

**Response to the Notice of Disapproval for the
Lower Pajarito Canyon Aggregate Area Investigation Work Plan,
Los Alamos National Laboratory, EPA ID #NM0890010515, HWB-LANL-10-052,
Dated October 7, 2010**

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. The comments are divided into general and specific categories, as presented in the notice of disapproval. Los Alamos National Laboratory's (LANL's or the Laboratory's) responses follow each NMED comment. This response contains data on radioactive materials, including source, special nuclear, and byproduct material. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with U.S. Department of Energy policy.

GENERAL COMMENTS

NMED Comment

1. Section 2.2, Operational History, pages 3 and 4:

The Plan indicates that niobium and zirconium hydride were among materials that have historically been used at Technical Area 18 (TA-18), but does not indicate the precise location(s) within TA-18. To the extent possible, the Permittees must identify the Areas of Concern (AOCs) and Solid Waste Management Units (SWMUs) where these materials were used. Analyses of niobium and zirconium hydride must be added to the analytical suites at AOCs and SWMUs where the materials were used, or the Permittees must provide technical justification(s) for not including them at potentially-affected AOCs and SWMUs.

LANL Response

1. The text in section 2.2 has been revised to identify the solid waste management units (SWMUs) and areas of concern (AOCs) where niobium and zirconium hydride were used—SWMUs 18-003(a), 18-003(b), 18-003(c), 18-003(d), 18-012(a), and AOCs 18-013 and 18-010(f). Zirconium has been added to the analytical requirements for samples proposed at those sites. No reliable method for analysis of niobium is available, and it is not included as part of the analyses for samples proposed at those sites. The text in sections 4.6.1.3, 4.6.2.3, 4.7.3, 4.8.3, 4.21.3, 4.23.3, and 4.25.3 has been revised to reflect this change. Tables 4.6-5, 4.6-10, 4.7-5, 4.8-4, 4.21-1, 4.23-1, and 4.25-1 have been revised to include zirconium analysis.

NMED Comment

2. SWMUs and AOCs Where Groundwater will Likely be Encountered:

Several of the specific comments below require the Permittees to show existing groundwater monitoring wells on site maps of specific AOCs and SWMUs. For sites where wells are located, the Permittees are required to provide monitoring results in the Lower Pajarito Canyon Aggregate Area Investigation Report (IR) for sampling events that will occur in 2011. Specific comments below require

more detailed information about what actions will be taken in the field if groundwater is encountered at various subsurface sample locations. Due to the differences in scales between Plate 1 of the Plan and figures for the individual SWMUs, AOCs and Consolidated Units, NMED may not have identified all SWMUs and AOCs where monitoring wells are located or where groundwater may be encountered during subsurface sampling activities. The Permittees must revise figures to show well locations for the individual sites which have wells located within the illustrated site boundaries.

LANL Response

2. Figures 4.7-1 through 4.7-5, 4.9-1, 4.9-2, 4.11-1, 4.11-2, and 4.15-1 through 4.15-4 have been revised to include monitoring well locations that are within the map boundaries for affected SWMUs and AOCs. The text in section 7.4 has been revised to state what measures will be taken in the event groundwater is encountered while advancing the boreholes.

As indicated in the revised text (section 8.1), groundwater data are reported through other documents, including periodic monitoring reports. Groundwater data from wells within the Lower Pajarito Canyon Aggregate Area will be evaluated as appropriate when preparing the investigation report and may be summarized in the context of the investigation. Groundwater data will not be presented except in the appropriate periodic monitoring report for the Pajarito Canyon watershed.

NMED Comment

3. ***SWMUs and AOCs Where 20 Percent of the Soil Samples are Proposed for Polychlorinated Biphenyls (PCBs) Analyses:***

The Permittees must state what criteria will be used for choosing which one in five samples or sample intervals will be selected for PCB analyses (e.g., only surficial samples will be chosen or only sample intervals found to contain SVOCs).

LANL Response

3. Text has been added to section 7.8 stating that two criteria are applied to select locations for polychlorinated biphenyl (PCB) analysis. The first criterion is to spatially separate the locations into areas that are most likely to define lateral extent of PCBs if they are present. The second criterion is to include PCB analysis for all depth intervals at each location selected by the first criterion for the purpose of defining the vertical extent at any location where PCBs are detected.

