



**STATE OF NEW MEXICO  
BEFORE THE SECRETARY OF ENVIRONMENT**

**IN THE MATTER OF PROPOSED DISCHARGE  
PERMIT DP-1132 FOR THE RADIOACTIVE  
LIQUID WASTE TREATMENT FACILITY AT  
LOS ALAMOS NATIONAL LABORATORY,  
LOS ALAMOS, NEW MEXICO**

**No. GWB 19-24(P)**

**TRIAD NATIONAL SECURITY, LLC AND  
THE UNITED STATES DEPARTMENT OF ENERGY'S  
STATEMENT OF INTENT TO PRESENT TECHNICAL TESTIMONY**

Triad National Security, LLC (“Triad”) and the United States Department of Energy (“DOE”) (together referred to as “Applicants”) hereby submit this Statement of Intent to Present Technical Testimony in support of the issuance of Discharge Permit 1132 at the hearing of this matter, pursuant to the Notice of Public Hearing herein and the requirements of 20.1.4.300 NMAC and 20.6.2.3110.C NMAC.

**I. Identity, Qualifications, and Testimony Summaries of Applicants’ Technical Witnesses**

At the hearing of this matter Applicants will present the following three technical witnesses. Applicants reserve the right to present additional non-technical witnesses as part of their direct presentation, as well as technical and non-technical witnesses in rebuttal or in response to witnesses, statements or evidence of other parties or members of the public:

- A. Mr. Robert S. Beers  
17 Coyote Hills Lane  
Santa Fe, New Mexico 87505**

**1. Summary of Mr. Beers’ Qualifications and Direct Testimony**

Mr. Robert Beers is currently employed as a consultant to Triad. Previously, Mr. Beers worked as an Environmental Professional at Los Alamos National Laboratory (“LANL”), where

he had been employed for approximately twenty-four years. He has broad expertise in environmental project management at LANL, including discharge permit management. He has expertise in regulatory compliance and permit management. Mr. Beers has a Bachelor of Science degree from Cornell University and a Masters in Water Resources Administration from the University of New Mexico.

Mr. Beers' direct testimony, which includes advance written testimony submitted herewith, will cover several subject areas, and will include technical testimony. He will provide an introduction to the Radioactive Liquid Waste Treatment Facility ("RLWTF") and discuss the relevant operations at that facility, including the three discharge pathways identified in Draft DP-1132. Mr. Beers will discuss the permit application for DP-1132 and the regulatory background for issuance of the permit. He will provide an overview of the requirements of Draft DP-1132, including the discharges authorized by Draft DP-1132 and the standards applicable to the RLWTF's treated effluent. Mr. Beers will testify regarding certain particular requirements of Draft DP-1132, including requirements for the operational plan, monitoring requirements, reporting requirements, contingency plan provisions and the closure plan for the RLWTF. Mr. Beers will also provide testimony and an exhibit responding to public comments submitted by the Citizens for Clean Water in letters dated June 5, 2017 and a September 23, 2019 by Council members of CCW. Mr. Beers' testimony will include suggested changes to Draft DP-1132 via specific redlining of its provisions appearing in Exhibit 9 to his advance written testimony, which changes are designed to bring DP-1132 current based on new information and actions taken since DP-1132 was initially issued in August 2019.

## **2. Estimated Length of Mr. Beers' Direct Testimony**

It is estimated that Mr. Beers' direct testimony will last forty-five (45) minutes, more or less.

### **B. Mr. Danny Katzman Sealaska Technical Services Los Alamos, New Mexico 87544**

#### **1. Summary of Mr. Katzman's Qualifications and Direct Testimony**

Mr. Danny Katzman is currently employed as a Groundwater Remediation Manager for Sealaska Technical Services. Mr. Katzman previously served as the Technical Program Manager for the Associate Directorate for Environmental Management at LANL. He is an expert with over twenty-five years of experience in hydrogeology and environmental site investigations and remediation. Mr. Katzman worked at LANL from 1998 to 2018, where he served as the lead scientist for LANL's Environmental Management Directorate, group leader for LANL's Environmental Investigations Group, program manager for LANL's Water Stewardship Program, project leader for the Canyons Investigations and team leader for the Canyons Investigation. Mr. Katzman received his Bachelor of Science degree in geology from the University of Texas and his Masters of Science degree, with honors, from the University of New Mexico.

Mr. Katzman's direct testimony, which includes advance written testimony submitted herewith, will provide an introduction to the hydrogeologic setting at LANL and discuss why the setting is relevant to Draft DP-1132. Mr. Katzman will describe the groundwater monitoring requirements set forth in Draft DP-1132 at each of the discharge points included in the permit, specifically at NPDES Outfall 051, the Solar Evaporation Tank ("SET"), and the Mechanical Evaporation System ("MES"). Mr. Katzman will testify about the hydrogeologic setting of the monitoring wells, the purposes for and adequacy of the monitoring wells, the quality of the

monitoring wells, and the frequency and suite of monitoring. Mr. Katzman will testify regarding Draft DP-1132's requirements and procedures for detecting and addressing any future noncompliant releases. He will also offer testimony about pre-existing conditions at LANL that are relevant to certain conditions in Draft DP-1132.

## **2. Estimated Length of Mr. Katzman's Direct Testimony**

It is estimated that Mr. Katzman's direct testimony will last forty-five (45) minutes, more or less.

**C. Ms. Karen E. Armijo  
National Nuclear Security Administration  
Los Alamos Field Office  
3747 West Jemez Road, MS A316  
Los Alamos, New Mexico 87545**

### **1. Summary of Ms. Armijo's Qualifications and Direct Testimony**

Ms. Armijo is a physical scientist currently employed by the National Nuclear Security Administration. She is a technical subject matter expert for environmental management, including water resources and waste management. Ms. Armijo oversees environmental compliance programs on behalf of DOE, to include hazardous waste management and groundwater discharges, and provides contract oversight of Triad's performance on environmental compliance. Ms. Armijo has a Bachelor of Science degree from New Mexico State University in Environmental Science, with Minors in Environmental Chemistry and Waste Management, and a Masters in Environmental Policy and Management from the University of Denver.

Ms. Armijo's testimony will address certain comments received on the Draft DP-1132 regarding signage in the vicinity of the RLWTF and the staffing of LANL's Emergency Operations Center. Her testimony will explain why the proposed signage requirements of Draft DP-1132 are adequate, and why the suggestions of Communities for Clean Water regarding signage have been

resisted by Applicants and not included in Draft DP-1132. Ms. Armijo will testify as to certain DOE restrictions regarding the staffing of the EOC, and explain that offsite response interfaces present an opportunity to have tribal involvement in the planning and preparation of emergency services and coordination during the delivery of emergency services for which tribal involvement is warranted which is the basic subject of Communities for Clean Water's comments regarding the staffing of the EOC.

**2. Estimated Length of Ms. Armijo's Direct Testimony**

It is estimated that Ms. Armijo's direct testimony will last thirty (30) minutes, more or less.

**II. Materials Referenced by Applicants' Witnesses**

In addition to the materials that Applicants will use as exhibits, as listed below and attached, one or more of Applicants witnesses referenced or reviewed the permit application materials that are on file with the New Mexico Environment Department, drafts of the permit that have been exchanged between Applicants and the Environment Department, letters and comments submitted to the Environment Department and made a part of the record, and the Water Quality Control Commission's regulations.

**III. Triad and DOE's Hearing Exhibits**

A. Mr. Beers' testimony will include presentation of the following exhibits:

1. Advance Written Testimony of Robert Beers
2. Resume of Robert Beers
3. The Community for Clean Water's ("CCW") June 5, 2017 Comment Letter
4. Sections of Los Alamos National Laboratory's NPDES Renewal Application (February 2012)

5. Response to CCW's June 5, 2017 Comment Letter (including Attachments A - E that are part of and appear at the end of the response)
  6. Tewa Women United, New Mexico Acequia Association, Honor Our Pueblo Existence, and Concerned Citizens for Nuclear Safety's September 23, 2019 Comment Letter
  7. Tables listing proposed revisions to Draft DP-1132
  8. NMED's March 12, 2019 Notification of amendments to Ground and Surface Water Protection Regulations (20.6.2 NMAC)
  9. Suggested changes to Draft DP-1132
  10. PowerPoint Presentation, Robert Beers
- B. Mr. Katzman's testimony will include presentation of the following exhibits:
11. Advance Written Testimony of Danny Katzman (including figures that are part of and appear at the end of his advance written testimony)
  12. Resume of Danny Katzman
  13. PowerPoint Presentation, Danny Katzman
- C. Ms. Armijo's testimony presentation of the following exhibits:
14. Advance Written Testimony of Karen Armijo
  15. Resume of Karen Armijo
  16. Communications in connection with CCW's comments regarding multi-language signage in the vicinity of the RLWTF
  17. Letter from DOE to the New Mexico Environment Department dated May 20, 2015 with comments on a draft of the permit and proposed signage language

D. Other Triad/DOE Exhibits

18. Monthly Monitoring Report for Outfall 051 submitted to the U.S.  
Department of Energy July 23, 2019

19. Certification dated July 10, 2019 relating to NPDES Outfall 051

E. Yet to be identified exhibits Triad and DOE may use in rebuttal.

Respectfully submitted,



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**CERTIFICATE OF SERVICE**

I hereby certify that on November 4, 2019, a copy of the foregoing “Statement of Intent to Present Technical Testimony” was hand-delivered to the following:

Cody Barnes  
Hearing Clerk  
New Mexico Environment Department  
1190 Saint Francis Drive, Suite S-2103  
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and served via electronic and U.S. mail to the following:

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*/s/ Stuart R. Butzier*

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Stuart R. Butzier

**STATE OF NEW MEXICO  
BEFORE THE SECRETARY OF ENVIRONMENT**

**IN THE MATTER OF THE APPLICATION OF THE  
UNITED STATES DEPARTMENT OF ENERGY AND  
LOS ALAMOS NATIONAL SECURITY, LLC FOR A  
GROUND WATER DISCHARGE PERMIT (DP-1132)  
FOR THE RADIOACTIVE LIQUID WASTE  
TREATMENT FACILITY**

**No. GWB 17-20(P)**

**PRE-FILED TECHNICAL TESTIMONY OF MR. ROBERT S. BEERS,  
A WITNESS ON BEHALF OF TRIAD NATIONAL SECURITY, LLC  
AND THE UNITED STATES DEPARTMENT OF ENERGY**

**1 I. Introduction, Experience and Education**

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My name is Robert S. Beers. I was the Environmental Professional who previously testified in support of DP-1132 in the hearing that occurred in 2018. At the time, I was with the predecessor of Triad National Security, LLC (“Triad”), Los Alamos National Security, LLC (“LANS”). Although I remained in my same basic position when Triad took over from LANS as the operator of Los Alamos National Laboratory (“LANL”), I am now semi-retired and serving as an expert for Triad as a private consultant.

I am offering testimony as an expert in support of the permit application submitted by Triad National Security, LLC and the U.S. Department of Energy (“DOE”) (together referred to as the “Applicants”) and the resulting draft discharge permit 1132 (“Draft DP-1132”) for the Radioactive Liquid Waste Treatment Facility (“RLWTF”) located at TA-50 within LANL. I provide this testimony in support of the New Mexico Environment Department’s (“NMED”) issuance of DP-1132.

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15 I have a Bachelor of Science degree from Cornell University, Ithaca, New York. I also  
16 have a Masters in Water Resources Administration from the University of New Mexico,  
17 Albuquerque, New Mexico. I have approximately twenty-four years of experience in  
18 environmental project management at LANL. While I was a Masters student at the University of  
19 New Mexico, I was employed by LANL as a Graduate Research Assistant. In this role, I  
20 supported technical staff with Safe Drinking Water Act compliance. Upon graduation, I obtained  
21 a technical staff position at LANL. My resume is attached as Triad/DOE Exhibit 2.

22 I have detailed knowledge of the groundwater discharge permitting program and  
23 requirements of the New Mexico Water Quality Control Commission's ("WQCC") Ground  
24 Water Quality Regulations at 20.6.2 NMAC. My exclusive focus for approximately the last  
25 twenty two years has been on groundwater discharge permits issued by NMED. In this capacity,  
26 I have supported numerous permit applications and discharge permits, including the pending  
27 permit application for the RLWTF discharges. In addition, I have been directly involved with  
28 the implementation of ground water discharge permits including compliance efforts relating to  
29 facilities and activities associated with LANL. I was the environmental project lead for  
30 preparing the first discharge permit application for the RLWTF from 1996 until October 8, 2019.

31 **II. Purpose of Testimony**

32  
33 The purpose of my testimony is to describe why the proposed Draft DP-1132 fully meets  
34 the requirements of the New Mexico Water Quality Act and New Mexico Ground Water Quality  
35 Regulations of the Water Quality Control Commission and should be approved by NMED. I will  
36 discuss the permit application and the regulatory background for issuance of the Draft DP-1132.  
37 In addition, I will explain the basic requirements of the Draft DP-1132, including the operational  
38 plan, monitoring, reporting, contingency plan and closure. Further, my testimony will address

39 public comments received on the Draft DP-1132. The public comments consist of eighteen  
40 points raised in a comment letter dated September 23, 2019 that is attached as Triad/DOE  
41 Exhibit 3. Finally, my testimony will provide support for changes to DP-1132, some of which  
42 are to address specific comments, but most of which are needed and justified by actions Triad  
43 has already taken to comply with a number of conditions that were in DP-1132 when it was  
44 previously issued in 2018 and since that time.

45 **III. Introduction to Draft DP-1132**

46 NMED determined that the Applicants were required to submit a ground water permit  
47 application and obtain a ground water discharge permit to control the discharge, and potential  
48 release, of treated water from the RLWTF so as to protect ground water for present and potential  
49 future use as a domestic water supply or an agricultural water supply. The mission of NMED’s  
50 ground water program, as mandated by 20.6.2 NMAC, is to preserve and protect groundwater in  
51 the State of New Mexico for future generations. As provided in 20.6.2.7.R NMAC a “discharge  
52 plan” means “a description of any operational, monitoring, contingency, and closure  
53 requirements and conditions for any discharge of effluent or leachate which may move directly  
54 or indirectly into groundwater.” To be approved by NMED, the proposed ground water permit  
55 application and Draft DP-1132 must meet the requirements of the ground water quality  
56 regulations at 20.6.2.3109 NMAC.

57 The Applicants submitted an initial ground water permit application to NMED on August  
58 19, 1996, and, at NMED’s request, replaced that with a comprehensive updated permit  
59 application to NMED on February 16, 2012. Subsequently, the Applicants provided  
60 supplemental information all of which is contained in the administrative record for the Draft DP-

61 1132. These supplements ensured that the application was up-to-date, and included plans and  
62 specifications for new or upgraded units as well as a Closure Plan.

63 On August 23, 2019, NMED issued a public notice to accept public comment until  
64 September 23, 2019, for the Draft DP-1132. During the public comment period that ensued,  
65 NMED received public comments from the Tewa Women United, New Mexico Acequia  
66 Association, Honor Our Pueblo Existence, and Concerned Citizens for Nuclear Safety in a letter  
67 dated September 23, 2019. On July 17, 2019, the Secretary of NMED made a determination to  
68 grant a public hearing and the matter was docketed. On July 17, 2019, Administrative Law  
69 Judge Richard Virtue was appointed to conduct the hearing pursuant to 20.1.4.100(E)(2) NMAC.  
70 On October 9, 2019, NMED issued a Notice of Public Hearing on the matter for November 14-  
71 15, 2019.

72 **IV. Introduction to the RLWTF and the Discharges Authorized by Draft DP-1132**

73  
74 The RLWTF is a waste water treatment facility designed to support LANL programs by  
75 treating radioactive liquid waste waters received from technical areas throughout the Laboratory.  
76 The programs supported include fabrication of fuel for NASA to power projects such as the Mars  
77 land rover and the Pluto fly-by mission, work for the Department of Homeland Security, the  
78 creation of medical isotopes, and Department of Defense missions.

79 The RLWTF has an influent collection and storage system, including the Waste  
80 Management Risk Mitigation Facility (“WMRM”), a main treatment process for low-level  
81 radioactive liquid waste (“RLW”), a process for treating transuranic RLW, and a secondary  
82 treatment process for waste streams from both the low-level and transuranic processes. The low-  
83 level and transuranic RLW processes have separate collection systems, separate influent storage  
84 tanks, and separate treatment equipment. Approximately 99% of the volume of radioactive

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85 liquid waste received at the RLWTF is low-level RLW, but in contrast, up to 90% of the  
86 radioactivity (curies) is received at the RLWTF in the transuranic RLW stream.

87 Section V of Draft DP-1132 acknowledges these systems and authorizes the Laboratory  
88 to discharge resulting treated effluent streams. Specifically, under Section V.C, the RLWTF  
89 would be authorized to discharge up to 40,000 gallons per day. Section V.C, Authorization to  
90 Discharge, allows wastewater to be discharged to three different systems:

- 91 • to a natural gas-fired mechanical evaporator that receives treated effluent for  
92 evaporation, referred to as the Mechanical Evaporator System (“MES”);
- 93 • to the synthetically lined Solar Evaporative Tank System (“SET”) (also referred  
94 to as the “Zero Liquid Discharge (“ZLD”) solar tanks);<sup>1</sup> and
- 95 • through Outfall 051 that is also the subject of a National Pollutant Discharge  
96 Elimination System Permit #NM0028355 (“NPDES Permit”) issued by Region 6  
97 of the United States Environmental Protection Agency pursuant to the federal  
98 Clean Water Act Section 402, 33 U.S.C. §1342.<sup>2</sup>

99 **V. Standards Applicable to the RLWTF’s Treated Effluent**

100 The RLWTF treats the effluent to meet standards under a comprehensive and complex  
101 regulatory system. The Draft DP-1132 establishes effluent standards to ensure protection against  
102 discharges and potential releases that may reach ground water under the New Mexico Water  
103 Quality Act.

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<sup>1</sup> The SET was constructed in November of 2012, and the design drawings were submitted to NMED in November 2011 [AR #256]. As-built drawings were submitted in November 2012 [AR #322].

<sup>2</sup> Per LANL’s NPDES Permit renewal application, “Treated effluent may be discharged to the NPDES Outfall 051, the SET located at TA-52, or the mechanical evaporation system (MES) located at TA-50-257.” LA-UR-19-22215, NPDES Permit Re-Application Permit No. NM0028355, Outfall 051 - Fact Sheet, Page 5 (March 27, 2019)

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104 Specifically, discharges that are authorized by DP-1132 shall not exceed the effluent  
105 quality limits specified in Condition Nos. 16 (for discharges through NPDES Outfall 051) and 17  
106 (for discharges to the MES & SET). Effluent quality limits for discharges through NPDES  
107 Outfall 051 include all water contaminants listed in 20.6.2.3103 NMAC and toxic pollutants in  
108 20.6.2.7.WW NMAC. For those toxic pollutants without a numeric limit in 20.6.2.3103 NMAC,  
109 the limit shall be the concentration listed in Table A-1 of NMED Risk Assessment Guidance for  
110 Site Investigation and Remediation. (See Table A-1 at Condition VI.D.16.c).

111 Under Permit Condition VI.A.17, the effluent quality limits for treated discharges to the  
112 MES and SET differ from the limits required for treated discharges through NPDES Outfall 051  
113 (Condition VI.A.16). The rationale for establishing different standards for discharges through  
114 NPDES Outfall 051, as compared to discharges to MES/SET, is grounded in the difference in  
115 potential risk to impact groundwater. The discharges authorized through Outfall 051 consist of  
116 treated effluent released directly into Effluent Canyon, which is a tributary to Mortandad  
117 Canyon. Unlike the treated effluent to the MES and SET, discharges of treated effluent from  
118 Outfall 051 reach surface waters and indirectly, have the potential to impact groundwater.  
119 Discharges from Outfall 051 must also be treated to meet the federal Clean Water Act NPDES  
120 Permit.

121 Discharges of treated effluent to the MES and SET are into evaporative tank units, and  
122 per NMED, require a discharge plan due to the potential for effluent from the RLWTF to move  
123 indirectly into ground water within the meaning of 20.6.2.3104 NMAC. Per Permit Condition  
124 VI.A.17, discharges to the MES and SET shall not exceed the numeric limits in 20.6.2.3103  
125 NMAC for general inorganics, metals, Ra-226+228, and Nitrate (as N), and perchlorate with the  
126 following exception:

127           • The numeric limits for Barium, Chromium, Copper, and Silver shall be the less  
128           stringent federal Safe Drinking Water Act Maximum Contaminant Levels  
129           (MCLs) in lieu of the 20.6.2.3103 NMAC standards.

130           In other words, for certain constituents where MCLs are less stringent than the  
131           20.6.2.3103 NMAC standards, the MCLs are the applicable effluent limit for discharges to the  
132           MES and SET. For discharges through Outfall 051, however, where more stringent standards  
133           exist under 20.6.2.3103, those standards apply rather than the less stringent MCLs. This makes  
134           logical sense given that Draft DP 1132 discharges authorized through Outfall 051 are discharges  
135           that would be directly to the ground, as opposed to being discharges to evaporative tank units.  
136           As I will discuss later in my testimony, some of the groundwater quality standards identified in  
137           Conditions 16 and 17 in DP-1132 need to be updated to reflect recent groundwater standards  
138           changes. See the letter from NMED that is Triad/DOE Exhibit 8.

139           **VI. The Basic Elements and Key Requirements of Draft DP-1132**

140           Draft Discharge Permit DP-1132 is structured around four foundational elements that are  
141           relied upon to ensure protection of groundwater and compliance with regulatory requirements.  
142           Each of these foundational elements is briefly discussed below:

143           A. Operational Plan

144           The Operational Plan in Section VI.A of Draft DP-1132 contains 22 conditions with  
145           specific requirements for the operation and maintenance of those units identified in the permit.  
146           For example, Condition VI.A.8 requires certain prescribed testing of, and demonstrations for,  
147           various systems intended to convey, store, treat or dispose of liquid or semi-liquid waste streams  
148           to ensure they are not leaking, and Condition VI.A.9 details corrective actions to be taken to  
149           repair or permanently cease operation of a system in the event successful demonstrations cannot

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150 be made. Conditions VI.A.16 and .17 of the Operational plan detail the effluent limitations  
151 already discussed for discharges to the MES and the SET, and discharges through Outfall 051.

152 In addition, the Operational Plan conditions dictate many other aspects of operations such  
153 as annual update requirements (Condition VI.A.1), communicating with and obtaining NMED  
154 approval for proposed changes to the existing facility (Conditions VI.A.2 through .4), entry  
155 restrictions and signage (Conditions VI.A.5 and .6), secondary containment verifications and  
156 certifications of leak detection systems (Condition VI.A.7), inspection, maintenance,  
157 measurement, containment and calibration requirements (Conditions VI.A.10 through .15, .21  
158 and .22), and corrective action and emergency response procedures and personnel qualifications  
159 requirements (Conditions VI.A.18 through .20).

160 B. Monitoring and Reporting

161 The Monitoring and Reporting requirements in Section VI.B of Draft DP-1132 prescribe  
162 in detail how data on both volume and water quality are collected and reported to NMED.  
163 Approved methodologies for conducting sampling and analysis are set forth in Condition  
164 VI.B.23. Data collected is reported to the NMED quarterly, including daily volume data on low-  
165 level radioactive and TRU influent waste water as well as treated water discharged to the SET,  
166 MES and Outfall 051 (Conditions VI.B.24 through .27). Current written or electronic waste-  
167 tracking information must be maintained for NMED inspection, upon request (Condition  
168 VI.B.28). Sampling and analyses are required to determine the quality of treated water  
169 discharged to the SET, MES, and Outfall 051. (Condition VI.B.29). A soil moisture monitoring  
170 system of monitoring boreholes is required before Triad may use the two double-lined tank cells  
171 of the SET in order to detect any leak, and notification and corrective action steps are prescribed  
172 in the event one is detected. (Conditions VI.B.30 and .31).

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173 Several conditions address monitoring well replacements, construction, quarterly  
174 monitoring and analyses, a process for reporting any newly detected ground water quality  
175 exceedances associated with the defined systems in the permit, and a prescribed process for  
176 investigating and developing and implementing a work plan for abatement. (Conditions VI.B.32  
177 through .37). The monitoring wells and associated activities addressed by these conditions are  
178 addressed more fully in the technical testimony of Danny Katzman.

179 C. Contingency Plans

180 Contingency plans to mitigate damages, provide notifications and take corrective actions  
181 in the event of any spill or unauthorized release are prescribed in detail by requirements in  
182 Section VI.C of Draft DP-1132. In the event of a spill or release not authorized by the permit,  
183 DOE/Triad must notify NMED within 24-hrs, and following this initial notification, DOE/Triad  
184 must submit both 7-day and 15-day corrective action plans to address the failure, and those must  
185 be implemented according to schedules upon approval by NMED. (Condition VI.C.38).  
186 DOE/Triad is not thereby relieved of other aspects of NMED's ground water protection program,  
187 and in the event any unauthorized discharge causes or may with reasonable probability cause  
188 water pollution in excess of abatement standards under 20.6.2.4103 NMAC, abatement to those  
189 standards may be required, and in certain instances may require permit modifications to achieve  
190 compliance with the ground water protection program it administers. (Conditions VI.C.38 and  
191 .39).

192 D. Closure

193 The closure requirements for specific units that are to cease being used after the issuance of  
194 Draft DP-1132, as well as at final closure and post-closure monitoring are set forth in Section  
195 VI.D of the permit. Condition VI.D.40 prescribes units which are to be permanently removed

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196 from service within 60 days of the effective date of the permit. Specific requirements for  
197 managing units and systems that will be permanently removed from service are comprised of a  
198 two-step process: (1) stabilization of the unit to render it inoperable and remove any potential  
199 discharge to the environment; and (2) closure of the unit in accordance with the Closure Plan  
200 attached to Draft DP-1132. (Conditions VI.D.41 and .42).

201 The elements of the Closure Plan are specifically dictated by subparagraphs a through k  
202 of Condition VI.D.42 in Draft DP-1132. The following figure briefly identifies those specific  
203 requirements and shows what sections of the Closure Plan address the requirements of the permit  
204 condition:

**Figure 1**  
**DP-1132 Requirements in the RLWTF Closure Plan**

Requirement	DP-1132	Closure Plan
Description of how each unit and system at the facility will be closed	C42.a	4.1
Actions to be taken to decommission, demolish, and remove each unit, system, and other structure	C42.b	4.1.9 4.2.3
Actions and controls that will be implemented during closure to prevent the release of water contaminants into the environment	C42.c	5.1
Methods to be used for decontamination of the site and decontamination of equipment used during closure	C42.d	4.1.5 5.3
Actions that will be taken to reclaim the site	C42.e	5.4
Monitoring, maintenance and repair, and controls that will be implemented after closure	C42.f	5.5
Ground water monitoring plan that to detect water contaminants that might move directly or indirectly into ground water after closure	C42.g	5.5
Methods that will be used to characterize all wastes generated during closure	C42.h	5.7
Actions that will be taken to investigate and characterize the	C42.i	3.1

potential impact to soil and groundwater from the facility, system, or individual unit		5.2
Methods that will be used to remove, transport, treat, recycle, and dispose of all wastes generated during closure	C42.j	5.8
Detailed schedule for closure and removal of units and systems	C42.k	5.9

208

209 **VII. Overview of Groundwater Protection and Regulatory Compliance**

210 To ensure protection of groundwater and compliance with WQCC regulations, multiple  
211 lines of defense are deployed. Draft DP-1132 adopts this strategy by establishing requirements  
212 across the following three fronts: effluent quality monitoring, controls to prevent unplanned  
213 releases, and groundwater quality monitoring. Each is addressed briefly below:

214 A. Effluent quality monitoring. This is the first line of defense against groundwater  
215 contamination. Draft DP-1132 achieves that goal by requiring monthly or quarterly  
216 monitoring of effluent discharged to the MES, SET or Outfall 051 for all contaminants  
217 listed in 20.6.2.3103 NMAC and all Toxic Pollutants defined in 20.6.2.7WW NMAC.  
218 These conditions are found at Conditions VI.A.16, 17 and 29.

219 B. Controls to prevent unplanned releases. These are the second line of defense and are  
220 achieved through the Draft DP-1132. Examples of these are as follows:

- 221 1. requirements for secondary containment of all units and systems intended  
222 to convey, store, treat or dispose of an untreated liquid or semi-liquid  
223 waste stream. (Condition VI.A.3.j);
- 224 2. verification of secondary containment and certification of an operational  
225 leak detection system for each unit or system (Condition VI.A.4);
- 226 3. water tightness testing of lines without secondary containment (Condition  
227 VI.A.8);

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- 228 4. routine facility inspections (Condition VI.A.11);  
229 5. freeboard maintenance at the SET (Condition VI.A.15);  
230 6. operator certification (Condition VI.A.19);  
231 7. soil moisture monitoring system at the SET (Condition VI.B.30); and  
232 8. 24-hr reporting of damage to structural integrity (Condition VI.A.14).

233 C. Groundwater Quality Monitoring. The final line of defense for protection of the  
234 environment is groundwater quality monitoring. Section VI.B of Draft DP-1132 contains  
235 a system of monitoring at alluvial, perched/intermediate, and regional aquifer  
236 groundwater monitoring wells. These monitoring systems are addressed more fully in the  
237 technical testimony offered by Danny Katzman.

238 **VIII. Draft DP-1132 Comments and Proposed Changes**

239 During the public comment period that ensued following NMED’s public notice on August 23,  
240 2019, NMED received public comments on the Public Involvement Plan (PIP) from the Tewa  
241 Women United, New Mexico Acequia Association, Honor our Pueblo Existence and Concerned  
242 Citizens for Nuclear Safety (“CCNS”) in a letter dated September 23, 2019. I will not be  
243 responding to the comment letter addressed to the PIP. In addition, the NMED received public  
244 comments from Tewa Women United, New Mexico Acequia Association, Honor our Pueblo  
245 Existence and “CCNS” in a separate letter dated September 23, 2019. The letter requested a  
246 public hearing, identified 14 numbered comments on which the commenters requested the public  
247 hearing, incorporated by reference comments made by Citizens for Clean Water (“CCW”) dated  
248 June 5, 2017, and included comments on the NMED FACT SHEET—DP-1132. I likewise will  
249 not be addressing the comments on the NMED Fact Sheet. However, attached as Triad/DOE  
250 Exhibit 5 is Applicants’ item-by-item response to 13 comments in CCW’s June 5, 2017 comment

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251 letter. The 14 comments on which CCNS requested a public hearing in the September 23, 2019  
252 comment letter are addressed by the item-by-item discussion in the exhibit, because items 1 and  
253 3-14 of the September 23, 2019 comments are identical to the 13 comments of CCW in its  
254 comment letter dated June 5, 2017. The only new comment on which the September 23, 2019  
255 comment letter requests a comment is comment 2, and the response to that comment is  
256 adequately addressed in the response to comment 1 from CCW's June 5, 2017 comment letter.  
257 To the extent Applicants believe the comments warrant minor changes to the wording of Draft  
258 DP-1132, Triad/DOE Exhibit 5 includes a redline of permit language that include the minor  
259 changes Triad/DOE would find acceptable as changes in the final permit to address one of the  
260 issues raised by CCW.

261 Triad/DOE Exhibit 9 also includes other changes to Draft DP-1132 that are needed to  
262 bring DP-1132 current. Specifically, changes are needed to reflect actions which have been  
263 taken at LANL since August 29, 2018 to address certain on-time or ongoing actions that were  
264 conditions of DP-1132 when it was originally issued on that date, and that have been taken  
265 during the period when DP-1132 was in effect as well as since the previously issued DP-1132  
266 was vacated.

267 On August 29, 2018, NMED issued DP-1132 to LANS/DOE, which is now Triad/DOE.  
268 DP-1132 contained 60 permit conditions; approximately one-third of the 60 conditions required  
269 the completion of either a one-time or ongoing action followed by written notification to the  
270 NMED documenting completion of the action. For example, Condition No. 7, *Verification of*  
271 *Secondary Containment*, is a one-time action, whereas Condition No. 1, *Annual Update*, is an  
272 ongoing action. Between August 29, 2018, and September 25, 2019, DOE/Triad submitted  
273 approximately 22 written reports to the NMED to satisfy the documentation requirements in the

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274 Permit. All of the referenced reports are in the NMED Administrative Record for Draft DP-1132.  
275 When an action could not be completed on time, an extension request was submitted to NMED  
276 for its approval; approximately four extension requests were made and granted during the  
277 referenced period.

278 During the RLWTF's first year of operation under DP-1132 a number of substantial one-  
279 time actions were completed. Most notably, the seven vessels identified in Condition No. 40  
280 were removed from service and the new, more modern, Waste Mitigation and Risk Management  
281 (WMRM) Facility became the influent storage system. Work plans were submitted and approved  
282 by NMED for the SET Soil Moisture Monitoring System and replacement alluvial ground water  
283 wells; stabilization plans (2) were submitted and approved by NMED for the seven vessels that  
284 were removed from service. The SET Soil Moisture Monitoring System was installed and  
285 baseline monitoring to establish background soil moisture is in progress. Installation of two  
286 replacement alluvial ground water monitoring wells in Mortandad Canyon was completed. The  
287 pipeline from the RLWTF to Outfall 051 successfully passed a water-tightness test. Six  
288 secondary containment units that previously were without functioning leak detection systems  
289 were upgraded to comply with the requirements of Condition No. 7.

290 Some Permit conditions in DP-1132 contained a one-time action that, once completed,  
291 rendered the condition irrelevant. An example of a Permit condition with a one-time action is  
292 Condition No. 7, *Verification of Secondary Containment*. In the redlined Draft DP-1132 that is  
293 Triad/DOE Exhibit 9, such conditions are recommended for removal in cases where the  
294 condition has been fully satisfied. Other Permit conditions, such as Condition No. 20, *Emergency*  
295 *Response Procedures*, contain a one-time action coupled with on-going requirements. Partial  
296 fulfilment of these Permit conditions in some instances make them candidates for editing, and

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297 those edits are also reflected in Triad/DOE Exhibit 9. Additionally, some Permit conditions  
298 require editing due to new information.

299 Triad/DOE Exhibit 7 is a summary table identifying those Permit conditions Triad/DOE  
300 proposes for removal or editing. The summary table is divided into two sections: Table 1 lists  
301 edits necessary to update the permit as a result of partial fulfilment of conditions or new  
302 information since DP-1132 was originally issued on August 29, 2018, and Table 2 identifies  
303 edits necessary because one-time actions required by the Permit have been fully satisfied. A  
304 discussion of the edits proposed in Tables 1 and 2 of Triad/DOE Exhibit 7 is presented below.

305 Table 1 Edits: Changes are required to the ACRONYMS list (Page 4) and to Section III  
306 *Introduction* to update the reference to the Management & Operations (M&O) contractor for Los  
307 Alamos National Laboratory; Los Alamos National Security, LLC (LANS) was replace by Triad  
308 National Security, LLC (Triad) on November 1, 2018. The definition of Consent Order in  
309 Section II.F. DEFINITIONS needs to be updated to the *Compliance Order on Consent (June*  
310 *2016, Consent Order)*. Condition No. 8, *Water Tightness Testing*, contains a compliance  
311 deadline (“by February 25, 2019”) that must be updated with a new date once the permit is re-  
312 issued. Condition Nos. 16, 17 and 29 contain effluent limits for discharges to Outfall 051 and  
313 the MES/SET, respectively. These limits need to be updated to be consistent with the New  
314 Mexico Water Quality Control Commission’s amendments to 20.6.2.3103 NMAC effective  
315 December 21, 2018, as shown in the letter that is Triad/DOE Exhibit 8. The list of ground water  
316 monitoring locations cited in Condition No. 36, *Ground Water Monitoring*, included generic  
317 placeholder names, *Replacement Alluvial Well*, pending installation of the replacement well. The  
318 replacement wells have been installed and new well IDs assigned: MCA-RLW-1 and MCA-  
319 RLW-2. Accordingly, Condition No. 36 should be updated to reflect the new well names. As will

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320 be described further below, three Permit conditions—7, 33 and 40—are recommended for  
321 removal due to the completion of all required actions within the condition. With these three  
322 conditions removed, the posting of associated documents to the LANL Electronic Public  
323 Reading Room, required by Condition No. 49, *Electronic Posting*, is no longer relevant.

324 Table 2 Edits: Condition No. 7, *Verification of Secondary Containment*, contains a one-time  
325 action to document that all defined units and systems have secondary containment and a  
326 functioning leak detection system. Verification was submitted to NMED in 2018 and 2019, to  
327 document the completion of this requirement and, as a result, qualify Condition No. 7 for  
328 removal. In Condition No. 16.b NMED provided the Permittees with a compliance schedule for  
329 meeting the Total Nitrogen limit in Condition No. 16.a, Table 1. The referenced “new reverse  
330 osmosis treatment unit” at the RLWTF is operational; as a result, Condition 16.b is no longer  
331 applicable and can be removed from Draft DP-1132. Similarly, the compliance schedule for  
332 meeting the Nitrate (as N) limit in Condition No. 16.b (mislabelled “d”) is no longer applicable  
333 and may be removed. Condition No. 20, *Emergency Response Procedures*, required the one-  
334 time submittal of a written summary of the procedures to NMED within 120 days of the effective  
335 date of the permit. The summary was submitted in December 2018; as future summaries are not  
336 required, this action can be removed from the draft permit. The one-time action in Condition  
337 No. 21, *Installation of Flow Meters*, to document the installation and calibration of four flow  
338 meters by April 26, 2019, was satisfied in an April 9, 2019, report to NMED. Because there are  
339 on-going requirements in Condition No. 21 it cannot be removed in its entirety, but should be  
340 updated; the condition has been renamed *Operation of Flow Meters* to reflect the remaining, on-  
341 going requirements of the condition. Condition No. 22, *Calibration of Flow Meters*, contains a  
342 one-time action to calibrate the four referenced flow meters within 180 days of permit issuance

343 (by February 25, 2019). Calibration was completed and documented in an April 9, 2019, report.  
344 This one-time action can be removed from Condition No. 22. Condition No. 30, *Soil Moisture*  
345 *Monitoring System for the SET*, contained a one-time action to submit a work plan for the  
346 installation of a Moisture Monitoring System; the work plan was submitted in October 2018 and  
347 NMED approved the plan in January 2019. Installation of the moisture monitoring system was  
348 completed in August 2019. This one-time action can removed from the draft permit. DP-1132  
349 contained a one-time action to install two replacement alluvial ground water monitoring wells  
350 downgradient of Outfall 051. The required wells were installed in August 2019 and the  
351 completion reports submitted to NMED in September 2019. This one-time action has been fully  
352 satisfied and the condition can be removed. The final condition that qualifies for removal is  
353 Condition No. 40, *Cessation of Specific Units*, which contained a one-time action to permanently  
354 cease operating seven vessels. These seven vessel were permanently removed from service by  
355 the due-date of October 28, 2018, satisfying all actions contained within Condition No. 40.

356 **IX. Opinion Relating to Approval of Draft DP-1132**

357 In my opinion, the Applicants' permit application should be approved and Draft DP-1132  
358 should be issued with the changes as proposed in Triad/DOE Exhibit 9. Draft DP-1132 will  
359 meet all requirements of the WQCC groundwater regulations and authorized discharges will be  
360 fully protective of groundwater quality.

361 This concludes my testimony.

# ROBERT S. BEERS

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OCTOBER 2019—PRESENT

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## ENVIRONMENTAL PROFESSIONAL 4, LOS ALAMOS NATIONAL SECURITY, LLC

MAY 1995—OCTOBER 2019

Responsible for preparing and managing NMED discharge permit applications for LANL.

## GRADUATE RESEARCH ASSISTANT, LOS ALAMOS NATIONAL LABORATORY

NOVEMBER 1993 TO MAY 1995

Supported LANL technical staff with Safe Drinking Water Act (SDWA) compliance.

## EDUCATION | CORNELL UNIVERSITY, ITHACA, NY

B.S. BIOLOGY, 1977

## UNIVERSITY OF NEW MEXICO, ALBUQUERQUE, NM

MASTERS IN WATER RESOURCES ADMINISTRATION, 1994

## EMPLOYMENT HISTORY | BRENNER COMPANY, PROJECT MANAGER, CUSTOM HOMES, SANTA FE, NM

1988-1992

## RS BEERS CUSTOM HOME BUILDERS, PROPRIETOR, SANTA FE, NM

1982-1988

## RIO GRANDE ELEMENTARY SCHOOL, MATH & SCIENCE TEACHER, SANTA FE, NM

1978-1982



## Communities for Clean Water

June 5, 2017

Ms. Kathryn Hayden, Environmental Scientist  
Ground Water Quality Bureau  
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Santa Fe, NM 87502-5469  
By email to: [Kathryn.Hayden@state.nm.us](mailto:Kathryn.Hayden@state.nm.us)  
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RE: Comments and hearing request on DP-1132

Dear Ms. Hayden:

As you know, Communities for Clean Water ("CCW") has been actively participating in the process of arriving at a valid and protective permit for the Radioactive Liquid Waste Treatment Facility ("RLWTF") at the Los Alamos National Laboratory ("LANL") since December 2013. *See* comment letters and requests for hearing provided in PDF along with this letter.<sup>1</sup> A description of each constituent organization of CCW has been provided in the initial comment letters, and that information is incorporated herein by reference.<sup>2</sup> Despite significant good faith participation in an attempt to arrive at a final permit that our constituent organizations and members are satisfied is adequate to assure public health, safety, and protection of the environment, a number of unresolved issues remain upon which a hearing is requested. In this regard, we refer you to the comments and hearing requests we have incorporated herein by reference which we also identify by attachment number and filing date in the list below. This list shows remaining issues along with our suggestion for potential resolution, which could obviate a hearing. Pursuant to 74-6-5(G) NMSA 1978 and 20.6.2.3108(K) NMAC, we request a public hearing on these issues:

1. CCW has contended since its initial comments that the RLWTF, as, in LANL's words, "a zero liquid discharge" facility, is not properly regulated under the New Mexico Water Quality Act and implementing regulations. *See Attachment 15*, CCW Letter to

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<sup>1</sup> *See generally Attachments 1 to 15* which detail the resolved and continuing issues that CCW has with DP-1132.

<sup>2</sup> Membership in CCW's constituent organizations totals approximately 4,000 people who live downwind and downstream of the emissions from operations at LANL.

NMED re DP-1132 (January 13, 2017); see also **Attachments 1, 2, and 14a**, Comments and Requests for Hearing Letter to NMED re DP-1132 (December 6, 2013); Comments and Requests for Hearing to NMED re DP-1132 (December 12, 2013);<sup>3</sup> Cover letter, exhibit list, and petition to rescind NPDES permit for the RLWTF (June 17, 2016). CCW requests a hearing on this issue. CCW notes that it may not be necessary to hold a hearing if the Environment Department specifically stipulates in writing on the record that: (a) the RLWTF has not made any discharges since at least late 2011; (b) the RLWTF is a "zero liquid discharge" facility and no liquid discharges are anticipated from this facility; (c) the new RLWTF Low-Level Radioactive Waste Water ("RLW") Treatment System facility adjacent to the current RLWTF will likewise be a "zero liquid discharge facility"; and (d) once operating, no liquid discharges are anticipated to take place from the new RLWTF RLW facility.<sup>4</sup>

2. It is objectionable to have a permit apply to "subsequent replacement systems," which have not undergone the required public notice, comment and hearing under the Resource Conservation and Recovery Act ("RCRA") and the New Mexico Hazardous Waste Act ("NMHWA"). The new RLW facility, absent an exemption from RCRA/NMHWA, is subject to the NMED facility-wide hazardous waste permit for LANL. NMED notes that LANL constructs the building at its own risk. See **Attachment 16**, NMED letter to LANL (October 3, 2014). According to the letter, LANL submitted plans and specifications to NMED for review. NMED did not provide written approval. NMED made no comment regarding "the adequacy of the design, compliance with applicable State, Federal, local statute, code and requirements." Furthermore, there was no permit then in place for the new facility, nor would one be effective as there was not (and is no) discharge planned. Thus, NMED had no authority to review the "subsequent replacement systems" plans and specifications. DP-1132 Condition 3 requires "prior written approval by NMED" before implementing "any expansion, process modification, or alternation of a system or unit that could constitute a discharge permit modification (as defined in 20.6.2.7.P NMAC) of the intended function, design or capacity of any of the systems, units or components of the Facility's collection, treatment or disposal systems." Building a new facility would require a Class 3 permit modification under RCRA/NMHWA and requires advance public notice, comments and public hearing on request. A non-discharging facility that is not subject to a National Pollutant Discharge Elimination System ("NPDES") permit is covered under the RCRA/NMHWA permit.

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<sup>3</sup> Voluminous documents already in the possession of NMED that were referenced in the January 13, 2017 letter have been omitted from the attached PDF here.

<sup>4</sup> DP-1132 strains to justify a discharge permit ("DP") for a non-discharging facility, incorporating, e.g., elastic "discharge" definition, false "findings" that the facility is discharging, needless "authorization to discharge." See generally the issue and documents referenced above.

3. During discussions of DP-1132, LANL committed to working with CCW members to produce multi-language signage warning people to keep out of areas downstream of the RLWTF, but LANL has had no subsequent communication with CCW regarding the signage, despite the fact that CCW submitted draft copies of such signs. *See Attachment 7* (copy of email with attached copies of proposed signage).

4. Based upon discussions of DP-1132, LANL needs to include representatives of potentially affected Pueblos in emergency incident planning and provide designated seats within the LANL Emergency Operations Center for Pueblo representatives during preparation drills and actual emergencies.

5. Despite CCW's provision of information concerning current standard industry practices for calibration and sensitivity of monitoring equipment, DP-1132 fails to require monitoring equipment accurate to current industry standards.

6. Despite discussions and provisions of ample documentation on this issue, DP-1132 allows groundwater monitoring to be conducted with defective shallow, intermediate and regional wells.

7. In the final version of DP-1132, at LANL's request, NMED unilaterally changed the time for posting its submittals to NMED to the LANL Electronic Public Reading Room from seven (7) days to thirty (30) days. LANL's change effectively eliminates public notice about the 30-day comment period. *See Condition 42 (Closure Plan Amendments and Modifications)*. Moreover, the DP allows public review and comment on proposed amendments to the closure plan "30 days after the submittal." This means the public will likely only learn of a comment opportunity after it expires. *See DP-1132 Condition 42*.

8. The DP-1132 Closure Plan fails to state that closure and post-closure care will take place under the NMED Hazardous Waste Permit for LANL. *See Sec. VII.A.2 of the 2016 NMED Consent Order for LANL (requiring this)*.

9. Even if closure would take place under the Consent Order, closure is deferred and there is no proposed schedule provided in the DP-1132 Closure Plan.

10. The DP-1132 Closure Plan is limited to the low-level radioactive liquid waste treatment facility. LANL omitted to provide closure plans for the transuranic treatment facilities, component systems and "replacement" facilities.

11. The DP-1132 Closure Plan provides no performance standards that LANL must meet in order for NMED to assess whether LANL has met the standards so as to warrant closure. For example, it appears that underground pipe sections may be left in

place, yet there is no justification provided for doing so, and no basis provided for assessing the safety of such a decision. *See* Attachment 14b (performance standards).

12. The DP-1132 Closure Plan provides limited provisions for ground water monitoring; significantly, there is continued reliance on defective wells for monitoring purposes as noted above in ¶ 6.

13. The DP-1132 Closure Plan does not include required continued monitoring, sampling and reporting of contaminants of concern, e.g., perchlorates and radionuclides.

The above listed issues include (1) violations of federal and state law; (2) matters of public health and safety in the operation and ultimate clean-up of the RLWTF and any new “replacement” facilities built to handle the functions of the RLWTF after closure; and (3) inadequate public notice likely violating due process through a denuded posting submittal requirement for the LANL’s Electronic Public Reading Room. Resolution of these issues is of substantial interest to the interested members of the public represented by Communities for Clean Water. For that reason, we request a public hearing on all of the above listed unresolved issues.

Sincerely,

Communities for Clean Water

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## LIST OF ATTACHMENTS

- Attachment 1 CCW-TWU-Comments & Hrg Request DP-1132 RLWTF 2013-12-06
- Attachment 2 DP1132 Comments Tewa Women and CCW 2013-12-12
- Attachment 3 CCW Gilkeson & Sanchez Response to LANL DP1132 Comments 2014-01-26
- Attachment 4 CCW RLWTF Comments 2014-10-24
- Attachment 5 Rev1 CCW RLWTF Comments 2014-10-27
- Attachment 6 CCW Gilkeson Sanchez Remaining Issues 2014-12-03
- Attachment 7 Email with attachments re signage 2014-12-08
- Attachment 8 CCW Ltr to NMED 2015-06-01
- Attachment 9 Email string CCW NMED LANL re delayed postings to EPRR 2015-06-08
- Attachment 10 Email plus CCW re 8-31- S Draft DP-1132 and LANL GW report 2015-09-14
- Attachment 11 CCW DP-1132 memo to NMED 2015-09-14
- Attachment 12 CCW DP-1132 comments 2015-11-23
- Attachment 13 CCW Comments DP-1132 draft 2016-08-29
- Attachment 14a CCNS Ltr to Region 6-Ex List-Petition to Rescind RLWTF NPDES 8-29-16
- Attachment 14b Ex. B to CCW 8-29 Comments - Closure Performance Standards 8-29-16
- Attachment 14c Ex. C to CCW 8-29 Comments-Mtg Note DP-1132 Closure Plan 2016-08-30
- Attachment 15 CCW Comments to NMED re DP-1132 2017-01-13
- Attachment 16 NMED Ltr LANL re RLWTF-Upgrade Plan Plans & Specs 2014-10-3

**DISCHARGE RATE AND FREQUENCY**

The average daily flow rates for the sources that discharge to Outfall 051 are provided in Table 6.

**Table 6  
Source Flow Rates/Frequencies to Outfall 051**

Operation/Source	Average Flow (Gallon/Day)	Treatment Code
RLWTF	19,700	1G, 1O, 1S, 1Q, 1R 1U, 2J, 1F, 2K, 2C, 5Q, 5U

**SAMPLING AND ANALYSIS FOR RE-APPLICATION**

The RLWTF has not discharged to Outfall 051 since November 2010. LANL requests to re-permit the outfall so that the RLWTF can maintain the capability to discharge to the outfall should the Mechanical Evaporator and/or Zero Liquid Discharge (ZLD) Solar Evaporation Tanks become unavailable due to maintenance, malfunction, and/or there is an increase in treatment capacity caused by changes in LANL scope/mission.

A grab sample for the Form 2C Constituents will be collected for Outfall 051 when/if the RLWTF discharges effluent through the outfall. See the attached Discharge Monitoring Report Outfall Summary for the analytical data collected prior to November 2010.

**ANALYTICAL RESULTS PROVIDED**

- NPDES Discharge Monitoring Reports (DMRs) from August 2007 – December 2011.
- Material Safety Data Sheets for treatment chemicals.

**ADDITIONAL INFORMATION**

- Latitude – 35°51'54"
- Longitude – 106°17'54"

## Form 2C Section IV.B - Improvements

### ZERO LIQUID DISCHARGE (ZLD) PROJECT

The configuration of the RLWTF and Outfall 051 will be changing in the next 5 years due to the construction of two new Concrete Evaporation Tanks at Technical Area (TA) 52 under the Zero Liquid Discharge (ZLD) Project. These evaporation tanks will receive treated effluent from the RLWTF and will reduce the volume of treated effluent discharged to Outfall 051. The evaporation tanks will be connected to the RLWTF by a transfer pipe line that will be approximately 0.75 miles long. Figures 2 and 3 provide copies of the 90% review design drawings for the transfer line and evaporation tanks.

**Department of Energy/ Los Alamos National Security's Preliminary Response  
To The Communities for Clean Water's Public Comments Dated June 5, 2017**

This document contains the U.S. Department of Energy and Los Alamos National Security, LLC ("Applicants") preliminary responses to the Communities for Clean Water ("CCW") public comment letter dated June 5, 2017 on Draft DP-1132.<sup>1</sup> The numbered paragraphs presented below in italics are verbatim restatements of CCW's comments, and following each is the Applicants' preliminary responses. The Applicants reserve the right to further address these comments throughout this public hearing process, including in direct and rebuttal testimony, through cross-examination of witnesses, in the context of any motions or objections, and in post-hearing submissions.

- 1. CCW has contended since its initial comments that the RLWTF, as, in LANL's words, "a zero liquid discharge" facility, is not properly regulated under the New Mexico Water Quality Act and implementing regulations. See Attachment 15, CCW Letter NMED re DP-1132 (January 13, 2017); see also Attachments 1, 2, and 14a, Comments and Requests for Hearing Letter to NMED re DP-1132 (December 6, 2013); Comments and Requests for Hearing to NMED re DP-1132 (December 12, 2013); Cover letter, exhibit list, and petition to rescind NPDES permit for the RLWTF (June 17, 2016). CCW requests a hearing on this issue. CCW notes that it may not be necessary to hold a hearing if the Environment Department specifically stipulates in writing on the record that: (a) the RLWTF has not made any discharges since at least late 2011; (b) the RLWTF is a "zero liquid discharge" facility and no liquid discharges are anticipated from this facility; (c) the new RLWTF Low-Level Radioactive Waste Water ("RLW") Treatment System facility adjacent to the current RLWTF will likewise be a "zero liquid discharge facility"; and (d) once operating, no liquid discharges are anticipated to take place from the new RLWTF RLW facility.*

CCW's position is legally and factually unfounded. CCW argues that the RLWTF is "not properly regulated under the New Mexico Water Quality Act," citing letters suggesting that the RLWTF does not "discharge" and should be regulated under RCRA. As an initial matter, any argument that the RLWTF is a facility that should be regulated under RCRA is completely outside the scope of this discharge permit proceeding and has no bearing on the Laboratory's compliance with the WQCC's regulations and the Water Quality Act.

Moreover, the position that the RLWTF does not or will not "discharge" is incorrect. Section V.C of Draft DP-1132, Authorization to Discharge, allows wastewater to be discharged to three different systems: the MES, the SET and Outfall 051. The MES is a natural gas-fired mechanical evaporator. The SET—a two-cell, synthetically lined tank constructed in 2012—is sometimes referred to as a Zero Liquid Discharge ("ZLD") solar evaporation tank. Outfall 051 is an outfall from a pipe system directly to Effluent Canyon.

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<sup>1</sup> CCW also filed comments dated January 13, 2017 regarding a draft DP-1132 dated November 15, 2016. Although this draft is not the subject of this proceeding, the comments are legal in nature and are referenced in CCW's June 5, 2017 comments.

CCW's position is premised on mistaken or outdated facts. Neither NMED under the express terms of Draft DP1132, nor the Applicants, contemplate that discharges will not occur from Outfall 051. To the contrary, they contemplate that discharges would be authorized "through an outfall (identified as Outfall 051) also regulated by [NPDES Permit No. NM0028355] issued by [EPA]." See Section V.C. of Draft DP-1132. Per LANL's NPDES Permit renewal application, Outfall 051 is NPDES-permitted to allow the RLWTF to "maintain capacity to discharge should the [SET] and/or [MES] become unavailable due to maintenance, malfunction, and/or there is an increase in treatment capacity caused by changes to LANL scope/mission." See LANS/DOE Exhibit 4, Form 2C, pp. 5, 7, 2012 NPDES Permit Re-Application, Outfall 051, RWLTF, LA-UR-12-00359 (Feb. 2012). The intention that LANL be allowed to discharge is underscored by Condition VI.C.8 in Draft DP-1132, which would require water tightness testing within 180 days of the effective date of the permit for the conveyance to Outfall 051. This is an action the Applicants will perform, because they have an intention to convey treated effluent from the RLWTF through Outfall 051 to Effluent Canyon as needed to meet operational and maintenance requirements. See Affidavit of Robert C. Mason, attached to Applicants' April 2, 2018 Response to CCW's Motion to Dismiss DP-1132 Proceeding.

Even apart from CCW's factually erroneous conflation of the "Zero Liquid Discharge" SET facility with the MES and Outfall 051, CCW unreasonably disregards how Draft DP-1132 and NMED's ground water program regulations use the term "discharge." "Discharge" is defined in Section II.G of Draft DP-1132 to include the "intentional *or unintentional* release of an effluent or leachate which has the *potential* to move directly or indirectly into ground water." (Emphases added). Accordingly, even if the intended discharges authorized by Draft DP-1132 "through Outfall 051" to Effluent Canyon were disregarded, and only the discharges to the MES and SET evaporator systems were to be considered, CCW's position is still flawed, because it is the "potential" for a discharge to get to ground water that matters, regardless of intent.

