other types of pumping systems typically used for slurries. The injection tooling and methods have also been optimized to reduce surfacing, keeping material in the contaminated and saturated formation where it is needed.

Clean Inject System Specifications	
Injection flow rate	Up to 35 gallons per minute
Injection pressure	Up to 1,200 psi
Pump type	5 diaphragm, positive displacement
Injection pump horsepower required	30 hp, variable frequency drive; 0-1150 rpm
Pump compatibility	Stainless steel with Viton diaphragms
Blended injectate measuring	Float system
Mixing tank	200 to 300 gallons, stainless steel
Bulk carbon handling	1,000 lb. super sacks
Powder weighing system	Load cell, 5000 lb. capacity, 0.1 lb. accuracy
Mixing tank additive provisions	18" manway + liquid additive (oxidizers, nutrients)
On-board fresh water storage	500 gallon
Fresh water transfer rate	50 – 80 gpm
Fresh water inlet	3/4" threaded water supply or 2" camlock
Fresh water filtration	Y strainer, mesh straining element
Bulk powder transfer system	Double diaphragm
Dust suppression system	Clean-Inject® proprietary, e-type, passive vent
Water supply requirements	≥ 10 gpm (recommended)
Power requirements	70 kva, 460 volt, 3-phase
On-board compressed air supply	7.5-10 hp screw or reciprocating compressor
On-board fresh water wash down	50-80 gpm
Operating environment	All conditions: rain, freezing, wind, snow

With top-down injection methods, the amount of material injected can be varied by as tight as one foot intervals from the top of the contaminated interval to the bottom utilizing expensive reagents more efficiently and ensuring their effectiveness. Combined with better Remedial Design Characterization (RDC) and best the practices, treatment placement and coverage is now Optimized.

8 HYDRAULIC FRACTURING REMEDIATION

U.S. Patents 5570973, 5626437, 5773067

Why would I need Hydraulic Fracturing?

Are you having trouble reaching your clean-up levels? Are tight soils/bedrock causing poor air sparging (AS), or are soil vapor extraction (SVE) results prohibiting closure? Is inadequate contact and retention time between remedial fluids and contaminants slowing the closure process at your sites? Then *hydraulic fracturing* may be the technology for your site.

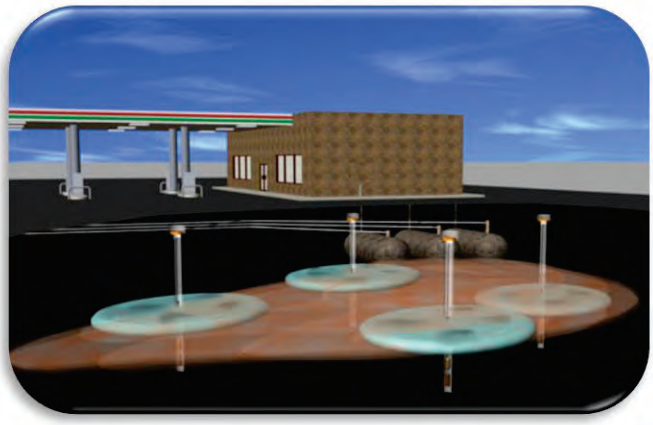
Hydraulic fracturing is a proven and patented technology where combinations of slurried proppants, chemical treatments, or bio-amended solutions are injected into tight soils and bedrock under high pressures for the purpose of creating fractures. Creation of such fractures increases permeability, enhances the distribution and contact of remedial solutions, and is used extensively for In-Situ Chemical Oxidation (ISCO), Chemical Reduction (ISCR), and Bio-Remediation (ISBR), and SVE applications. Once created, the fractures are held open with a variety of proppants such as sand or a more porous synthetic material which also act as a host for various bacteria.

Vista GeoScience staff was the first in the Rocky Mountain area to provide hydraulic fracturing services in the 1990s, and currently holds a license to hydraulically emplace fractures for remediation. Vista is experienced at injecting a wide variety of products into these fractures, including permanganates, chemical oxygen enhancers, lactates, peroxides, ZVI-slurries, EVO-emulsions, and bacteria suspensions.