SPECIFIC COMMENTS

NMED Comment

4. ***Section 4.1.1.3, Scope of Activities for SWMU 18-001(a), third paragraph, first three sentences, page 13:***

Permittees' Statement: "Eight surface and subsurface samples will be collected from location 1a-20 (Figure 4.1-3). Samples will be collected from eight depths (0–1 ft, 14–15 ft, 29–30 ft, 50–51 ft [below ground surface] bgs, and at 25-ft intervals thereafter to a depth of up to 150 ft bgs). Additional sampling intervals may be added to this location to ensure that a sample is collected from every geologic unit encountered."

NMED Comments: NMED agrees with the proposed location of this relatively deep boring and is in general agreement with the proposed sampling approach. As discussed with Permittee representatives during a September 24, 2010 site visit, certain additions to the Plan are necessary.

The proposed boring must be advanced to the contact between the Cerro Toledo Interval and Otowi Member. Based on the geologic logs collected at nearby wells R-20, R-32, R-51 and R-54, this contact is approximately 150 to 180 feet (ft) below ground surface. The Permittees must make an attempt to video log the open borehole or at the least, the lowest 20 to 50 feet portion of the borehole, corresponding to the anticipated approximate thickness of the Cerro Toledo Interval. The purpose of the video log is to determine if perched saturation is present and, if so, to estimate groundwater flow rates into the open hole. If it is determined that sufficient yield is present then the construction of a monitoring well may be warranted. Once the borehole has reached the required total depth, and assuming perched saturation is present, the Permittees must consult with NMED to determine the proper design for well construction. All procedures directed at these borings, including the installation of a monitoring well(s), must follow requirements as specified in the March 1, 2005 Compliance Order on Consent.

LANL Response

4. The text in section 4.1.1.3 and Table 4.1-1 have been revised to state that the borehole will be advanced to the contact between the Cerro Toledo interval and the Otowi Member. The text further states that video logging of the borehole will be performed as indicated. If perched saturation is present, groundwater flow rates into the open hole will be estimated. If sufficient yield is present, NMED will be consulted to determine whether construction of a monitoring well is warranted, and if so, to determine the design for construction of the well. The text in section 7.4 has been revised to include a discussion of the method of isolating boreholes from groundwater if it is encountered during drilling or sampling.

NMED Comment

5. **Section 4.1.1.3, Scope of Activities for SWMU 18-001(a), pages 13 and 14 and Figure 4.1-3, Proposed sampling locations for SWMU 18-001(a), page 69:**

The Plan (Section 4.1.1.1) and the associated Lower Pajarito Canyon Aggregate Area Historical Investigation Report (HIR, Section 2.1.1.1) indicate that this SWMU may have been affected by high explosives (HE) resulting from former explosives testing activities at TA-27. Although HE was not detected during previous sampling efforts in 1993, explosive compounds must be added to the analytical suites for selected sample locations at this AOC. Alternatively, the Permittees may provide technical justification(s) for not doing so. The figure indicates that discharges from Outfall 4S could flow to the northwest and also to the southeast of the outfall. However, sample locations are only proposed southeast of the outfall. Revise the Plan and figure to include six sample locations in the relatively level area located approximately 80 feet northwest of the outfall. One of the sample locations must be placed in the narrow, constricted area located approximately 30 feet northwest of the outfall.

Except for proposed sample location 1a-8, sample locations have not been proposed to sufficiently evaluate the drain line that exits from the south side of the former north lagoon. At least two additional sample locations must be proposed near the two areas where the line bends before turning to the northeast toward the outfall. Alternatively, this could be accomplished by moving proposed sample location 1a-9 approximately 40 feet northwest to the first bend between the lagoons and moving

proposed sample location 1a-23 approximately 60 feet southwest to the 90 degree bend located east of the lagoons. At new or relocated locations, samples must be tested for the same analytes and at the same sample depths as proposed for sample location 1a-8.

LANL Response

5. The firing site closest to SWMU 18-001(a) is approximately 400 ft away from the SWMU. Impact of the firing site on the SWMU 18-001(a) is extremely unlikely. Therefore, explosive compounds were not identified as potential contaminants at SWMU 18-001(a) and will not be added to the proposed analysis for that site.

The topography in the vicinity of the outfall is such that flow of discharge to the northwest is not possible. Site visits have confirmed that a small earthen berm and culvert are present and divert all discharge flow to the southeast. Sampling locations have not been added to the northwest of the outfall.