This regulatory approach is acknowledged as being correct both by the express terms of the Water Quality Act ("WQA") and case law interpreting that Act. The WQA fundamentally defines a "source" to mean "a building, structure, facility or installation from which there is *or may be*, a discharge of water contaminants directly *or indirectly* into water." 1978 NMSA, §74-6-2(L) (emphases added). In turn, the WQA defines a "water contaminant" to mean "any substance that could alter if discharged *or spilled* the physical, chemical, biological or radiological qualities of water." 1978 NMSA, §74-6-2(B) (emphasis added). These central building blocks of the WQA are worded in a way that clearly reflects a legislative intent not to construe the concept of regulated discharges under the Act as narrowly as CCW proposes.

The notion that NMED's regulatory permitting authority under the groundwater protection program only arises if and when there is an *actual* release, as CCW appears to argue, is fundamentally contrary to the central objective of the WQA to *prevent*—and not just *abate* after the fact—groundwater degradation. See *Bokum Resources Corp. v. New Mexico Water Quality Control Comm'n*, 93 N.M. 546, 555, 603 P.2d 285, 284 (1979). If the WQCC intended only to permit facilities once those potential sources *actually* release water contaminants, then its groundwater permitting program would be rendered superfluous, and the separate abatement program adopted by the WQCC and administered by NMED would be all that is needed.

NMED has understood the fundamental groundwater protection and prevention mandate of the WQCC for decades, and has pursued its groundwater protection program under the WQA accordingly. The GWQB's permitting files are replete with examples of groundwater discharge permits issued by NMED under the WQA where the coverage of the permit includes, in whole or part, facilities involving water that is conveyed or stored in man-made systems such as pipelines, tanks or lined ponds and other structures, facilities or installations. In very many of these examples, the company to which the permit has been issued may believe and/or intend that no groundwater will ever actually receive or otherwise be impacted by its facilities as a result of water and contaminant control practices. A conclusion by the GWQB that NMED has no authority to issue a discharge permit for the RLWTF would undermine a substantial portion of the GWQB's permitting program and place in doubt many long-standing permits issued or renewed to manufacturing, mining and other important potential sources for the preventative protection of New Mexico's groundwater resources.

Moreover, the future policy implications of adopting CCW's narrow interpretation of NMED's groundwater permitting authority would be troubling. It is ironic that the groups comprising CCW—concerned, as they laudably are, with environmental protection—would choose to advance such a narrow interpretation of NMED's permitting authority under the WQA. The fact that CCW would advance such a narrow position underscores that it is simply a position of convenience given its positions regarding the hazardous waste permitting regimes, which are beyond the scope of this discharge permit proceeding, and which therefore are clearly addressed to the wrong forum, as already stated.

Additionally, as the CCW comment suggests, CCW may seek to use the permitting proceedings on Draft DP-1132 as a forum in which to argue that the NPDES Permit issued by the EPA to LANS and DOE under the CWA for Outfall 051 relating to the RLWTF should be terminated or rescinded. If CCW attempted to do so, however, it would be wholly inappropriate, as CCW can only pursue—and indeed has pursued—the position administratively with the agency having primacy over NPDES permitting, which is the EPA.

In fact, EPA rejected a similar argument raised by Concerned Citizens for Nuclear Safety (“CCNS”) in an action whereby CCNS requested termination of LANL's RLWTF NPDES Permit. In that action, CCNS requested that EPA “terminate” LANL's NPDES Permit on the basis that the RLWTF was a “zero discharge facility.” According to CCNS, the facility was outside of EPA's jurisdiction to regulate under the NPDES permit program, and EPA should instead regulate the RLWTF as a RCRA facility. EPA flatly rejected CCNS' arguments. In EPA's final decision, the Agency stated that the NPDES permit coverage applied to the facility's requested NPDES coverage for *possible* discharges, and “*whether or not issuance of NPDES permit coverage might trigger RCRA's [Waste Water Treatment Unit] exemption has no bearing on EPA's NPDES permitting decisions, which must be based on the requirements of the CWA and implementing regulations.*” See Letter from the Region 6, EPA's Water Division Director to Mr. Lindsey Lovejoy and Mr. Jonathan Block, CCNS dated August 16, 2017 (Attachment A). CCW's position that the RLWTF is not “properly regulated” under the New Mexico Water Quality Act and implementing regulations ignores the plain language of the WQCC regulations that a discharge permit is required for discharges that “may move directly or indirectly into

ground water,” see 20.6.2.3104 NMAC, and the established purpose of the WQA to prevent ground water degradation. See *Bokum Resources*, 93 N.M. at 555, 603 P.2d at 284.

2. *It is objectionable to have a permit apply to “subsequent replacement systems,” which have not undergone the required public notice, comment and hearing under the Resource Conservation and Recovery Act (“RCRA”) and the New Mexico Hazardous Waste Act (“NMHWA”). The new RLW facility, absent an exemption from RCRA/NMHW, is subject to the NMED facility-wide hazardous waste permit for LANL. NMED notes that LANL constructs the building at its own risk. See Attachment 16, NMED letter to LANL (October 3, 2014). According to the letter, LANL submitted plans and specifications to NMED for review. NMED did not provide written approval. NMED made no comment regarding “the adequacy of the design, compliance with applicable State, Federal, local statute, code and requirements.” Furthermore, there was no permit then in place for the new facility, nor would one be effective as there was not (and is no) discharge planned. Thus, NMED had no authority to review the “subsequent replacement systems” plans and specifications. DP-1132 Condition 3 requires “prior written approval by NMED” before implementing “any expansion, process modification, or alternation of a system or unit that could constitute a discharge permit modification (as defined in 20.6.2.7.P NMAC) of the intended function, design or capacity of any of the systems, units or components of the Facility’s collection, treatment or disposal systems.” Building a new facility would require a Class 3 permit modification under RCRA/NMHW and requires advance public notice, comments and public hearing on request. A non-discharging facility that is not subject to a National Pollutant Discharge Elimination System (“NPDES”) permit is covered under the RCRA/NMHW permit.*

This comment makes arguments pertaining to RCRA and the Hazardous Waste Act that have no relevance whatsoever to this discharge permit hearing, and it seeks to obfuscate and confuse matters by implying that NMED in the October 3, 2014 letter declined to give any indication of approval to the plans and specifications for the RLWTF upgrade project that is the subject of the comment. The letter, however, explicitly states that NMED reviewed the plans and specifications “for compliance with basic elements necessary for protection of groundwater quality,” and found that they were “generally appropriate, and include adequate safeguards to protect groundwater quality including secondary containment, structural integrity, capacities, appropriate materials, and leak detection systems.” (AR #485; Bates Nos. 12780-12781). CCW’s assertions that in the letter NMED “did not provide written approval” and “made no comment regarding ‘the adequacy of the design, compliance with applicable State, Federal, local statute, code and requirements’” therefore is completely misleading in that it intentionally confuses and conflates building code compliance reviews, which are not within NMED’s province, with review to assess adequacy for groundwater protection, which is within NMED’s purview and in fact was performed based on the express statements in the letter.

3. *During discussions of DP-1132, LANL committed to working with CCW members to produce multi-language signage warning people to keep out of areas downstream of the RLWTF, but LANL has had no subsequent communication with CCW regarding the signage, despite the fact that CCW submitted draft copies of such*

*signs. See copy of e-mail with attached copies of proposed signage.*

This comment and the referenced e-mail is sufficiently addressed by the testimony of Karen Armijo for the Applicants. Her testimony supports that CCW's recommended signage was carefully considered but rejected based upon the fact that the required language would not translate appropriately and the RLWTF facility is interior to LANL property and does not share a boundary with San Ildefonso lands. CCW received notice of the rejection, so the assertion that there was no subsequent communication in the comment is not correct.

4. *Based upon discussions of DP-1132, LANL needs to include representatives of potentially affected Pueblos in emergency incident planning and provide designated seats within the LANL Emergency Operations Center for Pueblo representatives during preparation drills and actual emergencies.*

This comment is also addressed by the testimony of Karen Armijo for the Applicants. Her testimony supports that a DOE order in effect precludes non-LANL personnel from having a direct role in the Emergency Operations Center, but that the same order includes requirements of offsite response interfaces with local, state, tribal and federal organizations responsible for emergency response sufficient to satisfy the thrust of CCW's comment and the requirements of Draft DP-1132.

5. *Despite CCW's provision of information concerning current standard industry practices for calibration and sensitivity of monitoring equipment, DP-1132 fails to require monitoring equipment accurate to current industry standards.*

CCW does not identify what "information" it provided concerning current standard industry practice for calibration and sensitivity of monitoring equipment, nor does it explain or present facts that address why, as alleged, Draft DP-1132 fails to require "monitoring equipment accurate to current industry standards." In addition, CCW does not identify a change to any conditions in the Draft DP-1132. As an initial matter, for these reasons alone, CCW's generalized comment does not warrant any change to the Draft DP-1132.

Applicants will assume, however, that the "monitoring equipment" CCW refers to addresses "flow meters" and that the "information" it provided refers to a written submittal dated December 3, 2014 (AR No. 539, Attachment 6, Comment No. 12, page 7 to CCW's June 5, 2016). For the reasons stated below, CCW's position is technically unwarranted and does not support a change to Permit Condition VI.A.22.

#### **Permit Condition – Calibration of Flow Meters**

Draft DP-1132 Condition VI.A.22 requires that flow meters for the effluent lines to the SET, MES and Outfall 051 "shall be calibrated to within *plus or minus 5 percent* of actual flow, as measured under field conditions." The same Condition provides that the influent line to the RLWTF "shall be calibrated to within *plus or minus 10 percent* of actual flow, as measured under field conditions" (emphasis added).

#### **Discussion**

In the December 2014 submittal, CCW disagreed with the requirement in the Draft DP-1132 for calibrating flow meters, stating:

"ISO 17025-certified meters can achieve +/- 0.05 percent accuracy."

and:

"[M]easuring uncertainties of +/- 0.1% of rate are achievable with modern flowmeters." Jerry Stevens & Jason Pennington, "Flowmeter Calibration, Proving, & Verification Ensuring the accuracy & repeatability of your flow measurements (September 26, 2010). Online at:<http://www.flowcontrolnetwork.com/articles/calibration-proving-verification>

and:

"Additionally, it is important to note that the ISO/TEC 17025 General Requirements are the doormat for competent testing and calibration laboratories, so one would expect that LANL observe these standards in calibration and measurement."

AR No. 539 at 7.

CCW's technical position outlined in the December 2014 written submittal is flawed for multiple reasons.

First, Applicants were unable to locate the referenced 2010 report "*Flowmeter Calibration, Proving, & Verification Ensuring the Accuracy & Repeatability of Your Flow Meters*" purported to exist at the URL address above. In addition, Applicants were unable to locate any report written by the above-mentioned authors.

Second, CCW misrepresents the ISO/IEC 17025 standard as suggesting it is applicable to the RLWTF or flow meter accuracy rates. Instead, the referenced ISO/IEC standard applies to calibration laboratories and not production or treatment facilities like the RLWTF (see Attachment B, International Standard, ISO/IEC 17025:2005). Additionally, review of the referenced ISO/IEC standard reveals that it does not address flow meter accuracy nor contain any references to measuring achievable percentages such as +/- 0.05%.

Third, Contrary to CCW's assertion, the calibration of flow meters identified in Condition VI.A.22 is technically supportable and based on current industry standards. The EPA standard for flowmeter accuracy is  $\pm 10\%$ : "*If the permittee's flow measurement system is accurate within  $\pm 10$  percent, the inspector should use the installed system.*" See Attachment C (excerpt from the NPDES Inspection Compliance Manual, Chapter 6, Section B, "Flow Measurement Compliance, p.122). Consistent with this, the Laboratory's NPDES Permit states:

"Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from true discharge rates throughout the range of expected discharge volumes." See Attachment D (excerpt from

NPDES Permit No. NM0028355, Part III, "Standard Conditions for NPDES Permits," Condition C.6).

The NMED WQCC regulations have no numerical requirement for calibration accuracy and do not define calibration. The only reference in WQCC regulations to "calibration" is as follows: "The permittee shall retain records of all monitoring information, including... the calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation." See 20.6.2.5341.K(2)(a) NMAC. At a recent hearing regarding changes to WQCC regulations applicable to the dairy industry, however, the WQCC adopted NMED's proposal that all flow measurement devices be calibrated in-place, under actual operating conditions (field calibration) to within  $\pm 10\%$  of the actual flow. At the 2010 WQCC hearing on the Dairy Rule, Mr. Robert George of NMED-GWQB relied on an exhibit regarding "Flow Meter Calibration" in testifying that "NMED has proposed that all flow measurement devices be calibrated in-place, under actual operating conditions (field calibration) to within  $\pm 10\%$  of the actual flow." See Attachment E, which is an excerpt from Ashcraft Exhibit 6 from the Dairy Rule hearing in 2010.

In summary, the calibration accuracy for inflow and effluent flowmeters required under Condition VI.A.22 is consistent with what is required by the EPA and the NMED, and CCW has not demonstrated that this standard should be changed.

6. *Despite discussions and provisions of ample documentation on this issue, DP-1132 allows groundwater monitoring to be conducted with defective shallow, intermediate and regional wells.*

This comment is unfounded and is sufficiently addressed by the testimony of Danny Katzman for the Applicants. Groundwater monitoring will occur at four existing regional wells, an intermediate groundwater monitoring well, and two new alluvial wells. All existing groundwater monitoring wells have been constructed in accordance with NMED construction and design guidelines, and the two new alluvial groundwater monitoring wells required by the draft discharge permit are subject to approval by NMED, and will be constructed in accordance with NMED's guidelines.

7. *In the final version of DP-1132, at LANL's request, NMED unilaterally changed the time for posting its submittals to NMED to the LANL Electronic Public Reading Room from seven (7) days to thirty (30) days. LANL's change effectively eliminates public notice about the 30-day comment period. See Condition 42 (Closure Plan Amendments and Modifications). Moreover, the DP allows public review and comment on proposed amendments to the closure plan "30 days after the submittal." This means the public will likely only learn of a comment opportunity after it expires. See DP-1132 Condition 42.*

Based upon this comment, which the Applicants assume to be directed at Condition VI.E.49, DOE/LANS proposes a minor change to Condition VI.E.49 by changing the first sentence of that Condition as shown below:

Commencing on the Effective Date of this Discharge Permit the permittees shall, within

~~thirtyseven~~ business days of submittal to NMED, post on LANL's Electronic Public Reading Room located at <http://epr.lanl.gov/oppie/service> (or as updated) the following submittals to NMED.

8. *The DP-1132 Closure Plan fails to state that closure and post-closure care will take place under the NMED Hazardous Waste Permit for LANL. See Sec. VII.A.2 of the 2016 NMED Consent Order for LANL (requiring this).*

CCW's position is factually and legally unfounded. The Draft DP-1132 does not "fail" to state that closure or post-closure will take place under a different regulatory framework, e.g., the LANL Hazardous Waste Facility Permit. Draft DP-1132 *explicitly* addresses closure requirements for each "unit and system" at the RLWTF under Permit Condition 42, *Closure Plan*, and in the attached "Closure Plan." Permit Section 46, *Integration with the Consent Order*, states that the investigation, characterization, clean up and corrective action requirements for potential media from "solid waste management units" and "areas of concern" associated with the facility are regulated under the June 2016 Consent Order on Consent ("Consent Order") ([https://www.env.nm.gov/wp-content/uploads/2015/12/LANL\\_Consent\\_Order\\_FINAL.pdf](https://www.env.nm.gov/wp-content/uploads/2015/12/LANL_Consent_Order_FINAL.pdf)). This condition further states that "no activities required under [DP-1132] shall conflict with or duplicate activities for SWMUs and AOCs identified under the Consent Order (see Permit Condition 46).

There is no basis to conclude that the RLWTF closure must take place under LANL Hazardous Waste Facility Permit or that the Consent Order "requires" this. The RLWTF "units and systems" must be closed under Draft DP-1132 per the requirements of the ground water quality regulations. Further, Section VII.A.2 of the Consent Order does not, as stated by CCW require the RLWTF to be closed under that document. The Consent Order, Section VII.A.2 states:

#### VII. RELATIONSHIP TO PERMITS

NMED has determined that all corrective action for releases of hazardous waste or hazardous constituents at the Facility, required by Sections 3004(u) and (v) and 3008(h) of 24 RCRA, 42 U.S.C. §§ 6924(u) and (v) and 6928(h), and Sections 74-4-4(A)(5)(h) and (i) and 74-4-4.2(B) of the HWA, shall be conducted solely under this Consent Order and *not* under the current or any future Hazardous Waste Facility Permit ("Permit"), *with the exception* of the following five items which will be addressed in the Permit and not in this Consent Order:

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- 2) *The closure and post-closure care requirements of 20.4.1.500 NMAC (incorporating 40 C.F.R, Part 264, Subpart G), as they apply to hazardous waste management units at the Facility.*

In a September 11, 2014 letter to the Ground Water Quality Bureau, the Applicants identified six SWMUs and AOCs at the RLWTF that are regulated under the Consent Order which will establish priorities for characterization, cleanup, and closure of SWMUs and AOCs

(see AR #477 and DP-1132, Closure Plan). There are four non-SWMU/AOCs units that are not regulated under the Consent Order, including the Mechanical Evaporator System (“MES”), the Solar Evaporative Tank System (“SET”), the Waste Mitigation and Risk Management Tanks (“MMRM”), and the Bottoms Disposal Tanks. These four units must meet the closure requirements under Draft DP-1132.

The Consent Order does not state, as CCW alleges, that the RLWTF must be “closed” under the LANL Permit. Instead, the Consent Order requires hazardous waste management units (“HWMUs”) to meet the closure and post-closure requirements under the LANL Hazardous Waste Facility Permit. Attachment J of the LANL Hazardous Waste Facility Permit identifies the specific HWMUs required to meet closure and post-closure care under that Permit ([https://hwbdocuments.env.nm.gov/Los%20Alamos%20National%20Labs/TA%2054/38365/Attachment%20J\\_February\\_2018.pdf](https://hwbdocuments.env.nm.gov/Los%20Alamos%20National%20Labs/TA%2054/38365/Attachment%20J_February_2018.pdf)). The RLWTF is not a HWMU identified in Attachment J to the LANL Hazardous Waste Facility Permit.

*9. Even if closure would take place under the Consent Order, closure is deferred and there is no proposed schedule provided in the DP-1132 Closure Plan.*

For the reasons stated above in Comment No. 8, CCW is incorrect in stating that “even if closure would take place under the consent order \*\*\* there is no proposed schedule provided in the DP-1132 Closure Plan.” The Closure Plan, Section 5.9 provides a closure schedule including projected timetables and estimated durations for completing the various closure steps. In addition, Draft DP-1132 Permit Condition 43 requires the Permittees to notify NMED at least 120 days prior to initiation of closure activities and to continue ground-water monitoring.

*10. The DP-1132 Closure Plan is limited to the low-level radioactive liquid waste treatment facility. LANL omitted to provide closure plans for the transuranic treatment facilities, component systems and "replacement" facilities.*

CCW is incorrect in stating that the Draft DP-1132 Closure Plan omitted to provide closure for transuranic treatment facilities, component systems and “replacement” facilities. The July 2016 Closure Plan explicitly addresses closure of the transuranic RLW treatment systems under Section 2.3, Section 3, and Section 4.2.2 of the Closure Plan. In addition, “if a replacement facility component is put into operation (e.g., the new low-level treatment facility), then the Closure Plan will be revised to include the replacement facility, then submitted to the Ground Water Bureau for approval.” Closure Plan, Section 3.2, *Closure Approach*. Permit Condition 42 also provides that “changes that would affect the implementation of the Closure Plan” must be submitted to NMED for approval and allows for public comment regarding modified or amended closure plans prior to approval.

*11. The DP-1132 Closure Plan provides no performance standards that LANL must meet in order for NMED to assess whether LANL has met the standards so as to warrant closure. For example, it appears that underground pipe sections may be left in place, yet there is no justification provided for doing so, and no basis provided for assessing the safety of such a decision. See Attachment 14b (performance standards).*

CCW is incorrect in stating that the Draft DP-1132 Closure Plan provides “no performance standards that LANL must meet in order for NMED to assess” whether LANL has “met standards so as to warrant closure.” The New Mexico Ground Water Quality Regulations establish performance standards for closure plans stating the “a closure plan to *prevent the exceedance of standards at 20.6.2.3103 NMAC or the presence of a toxic pollutant in ground water after the cessation of operations which include a description of the closure measures, maintenance and monitoring plans... and other measures necessary to prevent or abate such contamination...*” 20.6.2.3107.A.11.

The Draft DP-1132 Closure Plan integrates these requirements as necessary to ensure that the performance standard (above) is achieved. The Closure Plan, establishes an approach that addresses removal of containers, structural assessments, removal of solids and liquids, decontamination, *removal of piping*, removal of units and associated components (Sections 3 and 4.1). In addition, Section 5 establishes requirements for site investigation and characterization, decontamination methods, post-closure monitoring, ground water monitoring, characterization and disposition of wastes and final closure. Finally, CCW’s example concluding that underground piping may be “left in place ... without justification” is vague and unclear, and not supported by facts.

*12. The DP-1132 Closure Plan provides limited provisions for ground water monitoring; significantly, there is continued reliance on defective wells for monitoring purposes as noted above in ¶ 6.*

This comment is sufficiently addressed by the testimony of Danny Katzman for the Applicants. As stated above, all existing groundwater monitoring wells have been constructed in accordance with NMED construction and design guidelines, and the two new alluvial groundwater monitoring wells required by the draft discharge permit are subject to approval by NMED, and will be constructed in accordance with NMED’s guidelines.

*13. The DP-1132 Closure Plan does not include required continued monitoring, sampling and reporting of contaminants of concern, e.g., perchlorates and radionuclides.*

CCW is incorrect in stating that the Closure Plan does not include required monitoring, sampling and reporting of contaminants of concern. As set forth in the Closure Plan, Section 5.6, post-closure groundwater monitoring will be conducted at the same wells as used for operational monitoring and will focus on contaminants that were associated with the RLWTF and that have the potential to migrate to groundwater (e.g., nitrate, perchlorate, and fluoride). In the event that groundwater contaminants associated with operations conducted at the RLWTF under the discharge permit are detected in any of the wells, an assessment of the condition would be performed and mitigation may be conducted.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
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August 16, 2017

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RE: Request to Terminate NPDES Permit #NM0028355 as to Outfall #051  
for Radioactive Liquid Waste Treatment Facility

Dear Mr. Lovejoy and Mr. Jantz:

This letter is in response to the above-referenced request to terminate permit coverage, which was filed pursuant to 40 C.F.R. § 124.5 with the Acting Regional Administrator of EPA Region 6 (Region 6) by Concerned Citizens for Nuclear Safety (CCNS) on March 9, 2017 (“Request to Terminate”). CCNS asks the Region to terminate permit coverage for Outfall 051 under NPDES Permit #NM0028355, issued in 2014 to Los Alamos National Security, LLC (LANS) and the Department of Energy (DOE) as co-permittees for the Los Alamos National Laboratory facility located at Los Alamos, NM (LANL). The permit authorizes LANL to discharge from eleven sanitary and/or industrial outfalls, including a discharge of treated radioactive liquid waste from the Radioactive Liquid Waste Treatment Facility (RLWTF) through Outfall 051 into Mortandad Canyon.

CCNS argues that because LANL’s RLWTF facility was redesigned as a zero discharge facility in the early 2000’s and has not discharged since 2010, Outfall 051 does not require NPDES permit coverage, and that in fact issuing such coverage is outside the jurisdiction of EPA pursuant to federal court rulings in *National Pork Producers Council v. EPA*, 635 F.3d 738 (5<sup>th</sup> Cir. 2011)(“*National Pork Producers*”) and *Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486 (2d Cir. 2005)(“*Waterkeeper*”). CCNS further argues that NPDES coverage for Outfall 051 is improper because it makes LANL’s RSWTF eligible for a Waste Water Treatment Unit (WWTU) regulatory exemption under the Resource Conservation and Recovery Act (RCRA) despite no actual Clean Water Act (CWA) discharges.

Region 6 does not agree with CCNS’s arguments and has determined not to unilaterally propose termination of LANL’s NPDES permit coverage for Outfall 051. Under 40 C.F.R. § 124.5(b), if the Regional Administrator decides a request to terminate NPDES permit coverage filed by an interested party is not justified, the Regional Administrator must send the requester “a brief written response giving a reason for the decision.” Accordingly, Region 6 provides the following response.

TRIAD/DOE

**Exhibit 5 -  
Attachment A**

U1701300

has authority under CWA § 402 (a) to issue a permit authorizing the discharge of pollutants should one occur. Otherwise, the CWA's requirement that facilities obtain NPDES permit coverage **prior to discharge** would be impossible for the agency to implement.

As to CCNS's argument that LANL's NPDES permit for discharges from Outfall 051 should be terminated because the NPDES permit coverage allows LANL to obtain a Waste Water Treatment Unit (WWTU) regulatory exemption under the Resource Conservation and Recovery Act (RCRA), Region 6 has determined this argument to be outside the scope of our decision. Whether or not issuance of NPDES permit coverage might trigger the RCRA WWTU regulatory exemption has no bearing on EPA's NPDES permitting decisions, which must be based on the requirements of the CWA and implementing regulations.

For the above reasons, Region 6 has determined CCNS's Request to Terminate LANL's NPDES permit coverage for Outfall 051 under NPDES Permit No. NM0028355 is not justified. Should you have any question regarding this matter, please contact Ms. Stacey Dwyer of my staff at (214) 665-6729, or Renea Ryland at (214) 665 -2130.

Sincerely,



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U1701300

INTERNATIONAL  
STANDARD

ISO/IEC  
17025

Second edition  
2005-05-15

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**General requirements for the competence  
of testing and calibration laboratories**

*Exigences générales concernant la compétence des laboratoires  
d'étalonnages et d'essais*

TRIAD/DOE

**Exhibit 5 -  
Attachment B**

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Reference number  
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## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of conformity assessment, the ISO Committee on conformity assessment (CASCO) is responsible for the development of International Standards and Guides.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

Draft International Standards are circulated to the national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 17025 was prepared by the *ISO Committee on conformity assessment* (CASCO).

It was circulated for voting to the national bodies of both ISO and IEC, and was approved by both organizations.

This second edition cancels and replaces the first edition (ISO/IEC 17025:1999), which has been technically revised.

## Introduction

The first edition (1999) of this International Standard was produced as the result of extensive experience in the implementation of ISO/IEC Guide 25 and EN 45001, both of which it replaced. It contained all of the requirements that testing and calibration laboratories have to meet if they wish to demonstrate that they operate a management system, are technically competent, and are able to generate technically valid results.

The first edition referred to ISO 9001:1994 and ISO 9002:1994. These standards have been superseded by ISO 9001:2000, which made an alignment of ISO/IEC 17025 necessary. In this second edition, clauses have been amended or added only when considered necessary in the light of ISO 9001:2000.

Accreditation bodies that recognize the competence of testing and calibration laboratories should use this International Standard as the basis for their accreditation. Clause 4 specifies the requirements for sound management. Clause 5 specifies the requirements for technical competence for the type of tests and/or calibrations the laboratory undertakes.

Growth in the use of management systems generally has increased the need to ensure that laboratories which form part of larger organizations or offer other services can operate to a quality management system that is seen as compliant with ISO 9001 as well as with this International Standard. Care has been taken, therefore, to incorporate all those requirements of ISO 9001 that are relevant to the scope of testing and calibration services that are covered by the laboratory's management system.

Testing and calibration laboratories that comply with this International Standard will therefore also operate in accordance with ISO 9001.

Conformity of the quality management system within which the laboratory operates to the requirements of ISO 9001 does not of itself demonstrate the competence of the laboratory to produce technically valid data and results. Nor does demonstrated conformity to this International Standard imply conformity of the quality management system within which the laboratory operates to all the requirements of ISO 9001.

The acceptance of testing and calibration results between countries should be facilitated if laboratories comply with this International Standard and if they obtain accreditation from bodies which have entered into mutual recognition agreements with equivalent bodies in other countries using this International Standard.

The use of this International Standard will facilitate cooperation between laboratories and other bodies, and assist in the exchange of information and experience, and in the harmonization of standards and procedures.

## General requirements for the competence of testing and calibration laboratories

### 1 Scope

1.1 This International Standard specifies the general requirements for the competence to carry out tests and/or calibrations, including sampling. It covers testing and calibration performed using standard methods, non-standard methods, and laboratory-developed methods.

1.2 This International Standard is applicable to all organizations performing tests and/or calibrations. These include, for example, first-, second- and third-party laboratories, and laboratories where testing and/or calibration forms part of inspection and product certification.

This International Standard is applicable to all laboratories regardless of the number of personnel or the extent of the scope of testing and/or calibration activities. When a laboratory does not undertake one or more of the activities covered by this International Standard, such as sampling and the design/development of new methods, the requirements of those clauses do not apply.

1.3 The notes given provide clarification of the text, examples and guidance. They do not contain requirements and do not form an integral part of this International Standard.

1.4 This International Standard is for use by laboratories in developing their management system for quality, administrative and technical operations. Laboratory customers, regulatory authorities and accreditation bodies may also use it in confirming or recognizing the competence of laboratories. This International Standard is not intended to be used as the basis for certification of laboratories.

NOTE 1 The term 'management system' in this International Standard means the quality, administrative and technical systems that govern the operations of a laboratory.

NOTE 2 Certification of a management system is sometimes also called registration.

1.5 Compliance with regulatory and safety requirements on the operation of laboratories is not covered by this International Standard.

1.6 If testing and calibration laboratories comply with the requirements of this International Standard, they will operate a quality management system for their testing and calibration activities that also meets the principles of ISO 9001. Annex A provides nominal cross-references between this International Standard and ISO 9001. This International Standard covers technical competence requirements that are not covered by ISO 9001.

NOTE 1 It might be necessary to explain or interpret certain requirements in this International Standard to ensure that the requirements are applied in a consistent manner. Guidance for establishing applications for specific fields, especially for accreditation bodies (see ISO/IEC 17011) is given in Annex B.

NOTE 2 If a laboratory wishes accreditation for part or all of its testing and calibration activities, it should select an accreditation body that operates in accordance with ISO/IEC 17011.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 17000, *Conformity assessment — Vocabulary and general principles*

VIM, *International vocabulary of basic and general terms in metrology*, issued by BIPM, IEC, IFCC, ISO, IUPAC, IUPAP and OIML

NOTE Further related standards, guides, etc. on subjects included in this International Standard are given in the Bibliography.

## 3 Terms and definitions

For the purposes of this document, the relevant terms and definitions given in ISO/IEC 17000 and VIM apply.

NOTE General definitions related to quality are given in ISO 9000, whereas ISO/IEC 17000 gives definitions specifically related to certification and laboratory accreditation. Where different definitions are given in ISO 9000, the definitions in ISO/IEC 17000 and VIM are preferred.

## 4 Management requirements

### 4.1 Organization

4.1.1 The laboratory or the organization of which it is part shall be an entity that can be held legally responsible.

4.1.2 It is the responsibility of the laboratory to carry out its testing and calibration activities in such a way as to meet the requirements of this International Standard and to satisfy the needs of the customer, the regulatory authorities or organizations providing recognition.

4.1.3 The management system shall cover work carried out in the laboratory's permanent facilities, at sites away from its permanent facilities, or in associated temporary or mobile facilities.

4.1.4 If the laboratory is part of an organization performing activities other than testing and/or calibration, the responsibilities of key personnel in the organization that have an involvement or influence on the testing and/or calibration activities of the laboratory shall be defined in order to identify potential conflicts of interest.

NOTE 1 Where a laboratory is part of a larger organization, the organizational arrangements should be such that departments having conflicting interests, such as production, commercial marketing or financing do not adversely influence the laboratory's compliance with the requirements of this International Standard.

NOTE 2 If the laboratory wishes to be recognized as a third-party laboratory, it should be able to demonstrate that it is impartial and that it and its personnel are free from any undue commercial, financial and other pressures which might influence their technical judgement. The third-party testing or calibration laboratory should not engage in any activities that may endanger the trust in its independence of judgement and integrity in relation to its testing or calibration activities.

4.1.5 The laboratory shall

- a) have managerial and technical personnel who, irrespective of other responsibilities, have the authority and resources needed to carry out their duties, including the implementation, maintenance and improvement of the management system, and to identify the occurrence of departures from the management system or from the procedures for performing tests and/or calibrations, and to initiate actions to prevent or minimize such departures (see also 5.2);

- b) have arrangements to ensure that its management and personnel are free from any undue internal and external commercial, financial and other pressures and influences that may adversely affect the quality of their work;
- c) have policies and procedures to ensure the protection of its customers' confidential information and proprietary rights, including procedures for protecting the electronic storage and transmission of results;
- d) have policies and procedures to avoid involvement in any activities that would diminish confidence in its competence, impartiality, judgement or operational integrity;
- e) define the organization and management structure of the laboratory, its place in any parent organization, and the relationships between quality management, technical operations and support services;
- f) specify the responsibility, authority and interrelationships of all personnel who manage, perform or verify work affecting the quality of the tests and/or calibrations;
- g) provide adequate supervision of testing and calibration staff, including trainees, by persons familiar with methods and procedures, purpose of each test and/or calibration, and with the assessment of the test or calibration results;
- h) have technical management which has overall responsibility for the technical operations and the provision of the resources needed to ensure the required quality of laboratory operations;
- i) appoint a member of staff as quality manager (however named) who, irrespective of other duties and responsibilities, shall have defined responsibility and authority for ensuring that the management system related to quality is implemented and followed at all times; the quality manager shall have direct access to the highest level of management at which decisions are made on laboratory policy or resources;
- j) appoint deputies for key managerial personnel (see Note);
- k) ensure that its personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the objectives of the management system.

NOTE Individuals may have more than one function and it may be impractical to appoint deputies for every function.

4.1.6 Top management shall ensure that appropriate communication processes are established within the laboratory and that communication takes place regarding the effectiveness of the management system.

## 4.2 Management system

4.2.1 The laboratory shall establish, implement and maintain a management system appropriate to the scope of its activities. The laboratory shall document its policies, systems, programmes, procedures and instructions to the extent necessary to assure the quality of the test and/or calibration results. The system's documentation shall be communicated to, understood by, available to, and implemented by the appropriate personnel.

4.2.2 The laboratory's management system policies related to quality, including a quality policy statement, shall be defined in a quality manual (however named). The overall objectives shall be established, and shall be reviewed during management review. The quality policy statement shall be issued under the authority of top management. It shall include at least the following:

- a) the laboratory management's commitment to good professional practice and to the quality of its testing and calibration in servicing its customers;
- b) the management's statement of the laboratory's standard of service;
- c) the purpose of the management system related to quality;

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- d) a requirement that all personnel concerned with testing and calibration activities within the laboratory familiarize themselves with the quality documentation and implement the policies and procedures in their work; and
- e) the laboratory management's commitment to comply with this International Standard and to continually improve the effectiveness of the management system.

**NOTE** The quality policy statement should be concise and may include the requirement that tests and/or calibrations shall always be carried out in accordance with stated methods and customers' requirements. When the test and/or calibration laboratory is part of a larger organization, some quality policy elements may be in other documents.

**4.2.3** Top management shall provide evidence of commitment to the development and implementation of the management system and to continually improving its effectiveness.

**4.2.4** Top management shall communicate to the organization the importance of meeting customer requirements as well as statutory and regulatory requirements.

**4.2.5** The quality manual shall include or make reference to the supporting procedures including technical procedures. It shall outline the structure of the documentation used in the management system.

**4.2.6** The roles and responsibilities of technical management and the quality manager, including their responsibility for ensuring compliance with this International Standard, shall be defined in the quality manual.

**4.2.7** Top management shall ensure that the integrity of the management system is maintained when changes to the management system are planned and implemented.

### 4.3 Document control

#### 4.3.1 General

The laboratory shall establish and maintain procedures to control all documents that form part of its management system (internally generated or from external sources), such as regulations, standards, other normative documents, test and/or calibration methods, as well as drawings, software, specifications, instructions and manuals.

**NOTE 1** In this context "document" could be policy statements, procedures, specifications, calibration tables, charts, text books, posters, notices, memoranda, software, drawings, plans, etc. These may be on various media, whether hard copy or electronic, and they may be digital, analog, photographic or written.

**NOTE 2** The control of data related to testing and calibration is covered in 5.4.7. The control of records is covered in 4.13.

#### 4.3.2 Document approval and issue

**4.3.2.1** All documents issued to personnel in the laboratory as part of the management system shall be reviewed and approved for use by authorized personnel prior to issue. A master list or an equivalent document control procedure identifying the current revision status and distribution of documents in the management system shall be established and shall be readily available to preclude the use of invalid and/or obsolete documents.

**4.3.2.2** The procedure(s) adopted shall ensure that:

- a) authorized editions of appropriate documents are available at all locations where operations essential to the effective functioning of the laboratory are performed;
- b) documents are periodically reviewed and, where necessary, revised to ensure continuing suitability and compliance with applicable requirements;

- c) invalid or obsolete documents are promptly removed from all points of issue or use, or otherwise assured against unintended use;
- d) obsolete documents retained for either legal or knowledge preservation purposes are suitably marked.

**4.3.2.3** Management system documents generated by the laboratory shall be uniquely identified. Such identification shall include the date of issue and/or revision identification, page numbering, the total number of pages or a mark to signify the end of the document, and the issuing authority(ies).

#### **4.3.3 Document changes**

**4.3.3.1** Changes to documents shall be reviewed and approved by the same function that performed the original review unless specifically designated otherwise. The designated personnel shall have access to pertinent background information upon which to base their review and approval.

**4.3.3.2** Where practicable, the altered or new text shall be identified in the document or the appropriate attachments.

**4.3.3.3** If the laboratory's document control system allows for the amendment of documents by hand pending the re-issue of the documents, the procedures and authorities for such amendments shall be defined. Amendments shall be clearly marked, initialled and dated. A revised document shall be formally re-issued as soon as practicable.

**4.3.3.4** Procedures shall be established to describe how changes in documents maintained in computerized systems are made and controlled.

#### **4.4 Review of requests, tenders and contracts**

**4.4.1** The laboratory shall establish and maintain procedures for the review of requests, tenders and contracts. The policies and procedures for these reviews leading to a contract for testing and/or calibration shall ensure that:

- a) the requirements, including the methods to be used, are adequately defined, documented and understood (see 5.4.2);
- b) the laboratory has the capability and resources to meet the requirements;
- c) the appropriate test and/or calibration method is selected and is capable of meeting the customers' requirements (see 5.4.2).

Any differences between the request or tender and the contract shall be resolved before any work commences. Each contract shall be acceptable both to the laboratory and the customer.

**NOTE 1** The request, tender and contract review should be conducted in a practical and efficient manner, and the effect of financial, legal and time schedule aspects should be taken into account. For internal customers, reviews of requests, tenders and contracts can be performed in a simplified way.

**NOTE 2** The review of capability should establish that the laboratory possesses the necessary physical, personnel and information resources, and that the laboratory's personnel have the skills and expertise necessary for the performance of the tests and/or calibrations in question. The review may also encompass results of earlier participation in interlaboratory comparisons or proficiency testing and/or the running of trial test or calibration programmes using samples or items of known value in order to determine uncertainties of measurement, limits of detection, confidence limits, etc.

**NOTE 3** A contract may be any written or oral agreement to provide a customer with testing and/or calibration services.

**4.4.2** Records of reviews, including any significant changes, shall be maintained. Records shall also be maintained of pertinent discussions with a customer relating to the customer's requirements or the results of the work during the period of execution of the contract.

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**NOTE** For review of routine and other simple tasks, the date and the identification (e.g. the initials) of the person in the laboratory responsible for carrying out the contracted work are considered adequate. For repetitive routine tasks, the review need be made only at the initial enquiry stage or on granting of the contract for on-going routine work performed under a general agreement with the customer, provided that the customer's requirements remain unchanged. For new, complex or advanced testing and/or calibration tasks, a more comprehensive record should be maintained.

**4.4.3** The review shall also cover any work that is subcontracted by the laboratory.

**4.4.4** The customer shall be informed of any deviation from the contract.

**4.4.5** If a contract needs to be amended after work has commenced, the same contract review process shall be repeated and any amendments shall be communicated to all affected personnel.

### **4.5 Subcontracting of tests and calibrations**

**4.5.1** When a laboratory subcontracts work, whether because of unforeseen reasons (e.g. workload, need for further expertise or temporary incapacity) or on a continuing basis (e.g. through permanent subcontracting, agency or franchising arrangements), this work shall be placed with a competent subcontractor. A competent subcontractor is one that, for example, complies with this International Standard for the work in question.

**4.5.2** The laboratory shall advise the customer of the arrangement in writing and, when appropriate, gain the approval of the customer, preferably in writing.

**4.5.3** The laboratory is responsible to the customer for the subcontractor's work, except in the case where the customer or a regulatory authority specifies which subcontractor is to be used.

**4.5.4** The laboratory shall maintain a register of all subcontractors that it uses for tests and/or calibrations and a record of the evidence of compliance with this International Standard for the work in question.

### **4.6 Purchasing services and supplies**

**4.6.1** The laboratory shall have a policy and procedure(s) for the selection and purchasing of services and supplies it uses that affect the quality of the tests and/or calibrations. Procedures shall exist for the purchase, reception and storage of reagents and laboratory consumable materials relevant for the tests and calibrations.

**4.6.2** The laboratory shall ensure that purchased supplies and reagents and consumable materials that affect the quality of tests and/or calibrations are not used until they have been inspected or otherwise verified as complying with standard specifications or requirements defined in the methods for the tests and/or calibrations concerned. These services and supplies used shall comply with specified requirements. Records of actions taken to check compliance shall be maintained.

**4.6.3** Purchasing documents for items affecting the quality of laboratory output shall contain data describing the services and supplies ordered. These purchasing documents shall be reviewed and approved for technical content prior to release.

**NOTE** The description may include type, class, grade, precise identification, specifications, drawings, inspection instructions, other technical data including approval of test results, the quality required and the management system standard under which they were made.

**4.6.4** The laboratory shall evaluate suppliers of critical consumables, supplies and services which affect the quality of testing and calibration, and shall maintain records of these evaluations and list those approved.

### **4.7 Service to the customer**

**4.7.1** The laboratory shall be willing to cooperate with customers or their representatives in clarifying the customer's request and in monitoring the laboratory's performance in relation to the work performed, provided that the laboratory ensures confidentiality to other customers.

NOTE 1 Such cooperation may include:

- a) providing the customer or the customer's representative reasonable access to relevant areas of the laboratory for the witnessing of tests and/or calibrations performed for the customer;
- b) preparation, packaging, and dispatch of test and/or calibration items needed by the customer for verification purposes.

NOTE 2 Customers value the maintenance of good communication, advice and guidance in technical matters, and opinions and interpretations based on results. Communication with the customer, especially in large assignments, should be maintained throughout the work. The laboratory should inform the customer of any delays or major deviations in the performance of the tests and/or calibrations.

**4.7.2** The laboratory shall seek feedback, both positive and negative, from its customers. The feedback shall be used and analysed to improve the management system, testing and calibration activities and customer service.

NOTE Examples of the types of feedback include customer satisfaction surveys and review of test or calibration reports with customers.

#### 4.8 Complaints

The laboratory shall have a policy and procedure for the resolution of complaints received from customers or other parties. Records shall be maintained of all complaints and of the investigations and corrective actions taken by the laboratory (see also 4.11).

#### 4.9 Control of nonconforming testing and/or calibration work

**4.9.1** The laboratory shall have a policy and procedures that shall be implemented when any aspect of its testing and/or calibration work, or the results of this work, do not conform to its own procedures or the agreed requirements of the customer. The policy and procedures shall ensure that:

- a) the responsibilities and authorities for the management of nonconforming work are designated and actions (including halting of work and withholding of test reports and calibration certificates, as necessary) are defined and taken when nonconforming work is identified;
- b) an evaluation of the significance of the nonconforming work is made;
- c) correction is taken immediately, together with any decision about the acceptability of the nonconforming work;
- d) where necessary, the customer is notified and work is recalled;
- e) the responsibility for authorizing the resumption of work is defined.

NOTE Identification of nonconforming work or problems with the management system or with testing and/or calibration activities can occur at various places within the management system and technical operations. Examples are customer complaints, quality control, instrument calibration, checking of consumable materials, staff observations or supervision, test report and calibration certificate checking, management reviews and internal or external audits.

**4.9.2** Where the evaluation indicates that the nonconforming work could recur or that there is doubt about the compliance of the laboratory's operations with its own policies and procedures, the corrective action procedures given in 4.11 shall be promptly followed.

#### 4.10 Improvement

The laboratory shall continually improve the effectiveness of its management system through the use of the quality policy, quality objectives, audit results, analysis of data, corrective and preventive actions and management review.

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### 4.11 Corrective action

#### 4.11.1 General

The laboratory shall establish a policy and a procedure and shall designate appropriate authorities for implementing corrective action when nonconforming work or departures from the policies and procedures in the management system or technical operations have been identified.

**NOTE** A problem with the management system or with the technical operations of the laboratory may be identified through a variety of activities, such as control of nonconforming work, internal or external audits, management reviews, feedback from customers and from staff observations.

#### 4.11.2 Cause analysis

The procedure for corrective action shall start with an investigation to determine the root cause(s) of the problem.

**NOTE** Cause analysis is the key and sometimes the most difficult part in the corrective action procedure. Often the root cause is not obvious and thus a careful analysis of all potential causes of the problem is required. Potential causes could include customer requirements, the samples, sample specifications, methods and procedures, staff skills and training, consumables, or equipment and its calibration.

#### 4.11.3 Selection and implementation of corrective actions

Where corrective action is needed, the laboratory shall identify potential corrective actions. It shall select and implement the action(s) most likely to eliminate the problem and to prevent recurrence.

Corrective actions shall be to a degree appropriate to the magnitude and the risk of the problem.

The laboratory shall document and implement any required changes resulting from corrective action investigations.

#### 4.11.4 Monitoring of corrective actions

The laboratory shall monitor the results to ensure that the corrective actions taken have been effective.

#### 4.11.5 Additional audits

Where the identification of nonconformities or departures casts doubts on the laboratory's compliance with its own policies and procedures, or on its compliance with this International Standard, the laboratory shall ensure that the appropriate areas of activity are audited in accordance with 4.14 as soon as possible.

**NOTE** Such additional audits often follow the implementation of the corrective actions to confirm their effectiveness. An additional audit should be necessary only when a serious issue or risk to the business is identified.

### 4.12 Preventive action

**4.12.1** Needed improvements and potential sources of nonconformities, either technical or concerning the management system, shall be identified. When improvement opportunities are identified or if preventive action is required, action plans shall be developed, implemented and monitored to reduce the likelihood of the occurrence of such nonconformities and to take advantage of the opportunities for improvement.

**4.12.2** Procedures for preventive actions shall include the initiation of such actions and the application of controls to ensure that they are effective.

**NOTE 1** Preventive action is a pro-active process to identify opportunities for improvement rather than a reaction to the identification of problems or complaints.

NOTE 2 Apart from the review of the operational procedures, the preventive action might involve analysis of data, including trend and risk analyses and proficiency-testing results.

#### 4.13 Control of records

##### 4.13.1 General

4.13.1.1 The laboratory shall establish and maintain procedures for identification, collection, indexing, access, filing, storage, maintenance and disposal of quality and technical records. Quality records shall include reports from internal audits and management reviews as well as records of corrective and preventive actions.

4.13.1.2 All records shall be legible and shall be stored and retained in such a way that they are readily retrievable in facilities that provide a suitable environment to prevent damage or deterioration and to prevent loss. Retention times of records shall be established.

NOTE Records may be in any media, such as hard copy or electronic media.

4.13.1.3 All records shall be held secure and in confidence.

4.13.1.4 The laboratory shall have procedures to protect and back-up records stored electronically and to prevent unauthorized access to or amendment of these records.

##### 4.13.2 Technical records

4.13.2.1 The laboratory shall retain records of original observations, derived data and sufficient information to establish an audit trail, calibration records, staff records and a copy of each test report or calibration certificate issued, for a defined period. The records for each test or calibration shall contain sufficient information to facilitate, if possible, identification of factors affecting the uncertainty and to enable the test or calibration to be repeated under conditions as close as possible to the original. The records shall include the identity of personnel responsible for the sampling, performance of each test and/or calibration and checking of results.

NOTE 1 In certain fields it may be impossible or impractical to retain records of all original observations.

NOTE 2 Technical records are accumulations of data (see 5.4.7) and information which result from carrying out tests and/or calibrations and which indicate whether specified quality or process parameters are achieved. They may include forms, contracts, work sheets, work books, check sheets, work notes, control graphs, external and internal test reports and calibration certificates, customers' notes, papers and feedback.

4.13.2.2 Observations, data and calculations shall be recorded at the time they are made and shall be identifiable to the specific task.

4.13.2.3 When mistakes occur in records, each mistake shall be crossed out, not erased, made illegible or deleted, and the correct value entered alongside. All such alterations to records shall be signed or initialled by the person making the correction. In the case of records stored electronically, equivalent measures shall be taken to avoid loss or change of original data.

#### 4.14 Internal audits

4.14.1 The laboratory shall periodically, and in accordance with a predetermined schedule and procedure, conduct internal audits of its activities to verify that its operations continue to comply with the requirements of the management system and this International Standard. The internal audit programme shall address all elements of the management system, including the testing and/or calibration activities. It is the responsibility of the quality manager to plan and organize audits as required by the schedule and requested by management. Such audits shall be carried out by trained and qualified personnel who are, wherever resources permit, independent of the activity to be audited.

NOTE The cycle for internal auditing should normally be completed in one year.

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**4.14.2** When audit findings cast doubt on the effectiveness of the operations or on the correctness or validity of the laboratory's test or calibration results, the laboratory shall take timely corrective action, and shall notify customers in writing if investigations show that the laboratory results may have been affected.

**4.14.3** The area of activity audited, the audit findings and corrective actions that arise from them shall be recorded.

**4.14.4** Follow-up audit activities shall verify and record the implementation and effectiveness of the corrective action taken.

### 4.15 Management reviews

**4.15.1** In accordance with a predetermined schedule and procedure, the laboratory's top management shall periodically conduct a review of the laboratory's management system and testing and/or calibration activities to ensure their continuing suitability and effectiveness, and to introduce necessary changes or improvements. The review shall take account of:

- the suitability of policies and procedures;
- reports from managerial and supervisory personnel;
- the outcome of recent internal audits;
- corrective and preventive actions;
- assessments by external bodies;
- the results of interlaboratory comparisons or proficiency tests;
- changes in the volume and type of the work;
- customer feedback;
- complaints;
- recommendations for improvement;
- other relevant factors, such as quality control activities, resources and staff training.

NOTE 1 A typical period for conducting a management review is once every 12 months.

NOTE 2 Results should feed into the laboratory planning system and should include the goals, objectives and action plans for the coming year.

NOTE 3 A management review includes consideration of related subjects at regular management meetings.

**4.15.2** Findings from management reviews and the actions that arise from them shall be recorded. The management shall ensure that those actions are carried out within an appropriate and agreed timescale.

## 5 Technical requirements

### 5.1 General

**5.1.1** Many factors determine the correctness and reliability of the tests and/or calibrations performed by a laboratory. These factors include contributions from:

- human factors (5.2);

- accommodation and environmental conditions (5.3);
- test and calibration methods and method validation (5.4);
- equipment (5.5);
- measurement traceability (5.6);
- sampling (5.7);
- the handling of test and calibration items (5.8).

**5.1.2** The extent to which the factors contribute to the total uncertainty of measurement differs considerably between (types of) tests and between (types of) calibrations. The laboratory shall take account of these factors in developing test and calibration methods and procedures, in the training and qualification of personnel, and in the selection and calibration of the equipment it uses.

## 5.2 Personnel

**5.2.1** The laboratory management shall ensure the competence of all who operate specific equipment, perform tests and/or calibrations, evaluate results, and sign test reports and calibration certificates. When using staff who are undergoing training, appropriate supervision shall be provided. Personnel performing specific tasks shall be qualified on the basis of appropriate education, training, experience and/or demonstrated skills, as required.

**NOTE 1** In some technical areas (e.g. non-destructive testing) it may be required that the personnel performing certain tasks hold personnel certification. The laboratory is responsible for fulfilling specified personnel certification requirements. The requirements for personnel certification might be regulatory, included in the standards for the specific technical field, or required by the customer.

**NOTE 2** The personnel responsible for the opinions and interpretation included in test reports should, in addition to the appropriate qualifications, training, experience and satisfactory knowledge of the testing carried out, also have:

- relevant knowledge of the technology used for the manufacturing of the items, materials, products, etc. tested, or the way they are used or intended to be used, and of the defects or degradations which may occur during or in service;
- knowledge of the general requirements expressed in the legislation and standards; and
- an understanding of the significance of deviations found with regard to the normal use of the items, materials, products, etc. concerned.

**5.2.2** The management of the laboratory shall formulate the goals with respect to the education, training and skills of the laboratory personnel. The laboratory shall have a policy and procedures for identifying training needs and providing training of personnel. The training programme shall be relevant to the present and anticipated tasks of the laboratory. The effectiveness of the training actions taken shall be evaluated.

**5.2.3** The laboratory shall use personnel who are employed by, or under contract to, the laboratory. Where contracted and additional technical and key support personnel are used, the laboratory shall ensure that such personnel are supervised and competent and that they work in accordance with the laboratory's management system.

**5.2.4** The laboratory shall maintain current job descriptions for managerial, technical and key support personnel involved in tests and/or calibrations.

**NOTE** Job descriptions can be defined in many ways. As a minimum, the following should be defined:

- the responsibilities with respect to performing tests and/or calibrations;
- the responsibilities with respect to the planning of tests and/or calibrations and evaluation of results;
- the responsibilities for reporting opinions and interpretations;
- the responsibilities with respect to method modification and development and validation of new methods;

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- expertise and experience required;
- qualifications and training programmes;
- managerial duties.

**5.2.5** The management shall authorize specific personnel to perform particular types of sampling, test and/or calibration, to issue test reports and calibration certificates, to give opinions and interpretations and to operate particular types of equipment. The laboratory shall maintain records of the relevant authorization(s), competence, educational and professional qualifications, training, skills and experience of all technical personnel, including contracted personnel. This information shall be readily available and shall include the date on which authorization and/or competence is confirmed.

### 5.3 Accommodation and environmental conditions

**5.3.1** Laboratory facilities for testing and/or calibration, including but not limited to energy sources, lighting and environmental conditions, shall be such as to facilitate correct performance of the tests and/or calibrations.

The laboratory shall ensure that the environmental conditions do not invalidate the results or adversely affect the required quality of any measurement. Particular care shall be taken when sampling and tests and/or calibrations are undertaken at sites other than a permanent laboratory facility. The technical requirements for accommodation and environmental conditions that can affect the results of tests and calibrations shall be documented.

**5.3.2** The laboratory shall monitor, control and record environmental conditions as required by the relevant specifications, methods and procedures or where they influence the quality of the results. Due attention shall be paid, for example, to biological sterility, dust, electromagnetic disturbances, radiation, humidity, electrical supply, temperature, and sound and vibration levels, as appropriate to the technical activities concerned. Tests and calibrations shall be stopped when the environmental conditions jeopardize the results of the tests and/or calibrations.

**5.3.3** There shall be effective separation between neighbouring areas in which there are incompatible activities. Measures shall be taken to prevent cross-contamination.

**5.3.4** Access to and use of areas affecting the quality of the tests and/or calibrations shall be controlled. The laboratory shall determine the extent of control based on its particular circumstances.

**5.3.5** Measures shall be taken to ensure good housekeeping in the laboratory. Special procedures shall be prepared where necessary.

### 5.4 Test and calibration methods and method validation

#### 5.4.1 General

The laboratory shall use appropriate methods and procedures for all tests and/or calibrations within its scope. These include sampling, handling, transport, storage and preparation of items to be tested and/or calibrated, and, where appropriate, an estimation of the measurement uncertainty as well as statistical techniques for analysis of test and/or calibration data.

The laboratory shall have instructions on the use and operation of all relevant equipment, and on the handling and preparation of items for testing and/or calibration, or both, where the absence of such instructions could jeopardize the results of tests and/or calibrations. All instructions, standards, manuals and reference data relevant to the work of the laboratory shall be kept up to date and shall be made readily available to personnel (see 4.3). Deviation from test and calibration methods shall occur only if the deviation has been documented, technically justified, authorized, and accepted by the customer.