Customized Fracturing Equipment & Real-Time Monitoring Systems

Different geology, contaminants, and treatment solutions require a wide variety of fracturing and proppant injection system design. Depending on these variables, Vista implements various fracture techniques, and utilizes progressive cavity pumps, piston pumps, diaphragm pumps, and mixing systems.

Vista offers real-time monitoring during the creation of each fracture. Our system allows the engineer the ability to map and control propagation of the fracture while simultaneously plotting the fracture position with time. This is especially critical when fractures are emplaced underneath residential/commercial sites and where determination of effective ROIs is necessary for full-scale remedial designs and regulatory concurrence.



9 DIRECT-PUSH TECHNOLOGIES

9.1 Dual-Technology Direct Push & Auger Combination Rigs

- **Geoprobe** (7822DT, 7730DT, 7720DT, 6610DT)
- **High-Tech, High Frequency** DPT hammers
- **150' Sampling Depths**
- **48,000 lbs of pull-back**
- **4,000 ft-lb Augers**
- **Small foot-print** with large capabilities
- **Heavy Duty DPT push-rod,** 1.5"–3.5"
- **Hollow Stem Auger** 3.25" - 4.25" ID
- **Solid Stem Auger** 3.5" - 4.5"
- **Angle Drilling** up to 45 degrees

9.2 Limited Access & Medium Duty DPT Rigs

- **Track Mounted** Rigs, Geoprobe 54DT
- **Dolly Mounted** for tight indoor areas & horizontal drilling
- **Ideal for** soil gas, shallow sampling, tight access areas, or inside buildings/basements

9.3 Specialized Tooling & Applications

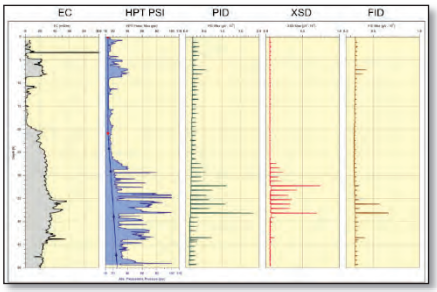
- **Ground Water:** Grab, Discrete, and Profiling
- **Soil Coring:** Dual-Tube Cased Continuous & Discrete coring, up to 2.6" diameter core
- **Soil Gas:** Post-Run Tubing (PRT), Vertical Profiling
- **Nested Vapor Wells:** (Up to 150')
- **Monitoring Wells:** Install 0.5" to 2.0" monitoring, SVE, soil gas, discrete or nested
- **Pre-Packed Well Screens:** 0.5" to 2"
- **Injection Tooling:** Top-Down Surgical Injections
- **Packers** for Hydraulic-Fracturing/Injection
- **High Pressure/High Flow Pumps**

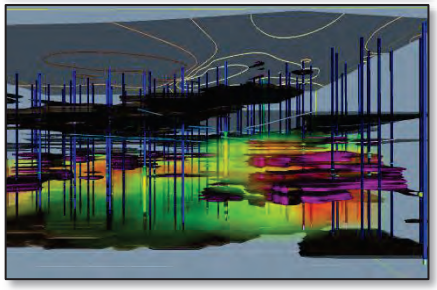
9.4 In-Situ Measurements

- **Membrane Interface Probe** (MIP/MiHPT)
- **Optical Image Profiler** (OIP-UV and OIP-G)
- **Tier-2 Landfill Testing:** NMOC Soil Gas
- **Cone Penetrometer**
- **Natural Gamma Ray:** SlimLine™ tool
- **Portable GCs** or Field Instrumentation
- **Real-Time Soil Gas Testing**