Proposed locations 1a-9 and 1a-23 have been moved northwest and southwest, respectively, to address the two bends in the line. Samples will be collected at the same depths as proposed for location 1a-8.

NMED Comment

6. **Section 4.1.2, SWMU 18-001(b), first paragraph, fourth line, page 14 and Figures 4.1-2 and 4.1-4, pages 68 and 70:**

Permittees' Statement: "Eleven manholes (structures 18-160, 18-161, and 18-169 to 18-177) are associated with the inactive sewer line."

NMED Comment: *The figures only show ten former manhole locations and do not show the location of former manhole 18-177. Revise the figures or the text as needed for consistency. This comment also applies to the second sentence of the first paragraph in Section 4.1.2.1 (Summary of Previous Investigations for SWMU 18-001(b)).*

LANL Response

6. Figures 4.1-2 and 4.1-4 have been revised to include an eleventh manhole, labeled as structure 18-177.

NMED Comment

7. **Section 4.2.2.3, Scope of Activities for SWMU 18-012(b), page 18 and Figure 4.2-2, Proposed sampling locations for SWMU 18-012(b), page 72:**

No sampling locations have been proposed for evaluation of the four-inch polyethylene drain lines extending from Buildings 18-30 and 18-31 and the associated outfall. Soil samples must be collected from beneath or immediately adjacent to the drain lines where they exit Buildings 18-30 and 18-31 and at the line junction located approximately 10 feet north of AOC 18-010(c).

There is another drain line shown on Figures 4.2-1 and 4.2-2. It runs in an east-southeast direction and it appears to originate from the southeast corner of Building 18-31. The line is not mentioned in the text and it is not clear on the figure whether or not it is connected to the line that serviced

Buildings 18-30 and 18-31. The line connects to a drain field located approximately 80 feet south of Building 18-37. The Permittees must clarify whether or not the line is associated with SWMU 18-012(b). If it is, several additional sample locations must be proposed at locations containing pipe junctions.

LANL Response

7. Text in section 4.2.2.3, Figure 4.2-2, and Table 4.2-1 have been revised to include three additional proposed sampling locations. Two locations were added where the drainlines exit buildings 18-30 and 18-31, and a third location was added at the line junction.

Text in section 4.2.2 has been revised to clarify that the drainline that exits the southeast corner of building 18-31 is not associated with SWMU 18-012(b).

NMED Comment

8. **Section 4.6.2.1, Summary of Previous Investigations for SWMU 18-003(b), third paragraph, second sentence, page 22:**

Permittees' Statement: *"Concrete and wood samples were collected from the interior of the tank, and soil samples were obtained from beneath the inlet and outlet connections."*

NMED Comment: *Provide additional information concerning the nature of the wood material that was sampled in 1997. The HIR indicates that there were wooden baffles in each end of the septic tank. Include a discussion of whether or not additional sampling of the wood material is needed.*

LANL Response

8. The goal of the investigation of SWMU 18-003(b) is to characterize the environmental media near the septic tank, i.e., the soil and/or tuff surrounding the tank, to determine if releases have occurred from the septic system. The results of samples collected from the wooden baffles in 1997, as potential indicators of contaminants that may have been present inside the tank, were considered when assigning the analytical suite for samples to be collected from the environmental media. Characterization of the wooden baffles is not warranted as part of the investigation. After the site is characterized, decisions will be made regarding the disposition of the septic tank, lines, and any remaining contents of the tank, including any wood baffles remaining. If the tank and contents are identified for removal and disposal, all removed material will be characterized for purposes of waste management according to an approved waste characterization strategy form. The text in section 4.6.2.1 has been revised to clarify that the samples were taken from the wooden baffles associated with the septic tank.

NMED Comment

9. **Section 4.7.1, Summary of Previous Investigations for SWMU 18-003(c), second paragraph, last sentence, page 23:**

Permittees' Statement: *"One permanent well (M-8) was installed to allow future groundwater monitoring."*

NMED Comment: *Plan Plate 1 depicts a well located near SWMU 18-003(c). The well is identified as 18-MW-8 on Plate 1. Verify that well M-8 is the same well as 18-MW-8. Show the well location on*

Figures 4.7-1 through 4.7-5, inclusive. According to Table 5.4-1 of the 2010 Interim Facility-Wide Groundwater Monitoring Plan, well 18-MW-8 is an alluvial well that is sampled annually for Target Analyte List (TAL) metals, volatile and semi-volatile organic compounds including tentatively identified compounds (VOCs, SVOCs and TICs, respectively), explosive compounds, radionuclides, several general inorganic analytes, perchlorate and various field indicator parameters. NMED internal correspondence indicates the well was scheduled for sampling in August 2010. If well 18-MW-8 is sampled in 2011, the Permittees must include that analytical data in the IR.