**NOTE** International, regional or national standards or other recognized specifications that contain sufficient and concise information on how to perform the tests and/or calibrations do not need to be supplemented or rewritten as internal procedures if these standards are written in a way that they can be used as published by the operating staff in a laboratory. It may be necessary to provide additional documentation for optional steps in the method or additional details.

#### 5.4.2 Selection of methods

The laboratory shall use test and/or calibration methods, including methods for sampling, which meet the needs of the customer and which are appropriate for the tests and/or calibrations it undertakes. Methods published in international, regional or national standards shall preferably be used. The laboratory shall ensure that it uses the latest valid edition of a standard unless it is not appropriate or possible to do so. When necessary, the standard shall be supplemented with additional details to ensure consistent application.

When the customer does not specify the method to be used, the laboratory shall select appropriate methods that have been published either in international, regional or national standards, or by reputable technical organizations, or in relevant scientific texts or journals, or as specified by the manufacturer of the equipment. Laboratory-developed methods or methods adopted by the laboratory may also be used if they are appropriate for the intended use and if they are validated. The customer shall be informed as to the method chosen. The laboratory shall confirm that it can properly operate standard methods before introducing the tests or calibrations. If the standard method changes, the confirmation shall be repeated.

The laboratory shall inform the customer when the method proposed by the customer is considered to be inappropriate or out of date.

#### 5.4.3 Laboratory-developed methods

The introduction of test and calibration methods developed by the laboratory for its own use shall be a planned activity and shall be assigned to qualified personnel equipped with adequate resources.

Plans shall be updated as development proceeds and effective communication amongst all personnel involved shall be ensured.

#### 5.4.4 Non-standard methods

When it is necessary to use methods not covered by standard methods, these shall be subject to agreement with the customer and shall include a clear specification of the customer's requirements and the purpose of the test and/or calibration. The method developed shall have been validated appropriately before use.

**NOTE** For new test and/or calibration methods, procedures should be developed prior to the tests and/or calibrations being performed and should contain at least the following information:

- a) appropriate identification;
- b) scope;
- c) description of the type of item to be tested or calibrated;
- d) parameters or quantities and ranges to be determined;
- e) apparatus and equipment, including technical performance requirements;
- f) reference standards and reference materials required;
- g) environmental conditions required and any stabilization period needed;
- h) description of the procedure, including
  - affixing of identification marks, handling, transporting, storing and preparation of items,
  - checks to be made before the work is started,
  - checks that the equipment is working properly and, where required, calibration and adjustment of the equipment before each use,
  - the method of recording the observations and results,
  - any safety measures to be observed;
- i) criteria and/or requirements for approval/rejection;
- j) data to be recorded and method of analysis and presentation;
- k) the uncertainty or the procedure for estimating uncertainty.

#### 5.4.5 Validation of methods

**5.4.5.1** Validation is the confirmation by examination and the provision of objective evidence that the particular requirements for a specific intended use are fulfilled.

**5.4.5.2** The laboratory shall validate non-standard methods, laboratory-designed/developed methods, standard methods used outside their intended scope, and amplifications and modifications of standard methods to confirm that the methods are fit for the intended use. The validation shall be as extensive as is necessary to meet the needs of the given application or field of application. The laboratory shall record the results obtained, the procedure used for the validation, and a statement as to whether the method is fit for the intended use.

NOTE 1 Validation may include procedures for sampling, handling and transportation.

NOTE 2 The techniques used for the determination of the performance of a method should be one of, or a combination of, the following:

- calibration using reference standards or reference materials;
- comparison of results achieved with other methods;
- interlaboratory comparisons;
- systematic assessment of the factors influencing the result;
- assessment of the uncertainty of the results based on scientific understanding of the theoretical principles of the method and practical experience.

NOTE 3 When some changes are made in the validated non-standard methods, the influence of such changes should be documented and, if appropriate, a new validation should be carried out.

**5.4.5.3** The range and accuracy of the values obtainable from validated methods (e.g. the uncertainty of the results, detection limit, selectivity of the method, linearity, limit of repeatability and/or reproducibility, robustness against external influences and/or cross-sensitivity against interference from the matrix of the sample/test object), as assessed for the intended use, shall be relevant to the customers' needs.

NOTE 1 Validation includes specification of the requirements, determination of the characteristics of the methods, a check that the requirements can be fulfilled by using the method, and a statement on the validity.

NOTE 2 As method-development proceeds, regular review should be carried out to verify that the needs of the customer are still being fulfilled. Any change in requirements requiring modifications to the development plan should be approved and authorized.

NOTE 3 Validation is always a balance between costs, risks and technical possibilities. There are many cases in which the range and uncertainty of the values (e.g. accuracy, detection limit, selectivity, linearity, repeatability, reproducibility, robustness and cross-sensitivity) can only be given in a simplified way due to lack of information.

#### 5.4.6 Estimation of uncertainty of measurement

**5.4.6.1** A calibration laboratory, or a testing laboratory performing its own calibrations, shall have and shall apply a procedure to estimate the uncertainty of measurement for all calibrations and types of calibrations.

**5.4.6.2** Testing laboratories shall have and shall apply procedures for estimating uncertainty of measurement. In certain cases the nature of the test method may preclude rigorous, metrologically and statistically valid, calculation of uncertainty of measurement. In these cases the laboratory shall at least attempt to identify all the components of uncertainty and make a reasonable estimation, and shall ensure that the form of reporting of the result does not give a wrong impression of the uncertainty. Reasonable estimation shall be based on knowledge of the performance of the method and on the measurement scope and shall make use of, for example, previous experience and validation data.

NOTE 1 The degree of rigor needed in an estimation of uncertainty of measurement depends on factors such as:

- the requirements of the test method;

- the requirements of the customer;
- the existence of narrow limits on which decisions on conformity to a specification are based.

NOTE 2 In those cases where a well-recognized test method specifies limits to the values of the major sources of uncertainty of measurement and specifies the form of presentation of calculated results, the laboratory is considered to have satisfied this clause by following the test method and reporting instructions (see 5.10).

**5.4.6.3** When estimating the uncertainty of measurement, all uncertainty components which are of importance in the given situation shall be taken into account using appropriate methods of analysis.

NOTE 1 Sources contributing to the uncertainty include, but are not necessarily limited to, the reference standards and reference materials used, methods and equipment used, environmental conditions, properties and condition of the item being tested or calibrated, and the operator.

NOTE 2 The predicted long-term behaviour of the tested and/or calibrated item is not normally taken into account when estimating the measurement uncertainty.

NOTE 3 For further information, see ISO 5725 and the Guide to the Expression of Uncertainty in Measurement (see Bibliography).

#### 5.4.7 Control of data

**5.4.7.1** Calculations and data transfers shall be subject to appropriate checks in a systematic manner.

**5.4.7.2** When computers or automated equipment are used for the acquisition, processing, recording, reporting, storage or retrieval of test or calibration data, the laboratory shall ensure that:

- a) computer software developed by the user is documented in sufficient detail and is suitably validated as being adequate for use;
- b) procedures are established and implemented for protecting the data; such procedures shall include, but not be limited to, integrity and confidentiality of data entry or collection, data storage, data transmission and data processing;
- c) computers and automated equipment are maintained to ensure proper functioning and are provided with the environmental and operating conditions necessary to maintain the integrity of test and calibration data.

NOTE Commercial off-the-shelf software (e.g. wordprocessing, database and statistical programmes) in general use within their designed application range may be considered to be sufficiently validated. However, laboratory software configuration/modifications should be validated as in 5.4.7.2 a).

### 5.5 Equipment

**5.5.1** The laboratory shall be furnished with all items of sampling, measurement and test equipment required for the correct performance of the tests and/or calibrations (including sampling, preparation of test and/or calibration items, processing and analysis of test and/or calibration data). In those cases where the laboratory needs to use equipment outside its permanent control, it shall ensure that the requirements of this International Standard are met.

**5.5.2** Equipment and its software used for testing, calibration and sampling shall be capable of achieving the accuracy required and shall comply with specifications relevant to the tests and/or calibrations concerned. Calibration programmes shall be established for key quantities or values of the instruments where these properties have a significant effect on the results. Before being placed into service, equipment (including that used for sampling) shall be calibrated or checked to establish that it meets the laboratory's specification requirements and complies with the relevant standard specifications. It shall be checked and/or calibrated before use (see 5.6).

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**5.5.3** Equipment shall be operated by authorized personnel. Up-to-date instructions on the use and maintenance of equipment (including any relevant manuals provided by the manufacturer of the equipment) shall be readily available for use by the appropriate laboratory personnel.

**5.5.4** Each item of equipment and its software used for testing and calibration and significant to the result shall, when practicable, be uniquely identified.

**5.5.5** Records shall be maintained of each item of equipment and its software significant to the tests and/or calibrations performed. The records shall include at least the following:

- a) the identity of the item of equipment and its software;
- b) the manufacturer's name, type identification, and serial number or other unique identification;
- c) checks that equipment complies with the specification (see 5.5.2);
- d) the current location, where appropriate;
- e) the manufacturer's instructions, if available, or reference to their location;
- f) dates, results and copies of reports and certificates of all calibrations, adjustments, acceptance criteria, and the due date of next calibration;
- g) the maintenance plan, where appropriate, and maintenance carried out to date;
- h) any damage, malfunction, modification or repair to the equipment.

**5.5.6** The laboratory shall have procedures for safe handling, transport, storage, use and planned maintenance of measuring equipment to ensure proper functioning and in order to prevent contamination or deterioration.

**NOTE** Additional procedures may be necessary when measuring equipment is used outside the permanent laboratory for tests, calibrations or sampling.

**5.5.7** Equipment that has been subjected to overloading or mishandling, gives suspect results, or has been shown to be defective or outside specified limits, shall be taken out of service. It shall be isolated to prevent its use or clearly labelled or marked as being out of service until it has been repaired and shown by calibration or test to perform correctly. The laboratory shall examine the effect of the defect or departure from specified limits on previous tests and/or calibrations and shall institute the "Control of nonconforming work" procedure (see 4.9).

**5.5.8** Whenever practicable, all equipment under the control of the laboratory and requiring calibration shall be labelled, coded or otherwise identified to indicate the status of calibration, including the date when last calibrated and the date or expiration criteria when recalibration is due.

**5.5.9** When, for whatever reason, equipment goes outside the direct control of the laboratory, the laboratory shall ensure that the function and calibration status of the equipment are checked and shown to be satisfactory before the equipment is returned to service.

**5.5.10** When intermediate checks are needed to maintain confidence in the calibration status of the equipment, these checks shall be carried out according to a defined procedure.

**5.5.11** Where calibrations give rise to a set of correction factors, the laboratory shall have procedures to ensure that copies (e.g. in computer software) are correctly updated.

**5.5.12** Test and calibration equipment, including both hardware and software, shall be safeguarded from adjustments which would invalidate the test and/or calibration results.

## 5.6 Measurement traceability

### 5.6.1 General

All equipment used for tests and/or calibrations, including equipment for subsidiary measurements (e.g. for environmental conditions) having a significant effect on the accuracy or validity of the result of the test, calibration or sampling shall be calibrated before being put into service. The laboratory shall have an established programme and procedure for the calibration of its equipment.

**NOTE** Such a programme should include a system for selecting, using, calibrating, checking, controlling and maintaining measurement standards, reference materials used as measurement standards, and measuring and test equipment used to perform tests and calibrations.

### 5.6.2 Specific requirements

#### 5.6.2.1 Calibration

**5.6.2.1.1** For calibration laboratories, the programme for calibration of equipment shall be designed and operated so as to ensure that calibrations and measurements made by the laboratory are traceable to the International System of Units (SI) (*Système international d'unités*).

A calibration laboratory establishes traceability of its own measurement standards and measuring instruments to the SI by means of an unbroken chain of calibrations or comparisons linking them to relevant primary standards of the SI units of measurement. The link to SI units may be achieved by reference to national measurement standards. National measurement standards may be primary standards, which are primary realizations of the SI units or agreed representations of SI units based on fundamental physical constants, or they may be secondary standards which are standards calibrated by another national metrology institute. When using external calibration services, traceability of measurement shall be assured by the use of calibration services from laboratories that can demonstrate competence, measurement capability and traceability. The calibration certificates issued by these laboratories shall contain the measurement results, including the measurement uncertainty and/or a statement of compliance with an identified metrological specification (see also 5.10.4.2).

**NOTE 1** Calibration laboratories fulfilling the requirements of this International Standard are considered to be competent. A calibration certificate bearing an accreditation body logo from a calibration laboratory accredited to this International Standard, for the calibration concerned, is sufficient evidence of traceability of the calibration data reported.

**NOTE 2** Traceability to SI units of measurement may be achieved by reference to an appropriate primary standard (see VIM:1993, 6.4) or by reference to a natural constant, the value of which in terms of the relevant SI unit is known and recommended by the General Conference of Weights and Measures (CGPM) and the International Committee for Weights and Measures (CIPM).

**NOTE 3** Calibration laboratories that maintain their own primary standard or representation of SI units based on fundamental physical constants can claim traceability to the SI system only after these standards have been compared, directly or indirectly, with other similar standards of a national metrology institute.

**NOTE 4** The term "identified metrological specification" means that it must be clear from the calibration certificate which specification the measurements have been compared with, by including the specification or by giving an unambiguous reference to the specification.

**NOTE 5** When the terms "international standard" or "national standard" are used in connection with traceability, it is assumed that these standards fulfil the properties of primary standards for the realization of SI units.

**NOTE 6** Traceability to national measurement standards does not necessarily require the use of the national metrology institute of the country in which the laboratory is located.

**NOTE 7** If a calibration laboratory wishes or needs to obtain traceability from a national metrology institute other than in its own country, this laboratory should select a national metrology institute that actively participates in the activities of BIPM either directly or through regional groups.

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**NOTE 8** The unbroken chain of calibrations or comparisons may be achieved in several steps carried out by different laboratories that can demonstrate traceability.

**5.6.2.1.2** There are certain calibrations that currently cannot be strictly made in SI units. In these cases calibration shall provide confidence in measurements by establishing traceability to appropriate measurement standards such as:

- the use of certified reference materials provided by a competent supplier to give a reliable physical or chemical characterization of a material;
- the use of specified methods and/or consensus standards that are clearly described and agreed by all parties concerned.

Participation in a suitable programme of interlaboratory comparisons is required where possible.

### 5.6.2.2 Testing

**5.6.2.2.1** For testing laboratories, the requirements given in 5.6.2.1 apply for measuring and test equipment with measuring functions used, unless it has been established that the associated contribution from the calibration contributes little to the total uncertainty of the test result. When this situation arises, the laboratory shall ensure that the equipment used can provide the uncertainty of measurement needed.

**NOTE** The extent to which the requirements in 5.6.2.1 should be followed depends on the relative contribution of the calibration uncertainty to the total uncertainty. If calibration is the dominant factor, the requirements should be strictly followed.

**5.6.2.2.2** Where traceability of measurements to SI units is not possible and/or not relevant, the same requirements for traceability to, for example, certified reference materials, agreed methods and/or consensus standards, are required as for calibration laboratories (see 5.6.2.1.2).

## 5.6.3 Reference standards and reference materials

### 5.6.3.1 Reference standards

The laboratory shall have a programme and procedure for the calibration of its reference standards. Reference standards shall be calibrated by a body that can provide traceability as described in 5.6.2.1. Such reference standards of measurement held by the laboratory shall be used for calibration only and for no other purpose, unless it can be shown that their performance as reference standards would not be invalidated. Reference standards shall be calibrated before and after any adjustment.

### 5.6.3.2 Reference materials

Reference materials shall, where possible, be traceable to SI units of measurement, or to certified reference materials. Internal reference materials shall be checked as far as is technically and economically practicable.

### 5.6.3.3 Intermediate checks

Checks needed to maintain confidence in the calibration status of reference, primary, transfer or working standards and reference materials shall be carried out according to defined procedures and schedules.

### 5.6.3.4 Transport and storage

The laboratory shall have procedures for safe handling, transport, storage and use of reference standards and reference materials in order to prevent contamination or deterioration and in order to protect their integrity.

**NOTE** Additional procedures may be necessary when reference standards and reference materials are used outside the permanent laboratory for tests, calibrations or sampling.

## 5.7 Sampling

**5.7.1** The laboratory shall have a sampling plan and procedures for sampling when it carries out sampling of substances, materials or products for subsequent testing or calibration. The sampling plan as well as the sampling procedure shall be available at the location where sampling is undertaken. Sampling plans shall, whenever reasonable, be based on appropriate statistical methods. The sampling process shall address the factors to be controlled to ensure the validity of the test and calibration results.

**NOTE 1** Sampling is a defined procedure whereby a part of a substance, material or product is taken to provide for testing or calibration of a representative sample of the whole. Sampling may also be required by the appropriate specification for which the substance, material or product is to be tested or calibrated. In certain cases (e.g. forensic analysis), the sample may not be representative but is determined by availability.

**NOTE 2** Sampling procedures should describe the selection, sampling plan, withdrawal and preparation of a sample or samples from a substance, material or product to yield the required information.

**5.7.2** Where the customer requires deviations, additions or exclusions from the documented sampling procedure, these shall be recorded in detail with the appropriate sampling data and shall be included in all documents containing test and/or calibration results, and shall be communicated to the appropriate personnel.

**5.7.3** The laboratory shall have procedures for recording relevant data and operations relating to sampling that forms part of the testing or calibration that is undertaken. These records shall include the sampling procedure used, the identification of the sampler, environmental conditions (if relevant) and diagrams or other equivalent means to identify the sampling location as necessary and, if appropriate, the statistics the sampling procedures are based upon.

## 5.8 Handling of test and calibration items

**5.8.1** The laboratory shall have procedures for the transportation, receipt, handling, protection, storage, retention and/or disposal of test and/or calibration items, including all provisions necessary to protect the integrity of the test or calibration item, and to protect the interests of the laboratory and the customer.

**5.8.2** The laboratory shall have a system for identifying test and/or calibration items. The identification shall be retained throughout the life of the item in the laboratory. The system shall be designed and operated so as to ensure that items cannot be confused physically or when referred to in records or other documents. The system shall, if appropriate, accommodate a sub-division of groups of items and the transfer of items within and from the laboratory.

**5.8.3** Upon receipt of the test or calibration item, abnormalities or departures from normal or specified conditions, as described in the test or calibration method, shall be recorded. When there is doubt as to the suitability of an item for test or calibration, or when an item does not conform to the description provided, or the test or calibration required is not specified in sufficient detail, the laboratory shall consult the customer for further instructions before proceeding and shall record the discussion.

**5.8.4** The laboratory shall have procedures and appropriate facilities for avoiding deterioration, loss or damage to the test or calibration item during storage, handling and preparation. Handling instructions provided with the item shall be followed. When items have to be stored or conditioned under specified environmental conditions, these conditions shall be maintained, monitored and recorded. Where a test or calibration item or a portion of an item is to be held secure, the laboratory shall have arrangements for storage and security that protect the condition and integrity of the secured items or portions concerned.

**NOTE 1** Where test items are to be returned into service after testing, special care is required to ensure that they are not damaged or injured during the handling, testing or storing/waiting processes.

**NOTE 2** A sampling procedure and information on storage and transport of samples, including information on sampling factors influencing the test or calibration result, should be provided to those responsible for taking and transporting the samples.

**NOTE 3** Reasons for keeping a test or calibration item secure can be for reasons of record, safety or value, or to enable complementary tests and/or calibrations to be performed later.

## 5.9 Assuring the quality of test and calibration results

**5.9.1** The laboratory shall have quality control procedures for monitoring the validity of tests and calibrations undertaken. The resulting data shall be recorded in such a way that trends are detectable and, where practicable, statistical techniques shall be applied to the reviewing of the results. This monitoring shall be planned and reviewed and may include, but not be limited to, the following:

- a) regular use of certified reference materials and/or internal quality control using secondary reference materials;
- b) participation in interlaboratory comparison or proficiency-testing programmes;
- c) replicate tests or calibrations using the same or different methods;
- d) retesting or recalibration of retained items;
- e) correlation of results for different characteristics of an item.

NOTE The selected methods should be appropriate for the type and volume of the work undertaken.

**5.9.2** Quality control data shall be analysed and, where they are found to be outside pre-defined criteria, planned action shall be taken to correct the problem and to prevent incorrect results from being reported.

## 5.10 Reporting the results

### 5.10.1 General

The results of each test, calibration, or series of tests or calibrations carried out by the laboratory shall be reported accurately, clearly, unambiguously and objectively, and in accordance with any specific instructions in the test or calibration methods.

The results shall be reported, usually in a test report or a calibration certificate (see Note 1), and shall include all the information requested by the customer and necessary for the interpretation of the test or calibration results and all information required by the method used. This information is normally that required by 5.10.2, and 5.10.3 or 5.10.4.

In the case of tests or calibrations performed for internal customers, or in the case of a written agreement with the customer, the results may be reported in a simplified way. Any information listed in 5.10.2 to 5.10.4 which is not reported to the customer shall be readily available in the laboratory which carried out the tests and/or calibrations.

NOTE 1 Test reports and calibration certificates are sometimes called test certificates and calibration reports, respectively.

NOTE 2 The test reports or calibration certificates may be issued as hard copy or by electronic data transfer provided that the requirements of this International Standard are met.

### 5.10.2 Test reports and calibration certificates

Each test report or calibration certificate shall include at least the following information, unless the laboratory has valid reasons for not doing so:

- a) a title (e.g. "Test Report" or "Calibration Certificate");
- b) the name and address of the laboratory, and the location where the tests and/or calibrations were carried out, if different from the address of the laboratory;

- c) unique identification of the test report or calibration certificate (such as the serial number), and on each page an identification in order to ensure that the page is recognized as a part of the test report or calibration certificate, and a clear identification of the end of the test report or calibration certificate;
- d) the name and address of the customer;
- e) identification of the method used;
- f) a description of, the condition of, and unambiguous identification of the item(s) tested or calibrated;
- g) the date of receipt of the test or calibration item(s) where this is critical to the validity and application of the results, and the date(s) of performance of the test or calibration;
- h) reference to the sampling plan and procedures used by the laboratory or other bodies where these are relevant to the validity or application of the results;
- i) the test or calibration results with, where appropriate, the units of measurement;
- j) the name(s), function(s) and signature(s) or equivalent identification of person(s) authorizing the test report or calibration certificate;
- k) where relevant, a statement to the effect that the results relate only to the items tested or calibrated.

NOTE 1 Hard copies of test reports and calibration certificates should also include the page number and total number of pages.

NOTE 2 It is recommended that laboratories include a statement specifying that the test report or calibration certificate shall not be reproduced except in full, without written approval of the laboratory.

### 5.10.3 Test reports

**5.10.3.1** In addition to the requirements listed in 5.10.2, test reports shall, where necessary for the interpretation of the test results, include the following:

- a) deviations from, additions to, or exclusions from the test method, and information on specific test conditions, such as environmental conditions;
- b) where relevant, a statement of compliance/non-compliance with requirements and/or specifications;
- c) where applicable, a statement on the estimated uncertainty of measurement; information on uncertainty is needed in test reports when it is relevant to the validity or application of the test results, when a customer's instruction so requires, or when the uncertainty affects compliance to a specification limit;
- d) where appropriate and needed, opinions and interpretations (see 5.10.5);
- e) additional information which may be required by specific methods, customers or groups of customers.

**5.10.3.2** In addition to the requirements listed in 5.10.2 and 5.10.3.1, test reports containing the results of sampling shall include the following, where necessary for the interpretation of test results:

- a) the date of sampling;
- b) unambiguous identification of the substance, material or product sampled (including the name of the manufacturer, the model or type of designation and serial numbers as appropriate);
- c) the location of sampling, including any diagrams, sketches or photographs;
- d) a reference to the sampling plan and procedures used;

## ISO/IEC 17025:2005(E)

- e) details of any environmental conditions during sampling that may affect the interpretation of the test results;
- f) any standard or other specification for the sampling method or procedure, and deviations, additions to or exclusions from the specification concerned.

### 5.10.4 Calibration certificates

**5.10.4.1** In addition to the requirements listed in 5.10.2, calibration certificates shall include the following, where necessary for the interpretation of calibration results:

- a) the conditions (e.g. environmental) under which the calibrations were made that have an influence on the measurement results;
- b) the uncertainty of measurement and/or a statement of compliance with an identified metrological specification or clauses thereof;
- c) evidence that the measurements are traceable (see Note 2 in 5.6.2.1.1).

**5.10.4.2** The calibration certificate shall relate only to quantities and the results of functional tests. If a statement of compliance with a specification is made, this shall identify which clauses of the specification are met or not met.

When a statement of compliance with a specification is made omitting the measurement results and associated uncertainties, the laboratory shall record those results and maintain them for possible future reference.

When statements of compliance are made, the uncertainty of measurement shall be taken into account.

**5.10.4.3** When an instrument for calibration has been adjusted or repaired, the calibration results before and after adjustment or repair, if available, shall be reported.

**5.10.4.4** A calibration certificate (or calibration label) shall not contain any recommendation on the calibration interval except where this has been agreed with the customer. This requirement may be superseded by legal regulations.

### 5.10.5 Opinions and interpretations

When opinions and interpretations are included, the laboratory shall document the basis upon which the opinions and interpretations have been made. Opinions and interpretations shall be clearly marked as such in a test report.

**NOTE 1** Opinions and interpretations should not be confused with inspections and product certifications as intended in ISO/IEC 17020 and ISO/IEC Guide 65.

**NOTE 2** Opinions and interpretations included in a test report may comprise, but not be limited to, the following:

- an opinion on the statement of compliance/noncompliance of the results with requirements;
- fulfilment of contractual requirements;
- recommendations on how to use the results;
- guidance to be used for improvements.

**NOTE 3** In many cases it might be appropriate to communicate the opinions and interpretations by direct dialogue with the customer. Such dialogue should be written down.

**5.10.6 Testing and calibration results obtained from subcontractors**

When the test report contains results of tests performed by subcontractors, these results shall be clearly identified. The subcontractor shall report the results in writing or electronically.

When a calibration has been subcontracted, the laboratory performing the work shall issue the calibration certificate to the contracting laboratory.

**5.10.7 Electronic transmission of results**

In the case of transmission of test or calibration results by telephone, telex, facsimile or other electronic or electromagnetic means, the requirements of this International Standard shall be met (see also 5.4.7).

**5.10.8 Format of reports and certificates**

The format shall be designed to accommodate each type of test or calibration carried out and to minimize the possibility of misunderstanding or misuse.

NOTE 1 Attention should be given to the lay-out of the test report or calibration certificate, especially with regard to the presentation of the test or calibration data and ease of assimilation by the reader.

NOTE 2 The headings should be standardized as far as possible.

**5.10.9 Amendments to test reports and calibration certificates**

Material amendments to a test report or calibration certificate after issue shall be made only in the form of a further document, or data transfer, which includes the statement:

"Supplement to Test Report [or Calibration Certificate], serial number... [or as otherwise identified]",

or an equivalent form of wording.

Such amendments shall meet all the requirements of this International Standard.

When it is necessary to issue a complete new test report or calibration certificate, this shall be uniquely identified and shall contain a reference to the original that it replaces.

## Annex A (informative)

### Nominal cross-references to ISO 9001:2000

Table A.1 — Nominal cross-references to ISO 9001:2000

ISO 9001:2000	ISO/IEC 17025
Clause 1	Clause 1
Clause 2	Clause 2
Clause 3	Clause 3
4.1	4.1, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2, 4.2.1, 4.2.2, 4.2.3, 4.2.4
4.2.1	4.2.2, 4.2.3, 4.3.1
4.2.2	4.2.2, 4.2.3, 4.2.4
4.2.3	4.3
4.2.4	4.3.1, 4.12
5.1	4.2.2, 4.2.3
5.1 a)	4.1.2, 4.1.6
5.1 b)	4.2.2
5.1 c)	4.2.2
5.1 d)	4.15
5.1 e)	4.1.5
5.2	4.4.1
5.3	4.2.2
5.3 a)	4.2.2
5.3 b)	4.2.3
5.3 c)	4.2.2
5.3 d)	4.2.2
5.3 e)	4.2.2
5.4.1	4.2.2 c)
5.4.2	4.2.1
5.4.2 a)	4.2.1
5.4.2 b)	4.2.1
5.5.1	4.1.5 a), f), h)
5.5.2	4.1.5 i)
5.5.2 a)	4.1.5 l)
5.5.2 b)	4.11.1
5.5.2 c)	4.2.4
5.5.3	4.1.6
5.6.1	4.15
5.6.2	4.15
5.6.3	4.15

ISO 9001:2000	ISO/IEC 17025
6.1 a)	4.10
6.1 b)	4.4.1, 4.7, 5.4.2, 5.4.3, 5.4.4, 5.10.1
6.2.1	5.2.1
6.2.2 a)	5.2.2, 5.5.3
6.2.2 b)	5.2.1, 5.2.2
6.2.2 c)	5.2.2
6.2.2 d)	4.1.5 k)
6.2.2 e)	5.2.5
6.3.1 a)	4.1.3, 4.12.1.2, 4.12.1.3, 5.3
6.3.1 b)	4.12.1.4, 5.4.7.2, 5.5, 5.6
6.3.1 c)	4.6, 5.5.6, 5.6.3.4, 5.8, 5.10
6.4	5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5
7.1	5.1
7.1 a)	4.2.2
7.1 b)	4.1.5 a), 4.2.1, 4.2.3
7.1 c)	5.4, 5.9
7.1 d)	4.1, 5.4, 5.9
7.2.1	4.4.1, 4.4.2, 4.4.3, 4.4.4, 4.4.5, 5.4, 5.9, 5.10
7.2.2	4.4.1, 4.4.2, 4.4.3, 4.4.4, 4.4.5, 5.4, 5.9, 5.10
7.2.3	4.4.2, 4.4.4, 4.5, 4.7, 4.8
7.3	5, 5.4, 5.9
7.4.1	4.6.1, 4.6.2, 4.6.4
7.4.2	4.6.3
7.4.3	4.6.2
7.5.1	5.1, 5.2, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9
7.5.2	5.2.5, 5.4.2, 5.4.5
7.5.3	5.8.2
7.5.4	4.1.5 c), 5.8
7.5.5	4.6.1, 4.12, 5.8, 5.10
7.6	5.4, 5.5
8.1	4.10, 5.4, 5.9
8.2.1	4.10
8.2.2	4.11.5, 4.14
8.2.3	4.11.5, 4.14, 5.9
8.2.4	4.5, 4.6, 4.9, 5.5.2, 5.5.9, 5.8, 5.8.3, 5.8.4, 5.9
8.3	4.9
8.4	4.10, 5.9
8.5.1	4.10, 4.12
8.5.2	4.11, 4.12
8.5.3	4.9, 4.11, 4.12

ISO/IEC 17025 covers several technical competence requirements that are not covered by ISO 9001:2000.

## Annex B (informative)

### Guidelines for establishing applications for specific fields

**B.1** The requirements specified in this International Standard are stated in general terms and, while they are applicable to all test and calibration laboratories, explanations might be needed. Such explanations on applications are herein referred to as applications. Applications should not include additional general requirements not included in this International Standard.

**B.2** Applications can be thought of as an elaboration of the generally stated criteria (requirements) of this International Standard for specified fields of test and calibration, test technologies, products, materials or specific tests or calibrations. Accordingly, applications should be established by persons having appropriate technical knowledge and experience, and should address items that are essential or most important for the proper conduct of a test or calibration.

**B.3** Depending on the application at hand, it may be necessary to establish applications for the technical requirements of this International Standard. Establishing applications may be accomplished by simply providing detail or adding extra information to the already generally stated requirements in each of the clauses (e.g. specific limitations to the temperature and humidity in the laboratory).

In some cases the applications will be quite limited, applying only to a given test or calibration method or to a group of calibration or test methods. In other cases the applications may be quite broad, applying to the testing or calibration of various products or items or to entire fields of testing or calibration.

**B.4** If the applications apply to a group of test or calibration methods in an entire technical field, common wording should be used for all of the methods.

Alternatively, it may be necessary to develop a separate document of applications to supplement this International Standard for specific types or groups of tests or calibrations, products, materials or technical fields of tests or calibrations. Such a document should provide only the necessary supplementary information, while maintaining this International Standard as the governing document through reference. Applications which are too specific should be avoided in order to limit the proliferation of detailed documents.

**B.5** The guidance in this annex should be used by accreditation bodies and other types of evaluation bodies when they develop applications for their own purposes (e.g. accreditation in specific areas).

## Bibliography

- [1] ISO 5725-1, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions*
- [2] ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*
- [3] ISO 5725-3, *Accuracy (trueness and precision) of measurement methods and results — Part 3: Intermediate measures of the precision of a standard measurement method*
- [4] ISO 5725-4, *Accuracy (trueness and precision) of measurement methods and results — Part 4: Basic methods for the determination of the trueness of a standard measurement method*
- [5] ISO 5725-6, *Accuracy (trueness and precision) of measurement methods and results — Part 6: Use in practice of accuracy values*
- [6] ISO 9000:—<sup>1)</sup>, *Quality management systems — Fundamentals and vocabulary*
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- [9] ISO 10012:2003, *Measurement management systems — Requirements for measurement processes and measuring equipment*
- [10] ISO/IEC 17011, *Conformity assessment — General requirements for accreditation bodies accrediting conformity assessment bodies*
- [11] ISO/IEC 17020, *General criteria for the operation of various types of bodies performing inspection*
- [12] ISO 19011, *Guidelines for quality and/or environmental management systems auditing*
- [13] ISO Guide 30, *Terms and definitions used in connection with reference materials*
- [14] ISO Guide 31, *Reference materials — Contents of certificates and labels*
- [15] ISO Guide 32, *Calibration in analytical chemistry and use of certified reference materials*
- [16] ISO Guide 33, *Uses of certified reference materials*
- [17] ISO Guide 34, *General requirements for the competence of reference material producers*
- [18] ISO Guide 35, *Certification of reference materials — General and statistical principles*
- [19] ISO/IEC Guide 43-1, *Proficiency testing by interlaboratory comparisons — Part 1: Development and operation of proficiency testing schemes*
- [20] ISO/IEC Guide 43-2, *Proficiency testing by interlaboratory comparisons — Part 2: Selection and use of proficiency testing schemes by laboratory accreditation bodies*

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1) To be published. (Revision of ISO 9000:2000)

**ISO/IEC 17025:2005(E)**

- [21] ISO/IEC Guide 58:1993, *Calibration and testing laboratory accreditation systems — General requirements for operation and recognition*
- [22] ISO/IEC Guide 65, *General requirements for bodies operating product certification systems*
- [23] GUM, *Guide to the Expression of Uncertainty in Measurement*, issued by BIPM, IEC, IFCC, ISO, IUPAC, IUPAP and OIML
- [24] Information and documents on laboratory accreditation can be found on the ILAC (International Laboratory Accreditation Cooperation): [www.ilac.org](http://www.ilac.org)



**ISO/IEC 17025:2005(E)**

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# NPDES Compliance Inspection Manual

## *Chapter 6*



EPA Publication Number: 305-K-17-001  
Interim Revised Version, January 2017

**TRIAD/DOE**

Exhibit 5 -  
Attachment C

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## CHAPTER 6 – FLOW MEASUREMENT

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## A. EVALUATION OF PERMITTEE'S FLOW MEASUREMENT

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### OBJECTIVE AND REQUIREMENTS

To comply with the permit requirements established under the National Pollutant Discharge Elimination System (NPDES), the permittee must accurately determine the quantity of wastewater being discharged. Discharge flow measurement is an integral part of the NPDES program, it is important that the inspector evaluate the accuracy of the measurement.

In addition to providing usable information for enforcement purposes, flow measurement serves to:

- Provide data for pollutant mass loading calculations.
- Provide operating and performance data on the wastewater treatment plant.
- Compute treatment costs, based on wastewater volume.
- Obtain data for long-term planning of plant capacity, versus capacity used.
- Provide information on Infiltration and Inflow (I/I) conditions, and the need for cost-effective I/I correction.

A Flow Measurement Inspection Checklist for the inspector's use appears at the end of this chapter.

### EVALUATION OF FACILITY INSTALLED FLOW DEVICES AND DATA

There are two types of wastewater flow: closed-channel flow and open-channel flow. Closed-channel flow occurs under pressure in a liquid-full conduit (usually a pipe). The facility will usually have a metering device inserted into the conduit that measures flow. Examples of closed-channel flow measuring devices are the Venturi meter, the Pitot tube, the paddle wheel, the electromagnetic flowmeter, Doppler, and the transit-time flowmeter. In practice, closed-channel flow is normally encountered between treatment units in a wastewater treatment plant, where liquids and/or sludges are pumped under pressure.

Open-channel flow occurs in conduits that are not liquid-full. Open-channel flow is partially full pipes not under pressure. Open-channel flow is the most prevalent type of flow at NPDES-regulated discharge points. Open-channel flows are typically measured using primary and secondary devices. Primary devices are standard hydraulic structures, such as flumes and weirs that are inserted in the open channel. Inspectors can obtain accurate flow measurements merely by measuring the depth of liquid (head) at the specific point in the primary device. In a weir application, for example, the flow rate is a function of the head of liquid above the weir crest.

Facilities use secondary devices in conjunction with primary devices to automate the flow measuring process. Typically, secondary devices measure the liquid depth in the primary device and convert the depth measurement to a corresponding flow, using established mathematical relationships. Examples of secondary devices are gauges, floats, ultrasonic transducers, bubblers, and transit-time flowmeters. A recorder generally measures the output of the

secondary device transmitted to a recorder and/or totalizer to provide instantaneous and historical flow data to the operator. Outputs may also be transmitted to sampling systems to facilitate flow proportioning. Appendix O, "Supplemental Flow Measurement Information," contains further information on flow measurement devices.

The inspector must assure that the permittee obtains accurate wastewater flow data to calculate mass loading (quantity) from measured concentrations of pollutants discharged as required by many NPDES permits. The permittee must produce data that meet requirements in terms of precision and accuracy. Precision refers to data reproducibility or the ability to obtain consistent data from repeated measurements of the same quantity. Accuracy refers to the agreement between the amount of a component measured by the test and the amount present.

The accuracy of flow measurement (including both primary and secondary devices) varies widely with the device, its location, environmental conditions, and other factors such as maintenance and calibration. Faulty fabrication, construction, and installation of primary devices are common sources of errors. Improper calibration, misreading, and variation in the speed of totalizer drive motors are major errors related to secondary devices (see Appendix O, "Supplemental Flow Measurement Information"). When evaluating facility installed devices, the inspector should do the following:

- Verify that the facility has installed primary and/or secondary devices according to the manufacturer's manual instructions.
- Inspect the primary device for evidence of corrosion, scale formation, or solids accumulation that may bias the flow measurement.
- Verify that weirs are level, plumb, and perpendicular to the flow direction.
- Verify that flumes are level and smooth-finished, the throat walls (narrowed section of flume) are plumb, and the throat width is the standard size intended.
- Inspect historical records (i.e., strip charts and logs) for evidence of continuous flow measurements and for routine and maintenance operations schedules. Compare periods of missing data with maintenance logs for explanations of measuring system problems.
- Observe the flow patterns near the primary device for excessive turbulence, velocity, or accumulating foam. The flow lines should be straight.
- Ensure that the flow measurement system or technique being used measures the entire wastewater discharge as required by the NPDES permit. Inspect carefully the piping to determine whether there are any wastewater diversions, return lines, or bypasses around the system. Make sure the system meets the permit requirement, such as instantaneous or continuous, daily, or other time interval measures. Note anomalies in the inspection report.
- Verify that the site chosen for flow measurement by the facility is appropriate and is in accordance with permit requirements.

- Verify that the site chosen by the facility for flow measurement is suitable for the type of discharge, flow range, suspended solids concentration, and other relevant factors.
- Determine if the facility has closed-channel flow measuring devices where the pipe is always full. If these devices are used, then there must also be a means for the permittee and regulatory agencies/inspector to verify the accuracy of these meters. Primary open-channel flow measuring devices such as weirs and flumes should be used in an open-channel segment above or below the closed-channel segment to verify the flow measured by the closed-channel flow measuring devices.
- Verify that the facility uses appropriate tables, curves, and formulas to calculate flow rates.
- Review and evaluate calibration and maintenance programs for the discharger's flow measurement system. The permit normally requires the facility to check the calibration regularly by the permittee. The facility must ensure that their flow measurement systems are calibrated by a qualified source at least once a year to ensure their accuracy. Lack of such a program is considered unacceptable for NPDES compliance purposes.
- Verify that the facility calibrates secondary flowmeter systems to be within 10 percent of the primary flow measurement system.
- Verify that primary and secondary devices are adequate for normal flow as well as maximum expected flows. Note whether the flow measurement system can measure the expected range of flows.
- Collect accurate flow data during inspection to validate self-monitoring data collected by the permittee.
- The facility must install a flow measuring system that has the capability of routine flow verification by the permittee or appropriate regulatory personnel.

#### EVALUATION OF PERMITTEE DATA HANDLING AND REPORTING

The permittee or facility must keep flow measurement records for a minimum period of three years. Many flow-measuring devices produce a continuous flowchart for plant records. Flow records should contain date, flow, time of reading, and operator's name. The facility should record maintenance, inspection dates, and calibration data.

The inspector should review the permittee's records and note the presence or absence of data such as:

- Frequency of routine operational inspections.
- Frequency of maintenance inspections.
- Frequency of flowmeter calibration (should be as specified in permit, generally at least once per year).
- Irregularity or uniformity of flow.

## EVALUATION OF PERMITTEE QUALITY CONTROL

The inspection should evaluate the following quality control issues during a compliance inspection to ensure:

- Proper operation and maintenance of equipment
- Accurate records
- Sufficient inventory of spare parts
- Valid flow measurement techniques
- Precise flow data
- Adequate frequency of calibration checks

Evaluate precision of float driven flow meters when flows are stable. Push the float gently downward, hold for 30 seconds, then allowed to return normally. The recorded flow rate should be the same before and after the float was moved. Evaluate accuracy by measuring the instantaneous flow rate at the primary device used at the facility and comparing the value against the value on the meter, graph, integrator, or company record. The difference between two stable totalizer readings (flow is steady for 10 minutes or more) should not exceed  $\pm 10$  percent of the instantaneous flow measured at the primary device. Note that most flow measurement systems have both an instantaneous meter readout and a totalizer. Both devices should agree, but that is not always the case due to electrical and other various malfunctions in the flow measuring system. In most cases, the totalizer reading will be what is reported by the permittee. If this is the case, then that device should be checked for accuracy and the permittee's flow measuring system rated accordingly.

In addition, the inspector can evaluate accuracy by installing a second flow measurement system, sometimes referred to as a reference system. Agreement in measured flow rates between the two systems should be within  $\pm 10$  percent of the reference rate if all conditions are as recommended for the systems.

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## B. FLOW MEASUREMENT COMPLIANCE

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### OBJECTIVES

The current NPDES program depends heavily on the permittee's submittal of self-monitoring data. The flow discharge measured during the NPDES compliance inspection should verify the flow measurement data collected by the permittee, support any enforcement action that may be necessary, and provide a basis for reissuing or revising the NPDES permit.

### FLOW MEASUREMENT SYSTEM EVALUATION

The responsibility of the inspector includes collecting accurate flow data during the inspection and validating data collected during the permittee's self-monitoring.

The NPDES inspector must check both the permittee's flow data and the flow measurement system to verify the permittee's compliance with NPDES permit requirements. If a flow-measuring device is located below ground or in confined space, inspectors are not to enter

confined spaces unless trained and permitted to do so. When evaluating a flow measurement system, the inspector should consider and record findings on the following:

- Whether the system measures the entire discharge flow.
- The system's accuracy and good working order. This will include a thorough physical inspection of the system and comparison of system readings to actual flow or those obtained with calibrated portable instruments.
- The need for new system equipment.
- The existence or absence of a routine calibration and maintenance program for flow measurement equipment.

If the permittee's flow measurement system is accurate within  $\pm 10$  percent, the inspector should use the installed system. If the flow sensor or recorder is found to be inaccurate, the inspector should determine whether the equipment can be corrected in time for use during the inspection. If the equipment cannot be repaired in a timely manner, use the portable flow sensor and recorder used to assess the accuracy of the permittee's system for the duration of the inspection. If nonstandard primary flow devices are being used, request the permittee to supply data on the accuracy and precision of the method being employed.

For flow measurement in pipelines, the inspector may use a portable flowmeter. The inspector should select a flowmeter with an operating range wide enough to cover the anticipated flow to be measured. The inspector should test and calibrate the selected flowmeter before use. The inspector should select the site for flow measurement according to permit requirements and install the selected flowmeter according to the manufacturer's specifications. The inspector should use the proper tables, charts, and formulas as specified by the manufacturer to calculate flow rates.

Four basic steps are involved in evaluating the permittee's flow measurement system:

- Physical inspection of the primary device
- Physical inspection of the secondary device and ancillary equipment
- Flow measurement using the primary/secondary device combination of the permittee
- Certification of the system using a calibrated, portable instrument

Facilities with a closed pipe flow measurement system present a challenge to the inspector. Have the facility personnel explain the operation of the system and how they calibrate the flow measurement system. Check if it is calibrated yearly at a minimum. It is suggested that the facility conduct periodic monthly checks of the flow measurement system. The inspector can do a calibration of the closed pipe flow measurement systems in the following ways:

1. If an open-channel primary device is maintained at the facility the inspector can obtain an instantaneous head reading to verify the accuracy of the closed channel flow measuring system. Flow should be within  $\pm 10$  percent of the closed channel system.

2. The inspector can use a portable flow meter (usually consists of two strap-on sensors that mount on the pipe and utilize the Doppler principle) to verify the accuracy of the facility's flow measurement system by conducting side-by-side comparisons. Flow should be within  $\pm 10$  percent.
3. Confirm that the calibration procedure demonstrated by the facility's calibration personnel is adequate.

The following sections present procedures for inspecting the more common types of primary and secondary devices, for measuring flow using common permanent and portable systems, and for evaluating flow data. Please note that the number of primary/secondary device combinations is limitless; therefore, it is not feasible to provide procedures for all systems. When encountering systems other than those discussed here the inspector should consult the manufacturer's manual or facility personnel for advice on how the flow-measurement system operates before preparing a written inspection procedure.

#### CLOSED CONDUIT EVALUATION PROCEDURES

For closed-channel flow, the inspector performs the following checks on the system:

- Check for straight pipe runs of sufficient length both upstream (8–10 inches) and downstream (4–6 inches) of the measuring device.
- Determine if the meter size is appropriate for pipe diameter and flow ranges based on equipment manufacturer literature.
- Determine frequency of cleaning of pressure taps.

#### PRIMARY DEVICE INSPECTION PROCEDURES

The two most common open-channel primary devices are sharp-crested weirs and Parshall flumes. Common sources of error when using them include the following:

- Faulty fabrication—weirs may be too narrow or not "sharp" enough. Flume surfaces may be rough, critical dimensions may exceed tolerances, or throat walls may not be vertical.
- Improper installation—the facility may install weirs and flumes too near pipe elbows, valves, or other sources of turbulence. The devices may be out of level or plumb.
- Sizing errors—the primary device's recommended applications may not include the actual flow range.
- Poor maintenance—primary devices corrode and deteriorate. Debris and solids may accumulate in them. Specific inspection procedures for the sharp-crested weir, the Parshall flume, and the Palmer-Bowlus flume devices follow.

#### ***Sharp-Crested Weir Inspection Procedures***

- Inspect the upstream approach to the weir.
  - Verify that the weir is perpendicular to the flow direction.

- Verify that the approach is a straight section of conduit with a length at least 20 times the maximum expected head of liquid above the weir crest.
- Observe the flow pattern in the approach channel. The flow should occur in smooth stream lines without velocity gradients and turbulence.
- Check the approach, particularly near the weir, for accumulated solids, debris, or oil and grease. The approach must have no accumulated matter.
- Inspect the sharp-crested weir.
  - Verify that the crest of the weir is level across the entire conduit traverse.
  - Measure the width of the weir crest. The edge of the weir crest should be no more than 1/8-inch thick.
  - Make certain the weir crest corresponds to zero-gauge elevation (zero output on the secondary device).
  - Measure the angle formed by the top of the crest and the upstream face of the weir. This angle must be 90 degrees.
  - Measure the chamfer (beveled edge) on the downstream side of the crest. The chamfer should be approximately 45 degrees.
  - Visually survey the weir-bulkhead connection for evidence of leaks or cracks that permit bypass.
  - Measure the height of the weir crests above the channel floor. The height should be at least twice the maximum expected head (2H) of liquid above the crest.
  - Measure the width of the end contraction. The width should be at least twice the maximum expected head (2H) of the liquid above the crest.
  - Confirm the location of the head-measuring device. The device should be located upstream of the weir at a point at least four times the maximum head.
  - Inspect the weir for evidence of corrosion, scale formation, or clinging matter. The weir must be clean and smooth.
  - Observe flow patterns on the downstream side of the weir. Check for the existence of an air gap (ventilation) immediately adjacent to the downstream face of the weir. Ventilation is necessary to prevent a vacuum that can induce errors in head measurements. Also, ensure that the crest is higher than the maximum downstream level of water in the conduit.
  - Verify that the nappe is not submerged and that it springs free of the weir plate.
  - If the weir contains a V-notch, measure the apex angle. The apex should range from 22.5 degrees to 90 degrees. Verify that the head is between 0.2 and 2.0 feet. The weir should not be operated with a head of less than 0.2 feet since the nappe may not spring clear of the crest.

King's *Handbook of Hydraulics* (King, 1963) frequently referenced throughout this chapter, provides a detailed discussion on weirs.

### ***Parshall Flume Inspection Procedures***

- Inspect the overall flume design.
  - Check that the flume is in a straight section of the conduit.
  - Check that the flume design is symmetrical and level in the transverse and translational directions.
  - Check that the flume is smooth-finished and constructed using a corrosion resistant material.
  - Measure the dimensions of the flume. Dimensions are strictly prescribed as a function of throat width (see Figure O-5 in Appendix O for critical dimensions).
  - Measure the head of liquid in the flume at two-thirds upstream of the throat in the convergence section and compare with the acceptable ranges in Table O-4 in Appendix O.
  - Check that the flow at the entrance is free of turbulence or "white" water. Flows should be laminar through the flume with uniform velocities across the width of the flume. Smaller flumes should have velocities less than 0.5 meters per second. Larger flumes should have velocities less than 2 meters per second.
- Inspect the flume approach (convergent section).
  - Confirm that the upstream channel is straight, horizontal, and of a uniform cross-section for a distance that is at least ten times the flume throat width.
  - Verify that the mouth of the convergent section is as wide as the channel and that the convergent section is merged flushed against the channel wall with rounded transitions (smooth transition between convergent section and channel wall—i.e., no sharp edges) to avoid turbulence in the flow.
  - Check that the upstream channel is free of accumulated matter. Accumulated matter may be indicative of oversizing of the flume or an incorrect setting of the flume in the channel.
  - Confirm that the location of the liquid measuring device is two-thirds upstream of the throat in the convergence section.
- Inspect the flume discharge (divergent section).
  - Check that the design of the downstream channel is low enough to allow free discharge conditions in the divergent section of the flume.
  - Check that the downstream channel is also free of accumulated matter.
  - Verify that the head of water in the discharge is not restricting flow through the flume. There should not be any obstruction, constriction, or channel turns in the divergent section that may cause the flow to back up in the flume. The existence of a "standard wave" is good evidence of free flow and verifies that there is no submergence present. This must be accounted for in the calculation of flow rate through the flume as described in the next section.

- Determine whether submergence occurs at or near maximum flow (e.g., look for water marks on the wall).

#### ***Palmer-Bowlus Flume Inspection Procedures***

- Inspect the overall flume design as outlined above. These flumes are seldom used for effluent flow measurement.
- Inspect the flume.
  - The flume should be in a straight section of the conduit.
  - Flow at the entrance should be free of "white" water.
  - Observe the flow in the flume. The profile should approximate that depicted in Figure O-8 in Appendix O.
  - The flume should be level in the transverse direction and should not exceed the translational slope in Table O-6 in Appendix O.
  - Measure the head of water in the flume. Head should be within the ranges specified in Table O-6 in Appendix O.
- Inspect the flume discharge.
  - Verify that free flow exists. Look for the characteristic "standing wave" in the divergent section of the flume.

#### ***Venturi Meter Inspection Procedures***

- Verify that the facility installed the Venturi meter according to manufacturer's instructions.
- Verify that the facility installed the Venturi meter downstream from a straight and uniform section of pipe, at least 5 to 20 diameters, depending on the ratio of pipe to throat diameter and whether straightening vanes are installed upstream. (Installation of straightening vanes upstream will reduce the upstream piping requirements.)
- Verify that the pressure measuring taps are free of debris and are not plugged.
- Verify the facility calibrated the Venturi meter in place by either the volumetric method or the comparative dye dilution method to check the manufacturer's calibration curve or to develop a new calibration curve.

### SECONDARY DEVICE INSPECTION PROCEDURES

The following are common sources of error in the use of secondary devices:

- Improper location—gauge is in the wrong position relative to the primary device.
- Inadequate maintenance—gauge is not serviced regularly.
- Incorrect zero setting—zero setting of gauge is not the zero point of the primary device.
- Operator error—human error exists in the reading.

***Flow Measurement Procedures in Weir Applications***

- Determine that the head measurement device is positioned 3 to 4 head lengths upstream of a weir.
- Verify that the zero or other point of the gauge is equal to that of the primary device.

The inspector should use an independent method of measuring head, such as with a yardstick or carpenter's rule (be sure to take your measurement at least four times the maximum head upstream and from the weir and convert to nearest hundredth of a foot). To determine flow rate, use the appropriate head discharge relationship formula (see Table O-1 in Appendix O).

***Flow Measurement Procedures in Parshall Flume Applications***

***Flow Measurement—Free-Flow Conditions.***

- Determine upstream head ( $H_a$ ) using staff gauge.
  - Verify that staff gauge is set to zero head. Use either a yardstick or carpenter's rule.
  - Verify that staff gauge is at proper location (two-thirds the length of the converging section back from the beginning of the throat).
  - Read to nearest division the gauge division at which liquid surface intersects gauge.
  - Read  $H_a$  in feet from staff gauge.
- To determine flow rate, use Figure N-6 in Appendix O in the unit desired, use tables published in flow measurement standard references, or calculate using the coefficients in Table O-5 in Appendix O.

***Flow Measurement—Submerged-Flow Condition.***

Generally, it is difficult to make field measurements with submerged-flow conditions. In cases when measurements can be obtained (using a staff or float gauge), the procedures listed below should be followed:

- Determine upstream head using staff or float gauge.
  - Read to nearest division and, at the same time as for  $H_b$ , the gauge division at which liquid surface intersects gauge.
  - Calculate  $H_a$  from gauge reading.
- Determine downstream head ( $H_b$ ) using staff or float gauge.
  - $H_b$  refers to a measurement at the crest.
  - Read to nearest division, and at the same time as for  $H_a$ , the gauge division at which liquid surface intersects gauge.
  - Calculate  $H_b$  from staff reading.
- Determine flow rate.
  - Calculate percent submergence:

$$\left[ \frac{H_b}{H_a} \right] \times 100$$

- Consult Table O-6 in Appendix O.
- When a correction factor is obtained, use  $H_a$  and find free-flow from Figure I-6.
- Multiply this free-flow value by the correction factor to obtain the submerged flow.

The inspector may use an independent method of measuring head, such as a yardstick or carpenter's rule at the proper head measurement point. Because of the sloping water surface in the converging section of a flume, it is essential that the proper head measurement point be used.

#### ***Flow Measurement in Palmer-Bowlus Flume Applications***

- Obtain head measurements as in the Parshall Flume application, using the secondary device. The head is the height of water above the step. The total depth upstream of the step is not the head.
- Refer to manufacturer-supplied discharge tables to convert head measurements to flow data. Palmer-Bowlus flumes, unlike Parshall flumes, are not constructed to standard dimensional standards. The inspector must not use discharge tables supplied by other manufacturers.

#### ***Verification***

Most flow measurement errors result from inadequate calibration of the flow totalizer, and recorder. If the inspector has determined that the primary device has been installed properly, verification of the permittee's system is relatively simple. Compare the flow determined from the inspector's independent measurement to the flow of the permittee's totalizer or recorder. The permittee's flow measurements should be within 10 percent of the inspector's measurements to certify accurate flow measurement. Optimally, flow comparisons should be made at various flow rates to check system accuracy.