10 HIGH-RESOLUTION SITE CHARACTERIZATION (HRSC)

Vista GeoScience owns the latest versions Geoprobe Direct Imaging® Tooling and Software systems to provide the most advanced High Resolution Site Characterization (HRSC) technologies which is operated by our Geoprobe trained and certified specialists. This allows your field scientists to collect extremely high-resolution contaminant, lithologic and hydrostratigraphic data real time in the field for real time TRIAD decision making. In addition to mapping in 3-D the contaminant distribution, you also gain valuable information on flow zones, aquitards and other soil characteristics. We follow all QA/QC in the data acquisition process according to the Geoprobe SOP and ASTM methods. The following tools are available for your HRSC project:





- **OIP-UV and OIP-G** - Optical Image Profiler locates free phase petroleum NAPL fluorescence. This tool has a similar response to Dakota LIF/UVOST and LIF/TarGOST, but is now integrated with the HPT and EC.
- **MIP** - Membrane Interface Probe locates dissolved and sorbed mass VOCs. Vapors are analyzed on three stable and selective laboratory instrument grade detectors – PID, FID and XSD in a GC custom built for the MIP system.
- **LL-MIP** - Low Level Membrane Interface Probe increases the sensitivity of VOCs detected by at least a factor of 10x, getting you down into the ppb range of detection limits.
- **HPT** - Hydraulic Profiling Tool measures pressure and flow to obtain permeability characteristics and estimated hydraulic conductivity (K).
- **HPT-GWP & HPT-GWS** - Hydraulic Profiling Tool combined with discrete groundwater sampling capability.
- **EC** - Electrical Conductivity Dipole, integrated with all of the above tools, for soil lithology and grain size characteristics.
- **MiHPT -** Combined MIP + HPT Tools with EC.
- **OiHPT -** Combined OIP + HPT Tools with EC.
- **3D Visualization and Conceptual Site Models (CSM) -** Integration of HRSC data with other site data into impressive 3D visualization models to improve CSMs and remediation design.

For more details on HRSC – ask for our HRSC Tool Overview document.

11 LANDFILL GAS TESTING FOR THE SOLID WASTE INDUSTRY

Vista GeoScience has over 20 years' experience conducting Tier-II landfill gas surveys at Class II/III Solid Waste Facility and SWMUs across the United States. We developed and perfected the tooling and methods required to sample and analyze NMOCs by EPA Method 25C (40-CFR60). Key staff has more than 30 years' experience in sampling, soil gas testing, remediation, and laboratory analysis. Our expertise includes mapping and analysis of stray and fugitive gas in soil gas and ground water.

Gas and Leak Detection Methods

- **Expert Tier-II (Method 25C) Landfill NMOC Gas Testing**
- **Proprietary SOPs for Tier-II and Soil Gas Testing**
- **Geoprobe® Direct-Push Track Rigs for Better Access**
- **MiHPT to Map Subsurface Methane Migration Pathways**
- **Active Soil Gas Sampling and Monitoring Point Installation**
- **Multi-Level Nested Soil Gas Monitoring Wells to 150'**
- **Passive Soil Gas Surveys**
- **Surface Leak Detection with Pedestrian FID-PID Surveys**
- **Soil Gas Flux Measurements - Fugitive & Stray Gas Mapping**
- **Interpretation & Analysis of Isotopic Gas Composition**

Unique Expertise

Measuring soil gas and ambient air emissions of natural gas, hydrocarbons, solvents, and fixed gases has been a major focus at Vista GeoScience by its staff for over 30 years. Vista has developed many unique sampling and analytical solutions to gas migration, seepage, leakage, and analysis problems. Projects include the Municipal Waste, Oil and Gas Extraction, Mineral Extraction, Gas Pipeline, Landfill, Utility, Remediation, and Real Estate Development industries.

12 HIGH RESOLUTION SOIL GAS SAMPLING

Soil Gas Sorbent Tube / TO-17 Method Overview

Traditional soil gas screening methods typically utilize various containers such as Tedlar® bags, disposable syringes, etc., and rely on direct injection into a GC or, at best, injection of a larger sample into a standard purge and trap unit designed for soil and water analysis. These methods generally have reporting limits well above indoor air screening or action levels. Vista GeoScience has developed a soil gas sampling method, based on EPA Methods TO-17 and SW846-8260, using multi-bed sorbent tubes similar to those designed for use indoor air analysis. These sorbent tubes contain multiple packed layers of adsorbent materials that are designed to adsorb compounds over a wide range of boiling points. The main advantage is that larger volumes of air or soil gas can be pumped through the tube concentrating the analyses resulting in lower detection limits.