LANL Response

9. The text has been revised (section 4.7.1) to refer to well M-8 as well 18-MW-8, the current Laboratory designation for the well. Figures 4.7-1 through 4.7-5 have been revised to show the well as well 18-MW-8.

As indicated in the revised text (section 8.1), groundwater data are reported through other documents, including periodic monitoring reports. Groundwater data from wells within the Lower Pajarito Canyon Aggregate Area will be evaluated as appropriate when preparing the investigation report and may be summarized in the context of the investigation. Groundwater data will not be presented except in the appropriate periodic monitoring report for the Pajarito Canyon watershed.

NMED Comment

- 10. Section 4.7.3, Scope of Activities SWMU 18-003(c), second and third paragraphs, pages 24 and 25, Figure 4.7-3, page 86, Figure 4.7-5, page 88, and Tables 4.7-1 and 4.7-3, pages 148 and 149:**

The Plan indicates in Section 4.7.2 (Summary of Data for SWMU 18-003(c)) that HE was detected in samples collected in 1997. The reader is directed to Figure 4.7-3 to view the concentrations and locations of various organic constituents detected in the 1997 samples. Explosive compounds are not shown on Figure 4.7-3 and are not listed in Table 4.7-3 although analyses were requested for six samples according to Table 4.7-1. The Permittees must review the historical analytical data to verify whether or not explosives were present in the 1997 samples. If they were present, explosive compounds must be added to the analytical suites for this SWMU. NMED will consider a proposal to add explosive compounds to selected samples/sample intervals (i.e., not all samples/sample intervals), if the Permittees provide a sound technical rationale for selection of the samples. The rationale must be based on previous analytical data or on reliable historical information about explosives use at the SWMU or related current or former structures.

Although the text indicates that locations chosen for sampling will be placed to coincide with the expected locations of pipe joints, review of Figure 4.7-5 indicates no sample locations have been proposed where the drain line exits Building 18-32, at the 45 degree bend located approximately 20 feet east of the building, or at the 45 degree bend located approximately 15 feet east of Building 18-128. The Permittees must either propose additional sample locations to evaluate the pipe joints or consider adjusting currently proposed locations to evaluate the joint locations.

LANL Response

10. The historical data associated with SWMU 18-003(c) have been reviewed. Explosive compounds were not detected in the 1997 data, which is decision-level data. Therefore, the text (section 4.7.2) has been revised to exclude explosive compounds from the list of contaminants detected during the

1997 voluntary corrective measure. Explosive compounds are not included in the analyses for the proposed samples at this site.

The text in section 4.7.3, Figure 4.7-5, and Table 4.7-5 have been revised to include three additional proposed sampling locations. One location has been added where the drainline exits building 18-32; one location has been added at the 45-degree bend approximately 20 ft east of the building; and one location has been added at the 45-degree bend approximately 15 ft east of building 18-128.

NMED Comment

11. Section 4.8, SWMU 18-003(d), Septic System, page 25, Figures 4.8-1 through 4.8-4 (inclusive), pages 89 through 92 and Plate 1:

Plan Plate 1 shows several monitoring wells in the vicinity of this SWMU. If any monitoring wells are located within the site boundaries shown on Figures 4.8-1 through 4.8-4, the well(s) must be added to the figures. In the event one or more wells are added to the figures and, if the well(s) will be sampled in 2011, the monitoring results must be included in the IR.

The SWMU figures indicate that the sewer line originates from the southwest corner of Building 18-270, approximately ten feet east of the manhole. As illustrated, the line enters the east side of the manhole, exits the manhole in a northerly direction and apparently enters the south side of Building 18-116 and subsequently exits the building extending north-northeast toward the septic tank and drain field. The Permittees must confirm whether or not this interpretation is correct and, if correct, sample locations must be proposed in the Plan to evaluate the manhole and the southern-most portions of the line as described in this comment.

LANL Response

11. Soil samples were collected from the monitoring wells when the wells were installed during the 1996–1998 voluntary corrective action (VCA). Results from those samples are presented in section 4.8.2. The wells were subsequently abandoned and are no longer in use. The locations shown on Plate 1 are the existing sampling locations associated with the abandoned wells. The nearest active monitoring wells shown on Plate 1 are approximately 900 ft away from SWMU 18-003(d) and are not included in the site figures.