When the permit requires that the daily average flow be measured by a totalizing meter, the inspector should verify that the totalizer is accurate (i.e., properly calibrated). This can be done during a period of steady flow by reading the totalizer and at the same time starting a stopwatch. Start the stopwatch just as a new digit starts to appear on the totalizer. After 10 to 30 minutes, the totalizer should be read again; just as a new digit begins to appear, the stopwatch is read. Subtract the two totalizer readings to determine, the total flow over the measured time period. Calculate the flow rate in gallons per minute by using the time from the stopwatch. Compare this flow rate to the flow determined by actual measurement of the head made at the primary device at the time interval. Consider the calibration of the totalizer satisfactory if the two flows are within 10 percent of each other, when the actual measured flow is used as the known value, or divisor, in the percent calculation.

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## C. REFERENCES

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<http://www.youtube.com/watch?v=y6hiOLgTo6g>

## D. FLOW MEASUREMENT INSPECTION CHECKLIST

A. GENERAL			
Yes	No	N/A	1. a. Primary flow measuring device properly installed and maintained.
Yes	No	N/A	b. Flow measured at each outfall? _____ Number of outfalls? _____
Yes	No	N/A	c. Is there a straight length of pipe or channel before and after the flowmeter of at least 5 to 20 diameter lengths?
Yes	No	N/A	d. If a magnetic flowmeter is used, are there sources of electric noise in the near vicinity?
Yes	No	N/A	e. Is the magnetic flowmeter properly grounded?
Yes	No	N/A	f. Is the full pipe requirement met?
Yes	No	N/A	2. a. Flow records properly kept.
Yes	No	N/A	b. All charts maintained in a file.
Yes	No	N/A	c. All calibration data entered into a logbook.
Yes	No	N/A	3. Actual discharged flow measured.
Yes	No	N/A	4. Effluent flow measured after all return lines.
Yes	No	N/A	5. Secondary instruments (totalizers, recorders, etc.) properly operated and maintained.
Yes	No	N/A	6. Spare parts stocked.
Yes	No	N/A	7. Effluent loadings calculated using effluent flow.
B. FLUMES			
Yes	No	N/A	1. Flow entering flume reasonably well-distributed across the channel and free of turbulence, boils, or other disturbances.
Yes	No	N/A	2. Cross-sectional velocities at entrance relatively uniform.
Yes	No	N/A	3. Flume clean and free of debris and deposits.
Yes	No	N/A	4. All dimensions of flume accurate and level.
Yes	No	N/A	5. Side walls of flume vertical and smooth.
Yes	No	N/A	6. Sides of flume throat vertical and parallel.
Yes	No	N/A	7. Flume head being measured at proper location.
Yes	No	N/A	8. Measurement of flume head zeroed to flume crest.
Yes	No	N/A	9. Flume properly sized to measure range of existing flow.
Yes	No	N/A	10. Flume operating under free-flow conditions over existing range of flows.
Yes	No	N/A	11. Flume submerged under certain flow conditions.
Yes	No	N/A	12. Flume operation invariably free-flow.

C. WEIRS			
Yes	No	N/A	1. What type of weir does the facility use?
Yes	No	N/A	2. Weir exactly level.
Yes	No	N/A	3. Weir plate plumb and its top and edges sharp and clean.
Yes	No	N/A	4. Downstream edge of weir is chamfered at 45°.
Yes	No	N/A	5. Free access for air below the nappe of the weir.
Yes	No	N/A	6. Upstream channel of weir straight for at least four times the depth of water level and free from disturbances.
Yes	No	N/A	7. Distance from sides of weir to side of channel at least 2H.
Yes	No	N/A	8. Area of approach channel at least (8 × nappe area) for upstream distance of 15H.
Yes	No	N/A	9. If not, is velocity of approach too high?
Yes	No	N/A	10. Head measurements properly made by facility personnel.
Yes	No	N/A	11. Leakage does not occur around weir.
Yes	No	N/A	12. Use of proper flow tables by facility personnel.
D. OTHER FLOW DEVICES			
			1. Type of flowmeter used:
			2. What are the most common problems that the operator has had with the flowmeter?
			3. Measured wastewater flow: _____ MGD; Recorded flow: _____; Error _____ %
E. CALIBRATION AND MAINTENANCE			
Yes	No	N/A	1. Flow totalizer properly calibrated.
			2. Frequency of routine inspection by proper operator: _____/day.
			3. Frequency of maintenance inspections by plant personnel: _____/year.
Yes	No	N/A	4. Flowmeter calibration records kept. Frequency of flowmeter calibration: _____/month.
Yes	No	N/A	5. Flow measurement equipment adequate to handle expected ranges of flow rates.
Yes	No	N/A	6. Calibration frequency adequate.

- b. The individual(s) who performed the sampling or measurements;
- c. The date(s) and time(s) analyses were performed;
- d. The individual(s) who performed the analyses;
- e. The analytical techniques or methods used; and
- f. The results of such analyses.

5. MONITORING PROCEDURES

- a. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit or approved by the Regional Administrator.
- b. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instruments at intervals frequent enough to insure accuracy of measurements and shall maintain appropriate records of such activities.
- c. An adequate analytical quality control program, including the analyses of sufficient standards, spikes, and duplicate samples to insure the accuracy of all required analytical results shall be maintained by the permittee or designated commercial laboratory.

6. FLOW MEASUREMENTS

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from true discharge rates throughout the range of expected discharge volumes.

D. REPORTING REQUIREMENTS

1. PLANNED CHANGES

a. INDUSTRIAL PERMITS

The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

- (1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR Part 122.29(b); or,
- (2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements listed at Part III.D.10.a.

b. MUNICIPAL PERMITS

Any change in the facility discharge (including the introduction of any new source or significant discharge or significant changes in the quantity or quality of existing discharges of pollutants) must be reported to the permitting authority. In no case are any new connections, increased flows, or significant changes in influent quality permitted that will cause violation of the effluent limitations specified herein.

2. ANTICIPATED NONCOMPLIANCE

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. TRANSFERS

This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act.

4. DISCHARGE MONITORING REPORTS AND OTHER REPORTS

Monitoring results must be reported to EPA on either the electronic or paper Discharge Monitoring Report (DMR) approved formats. Monitoring results can be submitted electronically in lieu of the paper DMR Form. To submit electronically, access the NetDMR website at [www.epa.gov/netdmr](http://www.epa.gov/netdmr) and contact the R6NetDMR.epa.gov in-box for further instructions. Until you

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Exhibit 5 -  
Attachment D

Exhibit (how to calibrate)**Flow Meter Calibration**

*Prepared by Robert George, NMED-GWQB*

Definition of Flow Meter Calibration

The Bureau of Reclamation's *Water Measurement Manual* defines calibration as:

"Calibration is the process used to check or adjust the output of a measuring device in convenient units of gradations. During calibration, manufacturers also determine robustness of equation forms and coefficients and collect sufficient data to statistically define accuracy performance limits. In the case of long-throated flumes and weirs, calibration can be done by computers using hydraulic theory. Users often do less rigorous calibration of devices in the field to check and help correct for problems of incorrect use and installation of devices or structural settlement. A calibration is no better than the comparison standards used during calibration."

This definition makes clear that calibration is the act of comparing and adjusting a measuring device against a standard. It also highlights that there are different levels of calibration that are performed for different purposes. NMED has proposed that all flow measurement devices be calibrated in-place, under actual operating conditions (field calibration) to within  $\pm 10\%$  of the actual flow. Calibrations are required following the installation of a device, repair of a device and annually thereafter. This proposal fits the latter description of calibration from the definition above, which is a calibration performed by users to a less rigorous standard for the purposes of checking and correcting problems with newly installed or repair devices or for devices that have been affected over the course of time. It is not intended to require a rigorous field calibration to determine the maximum accuracy that a manufactured device is capable of achieving in a particular setting, which NMED recognizes would be overly time-consuming, difficult and costly.

The Need for Flow Meter Equipment Field Calibration

The need for field flow meter equipment calibration is not obvious to some. Devices are frequently sold with statements that no calibration is required in order to achieve a stated accuracy, provided the device is installed and maintained in accordance with specific requirements. In the case of an ideal installation, this statement may be true. However, what is not considered is that: (1) most installation situations require compromise which leads to less than ideal installation conditions, (2) there are a wide variety of errors that can contribute to inaccuracy and these often go unidentified, and; (3) degradation tends to affect the accuracy of all installations over time in a manner that cannot be predicted. Without field calibration of flow measurement devices, NMED has no way of determining that gross inaccuracy of a flow measurement device does not exist. To this

end, NMED is less concerned with absolute precision than with verifying that measurements are reasonably accurate and repeatable over time.

**Definition of Terms Related to Calibration Accuracy**

*(Adapted from the Bureau of Reclamation's Water Measurement Manual)*

**Precision** is the ability to produce the same value within given accuracy bounds when successive readings of a specific quantity are measured. Precision represents the maximum departure of all readings from the mean value of the readings. Thus, a measurement cannot be more accurate than the inherent precision of the combined primary and secondary device precision.

**Error** is the deviation of a measurement, observation, or calculation from the truth. The deviation can be small and inherent in the structure and functioning of the system and be within the bounds or limits specified. Lack of care and mistakes during fabrication, installation, and use can often cause large errors well outside expected performance bounds. Since the true value is seldom known, some investigators prefer to use the term uncertainty.

**Spurious errors** are commonly caused by accident, resulting in false data. Misreading and intermittent mechanical malfunction can cause discharge readings well outside of expected random statistical distribution about the mean. A hurried operator might incorrectly measure discharge on a staff gauge. Spurious errors can be minimized by good supervision, maintenance, inspection, and training. Experienced, well-trained operators are more likely to recognize readings that are significantly out of the expected range of deviation. Unexpected blockages of flow in the approach or in the device itself can cause spurious errors. Repeating measurements does not provide any information on spurious error unless repetitions occur before and after the introduction of the error. On a statistical basis, spurious errors confound evaluation of accuracy performance.

**Systematic errors** are errors that persist and cannot be considered entirely random. Systematic errors are caused by deviations from standard device dimensions. Systematic errors cannot be detected by repeated measurements. They usually cause persistent error on one side of the true value. For example, error in determining the crest elevation for setting staff or recorder chart gage zeros relative to actual elevation of a weir crest causes systematic error. The error for this case can be corrected when discovered by adjusting to accurate dimensional measurements. Worn, broken, and defective flow meter parts, such as a permanently deformed, over-stretched spring, can cause systematic errors. This kind of systematic error is corrected by maintenance or replacement of parts or the entire meter. Fabrication error comes from dimensional deviation of fabrication or construction allowed because of limited ability to exactly reproduce important standard dimensions that govern pressure or heads in measuring devices. Allowable tolerances produce small systematic errors which should be specified.

Calibration equations can have systematic errors, depending on the quality of their derivation and selection of form. Equation errors are introduced by selection of equation forms that usually only approximate calibration data. These errors can be reduced by finding better equations or by using more than one equation to cover specific ranges of measurement. In some cases, tables and plotted curves are the only way to present calibration data.

**Random errors** are caused by such things as the estimating required between the smallest division on a head measurement device and water surface waves at a head measuring device. Loose linkages between parts of flow meters provide room for random movement of parts relative to each other, causing subsequent random output errors. Repeating readings decreases average random error by a factor of the square root of the number of readings.

**Total error** of a measurement is the result of systematic and random errors caused by component parts and factors related to the entire system. Sometimes, error limits of all component factors are well known. In this case, total limits of simpler systems can be determined by computation. In more complicated cases, different investigators may not agree on how to combine the limits. In this case, only a thorough calibration of the entire system as a unit will resolve the difference. In any case, it is better to do error analysis with data where entire system parts are operating simultaneously and compare discharge measurement against an adequate discharge comparison standard.

**Comparison standards** for water measurement are systems or devices capable of measuring discharge to within limits at least equal to the desired limits for the device being calibrated. Outside of the functioning capability of the primary and secondary elements, the quality of the comparison standard governs the quality of calibration.

**Discrepancy** is simply the difference of two measurements of the same quantity. Even if measured in two different ways, discrepancy does not indicate error with any confidence unless the accuracy capability of one of the measurement techniques is fully known and can be considered a working standard or better.

#### **Flow Measurement Device Field Calibration**

NMED is seeking to have initial and routine calibrations performed on flow measurement devices under actual operating conditions (field calibrations). Field calibrations of this type are to be performed by individuals knowledgeable in flow measurement and in the installation/operation of the particular device. As mentioned before, this type of calibration is performed for the purposes of checking and correcting problems with newly installed or repaired devices or for devices that may have been affected over the course of time and is recognized to be held to a less rigorous standard than a full characterization of a device to its maximum accuracy. NMED is proposing that accuracy of flow measuring devices be maintained to within  $\pm 10\%$  of the comparison standard discharge (actual

flow). The acceptable level of accuracy to be attained by the comparison standard discharge is at least equal to that of the allowable error of the device being calibrated ( $\pm 10\%$ ). The comparison standard is accepted to be "actual flow" but understood to contain some (undetermined) systematic and random level of error, although reasonable efforts should be made to minimize both. Spurious errors in establishing the comparison standard are to be largely avoided by careful oversight.

Typically during field calibration, the measurement output of the flow measurement device is evaluated at a stable discharge rate against the comparison standard. The discrepancy between the indicated discharge for the device and the actual flow (as determined by the comparison standard) is used to calculate percent of error (offset) as follows:

$$E\%Q_c = \frac{100(Q_{ind} - Q_c)}{Q_c}$$

Where:

$Q_{ind}$  = indicated discharge from device output

$Q_c$  = comparison standard discharge concurrently measured in a more precise way

$E\%Q_c$  = offset error in percent of comparison standard discharge

The level of error detected during the calibration represents the positive or negative offset of the device from the actual flow. Technically, this is not a statistically appropriate representation of the measurement error of the device, because no attempt at characterizing the accuracy of the calibration standard or of the discrepancy of the output of the device from the calibration standard throughout the measurement range (zero, mid-range and full scale) is made. Additionally, the level of inaccuracy allowable ( $\pm 10\%$ ) is not defined in terms of scale (zero, mid-range, full scale), so  $\pm 10\%$  is potentially acceptable at any range. However, because NMED is less concerned with absolute precision than with attaining a reasonable accuracy and a reasonable degree of repeatability, this level of calibration measurement is sufficient for this purpose. More sophisticated statistical analysis of the accuracy of a measurement device will be accepted by NMED, provided it follows accepted principals for calibration.

If the offset of the device is beyond the bounds of  $\pm 10\%$  of the calibration standard, adjustment of the device to bring it within these bounds is appropriate and should be attempted and the calibration rechecked. If the device shows a high level of inaccuracy beyond these bounds, displays an inability to repeat a measurement (within the same bounds), or calibration to within  $\pm 10\%$  cannot be attained, a faulty device or non-standard installation may be indicated and more in-depth investigation and device repair/replacement may be warranted.

### ***Calibration of Hydraulic Structure Primary Measuring Devices***

Hydraulic structure primary measuring devices are capable of accuracies of varying degree, dependent upon the device type and the range that it is operating in (scale) compared with its design range (full scale). Virtually all hydraulic structure primary measuring devices are capable of accuracies within  $\pm 10\%$  when installed in accordance with the specific requirements for each unique device. Beneficially, under most circumstances, the errors that can adversely affect the accuracy of hydraulic structure primary measuring devices are relatively limited and easy to detect. Should a hydraulic structure be installed improperly or damaged in place, problems with its operation can be readily identified by visual inspection (provided the inspector has an understanding of the function of the particular structure type). Once identified, most problems are easily corrected. Put simply, this class of device is fairly easy to install in a manner that will produce reasonably accurate results and the causes of inaccuracy are readily identified.

Because of these two characteristics, hydraulic structure primary measuring devices, when installed correctly, constitute a suitable comparison standard discharge (in and of themselves) which can therefore be used to represent "actual flow" for the purposes of calibrating secondary devices (head sensing, readout and totalizers). For this reason, NMED is not seeking field calibration of *standard* hydraulic structure primary measuring devices. The ability to act as a calibration standard and the inherent simplicity of these devices, accounts for their widespread use throughout the water supply, wastewater treatment and agricultural industries.

### ***Calibration of Head Sensing, Readout and Totalizing Secondary Devices***

In the case of head sensing, readout and totalizing equipment, initial and routine calibration/adjustment by comparison to the hydraulic structure primary measuring device is necessary to ensure that accurate flow measurements are first established and then maintained. NMED is proposing that calibrations be performed initially and then annually thereafter. When an initial or routine calibration is performed, the degree of inaccuracy (positive or negative offset) is characterized in relation to the flow in the hydraulic structure primary device.

### ***Calibration of Commercial Velocity Sensing Meters***

Commercial meters are sold with the device's stated accuracy clearly identified. Many meters claim that the device is sold pre-calibrated and that no field (sometimes referred to as "wet") calibration is needed. Some of the newest velocity sensing meters do allow diagnostics of the primary device elements (e.g. mag-meters often have the ability to self check their magnetic field characteristics), but they do not provide a suitable comparison standard discharge in and of themselves. Furthermore, what is not typically clear is that any deviation from the laboratory conditions under which the device was calibrated can result in inaccuracy. For example; the application of a device that was calibrated on

clean water to measuring wastewater with a high concentration of suspended solids could greatly affect accuracy. Unexpected (or detected) turbulence induced prior to a meter can result in very different performance than during calibration conditions. The length of pipe prior to and after a meter, the pipe material and even the roughness of the interior surface of the pipe can affect accuracy. The incident angle that a device is mounted at can affect accuracy and function. In fact, a great number of systematic, random and spurious errors can contribute to inaccuracies in real world conditions. Worse, these errors are generally not readily observable or measurable in closed-pipe systems and therefore not easily detected. NMED has no way of ensuring that closed-pipe flow measurement devices have been installed and are operating completely within the manufacturer's requirements, and therefore capable of accurate flow measurement. For this reason, field calibration of the primary and secondary elements of commercial closed-pipe velocity sensing meters is critical.

The selection of a suitable comparison standard discharge for the field calibration of commercial velocity sensing meters requires skill and knowledge about flow measurement. NMED is seeking to have individuals knowledgeable in flow measurements with the particular device in use develop and perform field calibrations. Examples of the type of comparison standard discharges that could be utilized for field commercial meter calibrations include:

- Volume/time comparison, where a known volume of liquid moves through the meter in a known amount of time. For example, the liquid level in a sump of known dimensions is measured before and after a pump moves liquid from the sump and through the meter over a five minute interval. By calculating the volume of liquid pumped in five minutes, a comparison standard discharge can be established. The totalized meter reading discrepancy from the actual flow for the five minute interval can be determined and the meter offset calculated. Errors of measurement and timing must be controlled.
- A standard hydraulic device primary measuring structure, such as an orifice plate can be inserted in the pipe metered by the device in question. Head readings taken at standard locations before and after the orifice plate can be used to determine the discharge (using an equation or table specific for the orifice plate) and the discharge can be used as a comparison standard discharge. Care must be taken in the centering of the orifice plate and in the head readings. The method can typically only be employed on wastewater for short calibration durations due to plugging at the head measurement locations.
- A standard hydraulic structure primary measuring device, such as a weir or flume can be constructed at the outlet of the discharge stream so that the actual discharge can be determined from the weir or flume for comparison by the close-pipe measuring device output.

NMED acknowledges that field calibration of commercial in-pipe meters can be difficult to accomplish under many circumstances but contends that field calibrations are necessary to eliminate gross inaccuracies of flow measurements at dairy facilities. NMED is seeking to have field calibration procedures outlined by dairy facilities (as

opposed to requiring specific approaches) to allow the use of the least expensive, most easily accomplished procedure for a given facility. NMED is proposing that calibration procedures be performed by individuals with experience in flow measurement and the use of the particular device in question. NMED anticipates that a variety of calibration methods will be used, as applicable in various settings.

#### ***Flow Meter Calibration Reports***

NMED is proposing to have dairy facilities submit a flow meter calibration report annually to demonstrate that flow measurements are achieving the required level of accuracy. The reports are required to contain an identification of the flow meter consistent with the Discharge Permit, the location of the meter, the method of flow meter calibration employed (assumed to be a narrative description), the measured accuracy of the meter before and after adjustment and a list of any repairs made to the meter in the previous year.

The report is to be submitted in the facility's monitoring report due by May 1 of each year.

#### **References**

United States Department of the Interior, Bureau of Reclamation, *Water Measurement Manual*, Revised Reprint 2001, available at:  
[http://www.usbr.gov/pmts/hydraulics\\_lab/pubs/wmm/](http://www.usbr.gov/pmts/hydraulics_lab/pubs/wmm/)

United States Department of the Interior, Environmental Protection Agency, NPDES Compliance Inspection Manual, Chapter 6, Flow Measurement, available at:  
<http://www.epa.gov/compliance/resources/publications/monitoring/cwa/inspections/npdesinspect/npdesmanual.html>

**TEWA WOMEN UNITED  
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September 23, 2019

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By email to: [AndrewCRomero@state.nm.us](mailto:AndrewCRomero@state.nm.us)

Re: Public Comments on the July 19, 2019 draft permit DP-1132 and the September 2016 DP-1132 Closure Plan for Los Alamos National Laboratory ("LANL") Radioactive Liquid Waste Treatment Facility ("RLWTF") at Technical Area 50 ("TA-50")

Dear Mr. Romero:

Thank you for providing the July 19, 2019 draft Discharge Permit DP-1132 and September 2016 Closure Plan (EPC-DO-16-262, LA-UR-16-27050) for the Los Alamos National Laboratory ("LANL") Radioactive Liquid Waste Treatment Facility ("RLWTF"). These public comments are submitted by the above-listed organizations, which have participated in the DP-1132 permitting process since 2013 and before and are Council members of the Communities for Clean Water ("CCW"). However, these

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comments are not submitted on behalf of CCW but only on behalf of the above listed organizations.

As you know, Tewa Women United (TWU), the New Mexico Acequia Association (“NMAA”), Honor Our Pueblo Existence (“H.O.P.E.”), and Concerned Citizens for Nuclear Safety (“CCNS”), as part of the Communities for Clean Water, began providing public comments and requesting a public hearing in December 2013. Several issues remain, despite hours of negotiations between TWU, NMAA, H.O.P.E., and CCNS and its partners, the New Mexico Environment Department (the “Department” or “NMED”), and the Applicants, Department of Energy (“DOE”), National Nuclear Security Administration (“NNSA”), and Los Alamos National Security, LLC (previous contractor) and now, Triad National Security, LLC (“TNS”).

**A. The Draft Permit is Not Supported by the Water Quality Act.**

1. NMED seeks to issue a discharge permit (“DP-1132”) under the Water Quality Act, § 74-6-1 *et seq.* NMSA 1978 (“WQA”) for the RLWTF. For four principal reasons DP-1132 may not issue:

a. First, the RLWTF does not and will not *discharge* any contaminated water. Without a discharge, NMED has no basis to issue a discharge permit. § 74-6-5(A), (I) NMSA 1978.

b. Second, NMED has no authority to issue a WQA permit for a “possible” or “potential” discharge, where there is no actual regulated discharge.

c. Third, a WQA permit for the RLWTF would be a nullity, because by law it would not become effective until there is a discharge, *i.e.* – never. A WQA permit that is not in effect may not be enforced for any purpose.

d. Fourth, the RLWTF is a *hazardous waste management facility*, and under § 74-6-12(B) NMSA 1978, “[t]he Water Quality Act does not apply to

any activity or condition subject to the authority of the environmental improvement board pursuant to the Hazardous Waste Act . . . ”

2. Specifically, the WQA authorizes the Water Quality Control Commission (“WQCC”) *only* to require “a permit for the discharge of any water contaminant” (*emphasis supplied*). § 74-6-5 NMSA 1978. The permitting rules are addressed to discharges. 20.6.2.3104 NMAC. Further, the WQA Regulations specifically describe a discharge plan as one that regulates releases of effluent or leachate “so that it may move directly or indirectly into ground water.” 20.6.2.3104 NMAC (*emphasis supplied*). 20.6.2.7.R NMAC. “Ground water” is further defined by regulation to mean “interstitial water which occurs in saturated earth material and which is capable of entering a well in sufficient amounts to be utilized as a water supply . . . ” 20.6.2.7.Z NMAC. Thus, the WQA applies only to an actual “discharge,” moving toward ground water, which is “interstitial water which occurs in saturated earth material and which is capable of entering a well in sufficient amounts to be utilized as a water supply.”

3. In contrast, the RLWTF is a “zero-liquid-discharge” facility. No water containing regulated contaminants is being released or will be released. No such water will be released that may move in any direction, much less toward water occurring in saturated earth material which is capable of entering a well in sufficient amounts to be utilized as a water supply.

4. The draft permit erroneously defines “discharge” in broad terms that far exceed the governing regulations:

G. Discharge- the intentional or unintentional release of an effluent or leachate which has the potential to move directly or indirectly into ground water or to be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property.

(Section II.G.) NMED has improperly inserted language into DP-1132 to suggest that a statutory “discharge” is occurring or anticipated. Specifically,

In issuing this Discharge Permit, NMED finds:

A. The Permittees are discharging effluent or leachate from the Facility so that such effluent or leachate may move directly or indirectly into ground water within the meaning of 20.6.2.3104 NMAC.

B. The Permittees are discharging effluent or leachate from the Facility so that such effluent or leachate may move into ground water of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of total dissolved solids (TDS) within the meaning of 20.6.2.3101.A NMAC.

C. The discharge from the Facility is within or into a place of withdrawal of ground water for present or reasonably foreseeable future use within the meaning of the WQA, NMSA 1978, § 74-6-5.E.3, and the WQCC Regulations at 20.6.2.3103 NMAC.

(Section IV.) These recitals are unsupported and refuted by, among other things, the consistent quarterly reports that show no discharges. The only release of water from the RLWTF that appears in any documentation is a release that contained no contaminants under 20.6.2.3103 that subject the source to permitting.

5. The Draft Permit also contains an “authorization to discharge,” purportedly allowing the Applicants to “discharge” contaminated water from one tank to another within the RLWTF:

B. The Permittees are authorized to discharge up to 40,000 gpd of low-level and transuranic radioactive industrial waste water using a series of treatment processes as described in Section

V(D) of this Discharge Permit in accordance with the Conditions set forth in Section VI of this Discharge Permit.

C. The Permittees are authorized to discharge up to 40,000 gpd of treated waste water, in accordance with the Conditions set forth in Section VI of this Discharge Permit. Discharges shall be to either the Mechanical Evaporator System (MES), the synthetically lined Solar Evaporation Tank System (SET), or through an outfall (Identified as Outfall 051) also regulated by a National Pollutant Discharge Elimination System (NPDES) permit (Permit No. NM0028355) issued by the United States Environmental Protection Agency [20.6.2.3104 NMAC, 20.6.2.3106C NMAC, 20.6.2.3109.C NMAC].

(Section V.)

6. These findings and authorizations are entirely bogus. It is known that regulated discharges through Outfall 051 stopped in 2010 and are neither occurring nor planned. The purported "authorization" to make discharges through Outfall 051 is meaningless, because LANL has no plans to do so. The other supposed "discharges" are simply transfers among parts of the contained system of the RLWTF, transfers that leave the water and any contaminant isolated from the environment and involve no release to the environment or towards ground water, as the WQA requires.

7. LANL has repeatedly asserted that a groundwater discharge permit would *not* be required for the evaporation tanks, because "there is no reasonable probability that liquid contained in the evaporation tanks would move into groundwater." (AR 213 at 03655. *See* AR 221 at 03704; AR 256 at 05217).

8. DP-1132 cannot be supported on the theory that an unplanned discharge through Outfall 051 is *possible*. The WQA does not authorize a permit when NMED finds that a facility might *possibly* discharge, *e.g.*, from an accidental leak. The WQA authorizes a permit *only* for an actual

“discharge.” If the *possibility* of equipment failure called for a discharge permit, then NMED would need to issue a discharge permit for any pipe that connects a water tank to a power plant boiler, or to cooling towers, or to another treatment system, or to any other building. But, by law, only a “discharge” may be regulated. § 20.6.2.3104 NMAC.

9. A permit for a non-discharging facility is entirely without effect. The WQA specifies that, for a new discharge, “the term of the permit shall commence *on the date the discharge begins.*” § 74-6-5(I) NMSA 1978 (*emphasis supplied*). See also 20.6.2.3109.H NMAC. DP-1132 authorizes new discharges to the MES and the SET. Since the term of such a permit starts only with an *actual* discharge, a permit to a non-discharging facility never comes into effect. Here, Outfall 051 will indefinitely have ‘zero liquid discharge’, *i.e.*, no discharge at all. When a permit is not in effect, it cannot be enforced; *i.e.*, there is no penalty for violation of its requirements.

10. Further, the WQA does not apply to a facility regulated under the HWA. A facility that is subject to the HWA cannot be regulated by the WQA. § 74-6-12.B NMSA 1978. The RLWTF manages hazardous waste, as defined in regulations under the HWA. 42 U.S.C. § 6903(5), (27). Consequently, the RLWTF must have a permit under the Resource Conservation and Recovery Act (“RCRA”) or an authorized state program. 42 U.S.C. § 6925, 40 C.F.R. § 270.1(c). But the RLWTF has no RCRA permit. LANL relies upon a statutory RCRA exemption (42 U.S.C. § 6903(27)) for discharges from facilities regulated under the NPDES and a regulatory exemption for a “wastewater treatment unit” (40 C.F.R. §§ 260.10 (*Tank system, Wastewater treatment unit*), 264.1(g)(6)). NMED itself has stated that the availability of the Wastewater Treatment Unit exemption depends upon the RLWTF discharging through a Clean Water Act outfall. 2010 LANL HWA permit § 4.6, at 86. But the discharges have stopped. Where there is no discharge, there is no basis for an NPDES permit. *Waterkeeper Alliance, Inc. v. U.S. Environmental Protection Agency*, 399 F.3d 486, 505 (2d Cir. 2005). See also *National Pork Producers Council v. U.S. Environmental Protection Agency*, 635 F.3d 738, 750 (5th Cir. 2011). Without a NPDES permit, there is no waste water treatment unit exemption from RCRA. Without an exemption, RCRA (*i.e.*, HWA) regulation is required. If a

facility is an “activity or condition subject to the authority of the environmental improvement board pursuant to the Hazardous Waste Act,” such a facility cannot be regulated by the WQA. (§ 74-6-12.B NMSA 1978). Therefore, no WQA permit may be issued, and this proceeding must be dismissed.

11. In this situation, clearly requiring full RCRA regulation of the RLWTF, we are appalled to learn that a “replacement” low-level radioactive liquid waste facility and a “replacement” transuranic radioactive liquid waste facility, designed by LANL to receive the same waste streams now going to the RLWTF for treatment, are being constructed by LANL without the prior approval, under a public process, of the proposed construction of a hazardous waste facility, as is required by RCRA.

#### **B. Specific Issues with the draft Permit.**

The proposed DP-1132 Permit, July 19, 2019, presents several specific issues that should be addressed, should NMED determine that a permit must issue here, despite the lack of legal support for the permit and closure plan:

12. Sec. 1 Acronyms. To be consistent with the Closure Plan, please add the following abbreviations:

LLRLW - low-level radioactive waste  
LLW - low-level waste  
TLW - transuranic liquid waste

13. Sec. II. Definitions.

a. Fix the definition of “Consent Order” to reflect the 2016 Consent Order and the new contractor, Triad National Security, LLC.

b. Change the definition of “Discharge” to conform to the WQA and 20.6.2.7.R NMAC. The definition of “discharge” has been changed from the earlier language, “may move directly or indirectly into ground water . .

." to "has the potential to move . . ." The new language implies that the water somehow and someday could make it to ground water, even if it is not moving that way right now. This change departs from the statutory language concerning a "discharge" and attempts to describe facts supporting a discharge permit, when in fact the situation required by the law does not exist. Clearly, the legal requirements for a permit cannot be altered by permit language. It must be changed.

c. The definition of Incident Command System is misplaced alphabetically and should make reference to the Department of Homeland Security protocols.

d. The definition of Leak Detection System should include such systems applicable to a single-containment unit.

e. The definition of "tank" follows the RCRA definition. There is no evidence in the Administrative Record that the SET satisfies that definition, insofar as it describes structural support.

14. Sec. III. Introduction.

a. Add "National Nuclear Security Administration (NNSA)" after "United States Department of Energy (DOE)."

b. Change the name of the contractor from LANS to Triad National Security, LLC.

c. Second paragraph: Delete the word "potential" release. The NM WQA does not authorize regulation of a "potential" release, neither is any definition of "potential release" proposed.

d. Third paragraph: Add information about the 2005 draft DP-1132 permit that was released for public review and comment.

15. Sec. IV. Findings.

The objectionable “findings” to the effect that the facility is discharging effluent or leachate so that such effluent or leachate may move directly or indirectly into ground water should be removed. There is no basis for such statements; they are in fact untrue.

16. Sec. V. Authorization to Discharge.

a. Subsection C. The objectionable “authorization to discharge” is unchanged in this draft. There is no need and no occasion for such authorization, since no discharge is planned.

b. Subsection D: Drawings of the Influent Collection System, as it now exists, should be put in the Administrative Record.

c. Subsection D: Drawings of the low-level radioactive waste water (“LLRLW”) treatment system, the TRU waste water treatment system, the secondary treatment system, the MES, and the SET should be in the Administrative Record. The definition of “The Low-level Radioactive Waste Water (RLW) Treatment System” includes “subsequent replacement facilities utilizing the same treatment processes located within the physical confines of TA-50. The process by which the individual treatment units within the low-level radioactive treatment system are utilized may, for attaining compliance with the effluent limits set forth in this Discharge Permit, be altered, by-passed, replaced, or removed in accordance with the Conditions set forth in this Discharge Permit.” This language improperly authorizes almost unlimited changes in the RLWTF treatment system and nullifies any effective regulation thereof.

d. “The Mechanical Evaporator System (MES)” definition says “units.” It should be explained that the units are movable, so that an inoperative MES unit may be removed and replaced.

17. Sec. VI.A. Conditions.

a. Subsection A.3.j refers to design specifications for secondary containment. The language should state expressly that this requirement

applies to the pipe component of the SET system that conveys treated water to TA-52. Such a statement should also appear in subsection A.3.m. Further, we have requested that the permit state that any change in waste transportation, storage, or treatment equipment or methods constitutes a “discharge permit modification” and requires a public process. This has not been done.

b. Subsection A.6 – signs referred to should be in Tewa as well as English and Spanish.

c. Subsection A.7 – Verification of secondary containment. It should be stated expressly that this requirement applies to the pipe component of the SET system that conveys treated water to TA-52. Also, there should be a definition of “untreated.”

d. Subsection A.8 – water tightness testing. It is unclear what unit or system is referred to that would be used to convey, store, etc. a liquid waste stream without secondary containment, since such units or systems are required to have secondary containment under Conditions referred to above. Please explain and clarify the language.

e. Comparing Table 1 – Effluent Quality Limits for Discharges to Outfall 051 with Table 2 – Effluent Quality Limits for Discharges to MES and SET, we find that the standards are higher in Table 2 than Table 1 for:

	<u>Table 1 mg/L</u>	<u>Table 2 mg/L</u>
Barium (dissolved)	1.0	2.0
Chromium (dissolved)	0.05	0.1
Copper (dissolved)	1.0	1.3
Silver (dissolved)	0.05	0.1

The differences should be explained. Also, there is no explanation why the Organic Chemicals listed in Table 1 are not found in Table 2.

f. Subsection A.20 – Emergency Response Procedures. The National Incident Management System requires that emergency planning include potentially affected Pueblos. The Permit should state that this will be done. Further, such procedures should be reviewed annually.

g. Subsections A.21, A.22 – Flow meters: The draft specifies that flow meters be installed 180 days after the effective date of the permit. This is not acceptable, since the permit becomes effective only upon a discharge, and the RLWTF is a zero liquid discharge facility. So the requirements will not arise. Further, 180 days after a discharge is too long a delay. In addition, no justification has been offered for the error-tolerance levels stated for flow meters. No justification is offered for the 10% accuracy level for the flow meter on the ten-inch influent line. No justification is offered for the 2% accuracy level for the soil moisture monitoring system.

h. Subsections B.23, B.24, B.36: Monitoring and Reporting: No change is made in the reliance on defective regional wells R-46, R-60, R-1, and R-14 for monitoring, which should be disallowed. We object also to the use of “characterization” wells for the purposes of monitoring. (*Please see Appendix A to CCW’s December 13, 2013 comments by Independent Registered Geologist Robert H. Gilkeson, entitled Deficiencies in Ground Water Protection in the Draft Groundwater DP-1132 Permit for more information about the deficiencies in the use of these wells.*)

i. Subsection D.49 – Electronic Posting – The draft states that mandatory posting shall be done within 30 days, but voluntary posting within seven days. It is not clear why the two times should be different. Any public posting should be completed quickly enough so that a member of the public can take action within any applicable deadline.

#### 18. Closure Plan:

a. Draft DP-1132 Section VI.A.42 states that the revised closure plan may be modified or amended at any time. This is unacceptable as there is no public process associated with the proposed modification or amendment. A public comment period of 30 days is provided, but there is

no requirement for the Applicants to notify the public of the proposed modification or amendment; nor is there a requirement for the Department to notify the public of the public comment period.

b. Paragraph VI(A)(42) now says that corrective action for any releases from existing or future SWMUs and AOCs associated with the RLWTF shall be conducted pursuant to the Consent Order. The 2016 Consent Order says that new releases and newly discovered releases of hazardous waste or hazardous constituents from hazardous waste management units shall be addressed in the [LANL RCRA] Permit and not the Consent Order. (Consent Order, June 2016, at VII.A). These provisions appear to contradict one another. TWU, NMAA, H.O.P.E., and CCNS propose that the language on the last page of the Closure Plan be revised to state:

“In accordance with Condition 46 of the Groundwater Permit, closure of the RLWTF shall be conducted solely under the NMED Consent Order of June 2016 and not under the Ground Water Discharge Permit. Through the Consent Order, the NMED establishes priorities for characterization, cleanup and closure of SWMUs and AOCs across LANL. Therefore, actual start date for closure of the RLWTF will be dependent upon the Consent Order process, and may differ from the start date indicated in this schedule.” (EPC-DO-16-208, LA-UR-16-21315, Fig. 4).

The proposed language (above) allows the closure process to be integrated with other remediation efforts in the area of TA-50 rather than viewed as an independent task. The Consent Order would incorporate the closure of the RLWTF into the overall cleanup effort.

c. There is a reference in the Closure Plan to the initiation of treatment of LLW in 2019, contingent on concurrence of NMED. (at 32). It is implied that an NMED bureau would state such concurrence. It should

be specified that the Hazardous Waste Bureau must give such concurrence, since the matter is clearly within the HWB's expertise.

### **C. Request for Public Hearing**

TWU, NMAA, H.O.P.E., and CCNS, individually and as a member of Communities for Clean Water, have been actively participating in the process of arriving at a valid and protective permit for the RLWTF since December 2013. Despite significant good faith participation in an attempt to arrive at a final permit that TWU, NMAA, H.O.P.E., and CCNS and its members are satisfied is adequate to assure public health, safety, and protection of the environment, a number of unresolved issues remain upon which a hearing is requested. In this regard, TWU, NMAA, H.O.P.E., and CCNS refers to previous comments and hearing requests, and specifically the CCW comments dated June 5, 2017, which are incorporated herein by reference and attached to these comments. Pursuant to 74-6-5(G) NMSA 1978 and 20.6.2.3108(K) NMAC, TWU, NMAA, H.O.P.E., and CCNS request a public hearing on these issues:

1. TWU, NMAA, H.O.P.E., and CCNS have contended since its initial comments that the RLWTF, as, in LANL's words, "a zero liquid discharge" facility, is not properly regulated under the New Mexico Water Quality Act and implementing regulations. NMED re DP-1132 (January 13, 2017); see also Attachments 1, 2, and 14a, Comments and Requests for Hearing Letter to NMED re DP-1132 (December 6, 2013); Comments and Requests for Hearing to NMED re DP-1132 (December 12, 2013); Cover letter, exhibit list, and petition to rescind NPDES permit for the RLWTF (June 17, 2016).

2. DP-1132 strains to justify a discharge permit ("DP") for a non-discharging facility, incorporating, e.g., elastic "discharge" definition, false "findings" that the facility is discharging, needless "authorization to discharge." *See generally* the issue and documents referenced above.

3. It is objectionable to have a permit apply to "subsequent replacement systems," which have not undergone the required public notice, comment and hearing under RCRA and the Hazardous Waste Act.

The new RLW facility, absent an exemption from RCRA/HWA, is subject to the NMED facility-wide hazardous waste permit for LANL. NMED noted that LANL constructed the building at its own risk. *See* Attachment 16, NMED letter to LANL (October 3, 2014). According to the letter, LANL submitted plans and specifications to NMED for review. NMED did not provide written approval. NMED made no comment regarding “the adequacy of the design, compliance with applicable State, Federal, local statute, code and requirements.” Furthermore, there was no permit then in place for the new facility, nor would one be effective as there was not (and is no) discharge planned. Thus, NMED had no authority to review the “subsequent replacement systems” plans and specifications. DP-1132 Condition 3 requires “prior written approval by NMED” before implementing “any expansion, process modification, or alternation of a system or unit that could constitute a discharge permit modification (as defined in 20.6.2.7.P NMAC) of the intended function, design or capacity of any of the systems, units or components of the Facility’s collection, treatment or disposal systems.” Building a new facility would require a Class 3 permit modification under RCRA/HWA and requires advance public notice, comments and public hearing on request. A non-discharging facility that is not subject to a National Pollutant Discharge Elimination System (“NPDES”) permit is covered under the RCRA/HWA permit.

4. During discussions of DP-1132, LANL committed to working with Communities for Clean Water (“CCW”) members to produce multi-language signage warning people to keep out of areas downstream of the RLWTF, but LANL has had no subsequent communication regarding the signage, despite the fact that CCW submitted draft copies of such signs. *See* Attachment 7 (copy of email with attached copies of proposed signage).

5. Based upon discussions of DP-1132, LANL needs to include representatives of potentially affected Pueblos in emergency incident planning and provide designated seats within the LANL Emergency Operations Center for Pueblo representatives during preparation drills and actual emergencies.

6. Despite CCW's provision of information concerning current standard industry practices for calibration and sensitivity of monitoring equipment, DP-1132 fails to require monitoring equipment accurate to current industry standards.

7. Despite discussions and provisions of ample documentation on this issue, DP-1132 allows groundwater monitoring to be conducted with defective shallow, intermediate and regional wells.

8. In the final version of DP-1132, at LANL's request, NMED unilaterally changed the time for posting its submittals to NMED to the LANL Electronic Public Reading Room from seven (7) days to thirty (30) days. LANL's change effectively eliminates public notice about the thirty (30)-day comment period. *See* Condition 42 (Closure Plan Amendments and Modifications). Moreover, the DP allows public review and comment on proposed amendments to the closure plan "30 days after the submittal." This means the public will likely only learn of a comment opportunity after it expires. *See* DP-1132 Condition 42.

9. The DP-1132 Closure Plan fails to state that closure and post-closure care will take place under the NMED Hazardous Waste Permit for LANL. *See* Sec. VII.A.2 of the 2016 NMED Consent Order for LANL (requiring this).

10. Even if closure took place under the Consent Order, closure is deferred, and there is no proposed schedule provided in the DP-1132 Closure Plan.

11. The DP-1132 Closure Plan is limited to the low-level radioactive liquid waste treatment facility. LANL omitted to provide closure plans for the transuranic treatment facilities, component systems and "replacement" facilities.

12. The DP-1132 Closure Plan provides no performance standards that LANL must meet in order for NMED to assess whether LANL has met the standards so as to warrant closure. For example, it appears that

underground pipe sections may be left in place, yet there is no justification provided for doing so, and no basis provided for assessing the safety of such a decision. *See* Attachment 14b (performance standards).

13. The DP-1132 Closure Plan provides limited provisions for ground water monitoring; significantly, there is continued reliance on defective wells for monitoring purposes as noted above in ¶ 6.

14. The DP-1132 Closure Plan does not include required continued monitoring, sampling and reporting of contaminants of concern, e.g., perchlorate and radionuclides.

The above listed issues include (1) violations of federal and state law; (2) matters of public health and safety in the operation and ultimate clean-up of the RLWTF and any new “replacement” facilities built to handle the functions of the RLWTF after closure; and (3) inadequate public notice likely violating due process through a modified posting submittal requirement for the LANL’s Electronic Public Reading Room. Resolution of these issues is of substantial interest to the interested members of the public. For that reason, TWU, NMAA, H.O.P.E., and CCNS request a public hearing on all of the above listed unresolved issues.

It must be noted that NMED has already determined that a public hearing is called for in this situation. Notice of Hearing Officer Appointment, Sept. 18, 2017. On June 18, 2019, the Water Quality Control Commission, on review, directed that the DP-1132 proceeding be vacated and remanded “for a new hearing.” Order, June 18, 2019. The Secretary of the Environment entered an order on July 17, 2019, entered a Notice of Hearing Determination and Hearing Officer Appointment.

Please contact us with any questions or comments you may have.

Sincerely,

Kathy Sanchez  
Beata Tsosie-Peña

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Table 1. Edits to Draft DP-1132 Due to Updated Information

Page No(s)	Section or Condition	Comment	Removes/ Edit	Documentation	Doc Date	Impacts to Other Conditions?
4, 8	Acronyms Introduction	Change LANS to Triad	Edit	Administrative Record Bates No: 14124-14137	9/12/18	None
5	Definitions	Definition of Consent Order needs to be updated to reference the June 2016 Compliance Order on Consent (See Condition No. 46).	Edit	Compliance Order on Consent	June 2016	None
15	Condition No. 8 Water Tightness Testing	The compliance deadline "by February 25, 2019" needs to be replaced with a new date once the permit is re-issued.	Edit	NA	NA	None
21 - 24	Conditions 16 & 17 Effluent Limits Table 1: Outfall 051 Table 2: SET & MES	Effluent limits in Tables 1 and 2 need to be updated pursuant to NMED's March 12, 2019 notification letter: <i>Changes to the Ground Water Standards.</i>	Edit	Exhibit Letter from NMED to ground water discharge permit holders RE: <i>Changes to Ground Water Standards</i>	3/12/19	None
36	Condition No. 36 Ground Water Monitoring	Replacement alluvial wells have been installed. The generic well names assigned in Condition No. 36, can be updated with the actual well location IDs. <i>MCA-RLW-1 and MCA-RLW-2.</i>	Edit	Administrative Record Bates No: 14763-14771 14785-14823	9/3/19 9/19/19	None

**Table 1. Edits to Draft DP-1132 Due to Updated Information (con't)**

Page No(s)	Section or Condition	Comment	Remove/Edit	Documentation	Doc Date	Impacts to Other Conditions?
46	Condition No. 49 Electronic Posting - Mandatory & Voluntary	Due to the completion of required actions under Condition Nos. 7, 21, and 33, the following posting requirements need to be removed. Mandatory Postings: <ul style="list-style-type: none"> <li>Condition VI.B.33</li> </ul> Voluntary Postings: <ul style="list-style-type: none"> <li>Condition VI.A.7</li> <li>Condition VI.A.21</li> <li>Condition VI.A.33</li> </ul>	Edit	See changes to Condition Nos. 7, 21, and 33.	NA	None

**Table 2. Edits to Draft DP-1132 Due to Completed Actions**

Page No(s)	Section or Condition	Comment	Remove/Edit	Documentation	Doc Date	Impacts to Other Conditions?
15	Condition No. 7 Verification of Secondary Containment	Verification of secondary containment required by Condition No. 7 was completed and documented to NMED.	Remove	Administrative Record Bates No: EPC-DO-18-403 EPC-DO-19-069 EPC-DO-19-162	11/19/18 3/20/19 6/3/19	Condition No. 49: Electronic Posting
23	Condition No. 16.b Effluent Limits: Outfall 051	Condition 16.b provided a 120-day compliance schedule for compliance with the Total Nitrogen limit of 15 mg/L. The condition is no longer applicable because the new reverse osmosis (RO) treatment unit is operational.	Remove Condition No. 16.b	Start-up of the new RO treatment unit is documented in RLWTF operational logs.	January 2019	None

Table 2. Edits to Draft DP-1132 Due to Completed Actions (con't)

Page No(s)	Section or Condition	Comment	Remove/ Edit	Documentation	Doc Date	Impacts to Other Conditions?
24	Condition No. 17.b Effluent Limits: MES and SET	Condition 17.b provided a 120-day compliance schedule for compliance with the Nitrogen limit of 10 mg/L. The condition is no longer applicable because the new reverse osmosis (RO) treatment unit is operational.	Remove Condition No. 17.b	Start-up of the new RO treatment unit is documented in RLWTF operational logs.	January 2019	None
26-27	Condition No. 20 Emergency Response Procedures	Permittees completed the action to submit a written summary of the emergency response procedures within 120 days of permit issuance.	Edit	Administrative Record Bates No: 14263-14267	12/18/18	None
27	Condition No. 21 Installation of Flow Meters	Installation and calibration of the four required flow meters was completed in October 2018. Written confirmation was submitted to NMED on April 19, 2019. These two requirements— installation and written confirmation—have been removed from Condition No. 21. The condition has been renamed "OPERATION OF FLOW METERS" to reflect the remaining requirements of the condition.	Edit	Administrative Record Bates No: 14509-145 12	4/9/19	Condition Nos. 22 and 49: Calibration and Electronic Posting

**Table 2. Edits to Draft DP-1132 Due to Completed Actions (con't)**

Page No(s)	Section or Condition	Comment	Remove/Edit	Documentation	Doc Date	Impacts to Other Conditions?
27-28	Condition No. 22 Calibration of Flow Meters	The requirement for calibration within 180 days of permit issuance was completed; this requirement can be removed. Routine calibration is conducted annually.	Edit	Administrative Record Bates No: 14509-145 12	4/9/19	Condition No. 49: Electronic Posting
32	Condition No. 30 Moisture Monitoring System for the SET	A work plan was submitted for the SET Moisture Monitoring System in Oct 2018; NMED approved the work plan in Jan 2019. Installation of the system is complete but the final construction report, including the baseline monitoring and action level, has not been submitted to NMED for approval.	Edit	Administrative Record Bates No: 14163-14195 14346-14349	10/31/18 1/30/19	None
34	Condition No. 33 Replacement of Two Existing Alluvial Ground Water Monitoring Wells	Installation of the two replacement alluvial ground water monitoring wells downgradient of Outfall 051 was completed in August 2019.	Remove Condition No. 33	Administrative Record Bates No: 14763-14771 14785-14823	9/3/19 9/19/19	Condition No. 49: Electronic Posting

Table 2. Edits to Draft DP-1132 Due to Completed Actions (con't)

Page No(s)	Section or Condition	Comment	Remove/ Edit	Documentation	Pos Date	Impacts to Other Conditions?
40	Condition No. 40 Cessation of Specific Units	The following specific units have been permanently removed from service: a. 75K tank (remains available for emergency storage) b. 100K tank c. two 26K clarifiers d. two 25K effluent storage tanks e. gravity filter	Remove Condition No. 40	Administrative Record Bates No: 14159	10/29/18	None



MICHELLE LUJAN GRISHAM  
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HOWIE C. MORALES  
Lieutenant Governor

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JAMES C. KENNEY  
Cabinet Secretary

JENNIFER J. PRUETT  
Deputy Secretary

March 12, 2019

Dear Permittee,

The New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB) wishes to notify you of recent amendments to the Ground and Surface Water Protection Regulations (20.6.2 NMAC). As a holder of a groundwater discharge permit, New Mexico's Water Quality Control Commission's amendments to the referenced regulations took effect on December 21, 2018, and these amendments may influence your current or future discharge permit.

**Changes to the Ground Water Standards**

The most significant changes for entities with discharge permits are the changes to the groundwater numerical standards at 20.6.2.3103 NMAC and the addition of several regulated contaminants. The numerical standards were revised to be consistent with the federal drinking water Maximum Contaminant Levels, resulting in both more and less stringent constituent specific standards. Please be aware that some of the revised standards will not take effect until July 1, 2020, as are identified in the regulations. Groundwater protection standards were adopted for 13 previously unregulated contaminants.

Furthermore, 13 additional contaminants were added to the list of "toxic pollutants" (See the definitions section at 20.6.2.7 NMAC). A minor change resulted in the toxic pollutants narrative standard being moved from the definitions section into the standards section at 20.6.2.3103 NMAC. A list showing the changes to the standards is enclosed for your reference.

Because of these changes to the standards, all general references in your current discharge permit to the standards of 20.6.2.3103 NMAC refer to the new standards, including the new contaminants. When your groundwater discharge permit is renewed or modified, it may contain specific requirements to sample for specific additional contaminants.

### Other Changes to the Regulations

Other significant changes to the regulations include:

- NMED must prepare a fact sheet to accompany draft permits for federal facilities, unless the permit pertains to only domestic waste. (See 20.6.2.3108.I)
- NMED must issue a response to significant comments received on draft permits. (See 20.6.2.3109.B)
- Injection wells and surface impoundments constructed to recharge an aquifer are not exempt from the requirement to obtain a Discharge Permit. (See 20.6.2.5006)
- Revised requirements pertain to the content of petitions for a variance from the regulations, and to the duration and review of variances. (See 20.6.2.1210)

This letter does not attempt to identify or characterize all the changes to the regulations. You can find links to the amendments that were published in the New Mexico Register, to a clean version of the amended regulations, and to the Water Quality Control Commission's Order and Statement of Reasons for adopting the amendments at the GWQB's website at:

<https://www.env.nm.gov/gwqb/gw-regulations/>

Thank you for your ongoing cooperation. If you have any questions you may contact the reviewer assigned to your discharge permit and with whom you are accustomed to working, or you may contact me at 505-827-2962 or at [steve.pullen@state.nm.us](mailto:steve.pullen@state.nm.us).

Sincerely,



Steve Pullen  
Manager, Pollution Prevention Section

Encl: 20.6.2.3103 Revised Groundwater Standards



**New Mexico Environment Department  
Ground Water Quality Bureau  
20.6.2.3103 STANDARDS FOR GROUND WATER**

Revised groundwater standards adopted by the New Mexico Water Quality Control Commission became effective on December 21, 2018. Some standards were changed, and new standards were adopted for additional contaminants. Designations for each contaminant now include the Chemical Abstracts Service (CAS) number for clearer identification. The following table summarizes the additions and changes to the numeric standards in Section 20.6.2.3103 NMAC. **Bold type** highlights the standards that have changed and identifies the contaminants that are new to the numeric standards (previous standard listed as "none"). The second table lists contaminants that were added to the "toxic pollutants" identified in Subsection I of 20.6.2.7 NMAC. For full details, please refer to the Ground and Surface Water Protection Regulations, 20.6.2 NMAC.