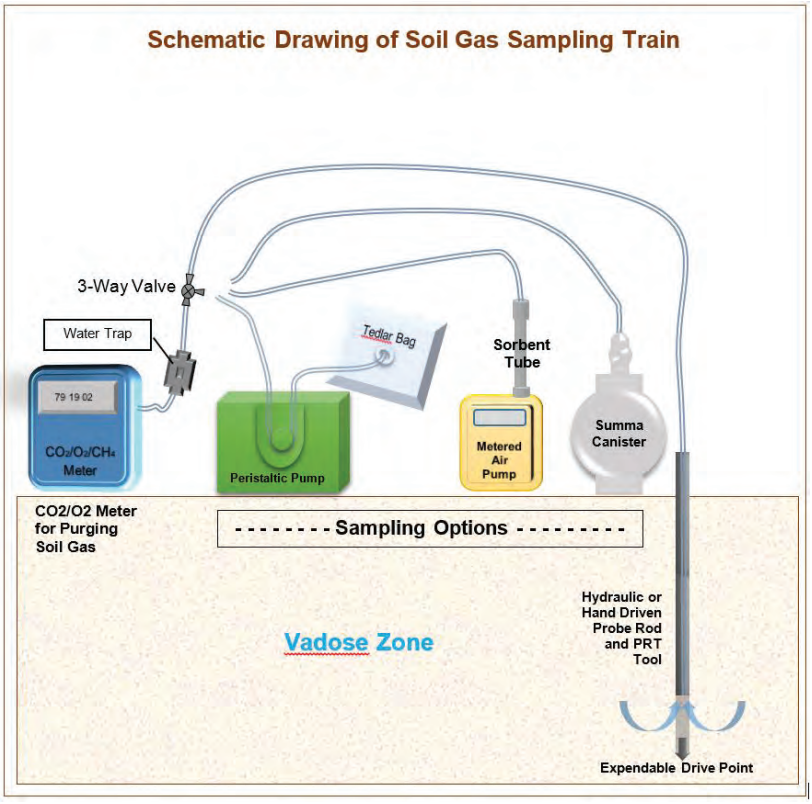
The sorbent tubes are thermally activated, batch tested, and sealed with brass swage-lock fittings prior to shipment to the field. The tubes remain sealed until readied for sampling, as the activated adsorbents will readily adsorb trace amounts of VOCs from the ambient air, and are quickly re-sealed after sampling is completed. As a control, unused and unopened sorbent tubes are preserved as trip blanks.

After the samples are collected on the sorbent tubes, they are shipped to the laboratory where they are loaded onto an automatic thermal desorption (ATD) unit that is connected to a GC/MS and configured to run EPA Methods TO-17 and SW846-8260. Method EPA Method TO-17 is the air VOC method equivalent to EPA Method SW846-8260, which is for water and solid wastes. This method is up to 1,000 times or more sensitive in detecting compounds of interest than conventional soil gas sampling and analysis methods. The detection limit is lowered by simply concentrating a larger volume on the sorbent tube. Indoor air screening and action levels can be achieved for most compounds that may have previously gone undetected in other soil gas surveys. The VOC compounds are desorbed from the tubes at high temperature and are concentrated onto a “cold trap,” then desorbed again onto the GC/MS for separation and analysis of up to 70 target compounds by EPA SW846 method TO-17/8260B. The results are reported in nanograms (ng), and the reporting limit (RL) for

individual VOCs is 5 ng for all the compounds in the target list. The lowest calibration point is set at 5 ng which sets the official method reporting limit. However, values detected between 1 and 5 ng are also reported and flagged as estimated if deemed reliable detections on the GC/MS by the analytical chemist. These low estimated values can be useful for mapping the trends or detecting deeper or low concentration contaminant plumes. Detections below 1 ng are rejected and not reported. The volume collected on the sorbent tube determines the reporting limit concentration. For example, if 1 liter of air/soil gas is collected on a tube, the reporting limit is 5 ng/L of air, or 5 µg/m^3 of air. Trip blanks, pre-ship blank checks, method blanks, surrogates, and spikes are run according to the method specifications.