The drainline associated with SWMU 18-003(d) does not serve building 18-270 but serves only building 18-116. Building 18-270 is a temporary building. The drainline serves the south side of building 18-116 and enters the manhole west of building 18-270. The text in section 4.8.3, Figure 4.8-4, and Table 4.8-4 have been revised to include three additional proposed sampling locations, one at the exit of building 18-116 and one each at the entrance and exit of the manhole.

NMED Comment

12. Section 4.8.1, Summary of Previous Investigations for SWMU 18-003(d), fourth paragraph, first and second sentences, page 25:

Permittees' Statement: "A [voluntary corrective action] VCA was conducted at SWMU 18-003(d) from October 1996 to September 1998. The VCA consisted of constructing five permanent alluvial monitoring wells in and around the SWMU 18-003(d) drain field and sampling the groundwater of the wells quarterly for 2 yr."

NMED Comment: *The wells must be shown on Figures 4.8-1 through 4.8-4. If the well(s) will be sampled in 2011, the monitoring results must be included in the IR.*

LANL Response

12. Soil samples were collected from the monitoring wells when the wells were installed during the 1996–1998 VCA. Results from those samples are presented in section 4.8.2. The wells were subsequently abandoned and are no longer in use. The locations shown on Plate 1 are the existing sampling locations associated with the abandoned wells. The nearest active monitoring wells shown on Plate 1 are approximately 900 ft away from SWMU 18-003(d) and are not included in the site figures. The text in section 4.8.1 has been revised to clarify that the wells were abandoned and are no longer active monitoring wells.

NMED Comment

13. Section 4.8.3, Scope of Activities for SWMU 18-003(d), page 26 and Figure 4.8-4, Proposed sampling locations for SWMU 18-003(d), page 92:

Include a discussion of the absence of analyses of explosive compounds at this SWMU, or include explosives compounds in the sample analytical suite.

LANL Response

13. High explosives (HE) were not used in any activities at building 18-116 (Kiva 3). The septic system serving building 18-116 would therefore not have received any HE-contaminated waste. Explosive compounds are not included in the analyses for the proposed samples at this site.

NMED Comment

14. Section 4.9, SWMU 18-003(e), Septic System, pages 26 and 27, Section 4.9.3, Scope of Activities for SWMU 18-003(e), first and second paragraphs, pages 27 and 28, Figures 4.9-1 and 4.9-2, pages 93 and 94 and Plate 1:

Plan Plate 1 indicates well 18-MW-9 is close enough to the SWMU to include its location on Figures 4.9-1 and 4.9-2. It is possible the well may be located in or very close to the drain field associated with the SWMU. Revise the figures to show the well location and indicate that all 2011 groundwater monitoring data for the well will be included in the IR.

Both figures are quite busy due to the concentration of various utilities in the area. Given the description of the buildings that discharged to the septic system (18-31, 18-37 and 18-129) or may have discharged to the system (18-28 and septic tanks associated with SWMUs 18-003(g and h)), it is not clear why sewer lines coming from those buildings and SWMUs are not proposed for evaluation. The Permittees must provide sound technical justification(s) for not evaluating those lines, or the Permittees must propose to evaluate the lines.

LANL Response

14. Figures 4.9-1 and 4.9-2 have been revised to include the location of well 18-MW-9. The text in section 4.9.3, Figure 4.9-2, and Table 4.9-1 have been revised to include 19 additional sample locations. The locations are proposed at the exits of buildings 18-31, 18-37, 18-129, 18-190, 18-189,

and along the drainlines that discharge from each respective building. Sampling of all added locations will be performed if practicable. Some locations, particularly those adjacent to buildings, may be impracticable to sample and may require delay until decontamination and decommissioning (D&D) of the respective buildings are complete.

As indicated in the revised text (section 8.1), groundwater data are reported through other documents, including periodic monitoring reports. Groundwater data from wells within the Lower Pajarito Canyon Aggregate Area will be evaluated as appropriate when preparing the investigation report and may be summarized in the context of the investigation. Groundwater data will not be presented except in the appropriate periodic monitoring report for the Pajarito Canyon watershed.