<b>Contaminant (Abbreviation) (CAS Number)</b>	<b>Previous Standard</b>	<b>Current Standard</b>
<b>Numerical Standards (mg/l unless otherwise noted)</b>		
Antimony (Sb) (CAS 7440-36-0)	None	0.006
Arsenic (As) (CAS 7440-38-2)	<b>0.1*</b>	<b>0.01*</b>
Barium (Ba) (CAS 7440-39-3)	1.0	<b>2.0</b>
<b>Beryllium (Be) (CAS 7440-41-7)</b>	None	<b>0.004</b>
Cadmium (Cd) (CAS 7440-43-9)	<b>0.01*</b>	<b>0.005*</b>
Chromium (Cr) (CAS 7440-47-3)	0.05	0.05
Cyanide (CN) (CAS 57-12-5)	0.2	0.2
Fluoride (F) (CAS 16984-48-8)	1.6	1.6
Lead (Pb) (CAS 7439-92-1)	<b>0.05*</b>	<b>0.015*</b>
Total Mercury (Hg) (CAS 7439-97-6)	0.002	0.002
Nitrate (NO <sub>3</sub> as N) (CAS 14797-55-8)	10.0	10.0
<b>Nitrite (NO<sub>2</sub> as N) (CAS 10102-44-0)</b>	None	<b>1.0</b>
Selenium (Se) (CAS 7782-49-2)	0.05	0.05
Silver (Ag) (CAS 7440-224)	0.05	0.05
<b>Thallium (Tl) (CAS 7440-28-0)</b>	None	<b>0.002</b>
Uranium (U) (CAS 7440-61-1)	0.03	0.03
Radioactivity: Combined Radium-226 (CAS 13982-63-3) and Radium-228 (CAS 15262-26-1)	<b>30 pCi/l*</b>	<b>5 pCi/l*</b>
Benzene (CAS 71-43-2)	<b>0.01*</b>	<b>0.005*</b>
Polychlorinated biphenyls (PCB's) (CAS 1336-36-3)	<b>0.001*</b>	<b>0.0005*</b>
Toluene (CAS 108-88-3)	0.75	1.0
Carbon Tetrachloride (CAS 56-23-5)	<b>0.01*</b>	<b>0.005*</b>
1,2-dichloroethane (EDC) (CAS 107-06-2)	<b>0.01*</b>	<b>0.005*</b>
1,1-dichloroethylene (1,1-DCE) (CAS 75-35-4)	0.005	<b>0.007</b>
tetrachloroethylene (PCE) (CAS 127-18-4)	<b>0.02*</b>	<b>0.005*</b>
trichloroethylene (TCE) (CAS 79-01-6)	<b>0.1*</b>	<b>0.005*</b>
ethylbenzene (CAS 100-41-4)	<b>0.75*</b>	<b>0.7*</b>
total xylenes (CAS 1330-20-7)	0.62	0.62
methylene chloride (CAS 75-09-2)	<b>0.1*</b>	<b>0.005*</b>
chloroform (CAS 67-66-3)	0.1	0.1
1,1-dichloroethane (CAS 75-34-3)	0.025	0.025
ethylene dibromide (EDB) (CAS 106-93-4)	<b>0.0001*</b>	<b>0.00005*</b>
1,1,1-trichloroethane (CAS 71-55-6)	<b>0.06</b>	0.2
1,1,2-trichloroethane (CAS 79-00-5)	<b>0.01*</b>	<b>0.005*</b>
1,1,2,2-tetrachloroethane (CAS 79-34-5)	0.01	0.01
vinyl chloride (CAS 75-01-4)	<b>0.001</b>	<b>0.002</b>

2018

PAHs: total naphthalene (CAS 91-20-3) plus monomethylnaphthalenes	0.03	0.03
benzo-a-pyrene (CAS 50-32-8)	0.0007*	0.0002*
cis-1,2-dichloroethene (CAS 156-59-2)	None	0.07
trans-1,2-dichloroethene (CAS 156-60-5)	None	0.1
1,2-dichloropropane (PDC) (CAS 78-87-5)	None	0.005
styrene (CAS 100-42-5)	None	0.1
1,2-dichlorobenzene (CAS 95-50-1)	None	0.6
1,4-dichlorobenzene (CAS 106-46-7)	None	0.075
1,2,4-trichlorobenzene (CAS 120-82-1)	None	0.07
pentachlorophenol (CAS 87-86-5)	None	0.001
atrazine (CAS 1912-24-9)	None	0.003
<b>Other Standards for Domestic Water Supply</b>		
Chloride (Cl) (CAS 16887-00-6)	250	250
Copper (Cu) (CAS 7440-50-80)	1.0	1.0
Iron (Fe) (CAS 7439-89-6)	1.0	1.0
Manganese (Mn) (CAS 7439-96-5)	0.2	0.2
Phenols	0.005	0.005
Sulfate (SO <sub>4</sub> ) (CAS 14808-79-8)	600	600
Total Dissolved Solids (TDS) TDS	1000	1000
Zinc (Zn) (CAS 7440-66-6)	10	10
pH	6-9	6-9
Methyl tertiary-butyl ether (MTBE) (CAS 1634-04-4)	None	0.1
<b>Standards for Irrigation Use</b>		
Aluminum (Al) (CAS 7429-90-5)	5.0	5.0
Boron (B) (CAS 7440-42-8)	0.75	0.75
Cobalt (Co) (CAS 7440-48-4)	0.05	0.05
Molybdenum (Mo) (CAS 7439-98-7)	1.0	1.0
Nickel (Ni) (CAS 7440-02-0)	0.2	0.2

\*For purposes of application of the amended numeric standards for arsenic, cadmium, lead, combined radium-226 & radium-228; benzene, PCBs, carbon tetrachloride, EDC, PCE, TCE, ethylbenzene, methylene chloride, EDB, 1,1,2-trichloroethane and benzo-a-pyrene, to past and current water discharges (as of July 1, 2017), the new standards will not become effective until July 1, 2020.

The following table lists contaminants that were added to the "toxic pollutants" identified in Subsection T of 20.6.2.7 NMAC. Narrative standards apply to the full list of toxic pollutants, as described in Subsection A of 20.6.2.3103 NMAC.

<b>Toxic Pollutants Added as of December 21, 2018</b>	
styrene (ethenylbenzene)	1,4-dioxane (1,4-D)
1,2-dichlorobenzene (ortho-dichlorobenzene)	sulfolane (thiolane 1,1-dioxide)
1,4-dichlorobenzene (para-dichlorobenzene)	perfluorohexane sulfonic acid (PFHxS)
1,2,4-trichlorobenzene	perfluorooctane sulfonate (PFOS)
pentachlorophenol (PCP)	perfluorooctanoic acid (PFOA)
1,2-dichloropropane (propylene dichloride, PDC)	atrazine
	prometon

2018

DP-1132  
Page | 1 of 50

GROUND WATER DISCHARGE PERMIT (DP-1132)  
RADIOACTIVE LIQUID WASTE TREATMENT FACILITY  
LOS ALAMOS NATIONAL LABORATORY

| 08-29-2018

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**I. ACRONYMS:**

The following acronyms and abbreviations may be used throughout this Discharge Permit:

BOD<sub>5</sub>-biochemical oxygen demand (5-day)  
CAS-Chemical Abstract Service  
CFR-Code of Federal Regulations  
Cl- chloride  
CQCAP- Construction Quality Control Assurance Plan  
DOE-United States Department of Energy  
EPA- United States Environmental Protection Agency  
gpd- gallons per day  
LANL-Los Alamos National Laboratory  
~~Triad - LANS - Los Alamos~~ Triad National Security, LLC  
MES-Mechanical Evaporator System  
Mg/L-milligrams per liter (or parts per million)  
NMAC-New Mexico Administrative Code  
NMSA-New Mexico Statutes Annotated  
NO<sub>3</sub>-N-nitrate-nitrogen  
NPDES-National Pollutant Discharge Elimination System  
PCBs-Polychlorinated Biphenyls  
QA/QC-Quality Assurance/Quality Control  
RLW-Low-level radioactive waste water  
RLWTF-Radioactive Liquid Waste Treatment Facility  
SET-Solar Evaporative Tank System  
TA-Technical Area  
TDS-total dissolved solids  
TKN-total Kjeldahl nitrogen  
TRU-Transuranic  
TSS-total suspended solids  
WQA-Water Quality Act  
WQCC-Water Quality Control Commission

**II. DEFINITIONS:**

The following is a list of definitions as they pertain specifically to this Discharge Permit:

- A. Average daily flow-** the rate determined by dividing the total monthly volume by the number of days for the reporting period.
- B. Active portion-** the portion of the Facility where treatment, storage or disposal of waste water occurs or has occurred in the past, including those portions of the Facility which are not in use and have not been closed in accordance with the conditions in this Discharge Permit.
- C. Calibration-** a comparison between an instrument of known magnitude or correctness (standard) and another measurement made in as similar a way as possible with a second device (test instrument).
- D. Closure-** to permanently discontinue the use of a unit, system, or component of the Facility (partial) or the entire Facility (final).
- E. Construction Quality Control Assurance Plan-** a written plan of activities necessary to ensure that construction and installation meet design criteria. A CQCAP includes practices and procedures for inspections, testing and evaluations of material and workmanship necessary to verify the quality of the constructed unit or system, and corrective actions to be implemented when necessary.
- F. Consent Order-** ~~Compliance Order on Consent (June 2016, Consent Order) March 1, 2005 Compliance Order on Consent~~ agreed to by NMED, DOE, and the Regents of the University of California-Triad National Security, LLC (successor ~~predecessor~~ to LANS) or subsequent versions.
- G. Discharge-** the intentional or unintentional release of an effluent or leachate which has the potential to move directly or indirectly into ground water or be detrimental to human health, animal or plant life, or property, or unreasonably interfere with the public welfare or the use of property.
- H. Effluent-** a liquid waste product resulting from the treatment or partial treatment of an influent waste stream intended to be discharged.
- I. Exfiltration-** the uncontrolled passage or penetration of waste water or sludge from a structural component of a unit or system through defective pipes, pipe joints, connections, cracks, structural failure, or material incompatibility and enters the surrounding environment.
- J. Flow meter-** a quantitative instrument or device that measures, displays, and records the flow of a fluid in a conduit or an open channel.
- K. Freeboard-** the vertical distance between the crest of the embankment and the carrying capacity level of an open tank, impoundment, or other open unit that contains a liquid or semi-liquid
- L. Impoundment-** a unit which is a natural topographic depression, man-made excavation, or diked area primarily constructed of earthen or other materials, specifically designed to hold, evaporate or store, an accumulation of liquid or semi-liquid waste.
- M. Industrial waste water-** the liquid wastes from industrial processes or non-household waste water which is generated through activity not solely derived from human excreta, residential sinks, showers, baths, clothes and dish-washing machines; or exceeds the characteristics of a domestic waste as defined in 20.7.3.7.D(6) NMAC; 300 mg/L BOD, 300 mg/L TSS, 80 mg/L total nitrogen or 105 mg/L fats, oils and

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grease.

- N. **Infiltration-** the uncontrolled passage or penetration of liquids or semi-liquids into a unit or system through defective pipes, pipe joints or connections, or manhole walls, cracks, structural failure, or material incompatibility.
- O. **Influent collection system-** the infrastructure and associated components (e.g. sumps, pumps) used for the collection and conveyance of waste water from the originator to the Facility's treatment systems.
- P. **Influent-** untreated water, waste water or other liquid or semi-liquid flowing into a reservoir, basin, or treatment plant.
- Q. **Incident Command System (ICS)-** A standardized approach to the command, control, and coordination of emergency response providing a common hierarchy within which responders from multiple agencies can be effective.
- R. **Leak detection system-** a system capable of detecting the failure of either the primary or secondary containment structure or the presence or release of an accumulated liquid in the secondary containment structure. The system must employ operational controls or consist of an interstitial monitoring device designed to detect continuously and automatically the failure of the primary or secondary containment structure or the presence of a release into the secondary containment structure.
- S. **Maintenance and repair-** all actions associated with keeping a system or component functioning as designed or restoring a system or component to its intended function. Maintenance and repair does not include alterations to a unit or system which change the intended function or design of the unit or alter the treatment process.
- T. **Maximum daily discharge-** the total daily volume of waste water (expressed in gallons per day) authorized for discharge by a discharge permit.
- U. **Open unit or system-** a unit or system designed to store, treat or dispose of liquids, semi-liquids or solids in which the uppermost portion of the unit is exposed.
- V. **Outfall-** the point where a treated waste water discharges to waters of the United States, or a tributary to waters of the United States.
- W. **Peak instantaneous flow-** the highest design flow rate for a unit or system, expressed in gallons per minute or cubic feet per second.
- X. **Record drawings-** the official record of the actual as-built conditions of the completed construction, to be held as the permanent record of each unit and system, which shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).
- Y. **Secondary containment-** a constructed unit or system designed to prevent any migration of waste streams or accumulated liquid out of the unit or system to the soil, ground water, or surface water at any time. Secondary containment can include, but is not limited to: double-walled pipes, concrete and floors equipped with sumps and alarm systems to detect potential leaks and must be:
  - Designed, constructed and maintained to surround the unit on sides and bottom;
  - Free of cracks, gaps, or fissures;
  - Constructed of, or lined with, materials that are compatible with the waste streams to be in contact with the unit or system;
  - Placed on a foundation or base capable of withstanding pressure gradients, settling or uplift which may cause failure of the unit or system; and
  - Equipped with a leak detection system that is designed and operated so that it will

detect the failure of the primary containment structure;

- Z. Settled solids measurement device-** an apparatus for testing settled solids in a liquid suspension for settling rate, compaction of the settled solids, and the resulting clarity of the liquid, or thickness of solids accumulated in an impoundment or tank.
- AA. Sludge or settled solids-** a solid or semisolid residue that results from the treatment or precipitation of solids from a waste stream, or the accumulation of natural sediment and debris settling in an open unit or system.
- BB. Synthetic Liner-** a continuous layer of man-made materials which restricts the downward or lateral escape of effluent or leachate.
- CC. Tank-** a stationary device, designed to contain an accumulation of waste water which is constructed primarily of non-earthen materials (e.g., concrete, steel, plastic) which provide structural support. Tanks can be further identified as either an **On ground tank** meaning a tank that is situated in such a way that the bottom of the tank is on the same level as the adjacent surrounding surface allowing for visual inspection of the vertical walls but not the external tank bottom, an **In-ground tank** meaning a tank constructed or installed so that a portion of the tank wall is situated to any degree within the ground, thereby preventing visual inspection of that portion of the external surface area, or an **Aboveground tank** meaning a tank that is completely elevated above the adjacent surrounding surface allowing for visual inspection of the vertical walls and external tank bottom.
- DD. Total Nitrogen-** The sum of total Kjeldahl nitrogen (TKN) and nitrate-nitrogen (NO<sub>3</sub>-N).
- EE. Toxic Pollutant-** a water contaminant or combination of water contaminants in concentration(s) which, upon exposure, ingestion, or assimilation either directly from the environment or indirectly by ingestion through food chains, will unreasonably threaten to injure human health, or the health of animals or plants which are commonly hatched, bred, cultivated or protected for use by man for food or economic benefit; as used in this definition injuries to health include death, histopathologic change, clinical symptoms of disease, behavioral abnormalities, genetic mutation, physiological malfunctions or physical deformations in such organisms or their offspring; in order to be considered a toxic pollutant a contaminant must be one or a combination of the potential toxic pollutants identified in the list in 20.6.2.7.WW NMAC and be at a concentration shown by scientific information currently available to the public to have potential for causing one or more of the effects listed above; any water contaminant or combination of the water contaminants identified in the list in 20.6.2.7.WW NMAC creating a lifetime risk of more than one cancer per 100,000 exposed persons is a toxic pollutant.
- FF. Treatment-** any method, technique or process that, through chemical biological and mechanical processes, modify waste water characteristics with the objective to neutralize and reduce or remove organic and inorganic water contaminants which if released to the environment could potentially impact ground water quality or pose a threat to human health.
- GG. Unauthorized Release or spill-** the intentional or unintentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil or other water contaminant not authorized in this Discharge Permit.

**HH. Water Contaminant** - any substance that could alter if discharged or spilled the physical, chemical, biological or radiological qualities of water; "water contaminant" does not mean source, special nuclear or by-product material as defined by the Atomic Energy Act of 1954.

### III. Introduction

The New Mexico Environment Department (NMED) issues this Discharge Permit (Discharge Permit), DP-1132, to the United States Department of Energy (DOE) and to ~~Triad Los Alamos~~ National Security, LLC (~~Triad LANS~~) (collectively the Permittees) pursuant to the New Mexico Water Quality Act (WQA), NMSA 1978, §§ 74-6-1 through 74-6-17, and the New Mexico Water Quality Control Commission (WQCC) Regulations, 20.6.2 NMAC.

NMED's purpose in issuing this Discharge Permit, and in imposing the requirements and conditions specified herein, is to control the discharge, and potential release, of water contaminants from the Los Alamos National Laboratory (LANL) Radioactive Liquid Waste Treatment Facility (Facility) so as to protect public health, ground water for present and potential future use as a domestic water supply or an agricultural water supply, and those segments of surface water gaining from ground water inflow. In issuing this Discharge Permit, NMED has determined that the requirements of 20.6.2.3109.C NMAC have been or will be met.

The application (i.e., discharge plan) consists of the materials submitted by the Permittees on August 19, 1996, an updated application submitted to NMED on February 16, 2012, an amendment to the application submitted to NMED on August 10, 2012, supplemental information submitted on June 6, 2016, and materials contained in the administrative record prior to issuance of this Discharge Permit.

The Facility is located within Los Alamos National Laboratory, approximately 1.5 miles south of Los Alamos, New Mexico, in Sections 16, 17, 20, 21 and 22, Township 19N, Range 06E, Los Alamos County. Ground water most likely to be affected ranges from depths of approximately one foot to 1,306 feet and has a total dissolved solids concentration ranging from approximately 162 to 255 milligrams per liter.

The Facility, as it pertains to conditions within this Discharge Permit (DP-1132), is a wastewater treatment facility that is authorized to discharge up to 40,000 gallons per day (gpd), specifically described in section V(D) of this Discharge Permit and includes: the influent collection and storage system including the Waste Management Risk Mitigation Facility (WMRM); the low-level radioactive liquid waste treatment system; the transuranic waste water treatment system; the secondary treatment system; the Mechanical Evaporator System (MES); the Solar Evaporative Tank (SET) impoundment; and an outfall (Outfall 051) regulated by a National Pollutant Discharge Elimination System (NPDES) permit issued by the United States Environmental Protection Agency (EPA) pursuant to the federal Clean Water Act Section 402, 33 U.S.C § 1342. The discharge may contain water contaminants with concentrations above the standards of 20.6.2.3103 NMAC and may contain toxic pollutants as defined in 20.6.2.7.WW NMAC.

Pursuant to 20.6.2.3109 NMAC, NMED reserves the right to require a Discharge Permit Modification in the event NMED determines that the requirements of 20.6.2 NMAC are being or may be violated or that the standards of 20.6.2.3103 NMAC are being or may be violated or a toxic pollutant as defined in 20.6.2.7.WW NMAC is present. Such modifications may include, without limitation, the implementation of structural controls, treatment processes, monitoring criteria, operational processes, changes in discharge activities and the abatement of water pollution and remediation of ground water quality.

Issuance of this Discharge Permit does not relieve the Permittees of the responsibility to comply with the WQA, WQCC Regulations, and all other applicable federal, state, and local laws and regulations.

#### **IV. Findings**

In issuing this Discharge Permit, NMED finds:

- A. The Permittees are discharging effluent or leachate from the Facility so that such effluent or leachate may move directly or indirectly into ground water within the meaning of 20.6.2.3104 NMAC.
- B. The Permittees are discharging effluent or leachate from the Facility so that such effluent or leachate may move into ground water of the State of New Mexico which has an existing concentration of 10,000 mg/L or less of total dissolved solids (TDS) within the meaning of 20.6.2.3101.A NMAC.
- C. The discharge from the Facility is within or into a place of withdrawal of ground water for present or reasonably foreseeable future use within the meaning of the WQA, NMSA 1978, § 74-6-5.E.3, and the WQCC Regulations at 20.6.2.3103 NMAC
- D. The discharge from the Facility to Outfall 051 is subject to the exemption set forth in 20.6.2.3105.F NMAC, to the extent that effective and enforceable effluent limitations (not including monitoring requirements) are imposed, unless the NMED Secretary determines that a hazard to public health may result.

#### **V. Authorization to Discharge**

- A. Pursuant to 20.6.2.3104 NMAC, it is the responsibility of the Permittees to ensure that discharges authorized by this Discharge Permit are consistent with the terms and conditions herein.
- B. The Permittees are authorized to discharge up to 40,000 gpd of low-level and transuranic radioactive industrial waste water using a series of treatment processes as described in Section V(D) of this Discharge Permit in accordance with the Conditions set forth in Section VI of this Discharge Permit.
- C. The Permittees are authorized to discharge up to 40,000 gpd of treated waste water, in accordance with the Conditions set forth in Section VI of this Discharge Permit. Discharges shall be to either the Mechanical Evaporator System (MES), the

synthetically lined Solar Evaporative Tank System (SET), or through an outfall (identified as Outfall 051) also regulated by a National Pollutant Discharge Elimination System (NPDES) permit (Permit No. NM0028355) issued by the United States Environmental Protection Agency [20.6.2.3104 NMAC, 20.6.2.3106.C NMAC, 20.6.2.3109.C NMAC].

- D. The Permittees are authorized to use the following defined systems with their associated units for the process of collecting, treating, and disposing of waste water:

**The Influent Collection System** is defined herein as all primary and secondary containment lines that convey transuranic or low-level radioactive waste water from Technical Areas TA-03, TA-35, TA-48, TA-50, TA-55, and TA-59 to the Transuranic Waste (TRU) treatment system and the Low-level Radioactive waste water (RLW) treatment system at TA-50. It includes the conveyance lines beginning at the point the pipe emerges from the building or other structure that comprises the site of generation, and extending to the vault immediately upstream of the influent tanks at TA-50. It also includes the conveyance of low-level radioactive waste water to the RLW treatment system by truck.

**The Waste Mitigation Risk Management (WMRM) Facility (Building 50-250)** is located about 50 meters southeast of Building 50-01. WMRM houses six tanks, with a capacity of 50,000 gallons each, for the storage of low-level RLW influent. Four of these tanks will be held in reserve for use in emergency situations; two will be used for day-to-day influent collection and storage. Tanks are located in the basement of WMRM; the basement further serves as secondary containment for the facility.

**The Low-level Radioactive Waste Water (RLW) Treatment System** is defined herein as the low-level radioactive waste water influent storage tanks, the associated treatment units (filters, feed tanks, ion exchange columns, reverse osmosis units, etc.) effluent storage tanks, and other associated low-level radioactive waste water components at TA-50 and subsequent replacement facilities utilizing the same treatment processes located within the physical confines of TA-50. The process by which the individual treatment units within the low-level radioactive treatment system are utilized may, for attaining compliance with the effluent limits set forth in this Discharge Permit, be altered, by-passed, replaced, or removed in accordance with the Conditions set forth in this Discharge Permit. The physical location of each unit and system and replacement systems that convey, store, or treat RLW waste streams coming into the low-level radioactive waste water treatment system is within TA-50.

**The Transuranic (TRU) Waste Water Treatment System** is defined herein as the influent storage tanks for each form of TRU (acidic and caustic) waste streams, the associated neutralization unit, pressure filters, the final processing tanks, and other associated TRU waste stream conveyance, storage and treatment components at TA-50. Sludge associated with TRU shall be disposed of at an off-site facility permitted to receive TRU waste.

**The Secondary Treatment System** is defined herein as the receiving tanks for reverse osmosis concentrate waste water generated through the RLW Treatment System and treated effluent generated from the TRU Treatment System, the

treatment process units for secondary reverse osmosis, the rotary vacuum filter, and other associated post-treatment conveyance, storage and treatment components at TA-50 designed to reduce waste stream volumes.

**The Mechanical Evaporator System (MES)** is defined herein as TA-50-0257 and the units in which treated RLW effluent is disposed of through natural gas generated mechanical evaporation.

**The Solar Evaporative Tank System (SET)** is defined herein as the concrete impoundment at TA-52 that receives treated effluent from the RLWTF for disposal by evaporation, and the conveyance line from TA-50. The SET consists of two cells separated by a single partitioned wall; each cell has a containerized volume of approximately 380,000 gallons. The SET is an unsealed subgrade concrete structure with a double-lined synthetic liner, and a leak detection system between the synthetic liners.

**Outfall 051** is defined herein as the outfall through which treated waste water from the Facility is discharged to Effluent Canyon, which is a tributary to Mortandad Canyon.

[20.6.2.3104 NMAC, 20.6.2.3106.C NMAC, 20.6.2.3109.C NMAC].

## VI. Conditions

NMED issues this Discharge Permit for the discharge of water contaminants subject to the following conditions:

### A. Operational Plan

1. **ANNUAL UPDATE**-The Permittees shall submit to NMED an updated Facility Process Description annually by February 1 of each year in conjunction with the February Quarterly Report. The annual Facility Process Description shall include the following:
  - a. A schematic of all major structures associated with the Facility, including all influent lines, buildings, exterior tanks, effluent lines, outfall and discharge locations identified in this Discharge Permit.
  - b. A comprehensive flow chart demonstrating the most current processes in operation for the collection, treatment and disposal of waste water for the Facility. The flow chart shall indicate any processes which have been bypassed, decommissioned, or are no longer used for the collection, treatment or final disposal of the waste water.
  - c. An associated narrative describing each of the systems and treatment units outlined in the flow chart. This narrative shall include the collection system, primary treatment units, secondary treatment units and any systems used in the disposition of any associated waste streams at the Facility. For each unit or system, the narrative shall include:
    - 1) The identification of the unit or system.
    - 2) The physical location.
    - 3) Intended function.
    - 4) Physical description.
    - 5) Operational capacity, if applicable.

- 6) The date the unit or system was placed in operation.
  - 7) Origin of waste streams that the unit or system receives.
  - 8) The unit or system(s) to which it discharges.
- d. The Annual Update shall also include the following documents to be submitted annually by February 1 of each year.
- 1) Summary of maintenance and repairs made during the reporting period.
  - 2) Water Tightness Testing results (VI.A.8).
  - 3) Settled Solids measurements (VI.A.10).
  - 4) Ground Water Flow report (VI.A.32).

[20.6.2.3106.C NMAC]

- 2. NOTIFICATION OF CHANGES-**The Permittees shall submit to NMED a written notification of any changes in the Facility's collection, treatment or disposal systems which are not maintenance and repair (as defined in this permit Section II), and which are not modifications (as defined in Condition VI.A.3, Plans and Specifications). The notification shall be submitted no less than thirty days prior to the date proposed for implementation. The notification shall include, at a minimum, the following items listed herein and others which may be determined to be required by NMED.
- a. Date process change is planned to be implemented.
  - b. Narrative of process change.
  - c. Justification for making the process change.
  - d. Units or components being removed from the process.
  - e. Units or components being incorporated into the process.
  - f. Operational controls implemented for the change in processes.
  - g. Intended duration of process change (e.g., permanent or limited duration).

LANL shall submit to NMED and add to the posting required in Condition VI.E.49 (Electronic Posting) any follow-up material required later by NMED, after NMED's review of a notification.

[20.6.2.3106.C NMAC]

- 3. SUBMITTAL OF PLANS AND SPECIFICATIONS-**The Permittees shall not implement any expansion, process modification, or alteration of a system or unit that could constitute a discharge permit modification (as defined in 20.6.2.7.P NMAC) of the intended function, design or capacity for any of the systems, units or components of the Facility's collection, treatment or disposal systems without prior written approval by NMED. Prior to implementing any such changes, the Permittees shall submit to NMED for approval a written proposal, including plans and specifications that describes in detail the proposed changes in the processes or components of the Facility's collection, treatment, or disposal systems. The proposal shall be delivered by certified mail or hand delivery. The Permittees shall not place any waste in a new or changed unit or system unless the Permittees receive prior written approval from NMED. NMED will provide such approval only if it finds that the

Permittees have submitted the required elements listed herein in sufficient detail to demonstrate that the unit or system is designed and constructed to minimize the possibility of an unauthorized release of water contaminants which could directly or indirectly impact ground water quality or pose a threat to human health. If NMED determines that the proposed changes require an amendment or modification of this Discharge Permit, NMED will so inform, in writing, Permittees.

The proposal shall include, at a minimum, the following information.

- a. Identification of all applicable units and a description of how they will be constructed.
- b. A map, to scale, of the Facility, with the location of the proposed unit relative to other identified structures or systems referenced in this Discharge Permit.
- c. Specifications for all new unit and system components (e.g., lift stations, valves, transfer lines, process units); whether new, retrofitted, or proposed for abandonment. All new system components for the collection, treatment or disposal of waste water at the Facility shall be designed to meet the projected needs of the Facility.
- d. Plans and specifications for proposed flow meters that will be used to measure the volume of waste water discharged to or from the unit or system.
- e. Demonstration that the proposed unit or system is adequately designed for its intended function.
- f. Compatibility of the unit or system's constructed material with the proposed waste stream, including, if applicable, information regarding corrosion protection to ensure that it will maintain its structural integrity and not collapse, rupture or fail.
- g. Certification that the foundation, structural support, seams, connections, and pressure controls, if applicable, are adequately designed and the unit or system has sufficient structural strength to convey, store, treat or dispose of the intended waste stream.
- h. Certification for all plans and specifications attesting to the capacity of the unit or system including, without limitation, waste water flow data derived using both average daily flow and peak instantaneous flow. Computations should be presented in a tabular form showing depths and velocities at minimum, design average, and peak instantaneous flow for all new system components.
- i. Water balance calculations for the capacity and evaporative potential for units which are subject to exposure to the environment and to which precipitation events may impact total capacity of the unit. The unit shall be designed such that two feet of freeboard or an NMED approved alternative is maintained at all times.
- j. Design specifications for secondary containment for all units or systems intended to convey, store, treat, or dispose of liquid or semi-liquid waste streams.

- k. Design specifications for leak detection systems associated with systems designed to convey, store, treat, or dispose of liquid or semi-liquid waste streams, which demonstrate the capability of detecting the failure of either primary or secondary containment or the presence of any release of any accumulated liquid in the secondary containment system within the earliest practicable time as approved in advance by NMED;
- l. Proposed leakage tests shall be specified for all new unit or system components with direct contact to treated or untreated waste water. This may include appropriate water or low pressure air testing. The use of a camera or other visual methods used for documentation of the inspection, prior to placing the unit or system in service is recommended.
- m. Design specifications for all units or systems designed to convey, store, treat, or dispose of liquid or semi-liquid waste streams, which demonstrate the ability to remove liquids and semi-liquids from the area of containment within the earliest practicable time as approved in advance by NMED.
- n. A Construction Quality Control Assurance Plan (CQCAP) assuring that the proposed unit or system will meet or exceed all design criteria and specifications.

Plans and specifications shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978) as well as applicable DOE and LANL Engineering Standards.  
[20.6.2.1202 NMAC, 20.6.2.3106.C NMAC, 20.6.2.3109.C NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]

- 4. **CONSTRUCTION REPORT**-Within 90 days following completion of construction for a unit or system that requires NMED approval, the Permittees shall prepare a final construction report that contains the following items.
  - a. A complete copy of record drawings, specifications, final design calculations, addenda, and change orders, as applicable, or in the alternative, a list and description of any substantive changes to design plans and specification made during construction (based on field concerns and changes).
  - b. Description of the procedures and results from all inspection and tests that occur before, during, and after construction to ensure that the construction materials and the installed unit or system components meet the design specifications.
  - c. A complete copy of the Operation and Maintenance Manual, specific to the unit or system being constructed.  
[20.6.2.1202 NMAC, 20.6.2.3109.C NMAC, 20.6.2.3106.C NMAC, 20.6.2.3107.C NMAC, NMSA 1978, §§ 61-23-1 through 61-23-32]
- 5. **RESTRICTING ENTRY**-The Permittees shall, at all times, prevent the unauthorized entry of persons, wildlife, or livestock into the active portions of this Facility (with the exception of Outfall 051) so that physical contact with

the waste streams, structures and equipment is restricted. Means to control unauthorized access shall include an artificial or natural barrier which completely surrounds the active portions of the Facility and a means to control entry, at all times, through gates or other entrances to the active portions of the Facility (e.g., locks, surveillance system).  
[20.6.2.3109.C NMAC]

6. **SIGNS**-The permittees shall post bilingual warning signs (in English and Spanish) at all gates and perimeter fences, where present, around the Facility. Signs shall be posted in sufficient numbers to be visible at all angles of approach as well as from a distance of at least 25 feet, Permittees shall include on the signs the following or an equivalent warning: DANGER – UNAUTHORIZED PERSONNEL KEEP OUT (PELIGRO – SE PROHIBE LA ENTRADA A PERSONAS NO AUTORIZADAS).  
[20.6.2.3109.C NMAC]

~~7. **VERIFICATION OF SECONDARY CONTAINMENT** Within 90 days following the effective date of this Discharge Permit (by November 27, 2018), the Permittees shall submit to NMED verification demonstrating all units and systems intended to convey, store, treat or dispose of an untreated liquid or semi-liquid waste streams meet the requirements of secondary containment as defined in this Discharge Permit. Verification must also include certification of an operational leak detection system for the unit or system.  
[20.6.2.3106.C NMAC, 20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]~~

**8.7 WATER TIGHTNESS TESTING**-Within 180 days following the effective date of this Discharge Permit (by February 25, 2019), and every 540 days thereafter, the Permittees shall demonstrate that each unit and system intended to convey, store, treat or dispose of a liquid or semi-liquid waste stream without secondary containment is not leaking and is otherwise fit for use. To make the demonstration, the Permittees shall conduct both a visual test, for those units and systems that are above-ground and visually inspectable, and a quantifiable test, as applicable.

For units and systems that are above-ground and visually inspectable, the visual assessment shall be adequate to detect obvious cracks, leaks, and corrosion or erosion that may lead to cracks and leaks. If necessary, the Permittees shall remove the stored waste from the unit or system to allow the condition of internal surfaces to be assessed.

The quantifiable assessment for units and systems that are used to store, treat or dispose of liquid or semi-liquid waste streams shall consist of obtaining tank level measurements over at least a 36 hour period during which no liquid or semi-liquid is added to or removed from the unit. The exfiltration or infiltration rate shall not exceed 0.07 gallons per hour per thousand gallons of capacity for the unit or system.

The quantifiable assessment for units and systems designed to convey a liquid or semi-liquid waste stream shall be determined through passive testing for leakage exfiltration and infiltration. The infiltration or exfiltration rate shall not exceed 50 gallons per mile per consecutive 24 hour period for any section of the system. Infiltration and exfiltration tests for conveyance lines shall be conducted as follows:

- a. Prior to testing for infiltration, the conveyance lines shall be isolated and evacuated so that maximum infiltration conditions exist at the time of testing. The Permittees shall measure and document the volume of infiltration entering each section of the conveyance line being tested. The cumulative results for the entire collection system shall not be a satisfactory method for gauging infiltration compliance.
- b. Prior to testing for exfiltration, the conveyance lines shall be isolated and filled with water to a level that produces, at minimum, two feet of hydrologic head above the uppermost point of the section being tested. The cumulative results for the entire collection system shall not be a satisfactory method for gauging exfiltration compliance.

Demonstration of water tightness shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978). The Permittees shall submit to NMED the procedures and findings of the evaluation in the Annual Update (Condition VI.A.1, Annual Update) by February 1 of each year immediately following the date when the water tightness test was performed. In the event that inspection reveals that the leakage rate is greater than permissible in this Discharge Permit, the Permittees shall implement the requirements of Condition V.I.A.9 (Actual or Potential Water-Tightness Failure) in this Discharge Permit.  
[20.6.2.3106.C NMAC, 20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

**9.8. ACTUAL OR POTENTIAL WATER-TIGHTNESS FAILURE**-In the event that any unit or system does not demonstrate water-tightness in accordance with this Discharge Permit or should inspection reveal damage to the unit that could result in structural failure, the Permittees shall take the following actions.

- a. If the unit or system failure resulted in an unauthorized release the Permittees shall provide NMED oral notification of the release in 20.6.2.1203 NMAC within 24 hours of learning of the release and take the following corrective actions.
  - 1) The Permittees shall remove the unit or system from service immediately; and
  - 2) As soon as possible following the failure of the unit or system, but within 30 days of the failure, the Permittees shall submit to NMED for approval a written proposal including a schedule for corrective actions to be taken to repair or permanently cease operation of the unit or system.

If repair or replacement of a unit or system requires construction, the Permittees shall submit plans and specifications to NMED with the proposed corrective actions. Plans and specifications shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).

Upon NMED approval, the Permittees shall implement the approved corrective actions according to the approved schedule.

Prior to placing a repaired or replaced unit or system back into service, the Permittee shall repeat the water-tightness testing in accordance with Condition VI.A.8 (Water Tightness Testing) to verify the effectiveness of the repair or replacement, and submit a report detailing the completion of the corrective actions to NMED. The report shall include the date of the test, the name of the individual that performed the test, written findings, photographic documentation of the unit's interior and water tightness test results. If notified to do so by NMED, the Permittees shall also submit record drawings that include the final, construction details of the unit. Record drawings shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC]

**10.9. SETTLED SOLIDS; SETTLED SOLIDS REMOVAL**-The Permittees shall inspect and measure the thickness of the settled solids in the SET on an annual basis. The Permittees shall measure the thickness of settled solids in accordance with the following procedure.

- a. The total surface area of each basin shall be divided into nine equally sized areas.
- b. A settled solids measurement device shall be utilized to obtain one settled solids thickness measurement (to the nearest half foot) within each area.
- c. The individual settled solids thickness for each of the nine measurement areas shall be averaged.

The Permittees shall record all measurements in an inspection log which must include, at a minimum, the following.

- a. Date and time of the inspection.
- b. The name of the inspector.
- c. Identification of the unit.
- d. The location of the unit.
- e. The estimated total volume of liquid or semi-liquid in the unit or system at the time of inspection.
- f. The total depth capacity of the unit or system (allowing for freeboard requirements).
- g. The method used to determine the settled solids thickness.
- h. The average measured thickness of settled solids in the unit.

The Permittees shall not allow settled solids to accumulate in any open unit or system used to convey, store, treat, or dispose of liquid or semi-liquid at an average depth greater than one foot. In the event that the settled solids accumulation in an open unit or system exceeds an average thickness of one foot, or in the event that the Permittees otherwise plan to initiate removal of settled solids from an open unit or system, the Permittees shall propose a plan for the removal and disposal of the settled solids from the unit or system. At least 60 days prior to any settled solids removal, the Permittees shall submit to NMED for approval a written settled solids removal and disposal plan. The plan shall include characterization of the settled solids, the estimated volume of settled solids to be removed, a method for removal throughout the unit or system in a manner that is protective of the structural integrity of the unit or system, a schedule for completing the settled solids removal and disposal, and a description of how the settled solids will be contained, transported, and disposed of in accordance with all applicable local, state, and federal laws and regulations. Upon NMED approval, the Permittees shall implement the plan according to the approved schedule.

The Permittees shall keep the inspection log on site for a minimum of five years from the date of inspection. The Permittees shall submit a summary report of all settled solids activities to NMED in the Annual Report submitted by February 1 of each year as well as the Quarterly Report for the period during which the activity occurs.  
[NMSA 1978, § 74-6-5.D, 20.6.2.3109.C NMAC, 20.6.2.3107.A NMAC]

**4-10. FACILITY INSPECTIONS-**The Permittees shall inspect the Facility for malfunctions, deterioration, leaks or spills which may be causing, or may lead to, an unauthorized release to the environment or pose a threat to human health.

The inspection shall be performed at the frequency prescribed for each unit or system in this Discharge Permit or based on the rate of deterioration of the equipment and the probability of an environmental or human health incident for those units and systems not specifically described herein.

- a. The Permittees shall inspect and test all leak detection systems to ensure performance within manufacturer specifications on a regular monthly basis.
- b. The Permittees shall inspect all externally observable portions of units and systems conveying, treating or storing liquids, semi-liquids, or solids including any secondary containment areas on a weekly basis. The Permittees shall examine for evidence of deterioration or failure of the units and systems. The visible portions of all synthetic liners used to store or dispose of liquids or semi-liquids shall be inspected for uniformity, damage, imperfections, punctures, blisters, and evidence of seam or joint failure on a regular monthly basis.

- c. The Permittees shall inspect, on a weekly basis through indirect observation, all units and systems conveying, processing, or storing liquids, semi-liquids, or solids that are inaccessible or otherwise cannot be directly observed. The Permittees shall identify the unit or system and note any observations which may suggest a breach or failure of containment in accordance with Condition VI.A.12 (Containment).
- d. The Permittees shall inspect all open units and systems which contain a liquid or semi-liquid, on each day during which the Facility is in operation, to ensure capacity of the unit or system is not exceeded.

The Permittees shall record all inspections in an inspection log which shall be kept on site for a minimum of five years from the date of inspection. At a minimum, these inspections shall include the date and time of the inspection, the name of the inspector, identification of the unit, the location of the unit, the total volume of liquid or semi-liquid in the unit or system at the time of inspection, a notation of the observations made, and the date and nature of any maintenance and repairs made.

[20.6.2.3107.A NMAC]

~~12.11.~~ **CONTAINMENT**-The Permittees shall institute corrective actions, as necessary, to ensure the protection of ground water and human health. In the event that a unit or system or secondary containment for a unit or system reveals damage that could result in structural failure or a release to the environment, the Permittees shall take the following actions.

- a. The Permittees shall remove the unit or system from service immediately.
- b. The Permittees shall take immediate, and if necessary temporary, corrective actions to minimize the potential for a release.
- c. Within 90 days following identification of the potential failure, the Permittees shall submit to NMED for approval a written corrective action report to include, at minimum, the following.
  - 1) Identification of the unit or system, or secondary containment for a unit or system in which the failure was observed.
  - 2) The date and time the failure was observed and the date and time it was estimated to have begun.
  - 3) The potential cause of the failure.
  - 4) For units in which a release occurred to secondary containment but was not released to the environment, the rate at which the release occurred and total volume released to the secondary containment.
  - 5) The characteristics of the waste stream being treated, stored or conveyed by the unit or system, with analytical results from waste stream samples taken with date, time, technical staff collecting the sample and the lab report with QA/QC.
  - 6) The corrective actions taken to remediate the failure or release with a timeline of when actions were implemented.
  - 7) Long-term actions, if any, that are proposed to be employed for maintaining the integrity of the secondary containment and the

- schedule for implementing such actions.
- 8) Ongoing measures for monitoring, inspecting, and determining structural integrity of the secondary containment.
  - 9) Proposed operation and maintenance and repair protocol, if applicable, to be instituted to prevent future failures.
- d. If failure of the unit or system or secondary containment resulted in a release to the environment, the Permittees shall comply with the requirements of Condition VI.C.38 (Spill or Unauthorized Release) of this Discharge Permit.

Upon NMED approval of the corrective action report, the Permittees shall implement any approved long-term actions to maintain the integrity of the secondary containment, and any other approved measures or protocols, according to the approved schedule.  
[20.6.2.3107.A NMAC]

**13.12. MAINTENANCE and REPAIR**-The Permittees shall maintain the function and structural integrity of the Facility at all times except during maintenance or repair. All routine maintenance and repair actions shall be noted in a maintenance log which shall be kept on site for a minimum of five years. Maintenance and repair of a unit or system required due to potential malfunction which could lead to an unauthorized discharge to the environment or pose a threat to human health shall be corrected as soon as possible, but no later than 30 days from the date of the observed malfunction. For good cause, NMED may approve a longer period. The Permittees shall submit to NMED a summary and description of the maintenance and repair activities performed on the Facility as part of the quarterly monitoring reports.

In the event that routine maintenance and repair reveal significant damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designed, the Permittees shall implement the requirements of Condition VI.A.14 (Damage to Structural Integrity) of this Discharge Permit.  
[20.6.2.3107.A NMAC]

**13.13. DAMAGE TO STRUCTURAL INTEGRITY**-In the event that an inspection required in this Discharge Permit, or any other observation, reveals damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designed, the Permittees shall take the affected unit out of service as quickly as possible, notify NMED orally within 24 hours, and shall propose the repair or replacement of the treatment system or its associated components. Within 30 days after discovery by the Permittees or following notification from NMED that corrective action is required, the Permittees shall submit to NMED for approval a written corrective action plan that includes a schedule for implementation and completion. The Permittees may request an extension of

the submittal deadline pursuant to Condition VI.E.53 (Extensions of Time). Upon NMED approval, the Permittees shall implement the plan according to the approved schedule. The Permittees shall remedy any deterioration or malfunction of equipment or structures which are discovered during inspection.  
[20.6.2.3107.A NMAC]

**15.14. FREEBOARD; FREEBOARD EXCEEDANCE**-The Permittees shall maintain two feet of freeboard in all open units and systems that contain a liquid or semi-liquid. If the Permittees determine that two feet of freeboard cannot be maintained, the Permittees shall submit to NMED for approval a written request for alternate freeboard requirements. In the request the Permittees shall, at a minimum, propose freeboard levels that will be maintained and propose demonstrated spill prevention controls and overflow prevention controls that include the prevention of overtopping by wave, wind or precipitation events.

In the event that established freeboard of two feet or an NMED approved alternative, is not maintained in an open tank, impoundment or other open unit or system that contains a liquid or semi-liquid, the Permittees shall take immediate corrective actions to restore the required freeboard.

In the event that the required freeboard cannot be restored within a period of 72 hours following discovery, the Permittees shall submit to NMED for approval a proposed corrective action plan to restore the required freeboard within 15 days following the date when exceedance of the required freeboard was initially discovered. The plan shall include a schedule for completion of corrective actions and quantifiable assessments to demonstrate preservation of the required freeboard for a period no less than five years. Upon NMED approval, the Permittees shall implement the corrective action plan according to the approved schedule.  
[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B & .C NMAC]

**16.15. EFFLUENT LIMITS: OUTFALL 051**-The Permittees shall not discharge treated waste water to Outfall 051 that exceeds the following limits (or is outside the following pH range):

- a. All water contaminants and their associated limits as listed in Table 1.

Table 1. Effluent Quality Limits for Discharges to Outfall 051

Inorganic Chemicals:	CAS#	mg/L	Organic Chemicals:	CAS#	mg/L
Aluminum (dissolved)	7429-90-5	5.0	Benzene (total)	71-43-2	0.01 0.005
Arsenic (dissolved)	7440-38-2	0.1 0.01	Benzo (a) pyrene (total)	50-32-8	0.0007 0.0002

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Barium (dissolved)	7440-39-3	<u>±0.2.0</u>
Boron (dissolved)	7440-42-8	0.75
Cadmium (dissolved)	7440-43-9	<u>0.01</u> <u>0.005</u>
Chromium (dissolved)	7440-47-3	0.05
Chloride (dissolved)	7647-14-5	250.0
Cobalt (dissolved)	7440-48-4	0.05
Copper (dissolved)	7440-50-8	1.0
Cyanide (dissolved)	57-12-5	0.2
Fluoride(dissolved)	16984-48-8	1.6
Iron (dissolved)	7439-89-6	1.0
Lead (dissolved)	7439-92-1	<u>0.05</u> <u>0.015</u>
Manganese (dissolved)	7439-96-5	0.2
Molybdenum (dissolved)	7439-98-7	1.0
Mercury (total)	92786-62-4	0.002
Nickel (dissolved)	7440-02-0	0.2
Perchlorate (total)	14797-73-0	0.0138
pH (total)		6 – 9
Selenium (dissolved)	7782-49-2	0.05
Silver (dissolved)	7440-22-4	0.05
Sulfate (dissolved)		600.0
Antimony (Sb)	7440-36-0	0.006
Beryllium (Be)	7440-41-7	0.004
Nitrite (NO <sub>2</sub> as N)	<u>10102-44-0</u>	<u>1.0</u>
Thallium (Tl)	<u>7440-28-0</u>	<u>0.002</u>
Total Dissolved Solids (dissolved)		1000.0
Uranium (dissolved)	7440-61-1	0.03
Zinc (dissolved)	9029-97-4	10.0

Carbon tetrachloride (total)	56-23-5	<u>0.04</u> <u>0.005</u>
Chloroform (total)	67-66-3	0.1
1,1-Dichloroethane (total)	75-34-3	0.025
1,2-Dichloroethane (total)	107-06-2	<u>0.04</u> <u>0.005</u>
1,1-Dichloroethylene (total)	75-35-4	<u>0.005</u> <u>0.007</u>
1,1,2,2-Tetrachloroethylene (PCE) (total)	127-18-4	<u>0.02</u> <u>0.005</u>
1,1,2-Trichloroethylene (TCE) (total)	<del>86-42-0</del> <u>79-01-6</u>	<u>0.1</u> <u>0.005</u>
Ethylbenzene (total)	100-41-4	<u>0.75</u> <u>0.7</u>
Ethylene dibromide (total) (EDB)	<del>1106-93-4</del>	<u>0.0004</u> <u>0.00005</u>
Naphthalene plus monomethylnaphthalenes (total)	91-20-3, 90-12-0, 91-57-6	0.03
Methylene chloride (total)	75-09-2	<u>0.1</u> <u>0.005</u>
Total PCBs (total)		<u>0.004</u> <u>0.0005</u>
Phenols (total)	108-95-2	0.005
Toluene (total)	108-88-3	<u>0.75</u> <u>1.0</u>
1,1,1-Trichloroethane(total)	<del>74552-83-3</del> <u>71-55-6</u>	<u>0.06</u> <u>0.2</u>
1,1,2-Trichloroethane (total)	79-00-5	<u>0.04</u> <u>0.005</u>
1,1,2,2-Tetrachloroethane (total)	79-34-5	0.01
Vinyl Chloride (total)	75-01-4	<u>0.004</u> <u>0.002</u>
Xylenes (total)	108-38-3,—1330-20-7,—95-47-6, 106-42-3	0.62
cis-1,2-dichloroethene	156-59-2	0.07
trans-1,2-dichloroethene	156-60-5	0.1
1,2-dichloropropane (PDC)	<u>78-87-5</u>	<u>0.005</u>
Styrene	<u>100-42-5</u>	<u>0.1</u>
1,2-dichlorobenzene	<u>95-50-1</u>	<u>0.6</u>
1,4-dichlorobenzene	106-46-7	0.075
1,2,4-trichlorobenzene	<u>120-82-1</u>	<u>0.07</u>
Pentachlorophenol	87-86-5	0.001
Atrazine	1912-24-9	0.003
Methyl tertiary-butyl ether (MTBE)	1634-04-4	0.1

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Radioactivity:	pCi/L	Nitrogen Compounds:	mg/L
Combined Radium-226 & Radium-228 (total)	30.5	Total Nitrogen (sum of TKN+NO <sub>3</sub> -N) (dissolved)	15

- b. Until LANL is operating new reverse osmosis treatment units, but no later than 120 days following the effective date of this Discharge Permit, the following alternative effluent quality limits for ~~NO<sub>3</sub>-N Total Nitrogen~~ shall apply for discharges to SET and MES Outfall 051:

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- Daily Maximum: 30 mg/L
- Quarterly average: 10 mg/L

- c. For any water contaminant that is not listed in Table 1 of this Discharge Permit but is listed as a toxic pollutant in 20.6.2.7.WW NMAC, the limit shall be the concentration listed in Table A-1 of NMED, Risk Assessment Guidance for Site Investigation and Remediation (most recent edition and provided as Appendix 1). For any water contaminant that is not listed in Table 1 of this Discharge Permit or in Table A-1 of the Risk Assessment Guidance, the limit shall be the most recent EPA Regional Screening Level (RSL) for residential tap water. If an RSL is applicable for a carcinogenic water contaminant, the limit shall be adjusted to represent a lifetime risk of no more than one cancer occurrence per 100,000 persons (i.e., a cancer risk of  $1 \times 10^{-5}$ ).

In the event that effluent limits are exceeded, the Permittees shall enact the requirements of Condition VI.A.18 (Effluent Exceedance) of this Discharge Permit. Water contaminants that are subject to effective and enforceable limitations in NPDES Permit No. NM0028355 for discharges to Outfall 051 are exempt from the limits set forth in this Condition.  
[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

**17.16. EFFLUENT LIMITS: MES and SET-**The Permittees shall not discharge treated waste water to either the MES or SET that exceeds the following limits (or is outside the following pH range):

All water contaminants and their associated limits as listed in Table 2.

Table 2. Effluent Quality Limits for Discharges to the MES and SET

Inorganic Chemicals:	CAS#	mg/L	Inorganic Chemicals:	CAS#	mg/L
Aluminum (dissolved)	7429-90-5	5.0	Lead (dissolved)	7439-92-1	0.05 0.015
Arsenic (dissolved)	7440-38-2	0.1 0.01	Manganese (dissolved)	7439-96-5	0.2
Barium (dissolved)	7440-39-3	2.0	Molybdenum (dissolved)	7439-98-7	1.0
Boron (dissolved)	7440-42-8	0.75	Mercury (total)	92786-62-4	0.002
Cadmium (dissolved)	7440-43-9	0.01 0.005	Nickel (dissolved)	7440-02-0	0.2
Chromium (dissolved)	7440-47-3	0.1	Perchlorate (total)	04797-73-0	0.0138
Chloride (dissolved)	7647-14-5	250.0	pH (total)		6 – 9
Cobalt (dissolved)	7440-48-4	0.05	Selenium (dissolved)	7782-49-2	0.05
Copper (dissolved)	7440-50-8	1.3	Silver (dissolved)	7440-22-4	0.1
Cyanide (dissolved)	57-12-5	0.2	Sulfate (dissolved)		600.0
Fluoride (dissolved)	16984-48-8	1.6	Total Dissolved Solids (dissolved)		1000.0
Iron (dissolved)	7439-89-6	1.0	Uranium (dissolved)	7440-61-1	0.03
			Zinc (dissolved)	9029-97-4	10.0

Radioactivity:	pCi/L
Combined Radium-226 & Radium-228 (total)	30.5

Nitrogen Compounds:	mg/L
NO <sub>3</sub> -N (dissolved)	10

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d. Until LANL is operating new reverse osmosis treatment units, but no later than 120 days following the effective date of this Discharge Permit, the following alternative effluent quality limits for NO<sub>3</sub>-N shall apply for discharges to the SET and MES:

- Daily Maximum: 30 mg/L
- Quarterly average: 10 mg/L

In the event that effluent limits are exceeded, the Permittee shall enact the requirements of Condition VI.A.18 (Effluent Exceedance) of this Discharge Permit.  
[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

**18.17. EFFLUENT EXCEEDANCE**-In the event that analytical result of an effluent sample indicate an exceedance for any of the effluent limits set forth in Conditions VI.A.16 (Effluent Limits: Outfall 51) and VI.A.17 (Effluent Limits: MES and SET) of this Discharge Permit, the Permittees shall, within 24 hours following receipt of analytical results indicating the exceedance, collect and submit for analysis a subsequent sample for the particular analyte that was in exceedance. In the event the analytical results of the subsequent sample confirm that the maximum limitation has been exceeded (i.e., confirmed exceedance), the Permittees shall take the following actions.

Within 24 hours of becoming aware of a confirmed exceedance, the Permittees shall:

- a. Cease discharges to the system for which limits have been exceeded with

the exception of the MES to which a confirmed exceedance shall not require immediate cessation;

- b. Notify the NMED Ground Water Quality Bureau that an effluent limit set forth in this Discharge Permit has been confirmed to be in exceedance; and
- c. Increase the frequency of effluent sampling to adequately establish the quality of discharges prior to resuming discharges to the system that was in exceedance. The sampling frequency for the particular analyte that was in exceedance shall increase from monthly or quarterly, as required by Condition VI.B.29 (Effluent Sampling) of this Discharge Permit, to weekly. If the particular analyte in exceedance remains below the effluent limit in three consecutive weekly samples, then the Permittees may resume discharges to the system that was in exceedance.

Within one week of becoming aware of a confirmed exceedance, the Permittees shall:

- a. Submit copies of the analytical results for the initial and subsequent sample confirming the exceedance to NMED;
- b. Examine the internal operational procedures, and maintenance and repair logs, required by Condition VI.A.13 (Maintenance and Repair) of this Discharge Permit, for evidence of improper operation or function of the units and systems; and
- c. Conduct a physical inspection of the treatment system to detect abnormalities, and correct any abnormalities.

A report detailing the corrections made shall be submitted to NMED within 30 days following correction.

In the event that analytical results from any two independent monthly effluent samples indicate an exceedance of the effluent limits for all discharge systems set forth in this Discharge Permit within any 12-month period, the Permittees shall propose to modify operational procedures or upgrade the treatment process to achieve the effluent limits. Within 90 days of receipt of the second sample analysis in which effluent limits have been exceeded, the Permittees shall submit to NMED for approval a corrective action plan. The plan shall include a schedule for completion of corrective actions. Upon NMED approval, the Permittees shall implement the corrective action plan according to the approved schedule.

When analytical results from three consecutive months of effluent sampling do not exceed the maximum limitations set forth by this Discharge Permit, the Permittees are authorized to return to a monthly or quarterly monitoring frequency as required in this Discharge Permit.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3107.C NMAC]

- 19.18. PERSONNEL QUALIFICATIONS**-Personnel responsible for the operation and maintenance and repair of the Facility shall successfully complete a program of classroom instruction or on-the-job training that provides the skills required to ensure the Facility is operated and maintained in a manner that complies with this Discharge Permit and all applicable local, state and federal laws and regulations. At a minimum, the operators shall be competent in the following.
- a. Management procedures for hazardous waste materials.
  - b. Conducting inspections.
  - c. Communications or alarm systems.
  - d. Emergency response due to unauthorized releases, fire, explosions, or other potential unauthorized releases from the Facility and threat to human health.
  - e. Emergency shutdown operations.

The operations and maintenance and repair of all or any part of the Facility shall be performed by, or under the direct supervision of, qualified personnel. Facility personnel shall review training and certifications on an annual basis to ensure training and certifications are current with any changes to the Facility's processes.

The Permittees shall maintain the following documents and records at the Facility for current personnel until closure of the Facility.

- a. The job title for each position at the Facility with a narrative of the position responsibilities, reporting hierarchy, requisite skill, education and other qualifications assigned to the position.
- b. The name of the individual who holds each position and all records documenting training and job experience demonstrating the qualifications of that individual to hold the position.

The Permittees shall maintain all documents and records pertaining to the training of operation and maintenance personnel, including former employees, for a period of five years and shall make such documents and records available to NMED upon request.

[20.6.2.3106.C NMAC, 20.7.4 NMAC]

**20.19. EMERGENCY RESPONSE PROCEDURES** The Permittees shall keep and maintain emergency response procedures at the Facility at all times. At a minimum, the procedures shall include the following.