Soil gas samples are collected using Vista GeoScience SOP NFSV101 "Standard Operating Procedure for Active Soil Gas Vapor Sampling Using Direct Push Probe and Post-Run Tubing (PRT) Adapter". After driving the PRT tool, with an expendable drive-point, to the target sample depth, the probe rod is retracted to drop the drive point and expose the formation. (see Figure 1.) A Teflon® lined tube and threaded adaptor is inserted into the rod and is threaded into the PRT tool at the bottom of the hole. This tubing is then connected to a portable gas meter (Landtech GEM2000) to measure CO_2, O_2, and CH_4 during purging. At least 3 system volumes are removed and purging continues until CO_2 and O_2 readings are stable, indicating that ambient air in the system has been removed and only soil gas was entering the sampling system. At that point, the flow is switched over to the sampling apparatus where the soil gas is pulled through the loaded sorbent tube using a vacuum pump. The flow rate and volume is monitored with a flow meter and kept below 200cc/minute. After 1 liter of soil gas has flowed through the sorbent tube, the flow is shut off and the sorbent tube is removed, immediately resealed and tagged with the sample ID. All of the meter and flow parameters are recorded on a sampling log form.

A Thermo Foxboro-TVA1000B FID-PID vapor meter can also be used to screen the soil gas. The FID (Flame Ionization Detector) responds to all hydrocarbons, including methane. The PID (Photo Ionization Detector) responds selectively to aromatics, alkene hydrocarbons, and solvents and is less sensitive to alkane compounds.



Typical Soil Gas Sampling Train

Property Access Agreement

DBS&A
Daniel B. Stephens & Associates, Inc.

CONSENT FOR ACCESS TO PROPERTY

Name of Property Owner: Christina Campos
Location of Property: Former Leonard's Conoco
1633 Historic Route 66, Santa Rosa, New Mexico 88435

This is my consent to the New Mexico Environment Department (Department) and its authorized officers, employees, contractors, and representatives for access to the above-described Property for corrective action consistent with the requirements of 20.5.119 NMAC and approved by the Department. Activities may include but are not limited to the following:

- Injection of chemical compounds to remediate soil and groundwater contamination from petroleum hydrocarbon release to include the installation of bore holes as applicable.
- Groundwater monitoring and associated activities to include monitoring well maintenance.
- Plugging and abandonment of bore holes and monitoring wells when applicable.
- All work will be conducted in an efficient, courteous manner and with minimal disruption and inconvenience to the patrons, employees, agents, and representative of the Owner.

The Department and its authorized officers, employees, contractors, and representatives will provide the Property Owner written or oral notice prior to each entrance onto Property. This notice shall be given to:

Property Owner: Christina Campos
Telephone: (575) 781-0158
Email: Christina_Campos@hotmail.com

It may be possible for the Property Owner to observe activities on the Property; however, all operations shall be conducted in accordance with the Occupational Health and Safety Regulations (see 29 CFR § 1910.120) and should any potential fire, explosion, health, safety or other hazards of the hazardous waste operation be identified, the Property Owner will not be allowed to observe. Should the property owner choose to have split samples collected and analyzed, then the Property Owner is responsible to arrange in advance for the provision of, and costs associated with any equipment, accessories and laboratory costs required for such split samples.

Installations on the Property will be placed to minimize interference with the movement of vehicles and regular activities on the Property. Following completion of the project, the Department and its authorized officers, employees, contractors, and representatives will properly abandon all wells, remove equipment, all materials, trash, fencing, and other associated items. The Department and its authorized officers, employees, contractors, and representatives will otherwise return the property as close as possible to the pre-entrance condition.