NMED Comment

15. Section 4.9.3, Scope of Activities for SWMU 18-003(e), third paragraph, second and third sentences, page 27:

Permittees' Statement: *"Samples will be collected from eight depths (immediately below the level of the line or tank, 5 ft below the level of the line or tank 25–26 ft bgs, and at 25-ft intervals thereafter to a depth of up to 150 ft bgs). Additional sampling intervals may be added to this location to ensure that a sample is collected from every geologic unit encountered."*

NMED Comment: *NMED agrees with the proposed location of this relatively deep boring and is in general agreement with the proposed sampling approach. As discussed with Permittee representatives during a September 24, 2010 site visit, certain additions to the Plan are necessary.*

The proposed boring must be advanced to the contact between the Cerro Toledo Interval and Otowi Member. Based on the geologic logs collected at nearby wells R-20, R-32, R-51 and R-54, this contact is approximately 150 to 180 feet (ft) below ground surface. The Permittees must make an attempt to video log the open borehole or at the least, the lowest 20 to 50 feet of the borehole, corresponding to the anticipated approximate thickness of the Cerro Toledo Interval. The purpose of the video log is to determine if perched saturation is present and, if so, to estimate groundwater flow rates into the open hole. If it is determined that sufficient yield is present then the construction of a monitoring well may be warranted. Once the borehole has reached the required total depth, and assuming perched saturation is present, the Permittees must consult with NMED to determine the proper design for well construction. All procedures directed at these borings, including the installation of a monitoring well(s), must follow requirements as specified in the March 1, 2005 Compliance Order on Consent.

LANL Response

15. The text in section 4.9.3 and Table 4.9-1 have been revised to state that the borehole will be advanced to the contact between the Cerro Toledo interval and the Otowi Member. The text further states that video logging of the borehole will be performed as indicated. If perched saturation is present, groundwater flow rates into the open hole will be estimated. If sufficient yield is present, NMED will be consulted to determine whether construction of a monitoring well is warranted, and if so, to determine the design for construction of the well. The text in section 7.4 has been revised to include a discussion of the method of isolating boreholes from groundwater if it is encountered during drilling or sampling.

NMED Comment

16. Section 4.9, SWMU 18-003(e), Septic System, pages 26 and 27, Section 4.9.3, Scope of Activities for SWMU 18-003(e), first and second paragraphs, pages 27 and 28, Figures 4.9-1 and 4.9-2, pages 93 and 94 and Plate 1:

Permittees' Statement: "Samples adjacent to the lines will be collected at 20-ft intervals along the path of the line, beginning at the point of exit from the building or tank, to coincide with the expected locations of the pipe joints."

NMED Comment: The Permittees have not proposed sampling in areas where drain lines exit buildings or other structures. At a minimum the Plan must be modified to propose the collection of samples at 20 foot intervals from the native soils immediately below the pipe backfill.

LANL Response

16. Nineteen additional sampling locations have been added to the scope of activities for SWMU 18-003(e). The added locations include points where lines exit the buildings served by the septic system and locations adjacent to the drainlines leading to the septic system. Samples will be collected at 20-ft intervals along the drainlines, from native soil or tuff immediately below the lines. Sampling of all added locations will be performed if practicable. Some locations, particularly those adjacent to buildings, may be impracticable to sample and may require delay until D&D of the respective buildings are complete. The text in section 4.9.3, Figure 4.9-2, and Table 4.9-1 have been revised to include these additional sampling locations.

NMED Comment

17. Section 4.9, SWMU 18-003(e), Septic System, pages 26 and 27, Section 4.9.3, Scope of Activities for SWMU 18-003(e), first and second paragraphs, pages 27 and 28, Figures 4.9-1 and 4.9-2, pages 93 and 94 and Plate 1:

Permittees' Statement: "Samples will be collected from eight depths (immediately below the level of the line or tank, 5 ft below the level of the line or tank 25–26 ft bgs, and at 25-ft intervals thereafter to a depth of up to 150 ft bgs). Additional sampling intervals may be added to this location to ensure that a sample is collected from every geologic unit encountered."

NMED Comment: As indicated in Section 4.9.1 (Summary of Previous Investigations for SWMU 18-003(e)), shallow groundwater was encountered and sampled at two locations when the SWMU was investigated in July 1994.

The Permittees are referred to the discussion provided in Section 3.3 (Chronological Drilling and Abandonment Activities for the PCI-2 Core Hole) of the Completion Report for Intermediate Aquifer Well PCI-2, September 2009 (LA-UR-09-5489, EP2009-0423). That section of the document provides information concerning advancement of a boring to a depth of 163 feet bgs using hollow stem auger equipment and sample collection using split-barrel core samplers.