- a. Actions Facility personnel must take in response to fires, explosions or any unplanned sudden or non-sudden release of a water contaminant from the Facility to the environment.
- b. A spill prevention and response plan to address all unauthorized releases to the environment or those that pose a threat to human health, chronic or acute.

- c. A list of all emergency equipment at the Facility that may be utilized in the event of an emergency, its intended function and physical location.
  - d. An evacuation procedure for all Facility personnel which describes signals to be used to notify personnel of an evacuation, routes to evacuated the Facility and alternate evacuation routes.
  - e. Description of the use of the Incident Command System (ICS) in response to all emergencies. The ICS is based on the on-scene management structure protocols of the National Incident Management System (NIMS).
- B. Conditions under which activation of Los Alamos National Laboratory's Emergency Operations Center (EOC) is appropriate for incidents requiring Laboratory and/or community involvement. The EOC provides a central location for interagency and interjurisdictional coordination and executive decision making in support of an incident response.

The emergency response procedures shall be reviewed, and updated as necessary, by the Permittees on no less than a triennial basis or in the event the plan fails during an emergency, the Facility changes design, construction, or accessibility, key personnel changes or the list of equipment changes. The emergency response procedures shall be made available for inspection at the facility.

The Permittees shall submit ~~a written summary of the procedures to NMED within 120 days of the effective date of this permit (by December 27, 2018)~~ and provide written updates of the procedures to NMED no more than 30 days following finalization of an amended plan.  
[20.6.2.3109.C NMAC]

~~**21.20. INSTALLATION OPERATION OF FLOW METERS**~~ Within ~~180~~ days following the effective date of this Discharge Permit, ~~(by February 25, 2019), the~~ The Permittees shall install the operate the following flow meters at the Facility.

- a. One flow meter ~~to be installed~~ on the RLW influent line to the Facility at a location that will capture and measure all influent to the Facility including waste water conveyed to the Facility by alternative methods (e.g. truck).
- b. One flow meter ~~to be installed~~ on the effluent line to the SET at a location that will capture and measure all discharges of treated water to the SET.
- c. One flow meter ~~to be installed~~ on the effluent line to the MES at a location that will capture and measure all discharges of treated water to the MES.
- d. One flow meter ~~to be installed~~ on the discharge line to Outfall 051 at a location that will capture and measure all effluent discharges to Outfall 051.

~~Within 60 days following the installation of flow meters, and within 240 days following the effective date of this Discharge Permit (by April 26, 2019), the Permittees shall submit to NMED written confirmation of the meter installation, describing the type, calibration, and location of each flow meter.~~

The flow meters shall be operational except during repair or replacement. Should a meter fail, it shall be repaired or replaced as soon as practical, but no later than 30 days from the date of the failure. ~~Prior to installation of the flow meters, and during~~ During periods of repair or replacement, an alternative method for determining the volume of influent and effluent shall be used until the meter is operational.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

**22.21. CALIBRATION OF FLOW METERS**-All flow meters referenced in this Discharge permit shall be capable of having their accuracy ascertained under actual working (field) conditions. A field calibration method shall be developed for each flow meter and that method shall be used to check the accuracy of each respective meter. Field calibrations shall be performed ~~within 180 days following the effective date of this Discharge Permit (by February 25, 2019) and, at a minimum, on an annual basis thereafter, and immediately upon repair or replacement of a flow meter.~~

Flow meters for the effluent lines to the SET, the MES and Outfall 051 shall be calibrated to within plus or minus 5 percent of actual flow, as measured under field conditions. The flow meter installed on the 10-inch influent line to the RLWTF shall be calibrated to within plus or minus 10 percent of actual flow, as measured under field conditions. Field calibrations shall be performed by an individual knowledgeable in flow measurement and in the installation and operation of the particular device in use. A calibration report shall be prepared for each flow meter at the frequency calibration is required.

The flow meter calibration report shall include the following information

- a. The meter location and identification.
- b. The method of flow meter field calibration employed.
- c. The measured accuracy of each flow meter prior to adjustment indicating the positive or negative offset as a percentage of actual flow as determined by an in-field calibration check.
- d. The measured accuracy of each flow meter following adjustment, if necessary, indicating the positive or negative offset as a percentage of actual flow of the meter.
- e. Any flow meter repairs made during the previous year or during field calibration.

The Permittees shall maintain records of flow meter calibration at a location accessible for review by NMED during Facility inspections.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC, 20.6.2.3109.H NMAC]

## **B. Monitoring and Reporting**

**23.22. METHODOLOGIES**-Unless otherwise approved in writing by NMED, the Permittees shall conduct sampling and analysis in accordance with the

most recent edition of the following documents.

- a. American Public Health Association, Standard Methods for the Examination of Water and Waste water.
  - b. U.S. Environmental Protection Agency, Methods for Chemical Analysis of Water and Waste.
  - c. U.S. Geological Survey, Techniques for Water Resources Investigations of the U.S. Geological Survey.
  - d. American Society for Testing and Materials, Annual Book of ASTM Standards, Part 31. Water.
  - e. U.S. Geological Survey, et al., National Handbook of Recommended Methods for Water Data Acquisition.
  - f. Federal Register, latest methods published for monitoring pursuant to Resource Conservation and Recovery Act regulations.
  - g. Methods of Soil Analysis: Part 1. Physical and Mineralogical Methods; Part 2. Microbiological and Biochemical Properties; Part 3. Chemical Methods, American Society of Agronomy;
- [20.6.2.3107.A NMAC, 20.6.2.3107.B NMAC]

**24-23. MONITORING REPORTS**-The Permittees shall submit monitoring reports to NMED on a quarterly basis. Quarterly sampling and analysis as required in this Discharge Permit shall be performed within the following periods and reports shall be submitted as described below.

- a. Sampling and analysis completed between January 1 and March 31—report to be submitted to NMED by May 1.
- b. Sampling and analysis completed between April 1 and June 30 – report to be submitted to NMED by August 1.
- c. Sampling and analysis completed between July 1 and September 30—report to be submitted to NMED by November 1.
- d. Sampling and analysis completed between October 1 and December 31—report to be submitted to NMED by February 1.

[NMSA 1978, § 74-6-5.D, 20.6.2.3109.B NMAC, 20.6.2.3109.C NMAC, 20.6.2.3107.A NMAC]

**25-24. INFLUENT VOLUMES RLW**-The Permittees shall measure the volume of all RLW influent waste water being conveyed to the Facility on a daily basis using the flow meter required to be installed pursuant to this Discharge Permit.

The total daily and monthly volumes of RLW influent conveyed to the Facility shall be submitted to NMED in the quarterly monitoring reports.

[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC, 20.6.2.3109.H NMAC]

**26-25. INFLUENT VOLUMES TRU**-The Permittees shall measure the daily volume of TRU influent waste water being conveyed to the Facility using electronic sensors which measure tank levels in both the acid waste and caustic waste influent tanks.

The electronic sensors on these tanks shall be operational except during repair or replacement. Should a sensor used to calculate TRU influent volumes fail, it shall be repaired or replaced as soon as practical, but no later than 30 days from the date of the failure. During repair or replacement, an alternative method for determining the flow of TRU influent shall be used until the defective sensor is repaired or replaced.

Volumes shall be determined by calculation using the head change and tank size. Operators shall record changes in influent tank levels whenever a batch of TRU waste water is conveyed to the Facility. The total daily and monthly volumes of TRU influent received by the Facility shall be submitted to NMED in the quarterly monitoring reports.  
[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC, 20.6.2.3109.H NMAC].

- 27-26. DISCHARGE VOLUMES**-The Permittees shall measure and record the volume of treated waste water discharged to the SET, MES and Outfall 051 on a daily basis. The Permittees shall determine effluent volumes as follows.
- a. Discharge volumes to the SET shall be determined by daily totalized meter readings on the flow meter required in this Discharge Permit, located on the effluent line to the unit.
  - b. Discharge volumes to Outfall 051 shall be determined by daily totalized meter readings on the flow meter required in this Discharge Permit, located on the effluent line to the outfall.
  - c. Discharge volumes to the MES shall be determined by daily totalized meter readings on the flow meter required in this Discharge Permit, located on the effluent line to the unit.

The daily and monthly discharge volumes for the reporting period shall be submitted to NMED in the quarterly monitoring reports.  
[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC, 20.6.2.3109.H NMAC]

- 28-27. WASTE TRACKING**-The Permittees shall maintain current written or electronic records of all waste streams conveyed to the Facility. At a minimum, the Permittees shall record the following information.
- a. The name of the generator and a unique waste stream identification number.
  - b. The time period for which the Permittee approved the generator to convey the waste stream to the Facility.
  - c. The location where the waste stream was generated.
  - d. Estimated volume and duration of the waste stream, including
    - Estimated number of days per year discharge occurred.
    - Average daily volume received by the Facility when discharge occurred.
    - Maximum daily volume received by the Facility each year when discharge occurred.

- Estimated total volume discharged to the facility each year.
- e. The waste stream characterization (i.e., analytical data or knowledge of process).
- f. The names of the personnel that approved the receipt of the waste at the Facility (e.g., Waste Certifying official, RCRA Reviewer, and Facility Reviewer).

Permittees shall also maintain written or electronic records of the following waste streams conveyed from the Facility: Radioactive Liquid Waste Bottoms, low-level sludge, TRU sludge, and low-level solid waste (PPE, sample bottles, filters, membranes, etc). Records will include date of shipment, quantity shipped, description of waste stream, shipping documentation and disposal location. The Permittees shall allow NMED or an authorized representative to have access to and copy, at reasonable times, records that must be kept under this condition.

The Permittees shall maintain all waste tracking records required by this Condition for five years from the date of the final discharge from the generator of that waste stream. The Permittees shall furnish upon request, and make available at all reasonable times for inspection, the waste tracking records required in this Discharge Permit.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

**29.28. EFFLUENT SAMPLING** -The Permittees shall sample and analyze effluent waste streams discharged to Outfall 051, the SET, and the MES.

Treated effluent samples shall be collected once per calendar month for any month in which a discharge occurs to Outfall 051. The Permittees shall collect a grab sample of treated effluent which shall be analyzed for all water contaminants listed in 20.6.2.3103 NMAC, TKN and all toxic pollutants as defined in 20.6.2.7.WW NMAC.

Treated effluent samples shall be collected once per calendar month for any month in which a discharge occurs to the MES or SET. The Permittees shall collect a grab sample of treated effluent which shall be analyzed for TKN, NO<sub>3</sub>-N, TDS, Cl, F and perchlorate.

The Permittees shall collect and analyze effluent samples once per quarter for any quarterly period in which a discharge occurs to the MES or SET. The Permittees shall collect a grab sample of treated effluent which shall be analyzed for all water contaminants listed in 20.6.2.3103 NMAC and all toxic pollutants as defined in 20.6.2.7.WW NMAC.

All samples shall be properly prepared, preserved, transported and analyzed in accordance with the parameters and methods authorized in this Discharge Permit and will be submitted to an independent environmental laboratory

accredited under the National Environmental Laboratory Accreditation Program. Analytical results shall be submitted to NMED in the quarterly monitoring reports. For any calendar month during which no discharge occurs, the Permittees shall submit a note in the quarterly report documenting the absence of discharge.  
[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

**30.29. SOIL MOISTURE MONITORING SYTEM FOR THE SET** ~~Within 120 days following the effective date of this Discharge Permit (by December 27, 2018), the Permittees shall submit to NMED for approval a proposed work plan, design and schedule for the installation of a moisture monitoring system for the detection of unauthorized releases from the SET. The Permittees shall construct a moisture monitoring system for the SET to detect unauthorized releases. The system shall be designed to detect, at a minimum, absolute variations in volumetric soil moisture content below the SET within a precision of 2%. The Permittees shall install the moisture monitoring boreholes in accordance with the final work plan, design and schedule approved by NMED.~~

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The Permittees shall use neutron moisture probes to log the moisture monitoring boreholes following installation to establish baseline conditions and to develop a calibration data set for the probe and a soil moisture action level, to be approved by NMED, which indicates that moisture is being detected below the SET at levels that are above baseline conditions.

Within 90 days following acceptance of the final construction of the moisture monitoring boreholes and prior to discharge to the SET by the Permittees, the Permittees shall submit to NMED for approval the following items.

- a. Confirmation that the moisture monitoring borehole installation has been completed.
- b. Record drawings of the final design of the completed installation.
- c. Reports on the baseline moisture condition and neutron probe calibration.
- d. A proposed action level to be used to indicate that elevated moisture has been detected beneath the SET.

Upon approval or approval with conditions by NMED of the completed installation and soil moisture action level, discharge to the SET can commence. The Permittees shall perform quarterly soil moisture monitoring in the moisture monitoring boreholes, and shall provide this information in the quarterly reports required by Condition VI.B.24 (Monitoring Reports).

The moisture monitoring boreholes and neutron probes shall be maintained so that the boreholes remain accessible for monitoring and the probe remains operational. Should the system or a component of the system fail, it shall be

repaired or replaced as soon as possible, but no later than 90 days from the date of the failure. For good cause, NMED may approve a longer period.

The Permittees shall maintain all documents and records pertaining to the quarterly monitoring events and maintenance or repair of the soil moisture monitoring system for a period of five years and shall make such documents and records available to NMED upon request.  
[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

**31-30. SOIL MOISTURE MONITORING SYSTEM EXCEEDANCE-** In the event that the synthetic liner leak detection system identifies a leak, or the soil moisture detection system for the SET detects a soil moisture increase beneath the SET that exceeds the NMED approved action level the Permittees shall take the following corrective actions.

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- a. Notify the NMED Ground Water Quality Bureau within 24 hours of a release detected by the release detection system within the synthetic liner.
- b. Notify the NMED Ground Water Quality Bureau within 15 days following the date when the soil moisture was initially discovered beneath the SET to exceed the action level.
- c. Within 60 days following the date when the soil moisture was initially discovered to exceed the action level, identify the source of the increased soil moisture beneath the SET to NMED and the basis for the identification of the source.

In the event the leak detection system between the primary and secondary liner identifies a leak, or the moisture exceedance in the soil moisture monitoring system is demonstrated to be associated with a leak from or breach of the SET, the Permittees shall cease discharges to the SET, remove all standing liquid from one or both cells (as appropriate), and submit a corrective action plan to NMED, for approval, within 30 days following the date when the Permittees identify the leak. At a minimum, the corrective action plan shall include the following.

- a. A proposal for repairing or replacing the synthetic liners within the SET, if leakage through the synthetic liners is found to be the source, or for other repairs.
- b. A plan for re-instituting soil moisture monitoring following repairs to the SET to demonstrate that the repairs resolved the source of the increased soil moisture beneath the SET.
- c. A schedule for implementation of the corrective action plan elements.

In the event the source of the soil moisture exceedance is demonstrated to be associated with an occurrence other than a failure of the SET, the Permittees shall submit a corrective action plan to NMED, for approval, within 120 days following the date when the soil moisture was initially discovered to exceed the action level. The corrective action plan shall include any actions necessary to ensure the soil moisture detection system is operating within its

intended function as required by this Discharge Permit including, but not limited to, re-calibration.

Upon NMED approval, or approval with conditions, the Permittees shall implement the corrective action plan according to the approved schedule.  
[20.6.2.3107.A NMAC, 20.6.2.3109.E NMAC]

**32.31. GROUND WATER FLOW**-The Permittees shall submit a ground water flow direction report to NMED in the Annual Report in conjunction with the Quarterly Report due February 1. The report shall contain regional, intermediate and alluvial aquifer ground water depth-to-water measurements, existing interconnections with other aquifers (if any are known), a narrative description of the known characteristics of the ground water elevation and flow direction within each aquifer and, to the extent practicable, ground water elevation contour map(s) for the aquifers underlying Sandia, Pajarito, Ten-Site and Mortandad Canyons.

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The ground water elevation contour maps shall depict the ground water flow direction based on the most recent representative ground water elevation data from monitoring wells located in the subject areas. Ground water elevations shall be estimated using common interpolation methods to a contour interval approved by NMED and appropriate to the available data. Ground water elevation contour maps shall depict the water table and potentiometric surfaces, ground water flow directions, and the location and name of each monitoring well and discharge location unit associated with this Discharge Permit.

[20.6.2.3107.A NMAC, 20.6.2.3109.C]

~~**33. REPLACEMENT OF TWO EXISTING ALLUVIAL GROUND WATER MONITORING WELLS** Within 90 days of the effective date of this Discharge Permit (by November 27, 2018), the permittees shall submit to NMED a work plan for the installation of two replacement monitoring wells in the alluvial aquifer at a location hydrologically downgradient of Outfall 051. The well installation work plan will include proposed well locations, drilling methods, well specifications, and proposed schedule for construction. Upon NMED approval, the Permittees shall construct the replacement wells in accordance with the Groundwater Quality Bureau, Monitoring Well Construction and Abandonment Guidelines, Revision 1.1, March 2011 and the approved work plan and schedule. A monitoring well completion report documenting the installation will be submitted to NMED within 60 days following completion.~~

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~~[NMSA 1978, § 74-6-5.D, 20.6.2.3109.B NMAC]~~

**34.32. MONITORING WELL LOCATION** - In the event that ground water flow information obtained pursuant to this Discharge Permit indicates that a monitoring well is not located hydrologically downgradient of the discharge location it is intended to monitor, NMED may require the Permittees to install

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a replacement well or wells. Within 90 days following receipt of such notification from NMED, the Permittees shall submit to NMED for approval a well installation work plan, describing each proposed well location, drilling methods and well specifications, and proposing a schedule for construction. Upon NMED approval, the Permittees shall construct the replacement well or wells according to the approved work plan and schedule.

Within 90 days following well completion, the Permittees shall survey the elevation and location of the newly installed replacement monitoring well or wells. Within 120 days following well completion, the Permittees shall submit to NMED a well completion report that will include: construction and lithologic logs, survey data, and a ground water elevation contour map.

Replacement wells shall be located, installed, and completed in accordance with the attachment titled: *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011, or according to other specifications as approved by NMED.  
[NMSA 1978, § 74-6-5.D, 20.6.2.3109.B NMAC]

**35.33. MONITORING WELL CONSTRUCTION** - In the event that information available to NMED indicates that a well is not constructed in a manner consistent with the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Guidelines, Revision 1.1*, March 2011 or NMED approved specification; contains insufficient water to effectively monitor ground water quality; or is not completed in a manner that is protective of ground water quality, NMED may require the Permittees to install a replacement well or wells. Within 90 days following receipt of such notification from NMED, the Permittees shall submit to NMED for approval a well installation work plan, describing each proposed well location, drilling methods, well specifications, and proposed schedule for construction. Upon NMED approval, the Permittees shall construct the replacement well or wells according to the approved work plan and schedule.

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Within 90 days following well completion, the Permittees shall survey the elevation and location of the newly installed replacement monitoring well or wells. Within 120 days of well completion, the Permittees shall submit to NMED construction and lithologic logs, survey data, and a ground water elevation contour map.

Replacement wells shall be located, installed, and completed in accordance with the attachment titled: *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011, or according to other specifications as approved by NMED.

Upon completion of the replacement monitoring well, the monitoring well requiring replacement shall be properly plugged and abandoned. Well

plugging, and abandonment and documentation of the abandonment procedures shall be completed in accordance with the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011, and all applicable local, state, and federal laws and regulations. The well abandonment documentation shall be submitted to NMED within 60 days of completion of well plugging activities.  
[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC]

**36.34. GROUND WATER MONITORING** - The Permittees shall collect ground water samples from the following ground water monitoring wells on a quarterly basis and analyze the samples for TKN, NO<sub>3</sub>-N, TDS, Cl, F and perchlorate.

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- a. ~~Replacement Alluvial Well MCA-RLW-1~~ - ~~Alluvial previously constructed and located in the alluvial aquifer replacement well installed as a condition of this Discharge Permit located~~ hydrologically downgradient of Outfall 051.
- b. ~~Replacement Alluvial Well MCA-RLW-2~~ - ~~previously constructed and located in the Alluvial alluvial aquifer replacement well installed as a condition of this Discharge Permit located~~ hydrologically downgradient of Outfall 051.
- c. MCOI-6 - previously constructed and located in the intermediate aquifer hydrologically downgradient of Outfall 051.

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The Permittees shall collect ground water samples from the following ground water monitoring wells on an annual basis and analyze the samples for all water contaminants listed in 20.6.2.3103 NMAC and all toxic pollutants listed in 20.6.2.7.WW.

- a. ~~Replacement Alluvial Well MCA-RLW-1~~ - ~~Installed as a condition of this Discharge Permit and previously constructed and located in the alluvial aquifer~~ hydrologically downgradient of Outfall 051.
- b. ~~Replacement Alluvial Well MCA-RLW-2~~ - ~~Installed as a condition of this Discharge Permit and previously constructed and located in the alluvial aquifer~~ hydrologically downgradient of Outfall 051
- c. MCOI-6 - previously constructed and located in the intermediate aquifer presumed to be hydrologically downgradient of Outfall 051.
- d. R-46 - previously constructed and located in the regional aquifer, topographically downgradient of the RLWTF.
- e. R-60 - previously constructed and located in the regional aquifer, topographically downgradient of the RLWTF.
- f. R-1 - previously constructed and located in the regional aquifer, topographically downgradient of the RLWTF.
- g. R-14 - previously constructed and located in the regional aquifer, topographically downgradient of the RLWTF.

Sampling shall be done in accordance with the methods authorized in this Discharge Permit and using the following procedure.

- a. Measure the ground-water surface elevation, to the nearest hundredth (0.01) of a foot, from the top of the casing, each time ground water is sampled.
- b. Calculate total volume of water within the monitoring well using the most recent total depth measurement.
- c. For intermediate and regional aquifer wells, purge three well volumes of water from the monitoring well prior to sampling, using an adequate pumping system. For alluvial wells, purge well for a minimum of one well volume.
- d. Collect samples from the well using appropriate methods to avoid cross-contamination of the samples and sources.
- e. Prepare the Chain-of-Custody, preserve the sample and transport samples in accordance with methods authorized in this Discharge Permit.
- f. Samples shall be analyzed by an independent analytical laboratory accredited under the National Environmental Laboratory Accreditation Program (NELAP) using EPA approved test methods.

The Permittees may submit to NMED for approval Standard Operating Procedures developed for the Interim Facility-Wide Groundwater Monitoring Plan that would apply in lieu of the sampling protocols described in this Permit Condition. Upon NMED approval or partial approval of such alternate plan, the approved plan or portion thereof shall apply and be fully enforceable in lieu of this Permit Condition.

The Permittees shall use sampling and analytical methods that ensure the production of accurate and reliable data indicative of ground water quality in all ground water that may be affected by any discharges from the Facility. The Permittees shall prepare ground water monitoring reports describing, in detail, the sampling and analytical methods used. The ground water monitoring reports shall contain, at minimum, the following information.

- a. Date sample was collected.
- b. Time sample was collected.
- c. Individuals collecting sample.
- d. Monitoring well identification.
- e. Physical description of monitoring well location.
- f. Ground-water surface elevation.
- g. Total depth of the well.
- h. Total volume of water in the monitoring well prior to sample collection.
- i. Total volume of water purged prior to sample collection.
- j. Physical parameters including temperature, conductivity, pH, oxidation-reduction potential.
- k. Description of sample methods (i.e., constituent being sampled for, container used, preservation methods).
- l. Chain-of custody.
- m. Map, to scale, identifying monitoring wells and their location.

The ground water monitoring report shall be submitted to NMED with the quarterly monitoring report required in this Discharge Permit.  
[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

**37.35. GROUND WATER EXCEEDANCE-** NMED reviews ground water data that is generated by the Permittees from samples collected from the monitoring wells identified in this Discharge Permit and other monitoring wells in the vicinity of the Facility. The Permittees report newly detected ground water quality standard exceedances or the newly detected toxic pollutants (as defined in this Discharge Permit and in 20.6.2.7.WW NMAC) in ground water for the entire Laboratory to NMED. If NMED determines that a ground water quality standard is exceeded or that a toxic pollutant is present in ground water, potentially due to a discharge associated with the Facility or defined systems in this Discharge Permit, the Permittees shall submit a ground water investigation/source control work plan to NMED for approval within 60 days following notification to do so by NMED.

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At a minimum, the ground water investigation/source control work plan shall include the following elements.

- a. A proposal to investigate the source, nature and extent of the ground water contamination, if unknown, which may utilize existing ground water monitoring wells or may propose the installation of new monitoring wells, as appropriate.
- b. A proposal to mitigate the discharge or mobilization of the water contaminant which might be causing ground water contamination, as appropriate.
- c. A schedule for implementation of the work plan and submittal of a report to NMED.

Upon NMED approval of the ground water investigation/source control work plan, or approval of the plan with conditions, the Permittees shall implement the work plan and submit a written report to NMED in accordance with the approved schedule.

Should the findings of the ground water investigation reveal that a discharge associated with the Facility or defined systems in this Discharge Permit is a source of the ground water contamination, the Permittees shall abate water pollution pursuant to 20.6.2.4000 through 20.6.2.4115 NMAC, following notification from NMED.

This Permit Condition does not apply to an exceedance of ground water quality standard or the presence of a toxic pollutant in ground water unrelated to a discharge associated with the Facility or defined systems in this Discharge Permit, to the extent that abatement of such ground water contamination is occurring, or will occur, pursuant to and in accordance with the June 2016 Compliance Order on Consent (Consent Order) agreed to by NMED, and the

Permittees pursuant to the New Mexico Hazardous Waste Act, NMSA 1978, §74-4-10 and the New Mexico Solid Waste Act, NMSA 1978, §74-9-36(D).  
[NMSA 1978, § 74-6-5.D, 20.6.2.3109.E NMAC, 20.6.2.3107.A NMAC]

### C. Contingency Plans

**38.36. SPILL OR UNAUTHORIZED RELEASE**-In the event of a release not authorized in this Discharge Permit, the Permittees shall take measures to mitigate damage from the unauthorized discharge and initiate the notifications and corrective actions required in 20.6.2.1203 NMAC and summarized below.

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Within 24 hours following discovery of the unauthorized discharge, the Permittees shall orally notify NMED and provide the following information.

- a. The name, address, and telephone number of the person or persons in charge of the Facility.
- b. The identity and location of the Facility.
- c. The date, time, location, and duration of the unauthorized discharge.
- d. The source and cause of unauthorized discharge.
- e. A description of the unauthorized discharge, including its estimated chemical composition.
- f. The estimated volume of the unauthorized discharge.
- g. Any actions taken to mitigate immediate damage from the unauthorized discharge.

Within one week following discovery of the unauthorized discharge, the Permittees shall submit written notification to NMED with the information listed above and any pertinent updates.

Within 15 days following discovery of the unauthorized discharge, the Permittees shall submit to NMED for approval a corrective action report and plan describing any corrective actions taken and to be taken to address the unauthorized discharge that includes the following.

- a. A description of proposed actions to mitigate damage from the unauthorized discharge.
- b. A description of proposed actions to prevent future unauthorized discharges of this nature.
- c. A schedule for completion of proposed actions.

Upon NMED approval of the corrective action report and plan, the Permittees shall implement the approved actions according to the approved schedule.

In the event that the unauthorized discharge causes or may with reasonable probability cause water pollution in excess of the standards and requirements of 20.6.2.4103 NMAC, and the water pollution will not be abated within 180 days after notice is required to be given pursuant to 20.6.2.1203.A(1) NMAC, the Permittees may be required to abate water pollution pursuant to

20.6.2.4000 through 20.6.2.4115 NMAC.

Nothing in this condition shall be construed as relieving the Permittees of the obligation to comply with all requirements of 20.6.2.1203 NMAC.  
[NMSA 1978, § 74-6-5.D, 20.6.2.1203 NMAC, 20.6.2.3109.B NMAC]

~~39.37. FAILURES IN DISCHARGE PLAN/DISCHARGE PERMIT-~~In the event that NMED or the Permittees identify any failure of the discharge plan or this Discharge Permit not specifically set forth herein, NMED may require the Permittees to submit for its approval a corrective action plan and a schedule for completion of corrective actions to address the failure. Additionally, NMED may require a Discharge Permit modification to achieve compliance with Part 20.6.2 NMAC.  
[20.6.2.3107.A NMAC, 20.6.2.3109.E NMAC]

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**D. Closure**

~~40. CESSATION OF OPERATION OF SPECIFIC UNITS~~ Within 60 days of the effective date of this Discharge Permit (by October 28, 2018), the Permittees shall permanently cease operation of the following units.

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- ~~a. The 75,000 gallon concrete influent storage tank (75K tank) will be taken out of service as an influent storage tank but remain available for use as emergency storage.~~
- ~~b. The 100,000 gallon steel influent storage tank (100K tank).~~
- ~~c. The two 26,000 gallon concrete clarifiers located within Building 1 of TA-50.~~
- ~~d. The two 25,000 gallon concrete effluent storage tanks (WM2-N, WM2-S).~~
- ~~e. The gravity filter located within Building 1 of TA-50.~~

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~~Upon the cessation of operation of these specific units, the Permittees shall initiate the requirements for stabilization (Condition 41) of the individual units, systems and components in accordance with this Discharge Permit.~~

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~~[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.E NMAC]~~

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~~41.38. STABILIZATION OF INDIVIDUAL UNITS AND SYSTEMS~~ - Within 120 days from the permanent cessation of operation of a unit or system, the Permittees shall submit to NMED for approval a written work plan for the stabilization of the unit or system for which operation has ceased. The work plan shall identify activities to be taken, and steps necessary to ensure that the unit or system can no longer receive a discharge and that no further releases of water contaminants occur as a result of the unit or system. At a minimum, the work plan shall include the following.

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- a. Identification of the unit or system in which cessation of use has occurred.
- b. A detailed description of the function of the unit or system.
- c. A detailed description of the historic influent waste streams to the unit or

- system.
- d. A detailed description of all conveyance lines leading to the unit or system and a description of how the lines will be terminated, plugged, re-routed or bypassed so that a discharge to the unit or system can no longer occur.
  - e. Identification of those portions of the approved Closure Plan required in Condition 3942 of this Discharge Permit that will be implemented.
  - f. A description of all proposed interim measures, actions and controls that will be implemented until such time of final removal of the unit, system or component to prevent the release of water contaminants into the environment; to prevent water contaminants, including storm water run-on and run-off, from moving into ground water; and to prevent water contaminants from posing a threat to human health.
  - g. A detailed description of the actions that will be taken under the Consent Order to investigate and characterize the potential impact to soil and groundwater from the facility, system, or individual unit pursuant to Condition 4346.
  - h. A schedule for implementation.

Upon NMED approval of the work plan, the Permittees shall implement the plan according to the approved schedule.

Within 30 days following the completion of all interim measures, actions and controls as required by this condition, the Permittees shall submit to NMED for approval a final written report on the actions taken to implement the partial closure.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.E NMAC]

**42.39. CLOSURE PLAN** - A closure plan is provided as an Attachment to this Discharge Permit. The closure plan includes the following.

- a. A detailed description of how each unit and system at the Facility will be closed.
- b. A detailed description of the actions to be taken to decommission, demolish, and remove each unit, system, and other structure, including any secondary containment system components.
- c. A detailed description of the actions and controls that will be implemented during closure to prevent the release of water contaminants into the environment; to prevent water contaminants, including run-on and run-off, from moving into ground water; and to prevent water contaminants from posing a threat to human health.
- d. A detailed description of the methods to be used for decontamination of the site and decontamination of equipment used during closure.
- e. A detailed description of the actions that will be taken to reclaim the site, including placement of clean fill material and re-grading to blend with surrounding surface topography, minimize run-on and run-off, and prevent infiltration of water, and re-vegetation.

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- f. A detailed description of all monitoring, maintenance and repair, and controls that will be implemented after closure, and of all actions that will be taken to minimize the need for post-closure monitoring, maintenance and repair, and controls.
- g. A ground water monitoring plan to detect water contaminants that might move directly or indirectly into ground water after closure, which shall provide for, at a minimum, eight consecutive quarters of ground water monitoring after achieving the standards of 20.6.2.3103 NMAC.
- h. A detailed description of the methods that will be used to characterize all wastes generated during closure, including treatment residues, contaminated debris, and contaminated soil, in compliance with all local, state, and federal laws and regulations.
- i. A detailed description of the actions that will be taken to investigate and characterize the potential impact to soil and groundwater from the facility, system, or individual unit, or, pursuant to Condition VI.D.46 (Integration with the Consent Order), if the unit or system will be investigated and characterized under the Consent Order, a description of such activities.
- j. A detailed description of the methods that will be used to remove, transport, treat, recycle, and dispose of all wastes generated during closure in compliance with all applicable local, state, and federal laws and regulations.
- k. A detailed schedule for the closure and removal of each unit and system, which lists each proposed action and the estimated time to complete it.

For changes that would affect the implementation of the attached Closure Plan, the Permittees shall submit to NMED for approval a written notification and an amended Closure Plan. Permittees will provide annual updates to NMED describing modifications to the Closure Plan. Public comments will be accepted by NMED for a period of 30 days after the submittal of a modified or amended closure plan prior to approval.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.E NMAC]

**43-40. FINAL CLOSURE - Permittee will notify the NMED a minimum of 120 days prior to initiation of closure activities at the facility.** Once closure begins, and until all closure requirements (excluding post-closure ground water monitoring) are completed, the Permittees shall submit to NMED, with the monitoring reports required in this Discharge Permit, quarterly status reports describing the closure actions taken during the previous reporting period and the actions scheduled for the next reporting period. Within 90 days following the completion of the closure, the Permittees shall submit to NMED for approval a final written report on the actions taken to implement closure.

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Upon termination of the RLWTF mission, Permittee will submit to NMED for approval a revised closure plan for the decommissioning of the active facility that incorporates the same criteria as identified in this condition.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.E NMAC]

**44-41. POST-CLOSURE GROUND WATER MONITORING -** After closure\* has been completed and approved by NMED, the Permittees shall continue ground water monitoring of any wells dedicated to the Facility according to the approved Closure Plan to confirm that the standards of 20.6.2.3103 NMAC are not exceeded and toxic pollutants in 20.6.2.7.WW NMAC are not present in ground water. Such monitoring shall continue for a minimum of eight consecutive quarters.

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If monitoring results show that a ground water quality standard in 20.6.2.3103 NMAC is exceeded or a toxic pollutant in 20.6.2.7.WW NMAC is present in ground water, the Permittees shall implement the requirements of Condition [3537](#) (Ground Water Exceedance) of this Discharge Permit.

This Permit Condition does not apply to an exceedance of ground water quality standard or the presence of a toxic pollutant in ground water unrelated to a discharge associated with the Facility or defined systems in this Discharge Permit, to the extent that abatement of such ground water contamination is occurring, or will occur, pursuant to and in accordance with the June 2016 Compliance Order on Consent (Consent Order) agreed to by NMED and the DOE.

Upon demonstration confirming ground water quality does not exceed the standards of 20.6.2.3103 NMAC and does not contain a toxic pollutant in 20.6.2.7.WW NMAC, the Permittees may submit a written request to cease ground water monitoring activities.

Following notification from NMED that post-closure monitoring may cease, the Permittees shall plug and abandon the monitoring well in accordance with

the *Ground Water Quality Bureau Monitoring Well Construction and Abandonment Conditions, Revision 1.1*, March 2011.  
[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.F NMAC, 20.6.2.4103.D NMAC]

**45.42. TERMINATION-** When all closure and post-closure requirements have been met, the Permittees may submit to NMED a written request for termination of the Discharge Permit.

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If the Discharge Permit expires or is terminated for any reason and any standard of 20.6.2.3103 NMAC is or will be exceeded, or a toxic pollutant in 20.6.2.7.WW NMAC is or will be present in ground water, NMED may require the Permittees to submit an abatement plan pursuant to 20.6.2.4104 NMAC.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.A NMAC, 20.6.2.3109.B NMAC, 20.6.2.3109.F NMAC, 20.6.2.4103.D NMAC]

**46.43. INTEGRATION WITH THE CONSENT ORDER --** The investigation, characterization, cleanup and corrective action requirements for potential releases of contaminants into soil, groundwater and other environmental media from "solid waste management units" (SWMUs) and "areas of concern" (AOCs) associated with the Facility and contained within the Compliance Order on Consent (June 2016, Consent Order) entered into between the New Mexico Environment Department and the DOE pursuant to the New Mexico Hazardous Waste Act, NMSA 1978, §74-4-10 and the New Mexico Solid Waste Act, NMSA 1978, §74-9-36(D)(see [https://www.env.nm.gov/wp-content/uploads/2015/12/LANL\\_Consent\\_Order\\_FINAL.pdf](https://www.env.nm.gov/wp-content/uploads/2015/12/LANL_Consent_Order_FINAL.pdf)) shall be governed by the Consent Order. The investigation, characterization, cleanup and corrective action of any future SWMUs and AOCs associated with the Facility shall be conducted solely under the Consent Order and not under this Permit until termination of the Consent Order. No activities required under this Permit shall conflict with or duplicate activities required for SWMUs and AOCs identified under the Consent Order. Permittees shall provide information regarding which units and systems are covered by the Consent Order in the submittals required by Conditions VI.D.41 (Stabilization of Individual Units and Systems) and VI.D.43 (Final Closure) of this permit, along with a description of the investigation and characterization that will occur under the Consent Order for each unit and system.

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[NMSA 1978, §74-4-10 NMSA 1978, §74-9-36(D)]

**E. General Terms and Conditions**

**47.44. APPROVALS** - Upon receipt of a work plan, written proposal, report, or other document subject to NMED approval, NMED will review the document and may either approve the document, approve the document with conditions, or disapprove the document. Upon completing its review, NMED will notify the Permittees in writing of its decision, including the reasons for any conditional approval or disapproval.  
[20.6.2.3107.A NMAC, 20.6.2.3109.C NMAC]

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**48.45. RECORD KEEPING** - The Permittees shall maintain a written record of the following information and shall make it available to NMED upon request.

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- a. Information and data used to prepare the application for this Discharge Permit.
- b. Records of any releases or discharges not authorized in this Discharge Permit and reports submitted pursuant to 20.6.2.1203 NMAC.
- c. Records, including logs, of the operation and maintenance and repair of all Facility and equipment used to treat, store or dispose of waste water.
- d. Facility record drawings (plans and specifications) showing the actual construction of the Facility and shall comply with the New Mexico Engineering and Surveying Practice Act (Chapter 61, Article 23 NMSA 1978).
- e. Copies of monitoring reports completed and submitted to NMED pursuant to this Discharge Permit.
- f. The volume of waste water or other wastes discharged pursuant to this Discharge Permit.
- g. Ground water quality and waste water quality data collected pursuant to this Discharge Permit.
- h. Copies of construction records (well logs) for all ground water monitoring wells required to be sampled pursuant to this Discharge Permit.
- i. Records of the maintenance and repair, replacement, and calibration of any monitoring equipment or flow measurement devices required by this Discharge Permit.
- j. Data and information related to field measurements, sampling, and analysis conducted pursuant to this Discharge Permit.

With respect to sampling and laboratory analysis, the Permittees shall record and maintain following information and shall make it available to NMED upon request.

- a. The dates, location and times of sampling or field measurements.
- b. The name and job title of the individuals who performed each sample collection or field measurement.
- c. The sample analysis date of each sample.
- d. The name and address of the laboratory, and the name of the signatory authority for the laboratory analysis.
- e. The analytical technique or method used to analyze each sample or collect

- each field measurement.
- f. The results of each analysis or field measurement, including raw data;
- g. The results of any split, spiked, duplicate or repeat sample.
- h. All laboratory analysis chain-of-custody forms and a description of the quality assurance and quality control procedures used.

The written record shall be maintained by the Permittees at a location accessible during a Facility inspection by NMED for a period of at least five years from the date of application, report, collection or measurement and shall be made available to NMED upon request.

[NMSA 1978, § 74-6-5.D, 20.6.2.3107.D NMAC, 20.6.2.3109.B NMAC]

**49.46. ELECTRONIC POSTING - MANDATORY** Commencing on the Effective Date of this Discharge Permit the permittees shall, within thirty calendar days of submittal to NMED, post on LANL's Electronic Public Reading Room located at <http://epr.lanl.gov/oppie/service> (or as updated) the following submittals to NMED.

- Condition VI.A1 – Annual Update Report
- Condition VI.A.3 – Submittal of Plans and Specifications
- Condition VI.A. 9 – Water Tightness Testing Failure
- Condition VI.A.14 – Damage to Structural Integrity
- Condition VI.A.18 – Exceedance of Effluent Standards
- Condition VI.B.31 – Soil Moisture Monitoring System Exceedance
- ~~Condition VI.B.33 – Alluvial Monitoring Well Replacement Installation Report~~
- Condition VI.B.37 – Exceedance of Groundwater Quality Standard
- Condition VI.C.38 – Spill or Unauthorized Discharge
- Condition VI.C.39 – Failures in Discharge Plan
- Condition VI.D.42 – Closure Plan Amendments or Modifications
- Condition VI.D.43 – Final Closure Report
- Condition VI.D.45 – Termination

**47. ELECTRONIC POSTING – VOLUNTARY** Commencing on the effective date of this Discharge Permit, permittees voluntarily agree to post on LANL's Electronic Public Reading Room located at <http://epr.lanl.gov/oppie/service> (or as updated) within seven calendar days after submission to NMED, the information listed below. Because permittees have voluntarily agreed to post the below-information, such posting shall not be subject to civil or criminal enforcement actions.

- Condition VI.A.2 – Notification of Changes
- Condition VI.A.4 – Construction Report
- ~~Condition VI.A.7 – Verification of Secondary Containment~~
- Condition VI.A.10 – Summary Report for Settled Solids Removal
- Condition VI.A.15 – Freeboard Exceedance Corrective Action Plan

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- Condition VI.A.20 – Emergency Response Procedures
- ~~Condition VI.A.21 – Written Confirmation of Installation of Flow Meters~~
- Condition VI.A.24 – Monitoring Reports
- ~~Condition VI.B.33 – Work plan for Replacement of Two Existing Ground Water Monitoring Wells~~
- Condition VI.B.34 – Monitoring Well Location Changes
- Condition VI.B.35 – Monitoring Well Construction Report
- Condition VI.D.41- Stabilization of Individual Units and Systems

[20.6.2.3107.A.8 NMAC]

**48.47. INSPECTION AND ENTRY** – The Permittees shall allow inspection by NMED of the Facility and its operations which are subject to this Discharge Permit and the WQCC regulations. NMED may upon presentation of proper credentials, enter at reasonable times upon or through any premises in which a water contaminant source is located or in which are located any records required to be maintained by regulations of the federal government or the WQCC.

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The Permittees shall allow NMED to have access to and reproduce any copy of the records, and to perform assessments, sampling or monitoring during an inspection for the purpose of evaluating compliance with this Discharge Permit and the WQCC regulations.

Nothing in this Discharge Permit shall be construed as limiting in any way the inspection and entry authority of NMED in the WQA, the WQCC Regulations, or any other local, state or federal laws and regulations.  
[NMSA 1978, §§ 74-6-9.B and 74-6-9.E, 20.6.2.3107.D NMAC]

**49.48. DUTY TO PROVIDE INFORMATION** - The Permittees shall, upon NMED's request, allow NMED to inspect and duplicate any and all records required by this Discharge Permit and furnish NMED with copies of such records.

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Nothing in this Discharge Permit shall be construed as limiting in any way the authority of NMED to gather information as stipulated in the WQA, the WQCC Regulations, or any other local, state or federal laws and regulations.  
[NMSA 1978, §§ 74-6-5.D, 74-6-9.B, and 74-6-9.E, 20.6.2.3107.D NMAC, 20.6.2.3109.B NMAC]

**50.49. MODIFICATIONS AND AMENDMENTS**– In the event the Permittees propose a change to the Facility or the Facility's discharge that would result in a change in the volume discharged; the location of the discharge; or in the amount or character of water contaminants received, treated or discharged by the Facility, the Permittees shall notify NMED prior to implementing such changes. The Permittees shall obtain written approval (which may require modification of this Discharge Permit) from NMED prior to implementing

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such changes.  
[NMSA 1978, § 74-6-5.D, 20.6.2.3107.C NMAC, 20.6.2.3109.E NMAC,]

**51.50. EXTENSIONS OF TIME** - The Permittees may seek an extension of time in which to perform an obligation in this Discharge Permit, for good cause, by sending a written request for extension of time that states the length of the requested extension and describes the basis for the request. NMED shall respond in writing, stating the reasons for any denial.

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**52.51. CIVIL PENALTIES** - Any violation of the requirements and conditions of this Discharge Permit, including any failure to allow NMED staff to enter and inspect records or Facility, or any refusal or failure to provide NMED with records or information, may subject the Permittees to a civil enforcement action. Pursuant to WQA 74-6-10(A) and (B), such action may include a compliance order requiring compliance immediately or in a specified time, assessing a civil penalty, modifying or terminating the Discharge Permit, or any combination of the foregoing; or an action in district court seeking injunctive relief, civil penalties, or both. Pursuant to WQA 74-6-10.C and 74-6-10.1, civil penalties of up to \$15,000 per day of noncompliance may be assessed for each violation of the WQA 74-6-5, the WQCC Regulations, or this Discharge Permit, and civil penalties of up to \$10,000 per day of noncompliance may be assessed for each violation of any other provision of the WQA, or any regulation, standard, or order adopted pursuant to such other provision. In any action to enforce this Discharge Permit, the Permittees waives any objection to the admissibility as evidence of any data generated pursuant to this Discharge Permit.  
[NMSA 1978, §§ 74-6-10 and 74-6-10.1]

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**53.52. CRIMINAL PENALTIES** - The WQA provides that no person shall:

- a. Make any false material statement, representation, certification or omission of material fact in an application, record, report, plan or other document filed, submitted or required to be maintained in the WQA;
- b. Falsify, tamper with or render inaccurate any monitoring device, method or record required to be maintained in the WQA; or
- c. Fail to monitor, sample or report as required by a permit issued pursuant to a state or federal law or regulation.

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Any person who knowingly violates or knowingly causes or allows another person to violate the requirements of this condition is guilty of a fourth degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who is convicted of a second or subsequent violation of the requirements of this condition is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition or knowingly causes another person to violate the requirements of this condition and thereby causes a substantial adverse environmental

impact is guilty of a third degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15. Any person who knowingly violates the requirements of this condition and knows at the time of the violation that he is creating a substantial danger of death or serious bodily injury to any other person is guilty of a second degree felony and shall be sentenced in accordance with the provisions of NMSA 1978, § 31-18-15.  
[NMSA 1978, §§ 74-6-10.2.A through 74-6-10.2.F]

**54.53. COMPLIANCE WITH OTHER LAWS** - Nothing in this Discharge Permit shall be construed in any way as relieving the Permittees of the obligation to comply with all applicable federal, state, and local laws, regulations, permits or orders.  
[20.6.2 NMAC]

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**55.54. LIABILITY**- The Permittees shall be jointly and severally liable for all their obligations in this Discharge Permit.  
[NMSA 1978, §§ 74-6-5.A and 74-6-10]

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**56.55. RIGHT TO APPEAL** - The Permittees may file a petition for review before the WQCC on this Discharge Permit. Such petition shall be in writing to the WQCC, shall be filed within thirty days of the receipt of this Discharge Permit, and shall include a statement of the issues to be raised and the relief sought. Unless a timely petition for review is made, the decision of NMED shall be final and not subject to judicial review.  
[NMSA 1978, § 74-6-5.O]

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**57.56. TRANSFER OF OWNERSHIP**- Prior to the transfer of any ownership, control, or possession of this Facility or any portion thereof, the Permittees shall.

- a. Notify the proposed transferee in writing of the existence of this Discharge Permit.
- b. Include a copy of this Discharge Permit with the notice.
- c. Deliver or send by certified mail to NMED a copy of the notification and proof that such notification has been received by the proposed transferee.

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Until both ownership and possession of the Facility have been transferred to the transferee, the Permittees shall continue to be responsible for any discharge from the Facility.  
[20.6.2.3104 NMAC, 20.6.2.3111 NMAC]

**58.57. PERMIT FEES**- Payment of permit fees is due at the time of Discharge Permit approval. Permit fees shall be paid in a single payment or shall be paid in equal installments on a yearly basis over the term of the Discharge Permit. Payments shall be remitted to NMED no later than 30 days after the Discharge Permit effective date.

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Permit fees are associated with issuance of this Discharge Permit. Nothing in this Discharge Permit shall be construed as relieving the Permittees of the obligation to pay all permit fees assessed by NMED. If the Permittees cease discharging at or from the Facility during the term of the Discharge Permit, they shall nevertheless pay all permit fees assessed by NMED. An approved Discharge Permit shall be suspended or terminated if the Permittees fail to remit payment when due.  
[20.6.2.3114.F NMAC, NMSA 1978, § 74-6-5.K]

**VII. Permit Term and Signature**

EFFECTIVE DATE: August 29, 2018  
TERM ENDS: August 29, 2023  
[20.6.2.3109.H NMAC, NMSA 1978, § 74-6-5.I]

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MICHELLE HUNTER  
Chief, Ground Water Quality Bureau  
New Mexico Environment Department



**DP-1132 LANL RLWTF**

**Bob Beers**

Public Hearing  
November 14-15, 2019

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LA-UR-17-31367

## Qualifications: Experience & Education

- Previously employed by LANL as an Environmental Professional
- 20+ yrs. of experience in discharge permit management
- Managed 3 discharge permits
- Served as single point of contact with NMED GWQB for NM WQCC regulatory compliance
- Bachelors of Science from Cornell University, Ithaca, NY
- Masters in Water Resources Administration from UNM, Albuquerque, NM

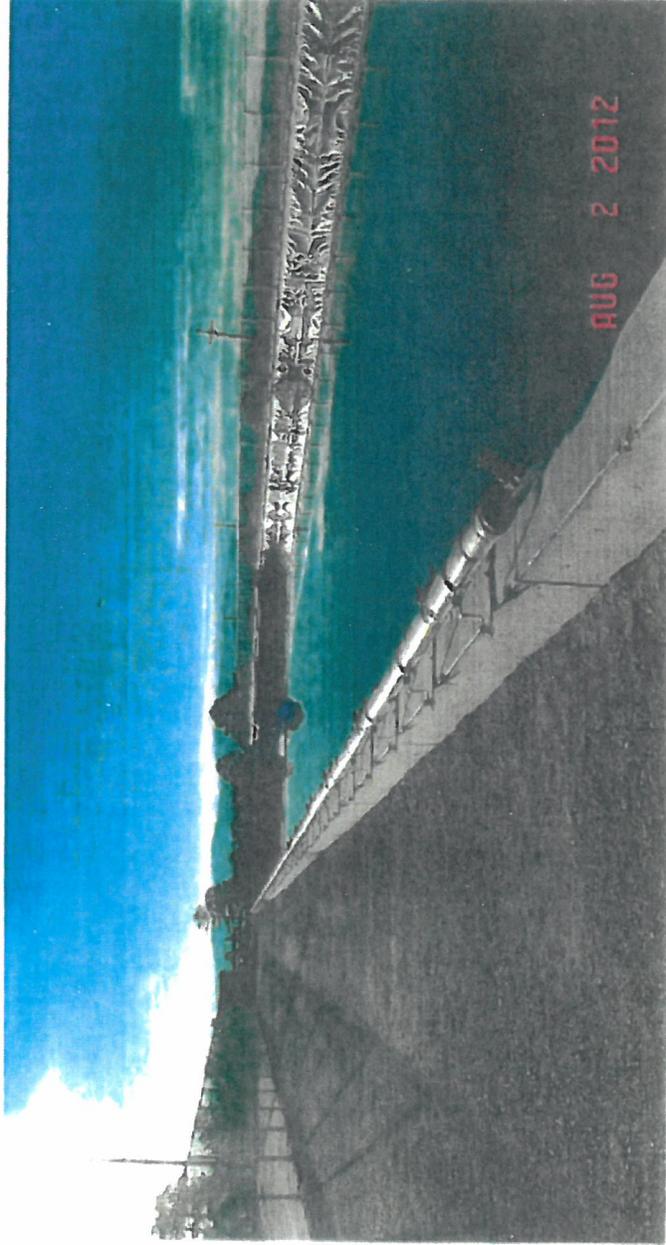
# DP-1132 Permitting History

- RLWTF at Technical Area (TA)-50
  - Pre-dates 1978 NM Water Quality Act and the June 18, 1977 permit application requirement in 20.6.2.3106.A NMAC
  - April 1996: NMED requests a DP application
  - August 1996: LANL submits 1<sup>st</sup> DP application
  - November 2011: NMED requests a new, comprehensive, and updated DP application
  - February 2012: LANL submits 2<sup>nd</sup> DP application
  - May 2017: NMED issues draft permit DP-1132
  - Public Hearing: April 2018
  - August 2018: NMED issues DP-1132
  - June 2019: DP-1132 remanded to NMED for a new hearing
  - August 2019: NMED issues public notice for draft DP-1132

# DP-1132 Permit Application Coverage

- What is covered by DP-1132?
  - All future discharges from the RLWTF to these:
    - ✓ Solar Evaporation Tank System (SET)
    - ✓ Mechanical Evaporation System (MES)
    - ✓ NPDES Permitted Outfall 051
  - Existing Low-Level & TRU treatment at TA-50
  - New WMRM tanks for influent storage
  - New Low-Level Treatment Facility

# DP-1132 Coverage: SET



SET: One Tank, Two Cells

Tank Dimensions: ~500 ft long, ~70 ft wide

Tank Capacity: ~760,000 gal @ 3 ft deep

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# DP-1132 Coverage: MES



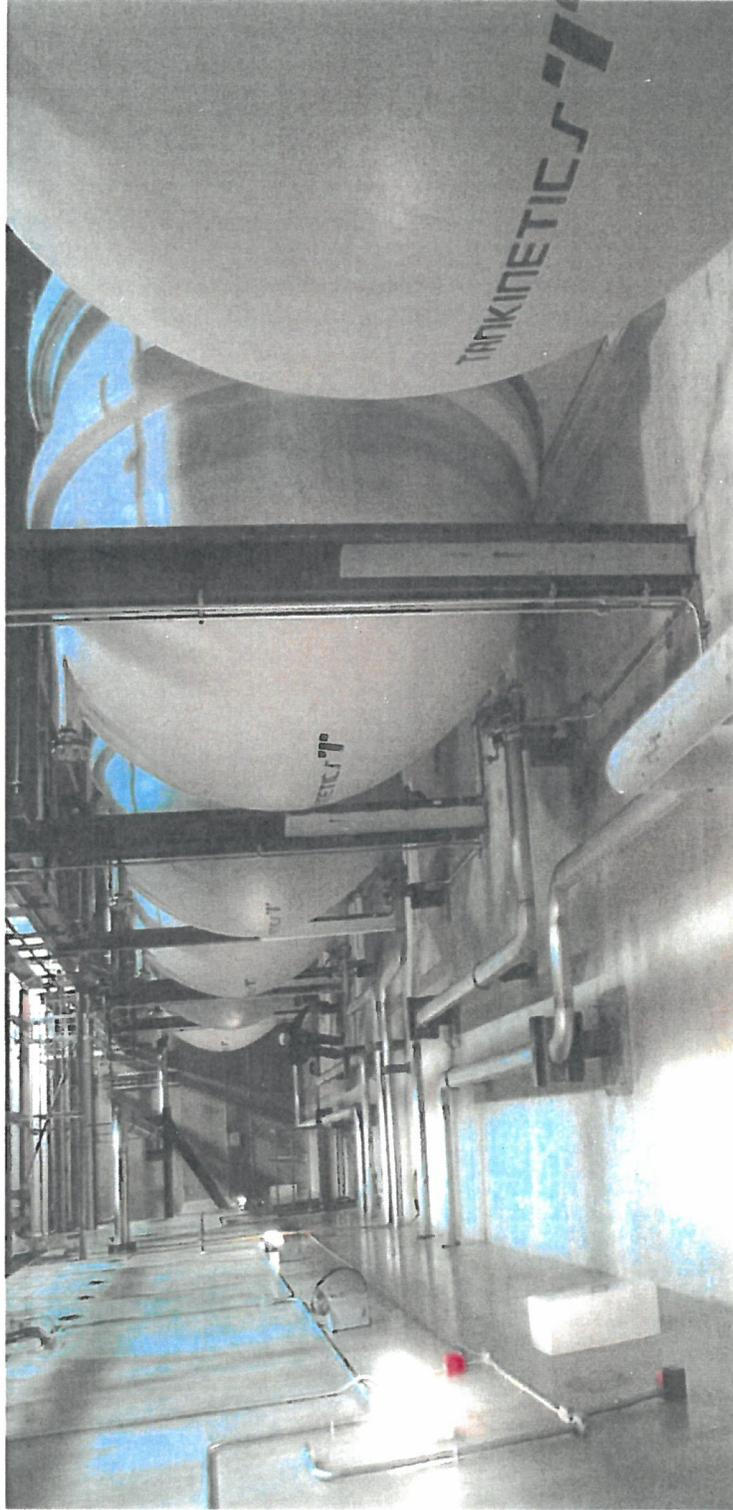
MES: Natural gas-fired mechanical evaporator

# DP-1132 Coverage: NPDES Outfall 051



NPDES Outfall 051 in Effluent Canyon (a tributary to Mortandad Canyon)

# DP-1132 Coverage: WMRM Facility



WMRM Tanks: 6 influent storage tanks, 50,000 gal each

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Slide 8

Los Alamos  
NATIONAL LABORATORY  
EST. 1943

MSA

## DP-1132: NMED Permitting Activity: 2012-2019

- New application submitted in February 2012
- Approximately 25 technical meetings in 56 months
- Approximately 6 meetings w/ NGOs in 22 months to negotiate draft permit conditions
- Multiple draft permits for NGOs & LANL review
- Multiple tours of the RLWTF by NMED
- RLWTF tour by ~10 individuals from NGOs
- Final draft permit for Public Notice (PN2): May 2017
- Reissuance of PN2: March 2018
- Public hearing: April 19, 2018
- Permit issued by NMED: August 2018
- June 2019: DP-1132 remanded to NMED for a new hearing
- August 2019: NMED issues public notice for draft DP-1132

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# DP-1132: Substantial Changes to the Draft Permit Prompted by NGO Participation

- LANL Electronic Reading Room posting requirements
- More rigorous discharge flow meter accuracy
- Adding 'Calibration' definition to the draft permit
- Soil moisture monitoring baseline prior to using SET
- Action Level for the Soil Moisture Monitoring System
- Two new alluvial wells in Mortandad Canyon
- Developed detailed Closure Plan to facilitate public input

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Slide 10

Los Alamos  
NATIONAL LABORATORY  
EST. 1943

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# DP-1132: Draft Permit Approves New Systems and is Protective of Groundwater

- New WMRM tanks for influent storage
- New Solar Evaporative Tank System (SET)
- New SET Soil Moisture Monitoring System
- New water tightness testing requirements
- New flow meters installed
- New reverse osmosis (RO) treatment unit installed
- New alluvial groundwater monitoring wells
- Routine monitoring at groundwater wells, SET, MES and Outfall
- Operational Plan requirements for discharges
- Extensive Engineering and Administrative Controls
- Annual updates to the Closure Plan

# Newly Proposed Changes to DP-1132

- Three Types of Proposed Changes to DP-1132:
  - ✓ Completion of One-Time Actions
    - Remove conditions if the one-time action is completed
  - ✓ Partial Completion of On-Going Actions
    - Edit conditions to remove completed one-time actions
  - ✓ Updated Information
    - Edit conditions to reflect updated information

**STATE OF NEW MEXICO  
BEFORE THE SECRETARY OF ENVIRONMENT**

**IN THE MATTER OF PROPOSED DISCHARGE  
PERMIT DP-1132 FOR THE RADIOACTIVE  
LIQUID WASTE TREATMENT FACILITY AT  
LOS ALAMOS NATIONAL LABORATORY,  
LOS ALAMOS, NEW MEXICO**

**No. GWB 19-24(P)**

**PRE-FILED TECHNICAL TESTIMONY OF MR. DANNY KATZMAN,  
A WITNESS ON BEHALF OF TRIAD NATIONAL SECURITY, LLC**

**1 I. Introduction to My Testimony**

**2**

**3**

My name is Danny Katzman. I am testifying as an expert witness in support of the New Mexico Environment Department's ("NMED") draft discharge permit 1132 ("Draft DP-1132") in this proceeding. This testimony begins with an overview of my credentials. I will then go on to discuss NMED's proposed groundwater monitoring at Los Alamos National Laboratory ("LANL") that is set forth in Draft DP-1132. I will specifically explain the complex hydrogeologic setting at LANL, the adequacy of the proposed groundwater monitoring under Draft DP-1132, the quality of the monitoring wells that are proposed to be used for groundwater monitoring under Draft DP-1132, and finally will provide some information about pre-existing conditions at LANL that are relevant to Draft DP-1132.