This permission is given by me voluntarily with knowledge of my right to refuse and without coercion. I have had an opportunity to ask questions and all my questions have been answered to my satisfaction.

Christina B Campos — Signature-Property Owner

02/09/2022 — Date

Injection Field Form

DBS&A
Daniel B. Stephens & Associates, Inc.

Amendment Injection Field Sheet

Project Name:	Date:
Project No.:	Contractor:
Injection Type: Well □ Direct push □ Other □	Well ID:
Injection product:	
Static Water Level:	Observation Wells:

Time	Volume (gallons)	Injection Pressure (psi)	Comment

Time	Volume (gallons)	Injection Pressure (psi)	Comment

Notes:

Amendment Injection Field Sheet

Project Name:

Time	Time Since Start (minutes)	Depth to Water (feet)	Comment

Time	Time Since Start (minutes)	Depth to Water (feet)	Comment

Daniel B. Stephens & Associates, Inc.

April 19, 2022

Lorena Goerger
NMED Petroleum Storage Tank Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87506

RE: Administrative Completeness Determination and Applicant's Public Notice Requirements, DP-1942, Leonard's Conoco

Dear Lorena Goerger,

The New Mexico Environment Department (NMED) received a Groundwater Discharge Permit Application for the above referenced facility on April 5, 2022. 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 April 6, 2022, 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 Andrew Romero at (505) 660-8624.

Sincerely,

Justin Ball, Chief
Ground Water Quality Bureau

enc: Instructions for Completing Public Notice Requirements
Affidavit
Public Notice Flyer
Text for Newspaper Display Ad

cc: John R. Bunch, P.G., Senior Scientist, Daniel B. Stephens & Associates, Inc., jbunch@geo-logic.com

INSTRUCTIONS FOR COMPLETING PUBLIC NOTICE REQUIREMENTS

Discharge Permit DP-1942 ☒ 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 on the property fence line facing Route 66.

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 Moise Memorial Library, 208 S. 5th St., Santa Rosa, NM 88435

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:

   Guadalupe County Communicator

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 ACR 04-19-2022

AFFIDAVIT OF PUBLIC NOTICE COMPLETION

New Permit

DP-1942

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-1942, Leonard's Conoco

Notice: DP-1942, Leonard's Conoco: NMED Petroleum Storage Tank Bureau proposes the discharge of up to 1,496 gallons total of remediation solution to injection points to cleanup petroleum contamination in groundwater. Potential contaminants from this type of discharge include inorganic compounds. The facility is located at 1633 Route 66, Santa Rosa, in Section 2, T8N, R21E, Guadalupe County. Groundwater most likely to be affected is at a depth of approximately 15 feet and had a pre-discharge total dissolved solids concentration of 3,140 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 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. NMED is developing a Public Involvement Plan (PIP) to provide public participation opportunities and information that may be needed for the community to participate in the permitting process. Your input is sought in the development of the PIP. A Community Member Public Involvement Plan Input Form is available at https://www.env.nm.gov/public-notices/. The PIP will be posted online at https://www.env.nm.gov/public-notices/ and placed at the NMED field office nearest to the proposed permitted activity.

Questions, comments, statements of interest, or requests for non-English language assistance should be directed to: Andrew Romero, Ground Water Quality Bureau, DP-1942 Telephone: (505) 660-8624, andrewc.romero@state.nm.us PO Box 5469, Santa Fe, NM 87502	Applicant: NMED Petroleum Storage Tank Bureau Leonard's Conoco 1633 Route 66 Santa Rosa, NM 88435

If you are a non-English speaker, do not speak English well, or if you have a disability, you may contact the NMED Permit Contact to request assistance, an interpreter, or an auxiliary aid in order to learn more about a Discharge Permit or the permitting process, or to participate in activities associated with the permitting process. Requested 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: Kathryn Becker, 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/general/environmental-justice-in-new-mexico/ to learn how and where to file a complaint of discrimination.