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I fully understand the importance of sound and appropriate monitoring requirements of a discharge permit, especially with respect to environmental protection. I served as LANL's technical lead for discussions of monitoring requirements that are included in Draft DP-1132, and am intimately familiar with the hydrogeologic setting that provides the basis for the monitoring configuration and approach in the draft permit. Based on this knowledge and expertise and for the reasons set forth in my testimony, Draft DP-1132 is protective of groundwater and should be approved.

19 **II. Statement of My Qualifications and Relevant Experience.**

20 My Resume is attached as Triad/DOE Exhibit 12. I received a Bachelor of Science degree  
21 in geology from the University of Texas in Austin in 1985 and a Master of Science in geology,  
22 with honors, from the University of New Mexico in 1991. I have twenty-seven years of experience  
23 working with multidisciplinary teams implementing innovative environmental site investigations  
24 and remediation. My focus since 2004 has been on groundwater characterization, investigations  
25 and monitoring, fate and transport analysis, conceptual model development, geomorphic and  
26 geologic studies, development of innovative analytical techniques for expedited field  
27 characterization and remediation, decision analysis, and waste management.

28 I have extensive experience working as a hydrogeologist. I worked at the NMED from 1991-  
29 1993. In my two years at the NMED, my responsibilities included groundwater-related regulatory  
30 work, primarily at LANL. I then worked as a consultant to LANL's environmental program from  
31 1993-1998 as a senior geologist. I began working as a LANL employee in 1998, and my work  
32 was focused primarily on groundwater issues since 2004. I retired from LANL in 2018 during the  
33 transition of the environmental cleanup mission from the LANL subcontractor, Las Alamos  
34 National Security, LLC, to the new cleanup subcontractor, N3B. I am an employee of Sealaska  
35 Technical Services which is part of N3B's critical subcontractor team known as Tech 2 Solutions.

36 My current title is Groundwater Remediation Manager. My current responsibilities include  
37 lead for groundwater characterization and development of remedial approaches for groundwater  
38 contamination. In this capacity, I have been closely involved with NMED on the development of  
39 the monitoring requirements in two separate discharge permits that are integral to LANL's  
40 technical strategy for mitigation of the chromium plume beneath LANL. I have extensive

41 experience with regulatory compliance at LANL, and am very familiar with New Mexico rules  
42 and regulatory programs related to groundwater protection, including discharge permits.

43 **III. Hydrogeologic Setting for Groundwater Monitoring at LANL**

44 **A. Groundwater Occurrences**

45 i. Overview of Groundwater at LANL

46 In order to understand the proposed permit requirements set forth in Draft DP-1132, it is  
47 essential to understand the complex hydrogeology that exists at LANL. This section of my  
48 testimony is intended to provide an overview of groundwater occurrences at LANL. I would like  
49 to clarify that when I refer to groundwater in my testimony, I am simply referring to water that is  
50 beneath the ground surface, and am not using the term as it is defined by the NMED ground and  
51 surface water regulations. *See* 20.6.2.7.Z NMAC (which defines “ground water” as “interstitial  
52 water which occurs in saturated earth material and which is capable of entering a well in sufficient  
53 amounts to be utilized as a water supply”).

54 There are three depths of groundwater occurrences that are present beneath LANL (Figure  
55 1). I refer to the groundwater occurrence nearest to the ground surface as alluvial groundwater.  
56 When alluvial groundwater is present, it occurs at the bottom of canyons. Sources of alluvial  
57 groundwater can include natural runoff from the mountains to the west of LANL and mesas within  
58 LANL property and, in some cases, permitted effluent associated with LANL operations. Alluvial  
59 groundwater fills loose sand and gravel, is generally only a few feet below ground surface, and  
60 most often is only a few feet thick (Figure 1). Alluvial groundwater sits “perched” on underlying  
61 bedrock, because the bedrock has lower permeability than the overlying alluvium. Alluvial  
62 groundwater can percolate downward into underlying bedrock where conditions are favorable,  
63 including along canyon reaches with fault-related fractures, or into bedrock layers with sufficiently

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64 high permeability to allow water to infiltrate. Alluvial groundwater is sometimes present in  
65 “Effluent Canyon” at the location of NPDES Outfall 051, which was historically a source of  
66 recharge to alluvial groundwater. Alluvial groundwater flow at LANL is downcanyon (to the east),  
67 because the canyon floors slope to the east causing the groundwater to flow in that direction.

68 The next groundwater occurrence from the ground surface is called perched-intermediate  
69 groundwater (Figure 1). Where present, it generally occurs beneath canyons that have persistently  
70 large amounts of surface water and alluvial groundwater. Occurrences of perched-intermediate  
71 groundwater also rely on the presence of geologic layers at depth with relatively low permeability  
72 causing infiltrating alluvial groundwater to collect (perch) on and within the low-permeability  
73 layers. Groundwater flow directions within the perched-intermediate groundwater can be in any  
74 direction and are generally governed by the slope of the perching layer(s). Depths of perched-  
75 intermediate groundwater vary widely across LANL, but are generally several hundred feet below  
76 the ground surface. Drilling that has been conducted across LANL indicates that the perched-  
77 groundwater is of limited lateral extent and occurs as stair-step like groundwater zones that may  
78 interconnect vertically where perched water “spills” off the edge of laterally discontinuous  
79 perching layers or infiltrates through fractures. Drilling conducted in the area near the Radioactive  
80 Liquid Waste Treatment Facility (“RLWTF”) has not identified the presence of perched-  
81 intermediate groundwater, although it is present in the subsurface approximately two miles  
82 downcanyon of the facility and NPDES Outfall 051.

83 The deepest of the three groundwater occurrences is referred to as the regional aquifer  
84 (Figure 1). The regional aquifer constitutes the large groundwater zone that is the source of water  
85 supply for Los Alamos County (“LAC”) and LANL. The depth of the regional aquifer below  
86 ground surface ranges from greater than 1400 feet in the western portion of LANL to less than 800

87 feet below ground surface east of LANL. Groundwater flow is generally from west to east and  
88 southeast, but can have local-scale variability depending on recharge areas and orientation of the  
89 sedimentary layers that make up the regional aquifer. Many of LAC’s water-supply wells are  
90 located within the LANL boundary. LAC operates its water-supply wells and distribution and  
91 treatment systems. The nearest water supply well to the RLWTF, specifically the mechanical  
92 evaporation system (“MES”) area, is PM-5, and it is approximately one mile downgradient from  
93 the RLWTF/MES area, and approximately two-thirds of a mile downgradient from the  
94 RLWTF/solar evaporation tank (“SET”).

95 **B. Hydrology of Groundwater Occurrences at Proposed Discharge Points**

96 The time for water and soluble contaminants to travel from the alluvial groundwater to the  
97 regional aquifer varies widely across the LANL area. Beneath wet canyons, where alluvial  
98 groundwater and perched-intermediate groundwater are present and persistent, travel times for  
99 water, and associated dissolved constituents, to the regional aquifer may be as short as  
100 approximately 5-10 years. Beneath dry canyons and dry mesas, travel times are at least several  
101 hundred years (Birdsell, et al., 2005). Mesa-top areas that are often wet because of disturbances,  
102 such as basins or impoundments, could have travel times to the regional aquifer similar to the  
103 travel times beneath wet canyons.

104 Effluent Canyon, where NPDES Outfall 051 is located, was historically a wet canyon  
105 largely because of historical discharges from Outfall 051. Effluent Canyon has its headwaters on  
106 the Pajarito Plateau, within LANL property, where there is very little natural continuous runoff.  
107 Periodically there is sufficient runoff from rainfall and snowmelt from surrounding paved areas to  
108 create alluvial groundwater that can extend several kilometers downcanyon during particularly wet

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109 periods and/or periods of frequent effluent releases, such as those historically associated with  
110 Outfall 051 and discharges from a cooling tower at TA-55, NPDES Outfall 03A181.

111 The mesa-top area where the RLWTF and the MES are located is considered a dry location.  
112 Although the RLWTF/MES area constitutes a disturbed area, there are no facilities or conditions  
113 where water will be impounded and come in direct contact with underlying disturbed ground and  
114 allow for infiltration of groundwater. Additionally, as I discuss later in my testimony, all facilities  
115 in the RLWTF/MES will incorporate engineering controls that do not allow for infiltration to  
116 occur. Furthermore, administrative controls will ensure that accidental releases are caught with  
117 early detection and stopped before infiltration to groundwater could occur.

118 Unlike the RLWTF/MES area, the SET area is a good example of a disturbed area where  
119 water impoundment under this permit could potentially result in enhanced infiltration rates more  
120 similar to the wet canyons described above, if impoundment led to a long-term undetected release.  
121 As described above, typically the hydrology of a dry mesa setting is such that infiltration to deep  
122 groundwater zones would be unlikely or take several hundred years. However, under the unlikely  
123 scenario of a long-term undetected release, infiltration to deep groundwater would be more feasible  
124 and would also occur over much shorter timeframes than from a typical dry mesa setting. As I  
125 discuss later in my testimony, pursuant to the conditions of Draft DP-1132, LANL will incorporate  
126 engineering controls at the SET that will not allow for infiltration to occur. Furthermore,  
127 administrative controls will ensure that accidental releases are caught with early detection and  
128 stopped before they can infiltrate to groundwater.

129 **IV. Proposed Groundwater Monitoring in Draft DP-1132**

130 The following portion of my testimony details the groundwater monitoring strategy  
131 associated with each discharge point identified in Draft DP-1132.

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132 Draft DP-1132 proposes a comprehensive groundwater monitoring plan, which includes  
133 monitoring systems, a set of monitoring wells and associated monitoring strategies. The  
134 monitoring approach outlined in Draft DP-1132 is specifically designed to support early-detection,  
135 which includes early detection of a noncompliant discharge as well as early detection of  
136 environmental impacts that may result from a noncompliant discharge. The approach provides a  
137 defense-in-depth strategy, where groundwater monitoring is conducted to ensure that groundwater  
138 and environmental protection is achieved.

139 Figures 2 and 3 show the monitoring network set forth in Draft DP-1132. Figure 2 shows  
140 the monitoring wells in “map view”, and Figure 3 shows the wells on a cross section that illustrates  
141 the geology that exists beneath and around the RLWTF. The geology represented in Figure 3 is  
142 interpreted from geologic data collected from numerous boreholes and wells near and surrounding  
143 the RLWTF, and is based on decades of geologic studies conducted by LANL and contractor staff,  
144 including early drilling conducted by the United States Geologic Survey.

145 **A. NPDES Outfall 051**

146 i. Monitoring Wells

147 NPDES Outfall 051 discharges into Effluent Canyon just north of the RLWTF. Draft DP-  
148 1132, Condition 33 (removed in Triad/DOE Exhibit 9), requires the installation of two new alluvial  
149 groundwater monitoring wells in the canyon downgradient of the outfall. The two new alluvial  
150 wells have been drilled and are currently being monitored. LANL submitted a work plan to  
151 NMED’s Ground Water Quality Bureau for approval prior to well installation.

152 The locations of these two new alluvial groundwater monitoring wells are downgradient of  
153 Outfall 051 and are shown in Figures 2 and 3. These wells will allow LANL to detect any  
154 discharges from Outfall 051 that are not compliant with DP-1132’s effluent limitations. In the

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155 event that a noncompliant release occurs at Outfall 051, the data from the alluvial wells will be  
156 used to determine if the release creates a measurable environmental impact in downcanyon alluvial  
157 groundwater.

158 The draft permit also includes a downgradient perched-intermediate groundwater  
159 monitoring well, MCOI-6, that provides an additional monitoring point to assess a potential  
160 noncompliant release from Outfall 051. Monitoring well MCOI-6 is located in the perched-  
161 intermediate groundwater zone that is known to be along the flow path between the alluvial  
162 groundwater and the regional aquifer (LANL, 2006). The regional groundwater monitoring wells  
163 in the permit were neither identified for early detection, nor expected to provide early detection.  
164 As described earlier, transport of soluble contaminants from the alluvial system to the perched-  
165 intermediate groundwater would likely take several years to manifest, if at all.

166 As I will describe in later testimony, contamination is known to be present in the alluvial  
167 groundwater in Effluent Canyon, in downgradient Mortandad Canyon, and in the perched-  
168 intermediate groundwater beneath Mortandad Canyon associated, in part, with past releases from  
169 Outfall 051. Draft DP-1132 is not intended to address this legacy contamination and only  
170 addresses any potential future noncompliant discharges, as provided by Draft DP-1132, Condition  
171 37 (Condition 35, Triad/DOE Exhibit 9). Accordingly, pursuant to the draft permit conditions, any  
172 potential new release would have to be carefully assessed to determine whether the new release  
173 creates a discernable change to pre-existing conditions in the alluvial groundwater and perched-  
174 intermediate groundwater. *See* Draft DP-1132, Condition 37 (Condition 35, Triad/DOE Exhibit 9).

175 ii. Monitoring Frequency and Suite

176 The alluvial groundwater monitoring wells have been, and will continue to be, sampled  
177 quarterly for the following constituents: total Kjehldal nitrogen (TKN), nitrate, total dissolved

178 solids, chloride, perchlorate, and fluoride. *See* Draft DP-1132, Condition 36 (Condition 34,  
179 Triad/DOE Exhibit 9). Annually, the suite also includes a “full suite” of constituents that includes  
180 a large list of organic compounds, metals, and general inorganic compounds. *See* Draft DP-1132,  
181 Condition 36 (Condition 34, Triad/DOE Exhibit 9). The full suite is determined pursuant to  
182 regulatory standards set forth in 20.6.2.3103 NMAC and 20.6.2.7 NMAC. This proposed  
183 monitoring regime is a supplement to the direct monitoring of Outfall 051, when in use. The  
184 proposed monitoring frequency and suite provides a strong foundation for determining whether an  
185 unauthorized discharge has occurred and for determining whether any unauthorized discharge  
186 would manifest as a measurable impact to the alluvial groundwater downgradient of Outfall 051.

187 **B. Solar Evaporation Tanks (“SET”)**

188 i. Monitoring System

189 Draft DP-1132 sets forth a comprehensive monitoring system for the SET. The draft permit  
190 required Triad to submit a work plan proposing a moisture monitoring approach for monitoring  
191 potential leaks beneath the SET. *See* Draft DP-1132, Condition 30 (Condition 29, Triad/DOE  
192 Exhibit 9). Triad submitted the work plan for the SET, which NMED approved and Triad installed  
193 at the SET. As a result, baseline soil moisture monitoring is in progress. This moisture monitoring  
194 approach is an additional way of monitoring for releases.

195 Draft DP-1132 also requires leak detection within the SET, which is already in place. *See*  
196 Draft DP-1132, Condition 31 (Condition 30, Triad/DOE Exhibit 9). The concept behind moisture  
197 monitoring beneath the SET is to provide a means for early detection of a “wetting front” that may  
198 form and advance downward beneath the tanks. This type of monitoring is in place in the event  
199 that a leak occurs and is not detected by leak-detection systems in the SET. The moisture  
200 monitoring is being conducted in a series of borings angled beneath the SET. The monitoring will

201 be able to detect small increases in moisture content within the rock layers beneath the SET. Triad  
202 submitted a work plan for the moisture monitoring system (including number of borings,  
203 monitoring frequency, etc.) for approval to NMED, which NMED approved and Triad installed.

204 This redundant monitoring approach for the SET ensures groundwater protection. As  
205 described earlier in my testimony, if an unauthorized release from the SET were to reach the  
206 regional aquifer, it would be expected to be decades before it would do so (if it were to reach the  
207 regional aquifer at all). Monitoring using the above-described moisture monitoring system will  
208 provide detection within months to years, if the release were sufficient to develop into a  
209 recognizable wetting front.

210 **C. Mechanical Evaporation System (“MES”)**

211 i. Monitoring Wells

212 Draft DP-1132 sets forth groundwater monitoring for the MES, at the main RWLTF,  
213 through the use of four regional aquifer monitoring wells located downgradient of the facility. *See*  
214 Draft DP-1132, Condition 36 (Condition 34, Triad/DOE Exhibit 9). The wells serve as “belts-and-  
215 suspenders” monitoring, which provides an additional defense-in-depth to the extensive  
216 engineering and administrative controls that will be in place for the MES, including volumetrically  
217 significant secondary containment and operational alarms for various leak-related triggers. As  
218 described earlier in my testimony, the location of the facility, on a dry mesa, is such that any  
219 unauthorized releases that were not somehow captured or detected by the engineering and  
220 administrative controls would potentially take decades or longer to reach the regional aquifer, if at  
221 all. Such releases would be subject to corrective actions under Draft DP-1132, Condition 37  
222 (Condition 35, Triad/DOE Exhibit 9). The regional groundwater monitoring wells in the permit  
223 were neither identified for early detection, nor expected to provide early detection.

224           ii.       Monitoring Frequency and Suite

225           The regional aquifer monitoring wells have and will be sampled annually for a “full suite”  
226 of constituents that include a large list of organic compounds, metals, and general inorganic  
227 compounds, including perchlorate. *See* Draft DP-1132, Condition 36 (Condition 34, Triad/DOE  
228 Exhibit 9). The full suite is determined pursuant to the requirements set forth at 20.6.2.3103  
229 NMAC and 20.6.2.7 NMAC. The proposed frequency is appropriate for the regional aquifer given  
230 the extremely long travel times for a potential release and contaminant to reach the aquifer.

231 **V.       Quality Of Monitoring Wells**

232           Existing groundwater monitoring wells are all constructed in accordance with NMED  
233 construction and design guidelines. These guidelines address monitoring-well attributes such as  
234 well diameter, well materials, and the type and width of construction materials surrounding the  
235 well. The new alluvial groundwater monitoring wells are also constructed in accordance with an  
236 NMED-approved work plan, and in accordance with NMED’s construction guidelines. *See* Draft  
237 DP-1132, Condition 33 (removed in Triad/DOE Exhibit 9). Groundwater samples have and will  
238 be collected under strict industry-standard protocols that ensure that the data from samples are  
239 representative of the groundwater conditions in the aquifer surrounding the well. These protocols  
240 involve purging sufficient water from the well and aquifer and collection of real-time field data of  
241 water quality (e.g., dissolved oxygen and pH) to guide sample collection.

242 **VI.       Draft DP-1132 Requirements for Exceedances**

243           Draft DP-1132 requires monitoring of treated water for each of the three discharge points  
244 (Outfall 051, SET, and MES). Treatment at RLWTF occurs at batch scale and can be distributed  
245 to any of the three permitted discharge points with valving that exists between the treated-water  
246 container and the piping to each of the three discharge points. In practice, monitoring for each of

247 the three discharge points will be conducted from a single port. Draft DP-1132 Condition 37  
248 (Condition 35, Triad/DOE Exhibit 9) provides that if a future exceedance is identified from  
249 compliance sampling of treated water and if a groundwater quality standard is exceeded in one or  
250 more of the monitoring wells in the permit due to a future unauthorized discharge from Outfall  
251 051, the SET or the MES, the NMED may determine that an investigation work plan is required.  
252 Again, Draft DP-1132 only contemplates regulation of future noncompliant discharges and is not  
253 intended to regulate pre-existing groundwater conditions at LANL. *See* Draft DP-1132, Condition  
254 37 (Condition 35, Triad/DOE Exhibit 9).

255 **VII. Pre-Existing Groundwater Conditions**

256 All three groundwater zones that will be monitored under the draft discharge permit  
257 currently have contamination (e.g., nitrate) present, including some constituents that are associated  
258 with past releases from Outfall 051. The RLWTF permit, Draft DP-1132, is forward-looking,  
259 meaning that it only addresses potential new releases from the permitted facilities (MES, Outfall  
260 051, and SET). *See* Draft DP-1132, Condition 37 (Condition 35, Triad/DOE Exhibit 9).  
261 Monitoring at the existing and proposed new wells under the proposed permit will provide a  
262 baseline understanding of the pre-existing conditions so that a future potential noncompliant  
263 discharge can be more accurately discerned using monitoring data.

264 Existing contamination from past releases related to the RLWTF is being addressed under  
265 a separate regulatory framework, the Consent Order dated June 2016. It is important to recognize  
266 and understand that the Consent Order is not tied to and is completely distinct from Draft DP-  
267 1132. Under the Consent Order, investigations and remediation are typically conducted for groups  
268 of solid waste management units (“SWMUs”) within “aggregate areas.” The investigation and  
269 remediation of SWMUs is based on conditions at the site, and prioritization is negotiated with the

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270 NMED on an annual basis following a process in the Consent Order. Outfall 051, which is SWMU  
271 number 50-006(d), is part of a group of SWMUs within what is called the Upper Mortandad  
272 Canyon Aggregate. The Consent Order places SWMUs like Outfall 051 that are active operational  
273 facilities into a deferred status. Deferred status sites will be brought into the investigation and  
274 remediation mode once active operations are terminated. Seven facilities at RLWTF are SWMUs.  
275 Accordingly, remediation of existing contamination at Outfall 051 and all other SWMUs will be  
276 conducted in accordance with the Consent Order. *See* Draft DP-1132, Condition 46 (Condition 43,  
277 Triad/DOE Exhibit 9).

278 **VIII. Conclusion**

279 In conclusion, the groundwater monitoring requirements proposed in Draft DP-1132 are  
280 robust and provide defense-in-depth as a redundant approach to monitoring. They are an additional  
281 monitoring safeguard to the extensive and protective engineered and administrative controls that  
282 are also proposed in the draft discharge permit. The monitoring strategy recognizes and is tailored  
283 to the complex hydrogeologic setting at LANL. The strategy ensures that early detection can be  
284 achieved, and that the extent of impact from any noncompliant discharges can be adequately  
285 assessed.

286

287 This concludes my direct testimony in this matter.

FIGURES

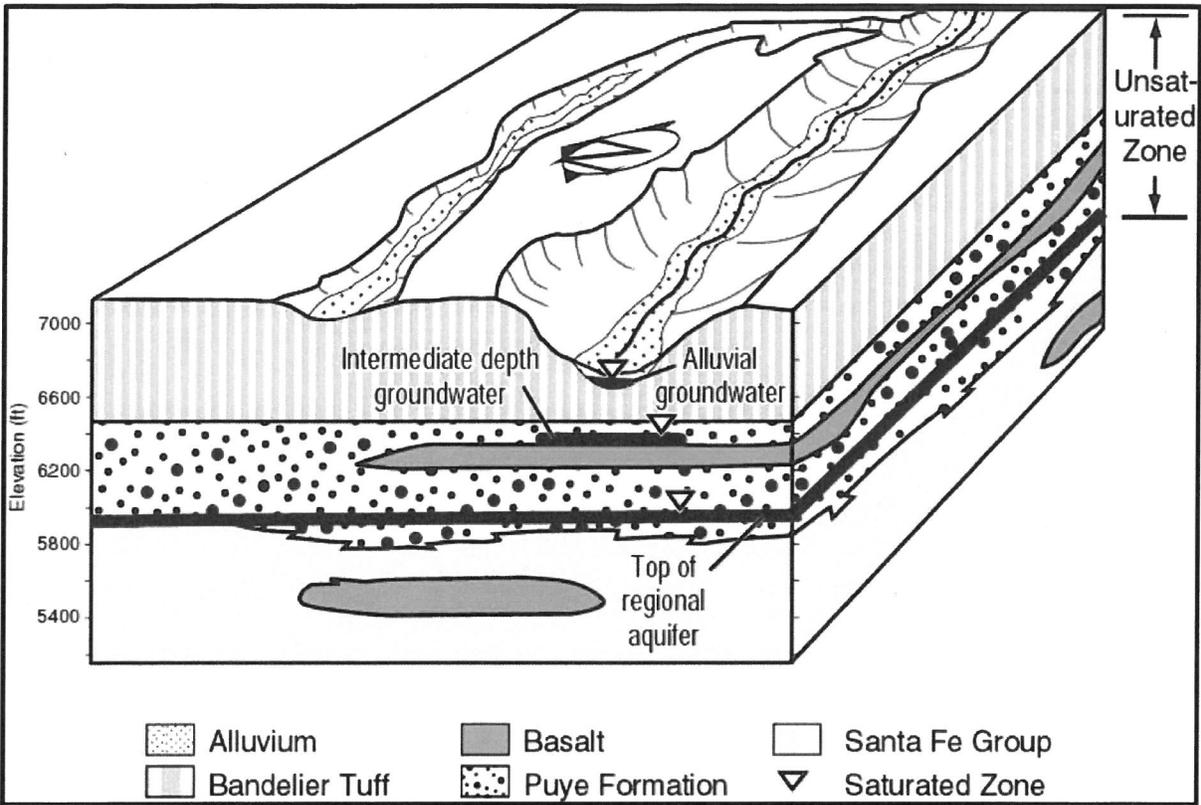


Figure 1. Simplified diagram of the subsurface hydrogeology beneath Los Alamos National Laboratory. Three groundwater zones are depicted: alluvial, perched-intermediate, and regional.

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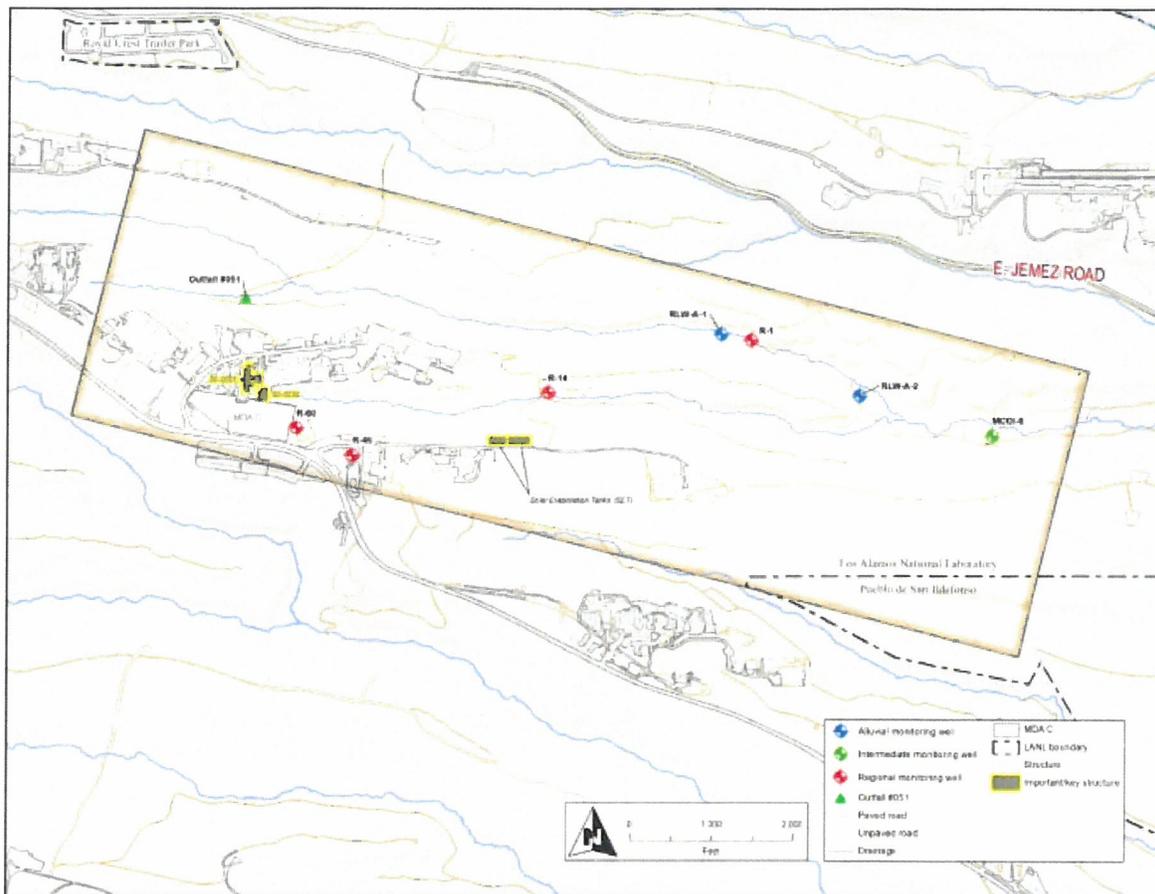


Figure 2. Map view showing the three RLWTF facilities (MES, Outfall 051, and SET) subject to DP-1132 and the groundwater monitoring network included in the draft permit. The MES is located with the building labeled 50-0001. The groundwater monitoring network consists of two alluvial wells, one existing perched-intermediate well, and four existing regional aquifer wells.

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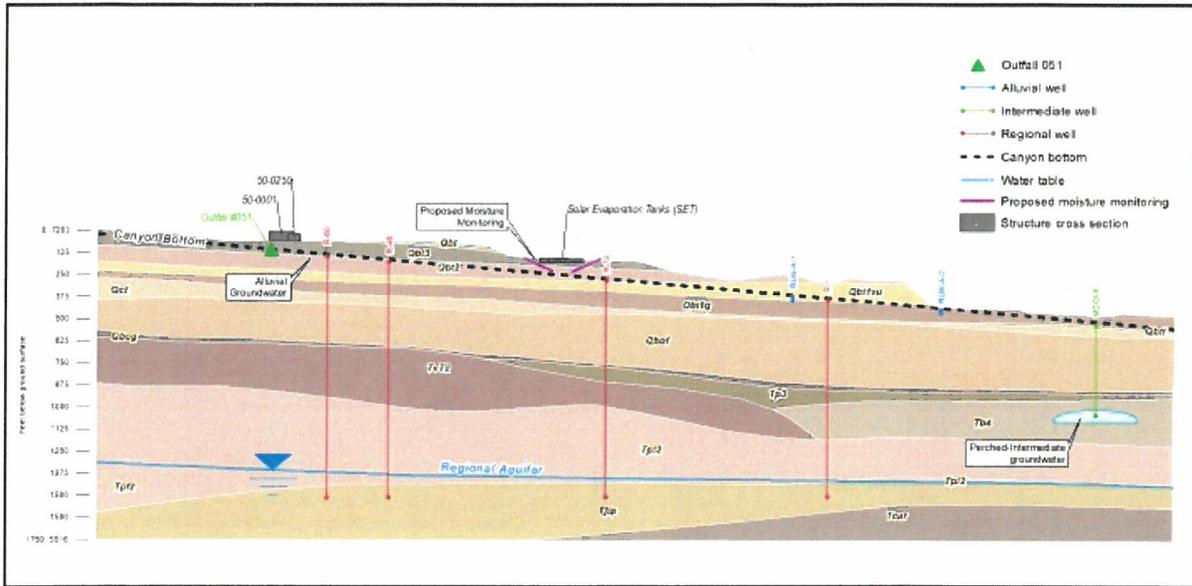


Figure 3. Cross section showing the geology and groundwater occurrences in related to the RLWT facilities.

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- Birdsell, Kay H., Newman, Brent, D., Broxton, Dave E., and Robinson, Bruce A., 2005. “Conceptual Models of Vadose Zone Flow and Transport beneath the Pajarito Plateau, Los Alamos, New Mexico”, in Vadose Zone Journal, A Special Section of Vadose Zone Journal, August 2005, V.4, Issue 3.
- LANL (Los Alamos National Laboratory), 2006. “Mortandad Canyon Investigation Report,” Los Alamos National Laboratory document LA-UR-06-6752, Los Alamos, New Mexico. (LANL 2006, 094161).

**Danny Katzman**  
**Sealaska Technical Services**  
**Los Alamos, New Mexico 87544**  
**505 309-1371**

**EDUCATION**      M.S., Geology (Honors), University of New Mexico, 1991  
                         B.S., Geology, University of Texas, 1985

**OVERVIEW OF  
EXPERIENCE**

I have 27 years of experience working with multidisciplinary teams implementing innovative environmental site investigations and remediation. My focus has been on groundwater investigations, groundwater program development and management, fate and transport analysis, conceptual model development, remediation, geomorphic and geologic studies, development of innovative analytical techniques for expedited field characterization and remediation, decision analysis, waste management, and EVMS baseline management. I have a strong track record of successfully providing short-term and long-term vision for strategic project implementation and completion. I also function as a lead interface for routine and complex regulatory negotiations, client (DOE) support, Pueblo relations, and Program Office representative for media inquiries, public meetings, tours, and outreach.

During two years with the New Mexico Environment Department, performed technical and regulatory review of facility groundwater programs and RFI Work Plans and Reports and served as key technical and programmatic contact for the Environmental Restoration Programs at Los Alamos and Sandia National Laboratories. Represented NMED on key technical issues with the USEPA Region VI.

**SPECIFIC WORK  
HISTORY**

**Sealaska Technical Services (2018 – Present)**  
**Water Programs and RCRA Remediation**

**Groundwater Remediation Manager.** Responsibilities include project management, regulatory compliance, groundwater characterization and assessment, and development of remedial approaches for groundwater contamination.

**Los Alamos National Laboratory (1998 - 2018)**  
**Los Alamos National Laboratory Environmental Restoration Project**

**Lead Scientist** for LANL's Environmental Management Division (ADEM) - Environmental Restoration Program Office. Responsibilities include technical program management and guidance, regulatory strategy, customer interface, and oversight for groundwater and soils investigations across the Program. Emphasis is on investigation and development of remedial alternatives strategies for chromium and RDX contamination in groundwater, and interim mitigation of the chromium plume. This also involves leadership of multi-agency (LANL, NMED, DOE) technical working groups for the chromium and RDX projects, and substantial effort on outreach to public and stakeholder groups and DOE Headquarters. The Lead Scientist role also involves development of programmatic direction on data assessment and data management protocols and automated tools to support assessments. Additional responsibilities include representing ADEM on the LANL's Environmental Sampling Board, lead author for the Annual Environmental (Surveillance) Report, and groundwater SME for the current assessment phase of the NRDA case at LANL.

**Group Leader** for the LANL's Environmental Investigations Group within the Environmental Program Directorate's Engineering and Technology Division. This

position involved direct line management of technical resources and the oversight of the technical aspects of site investigations within the LANL Environmental Programs. Emphasis is on technical innovation, integration across the DOE complex, and ensuring consistency in approach particularly within complex vadose zone and groundwater investigations. Key focus areas include groundwater fate and transport in complex hydrogeologic settings, and vadose zone vapor-phase plume characterization.

**Program Manager** for LANL's Water Stewardship Program. Managed a large multidisciplinary technical team and led implementation of multiple complex watershed investigations and associated reports. Also led implementation of a \$50 million drilling program to advance LANL's groundwater monitoring well network.

**Project Leader** for the Canyons Investigations. Managed annual budgets of \$3-6 million, managed and coordinated large technical teams focused on complex watershed-scale assessments of contamination in sediment, surface water, shallow alluvial groundwater, vadose zone, and regional groundwater. The composition of the technical teams included expertise in geology, geochemistry, hydrology, drilling, geomorphology, modeling, and risk assessment. The role also included a substantial component of integration across other related projects including the FFCA storm water program, the Interim Facility-wide groundwater monitoring program, and Material Disposal Areas.

**Team Leader** for Canyons Investigations. Managed annual budgets of \$1-2 million; managed and coordinated subcontractor personnel supporting the LANL team; developed technical and regulatory strategies for Canyons and PRS investigations and reports; prepared work plans, sampling plans, and RFI reports; developed safety plans; managed large data sets; and had extensive interactions with regulators, Indian tribes, and other stakeholders. The focus of the technical work was on watershed-scale systems and risk assessments. Responsibilities also include preparation of statements of work and contract management. Consistently managed projects within budget and on schedule. The role also included working with the negotiation team on the Compliance Order.

Led the development and implementation of a \$5 million/3-year project to characterize potential impacts of the Cerro Grande fire. Key issues pertained to flood transport of legacy contaminants, characterization of potential perturbations to the watershed systems related to elevated concentrations of radiological and non-radiological constituents in ash, and risk assessments. Initiated and participated in an Inter-Agency Flood Risk Assessment Team that included the New Mexico Environment Department, the New Mexico Department of Health, and San Ildefonso Pueblo.

*Recipient of numerous LANL performance awards.*

**Environmental Resources Management, Inc. (1993 - 1998)**  
**Los Alamos National Laboratory Environmental Restoration Project**  
**Senior Project Manager/Senior Geologist**

Provided project management, field team management, and field team leadership for site characterization projects for the Environmental Restoration Project at LANL. Emphasis was on geologic, geomorphic, and hydrogeologic characterization and remediation. Managed up to 18 staff during larger remediation projects.

Demonstrated experience in planning, coordinating, and implementing competitively-bid field characterization and remediation projects at RCRA hazardous and radioactively-contaminated sites. Responsible for regulatory compliance and implementation of field work and waste management under applicable regulations including OSHA standards, LANL procedures and standards, DOE regulations, NMED and EPA regulations, and Department of Transportation regulations.

Worked as a member of multi-disciplinary teams writing and preparing numerous RCRA RFI Plans and Reports, including Voluntary Corrective Action and Interim Action plans and reports. Also served as sole or chief author on numerous regulatory documents, including VCA Plans and Reports and responses to Notices of Deficiency.

Demonstrated success in project management working under budget and schedule constraints while maintaining exceptional quality assurance.

Led and supported numerous geomorphic-based characterization projects.

**New Mexico Environment Department (1991 - 1993)**  
**Santa Fe, NM**  
**Geologist III**

Worked as hydrogeologist responsible for technical and regulatory review of Los Alamos and Sandia National Laboratories Environmental Restoration Projects. Responsible for review of RCRA Facility Investigation Work Plans and Reports for technical adequacy and regulatory compliance. Evaluated groundwater, sediment and surface-water monitoring systems, fault/fracture studies, radionuclide/ sediment transport studies, and site-wide background-concentration studies.

Prepared RFI document reviews that were incorporated into USEPA Region VI Notices of Deficiency and submitted to the DOE and LANL.

Provided technical liaison to the Department of Energy-Los Alamos Area Office, and LANL and Sandia Project Leaders and technical staff. The role included field participation in LANL and Sandia sampling campaigns, and involvement with project managers and technical staff at the facilities on programmatic issues including surface water quality, site characterization plans, geologic and hydrologic characterization pertinent to the Pajarito Plateau, ground-water monitoring waiver applications, closure plans, and site ranking systems.

Provided oversight of the Environmental Surveillance Program and waste management activities at LANL.

**Community Involvement**

- Los Alamos County Environmental Sustainability Board Member
- Volunteer at Los Alamos County public schools

**Publications and References available upon request**

# Draft Discharge Permit 1132

Danny Katzman  
Groundwater Remediation Manager  
Sealaska Technical Services

Public Hearing  
November 14, 2019

18090

UNCLASSIFIED

LA-UR-17-XXXXX



# Qualifications

EDUCATION      M.S., Geology (Honors), University of New Mexico, 1991  
                      B.S., Geology, University of Texas, 1985

Sealaska Technical Services/N3B (2018-Present)

- Groundwater Remediation Manager

Los Alamos National Laboratory Environmental Restoration Project (1998-2018)

- Lead Scientist in Environmental Management Directorate
- Group Leader in the Engineering and Technology Division
- Program Manager for LANL's Water Stewardship Program.
- Project Leader for the Canyons Investigations.
- Team Leader for Canyons Investigations.

Environmental Resources Management, Inc. (1993 - 1998)

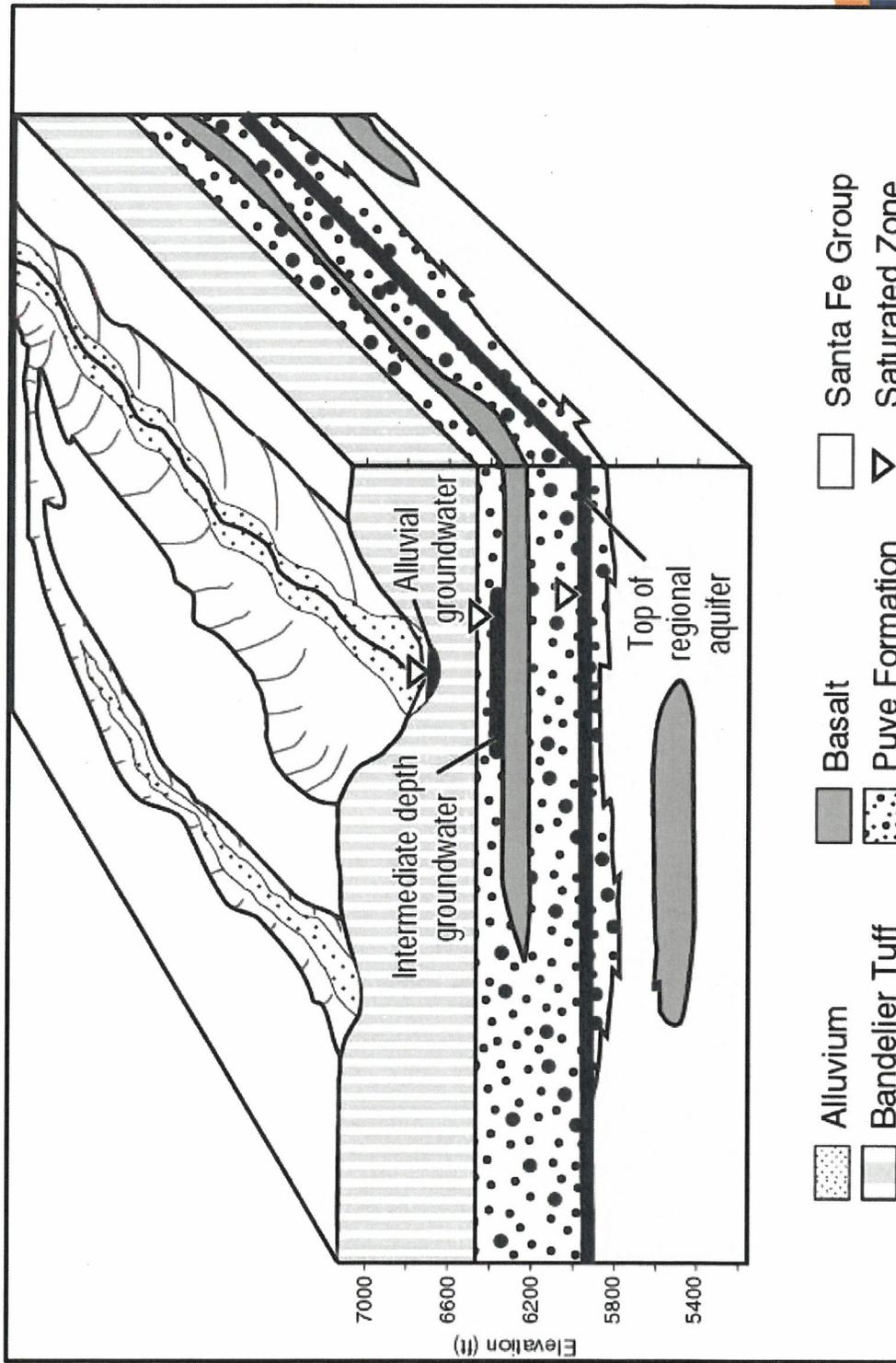
- Senior Project Manager/Senior Geologist

New Mexico Environment Department (1991 - 1993)

# Presentation Overview

- Site hydrogeologic setting
  - Geologic setting
  - Faults and fractures
- Groundwater monitoring for RLWTF
  - Objective
    - ✓ Early detection of any future noncompliant releases
    - ✓ Additional safety net to support extensive administrative and engineering controls
    - ✓ Monitoring to characterize extent of groundwater effected by noncompliant discharge
  - Monitoring well locations
  - Monitoring suite and frequency
  - Quality of wells
  - Defense in depth – groundwater monitoring coupled with use of engineering controls and visual inspections

# General Groundwater Setting



- 3 groundwater zones
- Alluvial
  - Perched-intermediate
  - Regional

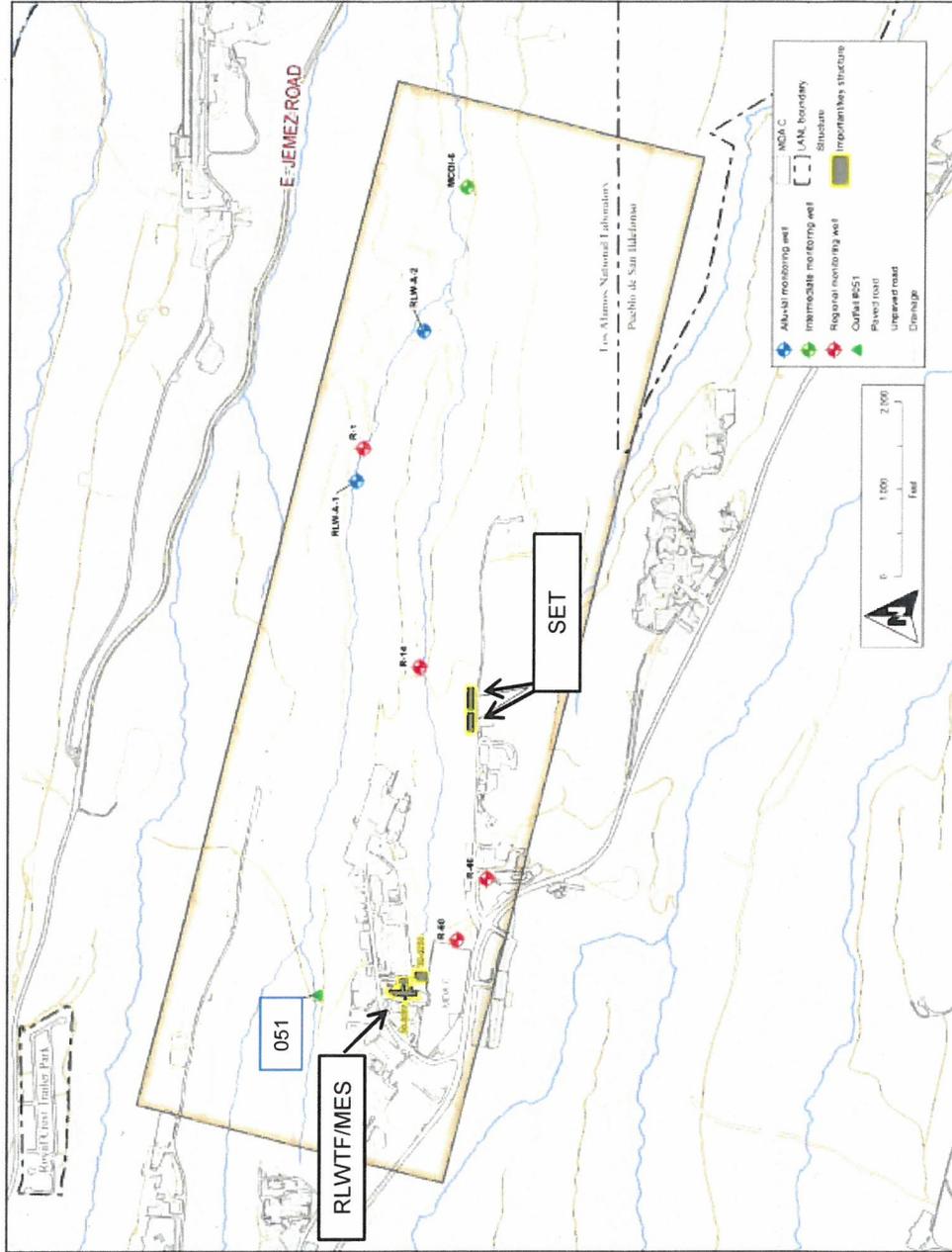
- Contaminant pathway to regional can be complete only under very unique conditions
- Large amount of mobile contaminant
  - Lots of water (millions of gallons)

Slide 4

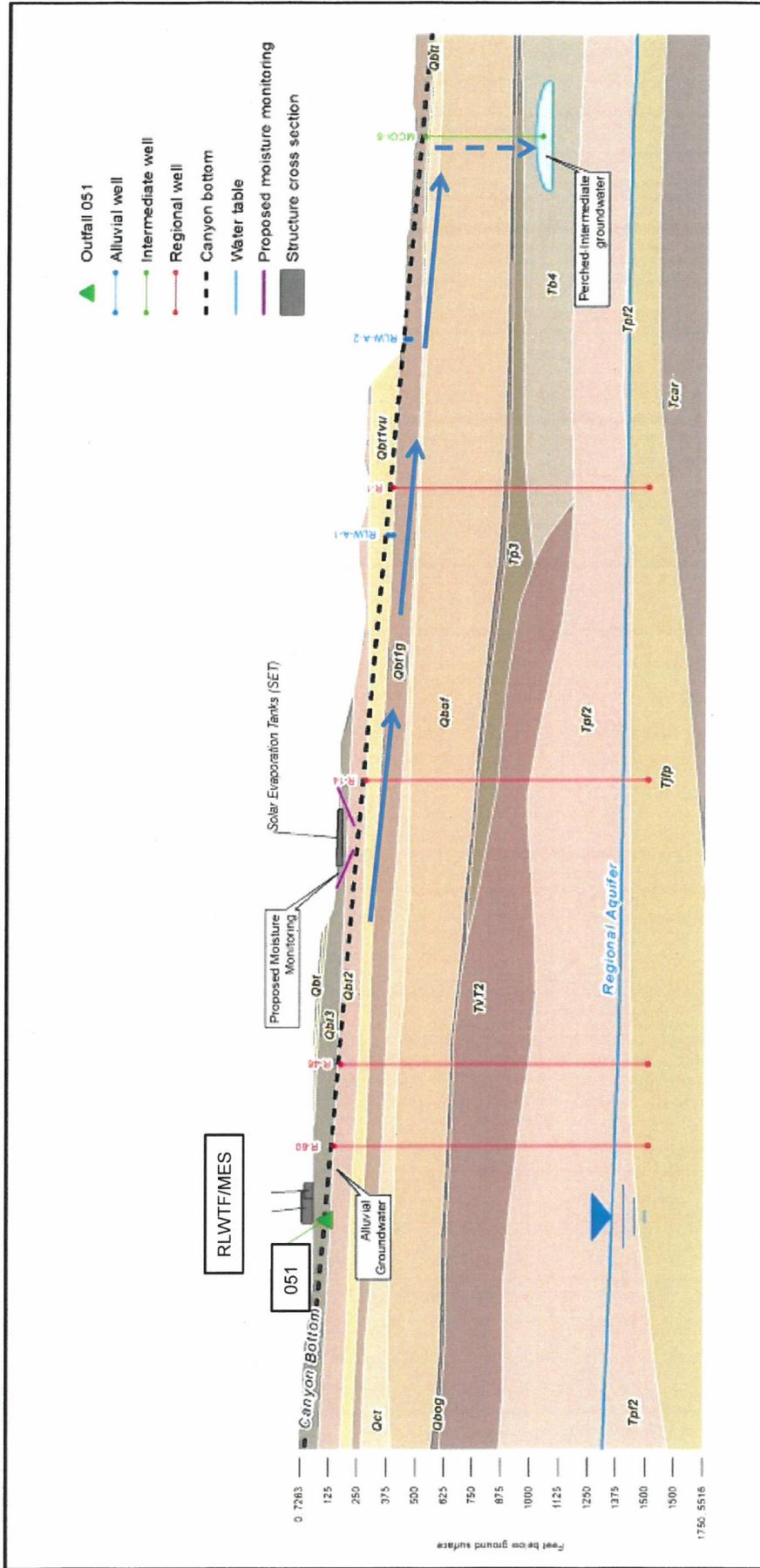
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# Groundwater Monitoring Network

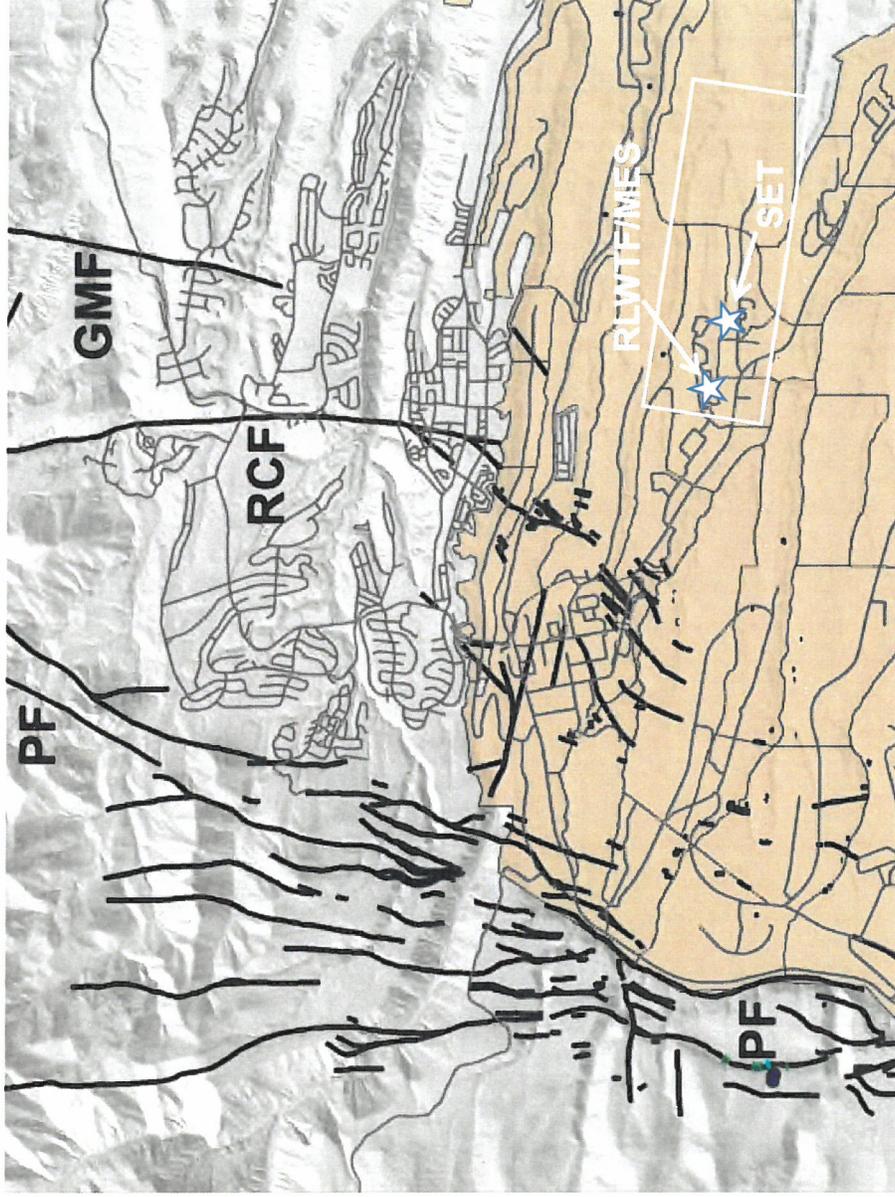
- 2 alluvial wells
- 1 perched-intermediate well (MCOI-6)
- 4 regional aquifer wells (R-60, R-46, R-14, R-1)



# Geology



# Faults and Fractures



- ❖ Faults are mapped for the Laboratory's seismic hazards program
- ❖ No known faults are located near RLWTF and associated facilities

# Groundwater Monitoring

## Groundwater Monitoring Objectives

- Early detection of any future noncompliant releases
- Additional safety net to support extensive administrative and engineering controls
- Monitoring to characterize extent of groundwater affected by noncompliant release
- 2 alluvial wells
  - ✓ Located in watercourse just downstream of RLWTF Outfall 051
  - ✓ Supplement monitoring at outfall for early detection and characterization of extent of potential environmental effect of non-compliant release from outfall
- 1 perched-intermediate well
  - ✓ Supplement monitoring at Outfall 051 and at alluvial wells to characterize extent of potential environmental effect of non-compliant release from Outfall 051
  - ✓ Located in the perched-intermediate groundwater zone beneath Mortandad Canyon, along infiltration pathway to regional aquifer
  - ✓ Environmental effect would still likely take years (greater than 2-3) to manifest in perched zone
- 4 regional aquifer wells
  - ✓ Monitor regional aquifer downgradient of main RLWT facility
  - ✓ Provides additional monitoring “safety net” within the regional aquifer
  - ✓ Environmental effect of release from facility would likely take decades to reach the regional aquifer

# Monitoring Suite and Frequency

- Alluvial and Perched-Intermediate Wells
  - Quarterly
  - TKN, Nitrate, TDS, Chloride, Fluoride, Perchlorate
- All Wells (incl. alluvial, perched, and regional)
  - Annually
  - “Full Suite” of permitted constituents listed in 20.6.2.3103 NMAC and 20.6.2.7

## Robust Monitoring

- ✓ All existing wells in the draft permit meet NMED construction and design guidelines
- ✓ All existing wells in the draft permit produce high-quality, representative data
- ✓ NMED-approved Interim Facility-Wide Groundwater Monitoring Plan recognizes these wells as providing representative data

## Defense in Depth

- ✓ Wells provide robust environmental protection to complement administrative and engineered controls
- ✓ Engineered and administrative controls provide most protective early-warning systems

**STATE OF NEW MEXICO  
BEFORE THE SECRETARY OF ENVIRONMENT**

**IN THE MATTER OF PROPOSED DISCHARGE  
PERMIT DP-1132 FOR THE RADIOACTIVE  
LIQUID WASTE TREATMENT FACILITY AT  
LOS ALAMOS NATIONAL LABORATORY,  
LOS ALAMOS, NEW MEXICO**

**No. GWB 19-24(P)**

**PRE-FILED TECHNICAL TESTIMONY OF MS. KAREN E. ARMIJO,  
A WITNESS ON BEHALF OF THE UNITED STATES DEPARTMENT OF ENERGY**

**1 I. Introduction to My Testimony**

2 My name is Karen E. Armijo. I am testifying on behalf of the United States Department  
3 of Energy (“DOE”) as an expert witness in support of the New Mexico Environment Department’s  
4 (“NMED”) draft discharge permit 1132 (“Draft DP-1132”) in this proceeding. DOE would be a  
5 co-permittee with Triad National Security, LLC (“Triad”) if Draft DP-1132 is issued (Triad and  
6 DOE are collectively referred to herein as “Applicants”). This testimony begins with an overview  
7 of my credentials. I will then go on to respond to public comments received from Communities  
8 for Clean Water (“CCW”) relating to signage in the general vicinity of the Radioactive Liquid  
9 Waste Treatment Facility (“RLWTF”) and the potential involvement of Pueblo representatives on  
10 Los Alamos National Laboratory’s (“LANL”) Emergency Operations Center.

**11 II. Statement of My Qualifications and Relevant Experience**

12 My Resume is attached as Triad/DOE Exhibit 15. I have a Bachelor of Science degree  
13 from New Mexico State University in Environmental Science, with Minors in Environmental  
14 Chemistry and Waste Management. I also have a Masters in Environmental Policy and  
15 Management from the University of Denver.

**TRIAD/DOE EXHIBIT 14**

18101

Direct Testimony of Ms. Karen E. Armijo – Applicants  
Case No. GWB 19-24(P)

16 I am currently employed as Physical Scientist by the National Nuclear Security  
17 Administration (“NNSA”), a semiautonomous agency within DOE, and have served in this  
18 position since May 2016. As a Physical Scientist, I oversee environmental compliance programs  
19 for water quality management and hazardous and radiological waste management. I am a technical  
20 subject matter expert for environmental management, including water resources and waste  
21 management. I also provide contract oversight of Triad’s performance on environmental  
22 compliance. I oversee environmental compliance programs on behalf of DOE, including hazardous  
23 waste management and groundwater discharges. Prior to my current position, I served as a Project  
24 Manager for Environmental Services with JG Management Systems, Inc., a technical and  
25 professional services firm offering services to government and private sector clients nationwide in  
26 a variety of areas such as Nuclear Professional Services, Engineering Design & Analysis,  
27 Environmental Compliance & Management, and Energy Management.

28 Prior to these positions, I have served as an Environmental Scientist for TetraTech, Inc.  
29 TetraTech is a leading provider of consulting and engineering services and supports government  
30 and commercial clients in the areas of water, environment, infrastructure, resource management,  
31 energy, and international development. I have also served in a number of positions with the New  
32 Mexico State Legislature, Molzen-Corbin & Associates, New Mexico State University, Los  
33 Alamos National Laboratory, the New Mexico Environment Department, and numerous research  
34 positions over the course of my professional career.

35 **III. CCW Comments Relating to Multi-Language Signage**

36 In October 2014, there were communications in which CCW requested multi-language  
37 signage downstream of the RLWTF, to include Tewa, the native language of some residents of the  
38 Pueblo of San Ildefonso. *See* Triad/DOE Exhibit 16. The eastern boundary of the Pueblo of San

Direct Testimony of Ms. Karen E. Armijo – Applicants  
Case No. GWB 19-24(P)

39 Ildefonso is approximately three miles to the west of the western boundary of the LANL facility  
40 in question. Under Draft DP-1132, the permittees are required to post bilingual warning signs (in  
41 English and Spanish) at all gates and perimeter fences, where present, around the Facility. The  
42 signs must be posted in sufficient numbers to be visible at all angles of approach as well as from  
43 a distance of at least 25 feet. The Facility is defined in the draft permit as the RLWTF, which is  
44 situated interior to the LANL boundary. The Facility is located within the security perimeter,  
45 which limits LANL access to badge holders. The RLWTF is not accessible to the general public,  
46 nor does the Facility share a boundary with any Pueblo. Additionally, the Permittees are required  
47 to include on the signs the following or an equivalent warning: DANGER – UNAUTHORIZED  
48 PERSONNEL KEEP OUT (PELIGRO – SE PROHIBE LA ENTRADA A PERSONAS NO  
49 AUTORIZADAS).

50 Applicants determined the Tewa language versions of the above language that were  
51 proposed by CCW would be inappropriate. One proposed sign would translate as "dangerous,  
52 harmful, death causing water." The water is not dangerous or harmful, nor death-causing - to post  
53 such a sign would be inaccurate and would cause unnecessary alarm. The other sign translates as  
54 "do not enter." Because the RLWTF is interior to LANL and does not share a border with the  
55 Pueblo of San Ildefonso, Applicants determined that it would be sufficient to have the signage in  
56 English and Spanish only, as required by Draft DP-1332. In addition, because LANL does not  
57 have similar signs in similar locations interior to the LANL campus prohibiting entrance, we felt  
58 this might be seen as discriminatory against Pueblo residents. In a May 20, 2015 letter to NMED,  
59 with our comments on a draft of the permit, DOE proposed language for signage, and the letter  
60 was copied to one of CCW's constituent organizations. See Triad/DOE Exhibit 17. This  
61 correspondence provided notice that DOE would not be utilizing the CCW proposal.

62 **IV. CCW Comments Relating to Participation in the Emergency Operations Center**

63 CCW also suggested including representatives of potentially effected Pueblos in  
64 emergency planning and providing designated seats for the representatives on LANL’s Emergency  
65 Operations Center (“EOC”) during preparatory drills and actual emergencies. Draft DP-1132  
66 defines the standards for emergency response procedures. Among these is a requirement to  
67 provide a written summary of the emergency response procedures to NMED within 120 days of  
68 the effective date of this permit if the permit issued. The permit does not specifically dictate  
69 emergency response procedures or designate seats on the EOC.

70 The functions of the LANL EOC, as well as the structural organization of the related  
71 Emergency Response Organization (“ERO”), are defined in DOE Order 151.1D. See Triad/DOE  
72 Exhibit 5. Under DOE Order 151.1 D, personnel staffing the ERO must possess the requisite  
73 authority to implement emergency management plans for LANL, which precludes non-LANL  
74 personnel from a direct role in the EOC. The DOE Order does, however, does establish offsite  
75 response interfaces that require LANL to maintain interfaces with local, state, tribal, and federal  
76 organizations responsible for emergency response. It is through this mechanism the Pueblo  
77 representatives may participate in EOC activities. This participation could include such events as  
78 familiarization with potential event-specific conditions and hazards, participation in drills or  
79 exercise, and provisions for communication of emergency information. Under the terms of Draft  
80 DP 1132, participation in this manner would be acceptable and, I am of the opinion that such  
81 participation should be sufficient to address the substance of CCW’s EOC-related comment.

82

83 This concludes my testimony in this matter.

## EXPERIENCE SUMMARY

Mrs. Armijo (also known as Karen Browne) is an environmental scientist with 18 years experience in environmental and natural resources work in the public and private sector. She has demonstrated a mastery of environmental science, and specializes in natural resources management, water resources, and regulatory compliance. Mrs. Armijo is a technical subject matter expert for environmental management, including water resources and waste management. She oversees environmental compliance programs for water quality management (WQM), hazardous and radiological waste, and environmental restoration activities. She has knowledge and familiarity with the Clean Water Act (CWA), Safe Drinking Water Act (SDWA), National Pollutant Discharge Elimination System (NPDES) programs, and laboratory and field water quality assessment techniques. Mrs. Armijo has experience evaluating environmental compliance for waste management activities, including hazardous materials management, Resource Conservation Recovery Act (RCRA) and Federal Hazardous and Solid Waste Amendments (HSWA), Comprehensive Environmental Response Compensation and Liability Act (CERCLA), Hazardous Materials Transportation Act (HMTA), and various environmental health and safety regulations.

Mrs. Armijo has experience with tasks related to natural resources management and planning, data collection and analysis, *National Environmental Policy Act* (NEPA) documentation, public outreach, project management and project planning, and administration of fiscal resources. She is experienced in developing and managing relationships with Federal, State, local governments, New Mexico tribes and organizations to support environmental management activities, including natural resources management and environmental documentation services. Mrs. Armijo has managerial experience for small and large teams, including program/project management, staff supervision, management of tasks, resources, schedule and budgets. Mrs. Armijo has a Master's Degree in Environmental Policy and Management, a Bachelor's Degree in Environmental Science with minors in environmental chemistry and waste management. She is a member of Connect New Mexico, a Master Gardener for Santa Fe County, and an active volunteer in her community.

## WORK EXPERIENCE

### NATURAL RESOURCES/PROJECT MANAGEMENT

**U.S. Department of Energy/ National Nuclear Security Administration (DOE/NNSA), Los Alamos Field Office (05/2016 to present)**—Mrs. Armijo performs oversight of the management and operating contractor (M&O) responsible for implementation of the NNSA mission at Los Alamos National Laboratory (LANL). Mrs. Armijo is responsible for management and oversight of the Resource Conservation and Recovery Act (RCRA) facility-specific hazardous waste permit and compliance with surface, storm and ground water protection regulations. In this capacity, she performs technical analysis and provides expertise to the DOE/NNSA Los Alamos Field Office (NA-LA) Field Office Manager and staff on environmental laws and regulatory requirements. Mrs. Armijo reviews site operations on a routine basis to evaluate and assure the adequacy of contractor environmental compliance and protection (ECP) programs, including the coordination/preparation of reports for regulatory agencies, and serves as the primary interface with regulatory agency staffs for these programs. As the technical subject matter expert for ECP at NA-LA, Mrs. Armijo defines objectives, policies and requirements to ensure compliance (and to restore compliance) with environmental protection regulations and laws.

**JG Management Systems, Inc- Albuquerque/Los Alamos Offices (04/2010 to 05/2016)**—Mrs. Armijo was a Project Manager for Environmental Services. In this capacity, she supported the Environmental Services Program with leadership and technical expertise. Mrs. Armijo routinely managed small and large teams for project execution, which required supervision of staff, management of tasks, schedule and budget ranging from \$48K to \$1M. Additionally, Mrs. Armijo conducted business development activities, including membership in professional organizations, networking, research and development for teaming relationships, business strategy and proposal development. Mrs. Armijo served on the Leadership Committee as the Deputy Chair, and was a

## KAREN E. ARMIJO

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principal author on the Leadership Plan for JGMS to support and encourage employee growth and development. Mrs. Armijo held two (2) positions with JGMS, each are detailed below.

**Project Manager for Los Alamos Site Office (LASO), Environmental Projects Office (EPO) (01/2011 to 03/2015)/ Environmental Management Los Alamos Field Office (EM-LA) (03/2015 to 05/2016), subcontractor to Project Time and Cost, LLC (PT&C)**— Mrs. Armijo was responsible for performing project management and technical analysis in support of the DOE Environmental Management mission at EM-LA/Environmental Projects Office for NNSA. Mrs. Armijo provided technical subject matter expertise for implementation of the National Pollutant Discharge Elimination System (NPDES) Individual Permit for Stormwater (IP), Nitrate Salt Waste Management Resumption Activities, Tribal Programs Support, and Assessment Program implementation. NPDES activities include negotiations with regulatory agencies and stakeholders for IP renewal permit and regulatory compliance evaluations. Nitrate Salt Waste Management Resumption Activities include oversight of contractor-led teams, evaluation of deliverables and contractor processes addressing corrective actions related to the Consent Order with the State of New Mexico. Tribal Programs Support include development of Tribal Program Implementation Plan, tracking of Tribal Permits and Data Reviews, development of messaging and training materials, and delivery of training to contractor audiences. From FY2012 to FY2015, Mrs. Armijo supervised one direct employee supporting PT&C/LASO.

**Deputy Team Leader for the Business Development (07/2010 to 01/2011)**—As Proposal Manager, Mrs. Armijo was responsible for identification of business opportunities, development of proposal strategy and formation of proposals. In this role, Mrs. Armijo led a 4-member team, organized bid and proposal response, facilitated the development of bid and proposal strategies, and managed resources to support business development. Mrs. Armijo has been integral in developing proposal strategies, formalizing group processes and improving tracking procedures for business development tasks. Mrs. Armijo contributed to the development of procedures and organization of team roles and responsibilities to streamline the process and improve the effectiveness of proposal opportunities.

**Tetra Tech, Inc.- Santa Fe Office/Alexandria Operations Center (07/2005 to 01/2010)**—Mrs. Armijo served as an Environmental Scientist II and as the Office Operations Manager for the local office, demonstrating service-oriented and successfully managing multiple programs and priorities.

**Office Operations Manager (10/2006 to 01/2010)**—In addition to her responsibilities as an Environment Scientist, Mrs. Armijo also served as the Office Operations Manager for the Santa Fe, New Mexico, Office. In this capacity, Mrs. Armijo was responsible for the day-to-day functionality of the location. She managed several contractors including cleaning services, IT support, support and maintenance contractors, and temporary employees. In this position, Mrs. Armijo was responsible for cost effective and efficient management of office resources, coordination with site personnel, management of contractors and services, and IT support. Mrs. Armijo provided primary support for the development of proposals, coordinated resources in support of proposals and marketing pursuits, and participated in several marketing initiatives on behalf of the Santa Fe Office.

**Environmental Scientist II (07/2005-01/2010)**—Mrs. Armijo routinely managed small and large teams for project execution, which required supervision of staff, management of tasks, schedule and budget ranging from \$25K to \$1.5M. As Project Manager or Deputy Project Manager, her responsibilities included team and client communication, management and oversight of technical information, management of project schedule and expenses. As a Team Member, Mrs. Armijo served as a Technical Subject Matter Expert for Natural Resources (e.g., Water, Air, Biological, Soils, Infrastructure, Emergency Response, etc.). Her role included environmental sampling and analysis, development of technical analysis, public education and outreach, and project planning and coordination. Mrs. Armijo's skills include technical editing, document integration, and quality control/quality assurance review.

## KAREN E. ARMIJO

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Roles and projects are listed below:

- Deputy Project Manager, Los Alamos Biosafety Laboratory Level 3 (BSL-3) Facility Operations Environmental Impact Statement (EIS), U.S. Department of Energy/National Nuclear Security Administration (DOE/NNSA), Los Alamos, NM (11/2005 to 01/2010)
- Public Outreach Support Staff, Global Nuclear Energy Partnership (GNEP) Programmatic EIS, U.S. Department of Energy/National Nuclear Security Administration (DOE/NNSA), New Mexico (06-12/2008)
- Project Manager, Watershed Study on Pueblo Lands Related to Plutonium and Sediment Transport, Environmental Office, Pueblo de San Ildefonso, New Mexico (05-12/2008)
- Project Manager, Indoor Air Quality Analysis of Goddard High School, Roswell, New Mexico, Keers Remediation, Inc. (03-06/2008)
- Document Review and Integrator/Comment Response Team Member, National Bio and Agro-Defense Facility (NBAF) EIS, U.S. Department of Homeland Security (03-12/2008)
- Technical Author, Colorado Sanchez Reservoir Mercury Total Maximum Daily Load (TMDL), Sources Assessment Update, Environmental Protection Agency- Region 8 (02-03/2008)
- Project Manager, Indoor Air Quality Analysis of the Neil Mertz Judicial Complex, Estancia, New Mexico, B&D Industries/Torrance County (11/2007 to 02/2008)
- Project Manager, Non-Point Source Assessment Report and Management Program Plan, Pueblo of Santa Ana Water Resources Division (09-12/2007)
- Project Manager, Environmental Assessment (EA) for the Geological Characterization of White Sands Missile Range and Nevada Test Site, Interim Action for the Complex Transformation Supplemental Programmatic EIS, DOE/NNSA (05/2007 to 03/2009)
- Team Logistics Coordinator/ Field Team Member, National Lakes Assessment- New Mexico Field Crew, EPA (05-09/2007)
- Deputy Project Manager, University of Hawaii Pacific Regional Biocontainment Laboratory (PacRBL) EA, National Institutes of Health (NIH)/ National Institute of Allergy and Infectious Diseases (NIAID), Honolulu, Hawaii (04/2007 to 01/2010)
- Field Team Member, New Mexico Task Force-1 Urban Search and Rescue Full Scale Exercise, New Mexico Department of Homeland Security and Office of Emergency Management (04-10/2007)
- Project Manager, Tufts University Regional Biocontainment Laboratory EA, NIH/NIAID, Grafton, Massachusetts (10/2006 to 09/2007)
- Water Resources Technical Author, Complex Transformation Supplemental Programmatic EIS, DOE/NNSA (10/2006 to 10/2008)
- Surface Water Resources Lead Technical Author, FutureGen EIS, DOE/NNSA (09/2006 to 09/2007)
- Deputy Project Manager, Non-Point Source Assessment Report and Management Program Plan, Pueblo of Taos Environmental Office (04-12/2006)
- Technical Author, Quality Assurance Project Plan/ Sample Analysis Plan Documents, Environmental Office, Pueblo de San Ildefonso, New Mexico (11/2005 to 01/2006)
- Team Logistics Coordinator/Field Team Member, Colorado Sanchez Reservoir Clean Mercury Sampling, EPA- Region 8 (11/2005 to 01/2006)
- Field Team Member, Watershed Assessment, Valles Caldera Trust/U.S. Forest Service (10/2005 to 09/2008)
- Water Resources Technical Author, Sandia Site-Wide EIS Supplemental Analysis, DOE (10/2005 to 02/2006)
- Emergency Responder, Hurricane Katrina START EPA-Region 6 Responder (09-10/2005)
- Technical Author, Utah Duchesne River Watershed TMDL, EPA- Region 8 (08-12/2005)

## KAREN E. ARMIJO

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- Project Support, Recreation Document, Salton Sea Authority, Salton Sea, California (07/2005 to 01/2006)
- Project Support, Buckman EIS Administrative Record, U.S. Forest Service, Santa Fe National Forest, Española District Office, Española, New Mexico (07/2005 to 12/2006)

### ADMINISTRATIVE EXPERIENCE

**New Mexico State Legislature, Secretary, Santa Fe, New Mexico (01/2010 to 02/2010)**—Mrs. Armijo provided administrative support to the Majority Whip for the New Mexico House of Representatives, Representative Sheryl Williams Stapleton, for the 2010 Regular Session. filing and organization of information, coordination with the public affairs office, and general housekeeping. In addition, Mrs. Armijo provided administrative support to other members of the majority party in the House of Representatives.

**Molzen-Corbin & Associates, Grants Administrator, Multiple Projects, Albuquerque, New Mexico (05/2003 to 07/2005)**—In this position, Mrs. Armijo participated in the management and coordination of community development projects; for local governments in New Mexico. She was responsible for preparing and administering funding grants on behalf communities to support engineering projects.

**New Mexico State University, Alumni Relations Associate Director, Santa Fe, New Mexico (03/2002-05/2003)**—In this position, Mrs. Armijo was responsible for organizing, building the and strengthening the alumni support in northern New Mexico on behalf of New Mexico State University. Her responsibilities included generating new contacts, coordination of campus resources to support the development of new alumni clubs, coordination of resources to support alumni events.

**Hazardous Materials Emergency Response Technician, Los Alamos National Laboratory, Los Alamos, New Mexico (01/2001 to 03/2002)**—Mrs. Armijo participated as a hazardous materials emergency responder, serving in various positions during response activities ranging from support staff to safety officer to entry team leader. She managed the training of the Auxiliary HazMat Team. Mrs. Armijo assisted in the preparation and execution of the annual HazMat Challenge to demonstrate skills, knowledge, and ability to mitigate hazardous situations such as damaged hazardous materials containers, malfunctioning pipes, explosive chemicals, confined spaces, etc.

**Total Maximum Daily Load (TMDL) Outreach, New Mexico Environment Department – Surface Water Quality Bureau, Santa Fe, New Mexico (06/2000 to 01/2001)**—Mrs. Armijo established a public outreach program for water quality issues in New Mexico, which included communications with Federal, State, local and tribal agencies and community organizations and environmental groups to encourage participation in water quality management at the local/regional level and the statewide level.

### RESEARCH POSITIONS

**Agricultural Pesticide Research, Hispanic Association of Colleges and Universities-USDA (08/1999 to 12/1999)**—Mrs. Armijo assisted in water, soil, and air sampling and analysis to support on-going projects related to pesticide movement in the atmosphere. Mrs. Armijo also assisted in the analysis of vegetable samples for residue on agricultural products from small farms application of pesticide.

**Administrative Aide/Work Study, NMSU (08/1998 to 05/2000)** — Mrs. Armijo supported the Academic Dean's Office as a student intern. Her responsibilities included general administrative support, student programs implementation, performance analysis and metrics tracking, and legislative initiatives. She directly supported the College's Academic Dean and the Colleges Legislative Liaison with administrative tasks.

**Aquatic Toxicology of Heavy Metals, NMSU (08/1995 to 05/1999)**—Mrs. Armijo participated in the sample and data analysis of water and soil samples in support of on-going mercury contamination research. As a Waste-management Education Research Consortium (WERC) Student Fellowship award recipient, she designed, coordinated and conducted independent research of aquatic toxicology of depleted uranium contamination and mercury contamination. Project 1: The Hematological Response of Waterborne Lead on

## KAREN E. ARMIJO

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Rainbow Trout; Project 2: The Effects of Depleted Uranium on Larval Fathead Minnows; Project 3: Determining the Toxicity of Depleted Uranium Using the Microtox Model 500 Analyzer.

### EDUCATION/TRAINING

M.S., Environmental Policy and Management, University of Denver, 2005

B.S., Environmental Science, Minor in Environmental Chemistry, Minor in Waste Management, New Mexico State University, 2000

Certified, Environmental Compliance, Technical Qualifications Program, DOE/NNSA, February 2018

Completed, Technical Management Program, University of California Los Angeles, September 2017

Certified, Inspector of Sediment and Erosion Control (CISEC), Certificate #2207, September 15, 2017

Completed, RCRA Fundamentals/Advanced RCRA Topics et.al (McCoy and Associates, 2016)

Completed, Core Program, Leadership New Mexico, 2015

Completed, 38-hour Army Corps of Engineers Wetland Delineation & Management Training Program (Richard Chinn Environmental Training, Inc., 2006)

Certified, Basic Field Techniques to Determine Stream Morphology (Watershed Conservation Resource Center, 2006)

Certified, 40-Hour HAZWOPER (ACME Environmental Inc., Certificate #092305-11, 2005)

Certified, HazMat Technician (California Specialized Training Institute [CSTI], Certificate #T793, 2001)

Certified, HazMat First Responder Operations Decon (CSTI, Certificate #OR166321, 2001)

OSHA 29 CFR 1910.96 Radiological Worker II (LANL 1999)

Certified, National Incident Management Systems Certified, Various Courses

### PUBLICATIONS/PRESENTATIONS

Armijo, K., Bronson, K., “Watershed Integration” (October 2015), 2015 New Mexico Infrastructure Finance Conference—Mrs. Armijo and Ms. Bronson presented information on watershed management and planning to mitigate impacts to built infrastructure. Mrs. Armijo moderated a panel of state and local government professionals to address funding and implementation of watershed improvement projects.

Armijo, K., “NEPA Implementation: Mitigation Planning and Monitoring Strategies”(February/April 2015), 2015 National Association of Environmental Professionals—Mrs. Armijo developed a paper and presentation to address mitigation action tracking, and demonstrates an overview of metrics to support effective monitoring of applied mitigation strategies.

Armijo, K., “Planning for Changing Environments” (October 2014), 2014 New Mexico Infrastructure Finance Conference—Mrs. Armijo presented infrastructure planning activities for community infrastructure projects. The presentation provided an overview of adaptive management strategies, monitoring and mitigation techniques, and risk management tools to effectively utilize environmental planning for community activities.

Armijo, K., “Planning for Changing Environments” (October 2013), 2013 New Mexico Infrastructure Finance Conference—Mrs. Armijo developed a presentation focusing on supporting local communities to implement planning and infrastructure improvements that would adapt to changes in the natural environment.

Browne, K. and K. M. Dors, “Water Resources Infrastructure Planning” (October 2008), 2008 New Mexico Infrastructure Finance Conference—Mrs. Armijo presented and co-developed a presentation focusing on water resources planning to effectively manage or prevent surface water contamination.

Tsatsaros, J., K. Browne, and R. Pava, “Water Quality Dynamics on the Valles Caldera” (March 2008), 2008 Jemez Mountains Science Symposium—Mrs. Armijo co-authored a paper and presentation summarizing the water quality assessment program on the Valles Caldera. The paper explored early trends in water quality data and its impact on management of the watershed by the Valles Caldera Trust.

Browne, K., “Disaster Preparedness Planning: A Review of the Hurricanes Katrina/Rita Response by Tetra Tech” (October 2006), 2006 New Mexico Infrastructure Finance Conference—Mrs. Armijo

## KAREN E. ARMIJO

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provided an overview of emergency response and planning requirements, Federal and State resources, large-scale disaster relief efforts, and mutual aid coordination with Federal, State, and local agencies.

**Browne, Karen, "Improving Oversight and Compliance with Federal and State Environmental Regulations for New Mexico's Community Development Block Grant Program" (May 2005) University of Denver Master's Project**—Mrs. Armijo designed, planned, and executed research to assess the current management practices employed by the State of New Mexico in implementing Federal and State environmental regulations.

**Browne, Karen, "Use of Acceptable Knowledge in Characterization of Waste Streams at Los Alamos National Laboratory" (August 1998) Los Alamos National Laboratory Student Symposium**—Mrs. Armijo authored technical report reviewing the use of acceptable knowledge in waste disposal practices. It was presented at the annual Student Symposium hosted by Los Alamos National Laboratory and published in the symposium proceedings.

CCW, Gilkeson and Sanchez Remaining Issues – Revised draft NMED GWDP DP-1132 (October 31, 2014)  
 November 14, 2014

PgNo	Description	Remaining Issues
1	§II.W. Secondary Containment	Before the pipeline between the RLWTF and the SET is operated, the pipeline must have secondary containment.
2	§V. Description of SET	<p>We still don't know if the SET is an "unsealed subgrade concrete structure with a single double-lined synthetic liner, and a leak detection system within the synthetic liner." At the 10/9/14 meeting, NNSA staff said they would get back to us on this issue. We have not received that information.</p> <p>If it is unsealed, we need to know how the thickness of the concrete structure. It would be helpful to have an engineering diagram of the concrete structure, as well as the leak detection system.</p>
3	§1. Annual Update - Posting to EPRR	<p>Posting to the Electronic Public Reading Room (EPRR) must be enforceable. We suggest a stepwise approach. If a document is found to not be posted, the Permittees have 14 days to post it to the EPRR. If it is not posted within that time frame, then it shall be enforceable under NMAC 20.6.2.1220.</p> <p>Below is the language from the 2010 HazWaste Permit, which may be helpful to include in the permit:</p> <p><b>1.13 PUBLIC NOTIFICATION VIA ELECTRONIC MAIL (E-MAIL)</b></p> <p>The Permittees shall notify individuals by e-mail of submittals as specified in this Permit. The Permittees shall maintain a list of individuals who have requested e-mail notification and send such notices to persons on that list. The notice shall be sent within seven days of the submittal date and shall include a direct link to the specific document to which it relates.</p> <p>The Permittees shall provide a link on the internet on the Permittees' environmental home page (<a href="http://www.lanl.gov/environment">http://www.lanl.gov/environment</a>) whereby members of the public may submit a request to be placed on the e-mail notification list. In the event that the environmental home page stops operation, the Permittees shall use their best efforts to fully restore the page and its operation as soon as possible.</p> <p>***</p> <p>Where a Permittee submittal and NMED response is required to be posted to the EPRR, the language needs to be clarified so that it is clear that the Permittees must post the submittal when it is submitted to NMED. We are concerned that the language could be interpreted to read that the Permittees may post their submittal when they receive NMED's response. For example, §12</p>

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CCW, Gilkeson and Sanchez Remaining Issues – Revised draft NMED GWDP DP-1132 (October 31, 2014)  
 November 14, 2014

4	11	§1. Website	Freeboard. CCW accepts the Permittees' proposal to establish a website six months from the effective date of the permit.  A wonderful example is the Permittee's Stormwater website at: <a href="http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/index.php">http://www.lanl.gov/community-environment/environmental-stewardship/protection/compliance/individual-permit-stormwater/index.php</a> We are concerned that Permittees cannot restrict entry into the area around the Outfall 051.
5	14	§5. Restricting Entry	Did NMED conduct government-to-government consultation with the Tribes about the signage? Signs are only required to be in English and Spanish. The requirement should include a requirement for a visual sign – one without words.  Below is language from 2010 HazWaste Permit, which may be helpful in the discussions: 2.5.1 Warning Signs The Permittees shall post bilingual warning signs (in English and Spanish) at all gates and perimeter fences, where present, around the permitted units (see 40 CFR § 264.14(c)). Signs shall be posted in sufficient numbers to be visible at all angles of approach as well as from a distance of at least 25 feet. The Permittees shall include on the signs the following or an equivalent warning: DANGER – UNAUTHORIZED PERSONNEL KEEP OUT (PELIGRO – SE PROHIBE LA ENTRADA A PERSONAS NO AUTORIZADAS) The Permittees shall post warning signs in the appropriate dialect of Tewa in a manner equivalent to the bilingual warning signs in English and Spanish along shared boundaries with the Facility's permitted units and the Pueblo of San Ildefonso (PO WHO GEH). The Permittees shall post signs requested by Santa Clara Pueblo (Kha-Po). The Permittees shall include on the signs the following warning: Wi-i ts'uni pi' – (DO NOT ENTER)
6	15	§6. Signs	Permittees must verify that systems and units that carry <b>untreated liquid</b> or semi-liquid waste streams meet requirements for secondary containment in §8 below. Permit gives LANL 180 days to verify. The permit should require verification within 30 days of the effective date of the permit. Are the Permittees verifying secondary containment now? Testing for water tightness should begin within 30 days of the effective date of the permit. Are
7	15	§7. Verification of Secondary Containment	
8	15	§8. Water Tightness	

9	Testing	the Permittees testing for water tightness now?
23	§17. Calibration of Flow Meters	LANL has stated that is should not be held to flow meter accuracy greater than +/- 10%. However, "ISO 17025-certified meters can achieve +/- 0.05 percent accuracy." Moreover, modern flow meters--of the type one would expect to be used at an advanced laboratory such as LANL-- are even more accurate. "[M]easuring uncertainties of +/- 0.1% of rate are achievable with modern flowmeters." Jerry Stevens & Jason Pennington, "Flowmeter Calibration, Proving, & Verification Ensuring the accuracy & repeatability of your flow measurements (September 26, 2010). Online at: <a href="http://www.flowcontrolnetwork.com/articles/calibration-proving-verification">http://www.flowcontrolnetwork.com/articles/calibration-proving-verification</a>
		<p>Additionally, it is important to note that the ISO/TEC 17025 General Requirements are the doormat for competent testing and calibration laboratories, so one would expect that LANL observes these standards in calibration and measurement. The standard is described as follows:</p> <p>ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories is the main ISO standard used by testing and calibration laboratories. <u>In most major countries, ISO/IEC 17025 is the standard for which most labs must hold accreditation in order to be deemed technically competent.</u> In many cases, suppliers and regulatory authorities will not accept test or calibration results from a lab that is not accredited. Originally known as ISO/IEC Guide 25, ISO/IEC 17025 was initially issued by the International Organization for Standardization in 1999. There are many commonalities with the ISO 9000 standard, but ISO/IEC 17025 is more specific in requirements for competence. And it applies directly to those organizations that produce testing and calibration results. Since its initial release, a second release was made in 2005 after it was agreed that it needed to have its quality system words more closely aligned with the 2000 version of ISO 9001.</p> <p>The standard was first published in 1999 and on 12 May 2005 the alignment work of the ISO/CASCO committee responsible for it was completed with the issuance of the reviewed standard. The most significant changes introduced greater emphasis on the responsibilities of senior management, and explicit requirements for continual improvement of the management system itself, and</p>

		<p>particularly, communication with the customer.</p> <p>The ISO/IEC 17025 standard itself comprises five elements that are Scope, Normative References, Terms and Definitions, Management Requirements and Technical Requirements. The two main sections in ISO/IEC 17025 are Management Requirements and Technical Requirements. Management requirements are primarily related to the operation and effectiveness of the quality management system within the laboratory. Technical requirements include factors which determine the correctness and reliability of the tests and calibrations performed in laboratory.</p> <p>Laboratories use ISO/IEC 17025 to implement a quality system aimed at improving their ability to consistently produce valid results. It is also the basis for accreditation from an accreditation body. Since the standard is about competence, accreditation is simply formal recognition of a demonstration of that competence. A prerequisite for a laboratory to become accredited is to have a documented quality management system. The usual contents of the quality manual follow the outline of the ISO/IEC 17025 standard.</p>
10	26	<p>On line at: <a href="http://en.wikipedia.org/wiki/ISO/IEC_17025">http://en.wikipedia.org/wiki/ISO/IEC_17025</a> (emphasis added).                  Flow meters don't have to be installed until 180 days after the effective date of the permit. How will the discharge volumes be determined in the interim?</p>
11	26	<p>Is there a flow meter on the discharge pipe that leaves TA-50, Bldg. 2 that splits to go to the Outfall and SET?                  The permit must require waste tracking for both conveyance and discharge of TRU and LLW waste streams. These numbers may be helpful if there is a problem with either conveyance or discharge.</p>
12	27	<p>Also, see comments to §31 below about Settled Solids Removal.                  It is not clear whether Permittees will be permitted to discharge to SET before the baseline conditions are established. Within 120 days following effective date of DP, Permittees are required to submit a workplan for the moisture monitoring system with neutron moisture probes.</p>

13	29	<p>After the effective date of the permit, it is foreseeable that a year could go before the installation of the soil moisture monitoring system. The baseline must be established before discharges to the SET begin. We suggest an interim system should be in place before discharge so that a baseline may be promptly established. We need baseline numbers before operations. Permittees agreed to provide CCW, Gilkeson &amp; Sanchez with letter confirming commitment to allowing us to witness drilling of new alluvial wells. We have not received it.</p> <p>We appreciate that NMED is requiring replacement of two alluvial wells. We remain concerned about the use MCOI-6 and the regional wells for ground water monitoring purposes. They should also be replaced. We reference the detailed comments of Robert H. Gilkeson, found in Appendix A, "Deficiencies in Ground Water Protection in the Draft Ground Water DP-1132 Permit, by Independent Registered Geologist Robert H. Gilkeson," to the CCW, Gilkeson and Sanchez December 12, 2013 comments for the DP-1132 draft permit. Gilkeson has provided detailed comments about why MCOI-6 and the regional wells need to be replaced.</p> <p>In addition, NMED has stated that the wells "were not installed for contaminant detection or groundwater monitoring." We quote from page 31 in the NMED November 2010 General Response to Comments on the LANL RCRA Renewal Permit:</p> <p>"The NAS report [National Academy of Sciences 2007 Final Report] references wells that were installed as part of LANL's groundwater characterization efforts that were conducted in accordance with their Hydrogeologic Work Plan (1998)... These [characterization] wells were not installed for contaminant detection or groundwater monitoring. Therefore, these wells have limited relevance to groundwater protection goals set forth by the March 1, 2005 Consent Order."</p> <p>We are concerned that there is no public participation requirement for the submittal of the settled solids removal workplan. Because the RLWTF is unlike any other facility in NM, we urge NMED to require the workplan now to be part of the permit that is released for public comment.</p> <p>Additionally, reporting on the nature and amount of solids, timing of disposal at WPPP should be a matter of course, as LANL's "Supplemental Information for Discharge Permit Application DP-</p>
14	34	<p>§26, et al., Groundwater Provisions.</p> <p>§31. Settled Solids Removal</p>

15	41	<p>1132, Radioactive Liquid Waste Treatment Facility (RLWTF) and Zero Liquid Discharge (ZLD) Solar Evaporation Tanks," ENV-RCRA-12-0173, LAUR-12-21591 (August 10, 2012, as revised) ("Supplement") states at A-8, page 1: "(2) Transuranic RLW treatment consists of influent collection and storage, treatment of the transuranic RLW, and sludge treatment. Treated water is not discharged; it either receives additional treatment (secondary reverse osmosis) or is sent to storage tanks in Building 50-248 for disposition as bottoms. Sludge from the treatment process is concentrated, solidified with cement, and shipped to the Waste Isolation Pilot Project as a solid transuranic waste." It is, thus, clear that LANL has records of settled solid accumulation and removal which could be share with the public.</p> <p>Additionally, it is clear that these records include the volumes of material being accumulated and processed, which means LANL also can provide this information. In fact, the Supplement goes on to state at B-12, page 2: "Transuranic influent is received in batches from TA-55, with these tanks are linked electronically to the RLWTF control room. Operators monitor and record tank level changes during each influent batch transfer. Influent volumes are calculated from the difference between beginning and ending tank levels."</p>
16	42	<p>Similar data collection applies separately to Low Level Waste, as the Supplement states further that: "Low-level RLW influent volumes will be determined by monitoring and recording the change in level of Tank 5 and Tank 6 in the Waste Management and Risk Management (WRRM) Facility. While radioactive liquid waste (RLW) is being fed to the treatment process from one of these two influent tanks (e.g. Tank 5), the fresh influent will be received in the other influent tank (e.g. Tank 6). In this illustration, the change in the level of Tank 6 from one day to the next will reflect the volume of the influent received." <i>Id.</i> It is difficult to imagine that given LANL keeping such records of the influent, they are failing to do so for the treated effluent Low-level RLW. Thus, it is reasonable for LANL to make the input-output data for both Low-level RLW and Transuranic RLW and solidified material available to the NMED and the public.</p> <p>We support retention of 75,000 gallon concrete influent storage tank for emergency storage for LLLW liquid waste. Should this specific condition be moved to another section, or have its own condition?</p> <p>The draft permit that is released for public comment must include the Closure Plan. There is no schedule for closure.</p>

**CCW, Gilkeson and Sanchez Remaining Issues – Revised draft NMED GWDP DP-1132 (October 31, 2014)**  
 November 14, 2014

17	Financial Assurance	CCW, et al., request financial assurance be required in the GWDP.
18	§52. Extensions of Time	The Permittees submittal must be posted to the EPRR. The NMED response must be posted to the EPRR.
19		CCW, et al., reserve the right to object or comment on issues raised or identified by CCW, et al.
20		CCNS received the DOE/LANL response to its November 2013 FOIA request. We are reviewing the documents and may have additional comments as a result.
		Did the Permittees calculate emissions to the air from the MES and SET for constituents other than the radionuclides? If so, please provide to us.



*Environmental Protection Division  
 Environmental Compliance Programs (ENV-CP)  
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 Los Alamos, New Mexico 87545  
 (505) 667-0666*

*National Nuclear Security Administration  
 Los Alamos Field Office, A316  
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 (505) 667-5794/Fax (505) 667-5948*

*Date: MAY 20 2015  
 Symbol: ENV-DO-15-0137  
 LA-UR: 15-23614  
 Locates Action No.: N/A*

Ms. Phyllis Bustamante, Acting Chief  
 Ground Water Quality Bureau  
 New Mexico Environment Department  
 Harold Runnels Building, Room N2250  
 1190 St. Francis Drive  
 P.O. Box 26110  
 Santa Fe, NM 87502

GROUND WATER  
 MAY 20 2015  
 BUREAU

Dear Ms. Bustamante:

**Subject: Draft Discharge Permit DP-1132 – Los Alamos National Laboratory, Radioactive Liquid Waste Treatment Facility**

This letter provides the responses of the United States Department of Energy and Los Alamos National Security, LLC (DOE/LANS) regarding issues identified during the April 16, 2015, meeting among representatives of the New Mexico Environment Department, Ground Water Quality Bureau (NMED), Citizens for Clean Water (CCW), Concerned Citizens for Nuclear Safety (CCNS), and DOE/LANS. In addition, this letter forwards a red-lined revision of the February 20, 2015, draft of DP-1132. The red-lined revision is attached to this letter as Enclosure 1. The attached red-lined revision (labelled 05/12/15 DOE/LANS REVISION) reflects the following proposed changes: (1) the language changes DOE/LANS had proposed on April 2, 2015, to Condition 24 (Waste Tracking), Condition 36 (SET Moisture Detection System Exceedance), Condition 43 (Stabilization of Individual Systems and Units), Condition 44 (Closure Plan); (2) the proposed new Conditions 47 (Integration with Consent Order) and 49 (Electronic Posting) DOE/LANS proposed on April 2, 2015; (3) a reorganization of certain conditions; and (4) some minor clarifications and typographic corrections.

**TRIAD/DOE EXHIBIT 17**

Responses to issues from the April 16, 2015, meeting are set forth below.

1. **Signage:** At the April 16 meeting, representatives of CCW raised a question about the location and content of signs they would like to have posted in the area below Outfall 51. DOE/LANS propose revising Condition 6 of the February 20, 2015, draft permit to provide as follows:

*Condition 6. Signs – The permittees shall post bilingual warning signs (in English and Spanish) at all gates and perimeter fences, where present, around the Facility. Signs shall be posted in sufficient numbers to be visible at all angles of approach as well as from a distance of at least 25 feet. Permittees shall include on the signs the following or an equivalent warning: DANGER – UNAUTHORIZED PERSONNEL KEEP OUT (PELIGRO – SE PROHIBE LA ENTRADA A PERSONAS NO AUTORIZADAS). The permittee shall post warning signs in the appropriate dialect of Tewa in a manner equivalent to the bilingual warning signs in English and Spanish along shared boundaries with the Facility and the Pueblo of San Ildefonso.*

2. **SET Liner System and Ultraviolet (UV) Resistance:** Enclosure 2 provides the manufacturer's product data sheets for the following five components of the SET liner and moisture detection system: (1) primary liner (GSE Smooth Geomembrane–60 mil), (2) secondary liner (GSE Smooth Geomembrane–40 mil), (3) geonet drainage material between the primary and secondary liners (GSE Hypemet–250 mil), (4) geotextile material between the secondary liner and the concrete floor (GSE Nonwoven Geotextile–NW12), and (5) leak detection system between the primary and secondary liners (HYDRO-TEMP™ Early Warning Alarm (EWA) System).

DOE/LANS contacted the manufacturer of the primary liner, GSE ENVIRONMENTAL™, for information on the liner's UV resistance. GSE ENVIRONMENTAL™ directed DOE/LANS to a 2011 white paper published by the Geosynthetic Institute, Folsom, PA, titled "Geomembrane Lifetime Prediction: Unexposed and Exposed Conditions." A copy is attached as Enclosure 3 of this letter. Page 24 of the above-referenced white paper states, "HDPE geomembranes (per GRI-GM13) are predicted to have lifetimes greater than 36 years; testing is ongoing."

3. **Settled Solids.** The February 20, 2015, Draft of DP-1132 addresses Settled Solids in two separate permit conditions, Condition 9 (Settled Solids) and Condition 31 (Settled Solids Removal). As reflected in the DOE/LANS proposal to revise the draft of DP-1132 so that settled solids and settled solids removal are addressed in a single condition that appears as Condition 10 in the red-lined revision attached as Enclosure 1 to this letter.
4. **"Likely to affect structural integrity of a unit or system" under Condition 11:** The second paragraph of Condition 11 (Maintenance and Repair) in the February 20, 2015, Draft Permit states: "In the event that routine maintenance and repair reveal significant damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designed, the Permittees shall implement the contingency plan set forth in this Discharge Permit. "

The direction to "implement the contingency plan" is ambiguous since the "contingency plan" in the February 20, 2015, draft includes ten different numbered paragraphs covering a variety of subjects. Therefore, DOE/LANS have proposed language revisions and a reorganization of the draft permit, as reflected on Enclosure 1. The reorganization attempts to place related paragraphs together.

For example, Condition 13 (Maintenance and Repair) now provides that if routine maintenance and repair reveal "significant damage likely to affect the structural integrity of a unit or system or any of its associated components, or its ability to function as designated, the Permittee shall implement the requirements of Condition 14 (Damage to Structural Integrity) of this Discharge Permit."

5. SOP for Maintenance and Repairs: DOE/LANS have determined that it is not reasonable or appropriate to provide Standard Operating Procedures (SOPs) for maintenance and repairs of all equipment and systems at the RLWTF. The SOPs are voluminous and are subject to regular updating and revision.
6. Notification Under Condition 16 (Emergency Procedures): DOE/LANS believe that the revisions NMED made to the lettered subparagraphs of Condition 16 (Emergency Procedures) in the February 20, 2015, draft of DP-1132 are appropriate and that NMED should not reinstate the language of subparagraphs c through f as they appeared in the October 28, 2014, draft of DP-1132.
7. Measurement of TRU Waste Flow into the RLWTF: Condition 22 of the February 20, 2015, draft of DP-1132 accurately describes how TRU influent volumes to the RLWTF currently are measured. As that condition states, "permittees shall estimate the volume of TRU influent wastewater being conveyed to the Facility using electronic sensors which measure tank levels in both the acid waste and caustic waste influent tanks." Volumes "shall be determined by calculation using the head change and tank size. Operators shall record changes in influent tank levels whenever a batch of TRU wastewater is conveyed to the facility. The total daily and monthly volumes of TRU influent received by the facility shall be submitted to NMED in quarterly monitoring reports . . . ." This permit language was specifically negotiated and agreed to by NMED more than two years ago.
8. Flow Meter Accuracy Requirements: DOE/LANS have previously demonstrated that the language in Condition 18 of the February 20, 2015, draft of DP-1132 that "flowmeters shall be calibrated to within plus or minus ten percent of actual flow, as measured under field conditions" is consistent with NMED flow calibration policy. That policy provides that "flow measurement devices be calibrated in place, under actual operating conditions (field calibration) to within +/- 10% of the actual flow." See NMED Flow Meter Calibration (prepared by Robert George, NMED-GWQB) attached hereto as Enclosure 4. As DOE and LANS have further demonstrated, the plus or minus ten percent standard is also consistent with USEPA wastewater flow measurement procedures. See Operating Procedure, Wastewater Flow Measurement (August 12, 2001) Region 4, USEPA Science and Ecosystem Support Division (attached hereto as Enclosure 5).

Ms. Phyllis Bustamante  
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9. Closure Plan: DOE and LANS will submit a closure plan to be included as a part of the permit. DOE and LANS currently anticipate that the plan will be submitted to NMED by December 31, 2015.

Please call Robert Beers at (505) 667-7969 if you have questions regarding this information.

Sincerely,



Alison M. Dorries  
Division Leader  
Environmental Protection Division  
Los Alamos National Security LLC

Sincerely,



Gene E. Turner  
Environmental Permitting Manager  
National Security Missions  
Los Alamos Field Office  
U.S. Department of Energy

AMD:GET:RSB/ms

- Enclosure: (1) Red-lined revision of the February 20, 2015, draft of DP-1132  
(2) SET liner and leak detection system product data sheets  
(3) Geomembrane Lifetime Prediction, Geosynthetic Institute White Paper #6  
(4) NMED Flow Meter Calibration (prepared by Robert George, NMED-GWQB)  
(5) USEPA wastewater flow measurement procedures

Cy: James Hogan, NMED/SWQB, Santa Fe, NM, (E-File)  
John E. Kieling, NMED/HWB, Santa Fe, NM, (E-File)  
Stephen M. Yanicak, NMED/DOE/OB, (E-File)  
Jennifer Hower, NMED/OGC, Santa Fe, (E-File)  
Jonathan Block, CCW, Santa Fe, (E-File)  
Lindsay Lovejoy, CCNS, Santa Fe, (E-File)  
Joni Arends, CCNS, Santa Fe, (E-File)  
Hai Shen, EM-SG, (E-File)  
Gene E. Turner, NA-LA, (E-File)  
Kirsten Laskey, EM-LA, (E-File)  
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Michael T. Brandt, ADESH, (E-File)  
Raeanna Sharp-Geiger, ADESH, (E-File)  
Alison M. Dorries, ENV-DO, (E-File)  
Randal S. Johnson, DSESH-TA55, (E-File)  
Stephen G. Cossey, DSESH-TA55, (E-File)  
Leslie K. Sonnenberg, TA-55-RLW, (E-File)  
John C. Del Signore, TA-55-RLW, (E-File)  
William H. Schwettmann, IPM, (E-File)  
Michael T. Saladen, ENV-CP, (E-File)

13040

Ms. Phyllis Bustamante  
ENV-DO-15-0137

- 5 -

Cy (continued):

Robert S. Beers, ENV-CP, (E-File)

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Symbol: EPC-DO: 19-260  
LAUR: 19-27012  
Date: **JUL 23 2019**

Mr. William S. Goodrum  
Manager, Los Alamos Field Office, A316  
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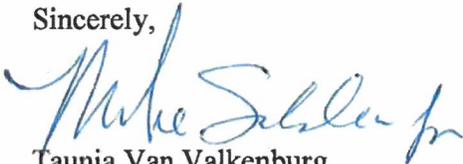
**Subject: Radioactive Effluent Quality at NPDES Outfall 051, TA-50-RLWTF, June 2019**

Dear Mr. Goodrum:

Enclosed is the monthly monitoring report for NPDES Outfall 051 for radioactive effluent quality data for June 2019. This report includes the monthly value (monthly average) compared with the DOE Derived Concentration Guideline (DCG) value for each parameter analyzed. The monthly value is an equal composite of all discharges that occurred during the monitoring period.

Please contact Jennifer Griffin at (505) 667-6741 or Mike Saladen at (505) 665-6085 if you have questions.

Sincerely,



Taunia Van Valkenburg  
Group Leader

TVV/MTS/JKG:jdm

Attachment(s): Attachment 1 Radioactive Effluent Quality at NPDES Outfall 051, TA-50-RLWTF, June 2019

**TRIAD/DOE EXHIBIT 18**

EPC-DO: 19-260  
Mr. William S. Goodrum

JUL 23 2019

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Month: June 2019  
 #Discharges: 1                      Liters Discharged: 80,798

Emitter	Isotope	Concentrations, pCi/L		Ratio
		Standard	Effluent	
Alpha	Am-241	170	1	0.006
Alpha	U-234	680	0.6	0.001
Alpha	U-238	750	0.028	0.000
Beta	H-3	1,900	7.1	0.004
Beta	Rb-83	18	0.062	0.003
<b>SUM of Ratios:</b>				<b>0.014</b>

Standard: DOE-STD-1196-2011, Table 5, Column = Ingested Water

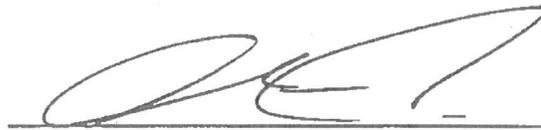
CERTIFICATION

Los Alamos National Laboratory  
TA-50 RLWTF  
DOE Derived Concentration Standard Report

Document Title and Date:

RADIOACTIVE EFFLUENT QUALITY AT NPDES OUTFALL 051, TA-50 RLWTF:  
**June 2019**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Signature

7-10-19

Date

Name of certifying official (Group Leader or above)	Z#	Title	Organization
Alvin M. Aragon	121089	Operations Mgr.	TA55-RLW

**TRIAD/DOE EXHIBIT 19**

**TA50 Radioactive Liquid Waste Treatment Facility  
Discharges to Mortandad Canyon Through NPDES Outfall 051**

Month: June 2019  
 #Discharges: 1                      Liters Discharged: 80,798

Emitter	Isotope	Concentrations, pCi/L		Ratio
		Standard	Effluent	
Alpha	Am-241	170	1	0.006
Alpha	U-234	680	0.6	0.001
Alpha	U-238	750	0.028	0.000
Beta	H-3	1,900	7.1	0.004
Beta	Rb-83	18	0.062	0.003
<b>SUM of Ratios:</b>				0.014

Standard: DOE-STD-1196-2011, Table 5, Column = Ingested Water

Prepared by: J.C. Del Signore / 113532  
 Date: 07/09/19