Aviso Público: Recibo de la Aplicación del Permiso de Descarga

DP-1942, Leonard's Conoco

Aviso: DP-1942, Leonard's Conoco: La Oficina de Tanques de Almacenamiento de Petróleo de NMED propone la descarga de hasta 1,496 galones en total de una solución de remediación en puntos de inyección para limpiar la contaminación por petróleo en las aguas subterráneas. Los posibles contaminantes de este tipo de descarga incluyen compuestos inorgánicos. La instalación está ubicada en 1633 Route 66, Santa Rosa, en la Sección 2, T8N, R21E, condado de Guadalupe. Las aguas subterráneas que tienen más probabilidad de ser afectadas se encuentran a una profundidad de aproximadamente 15 pies y tenían una concentración de sólidos disueltos totales antes de la descarga de 3,140 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. 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. El NMED está desarrollando un Plan de Participación Pública (PIP, por sus siglas en inglés) para proporcionar oportunidades de participación pública e información que pueda ser necesaria para que la comunidad participe en el proceso de permisos. Se solicita comentarios para el desarrollo del PIP. El formulario de comentarios para el plan de participación pública para miembros de la comunidad está disponible en https://www.env.nm.gov/public-notices/. El PIP será publicado en línea en https://www.env.nm.gov/public-notices/ y se colocará en la oficina de campo de NMED más cercana a la actividad autorizada propuesta.

Todas las preguntas, comentarios, declaraciones de interés o solicitudes de asistencia en otro idioma deben dirigirse a: Andrew Romero, La Oficina de Calidad de Aguas Subterráneas, DP-1942 Teléfono: (505) 660-8624, andrewc.romero@state.nm.us PO Box 5469, Santa Fe, NM 87502	Solicitante: NMED Petroleum Storage Tank Bureau Leonard's Conoco 1633 Route 66 Santa Rosa, NM 88435

Si usted no habla inglés, no habla bien inglés, o si tiene una discapacidad, puede comunicarse con el contacto de permisos de NMED para solicitar asistencia, un intérprete o un dispositivo auxiliar con el fin de aprender más sobre un Permiso de Descarga o el proceso de permisos, o para participar en actividades asociadas con el proceso de permisos. Los servicios de interpretación solicitados y las acomodaciones o servicios para personas con discapacidades serán organizados 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. Asistencia telefónica de interpretación para personas que no hablan inglés o no hablan bien el inglés está disponible de forma gratuita llamando a 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 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: Kathryn Becker, 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/general/environmental-justice-in-new-mexico/ para aprender cómo y dónde presentar una queja de discriminación.

Public Notice Synopsis, DP-1942
(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 APPLICATION

NMED Petroleum Storage Tank Bureau proposes the discharge of up to 1,496 gallons total of remediation solution to injection points to cleanup petroleum contamination in groundwater. Discharge location: Leonard's Conoco, 1633 Route 66, Santa Rosa, NM. For additional information, contact the New Mexico Environment Department and reference: DP-1942 PN1.

AVISO PÚBLICO

APLICACIÓN PARA PERMISO DE DESCARGA

La Oficina de Tanques de Almacenamiento de Petróleo de NMED propone la descarga de hasta 1,496 galones en total de una solución de remediación en puntos de inyección para limpiar la contaminación por petróleo en las aguas subterráneas. Sitio de descarga: Leonard's Conoco, 1633 Route 66, Santa Rosa, NM. Para información adicional comuníquese con el Departamento de Medio Ambiente de Nuevo México y ponga la referencia: DP-1942 PN1.

(505) 660-8624 https://www.env.nm.gov/public-notices/

Appendix D

FRP Legal Notice

DBS&A
Daniel B. Stephens & Associates, Inc.

Appendix E

Schedule for Implementation of Final Remediation Plan

DBS&A
Daniel B. Stephens & Associates, Inc.

Leonard's Conoco Remedial Action Schedule

Task	Working Days	Start Date	End Date
UIC Discharge Permit Submittal			4/19/2022
Final FRP Submittal			6/27/2022
FRP Approval	28 days	6/27/2022	7/25/2022
FRP Implementation			8/15/2022
FRP Implementation Report	21 days	8/15/2022	9/5/2022