The Permittees must also justify why only one sample location is proposed at the outfall within elevation contour 6724 since discharges from the outfall would likely flow a short distance to the west of the outfall and to a relatively large, flat area east of the outfall.

LANL Response

17. Only one sample was proposed at the outfall at elevation contour 6724 because of the proximity of canyon reach PA-3E. Text in section 4.9.3 has been revised to state that data from canyon reach PA-3E (shaded in green) will be included in the investigation report to supplement the data collected from SWMU 18-003(e) as needed to define the lateral extent of contamination. The text in section 7.4 has been revised to state what measures will be taken in the event that groundwater is encountered while advancing the boreholes.

NMED Comment

18. **Section 4.9, SWMU 18-003(e), Septic System, pages 26 and 27, Section 4.9.3, Scope of Activities for SWMU 18-003(e), page 27, Figures 4.9-1 and 4.9-2, pages 93 and 94 and Plate 1:**

Permittees' Statement: "Samples will be collected from eight depths (immediately below the level of the line or tank, 5 ft below the level of the line or tank 25–26 ft [below ground surface] bgs, and at 25-ft intervals thereafter to a depth of up to 150 ft bgs). Additional sampling intervals may be added to this location to ensure that a sample is collected from every geologic unit encountered."

NMED Comment: As indicated in Section 4.9.1 (Summary of Previous Investigations for SWMU 18-003(e)), shallow groundwater was encountered and sampled at two locations when the SWMU was investigated in July 1994. More information is needed concerning how the subsurface boring at location 3e-23 will be advanced, including what step(s) will be taken in the event groundwater is encountered.

The Permittees are referred to the discussion provided in Section 3.3 (Chronological Drilling and Abandonment Activities for the PCI-2 Core Hole) of the Completion Report for Intermediate Aquifer Well PCI-2, September 2009 (LA-UR-09-5489, EP2009-0423). That section of the document provides information concerning advancement of a boring to a depth of 163 feet bgs using hollow stem auger equipment and sample collection using split-barrel core samplers.

LANL Response

18. The text in section 7.4 has been revised to include a discussion of the method of isolating boreholes from groundwater if it is encountered during drilling or sampling.

NMED Comment

19. **Section 4.10.3, Scope of Activities for SWMU 18-003(f), page 28,**

NMED Comment: As indicated in Section 4.10.1 (Summary of Previous Investigations for SWMU 18-003(f)), shallow groundwater was encountered and sampled at three locations when the SWMU was investigated in August 1994. More information is needed concerning what step(s) will be taken in the event groundwater is encountered. See Comment 15 above.

LANL Response

19. The text in section 7.4 has been revised to include a discussion of the method of isolating boreholes from groundwater if it is encountered during drilling or sampling.

NMED Comment

20. Section 4.11, SWMU 18-003(g), Septic System, second paragraph, page 29:

Permittees' Statement: "From 1944 to the present, the septic system has been receiving sanitary and photochemical laboratory waste from building 18-1. The major part of building 18-1 was demolished in 1968, leaving only a high bay, which is currently used as an electronic assembly and storage area. In 1969, SWMU 18-003(g) was connected to the site sewer system that routed effluent to the sanitary sewage lagoons, which changed the function of the tank to a settling pit. Since 1992, the septic system waste has been pumped to the Laboratory [Sanitary Wastewater Systems Consolidation] SWSC plant."

NMED Comment: Some of these statements contradict one another. For example, if the septic system wastes have been pumped to the SWSC plant since 1992, it would be unlikely that the system received wastes from 1944 to the present. The SWMU is described as an inactive septic system which would also conflict with the statement that the system is currently receiving wastes. Clarify the history of this unit and explain any discrepancies in the historical records.

LANL Response

20. The text in section 4.11 has been revised to clarify the history of the septic system, stating that the septic system received sanitary and photochemical laboratory waste from building 18-1 beginning in 1944, and the system was rerouted in 1992. The septic system is currently inactive; any waste discharges have been rerouted to the Sanitary Wastewater Systems Consolidation (SWSC) Plant.

NMED Comment

21. Section 4.11.1, Summary of Previous Investigations at SWMU 18-003(g), second paragraph, first and last sentences, page 29 and Plan Plate 1:

Permittees' Statements: "Four subsurface soil samples and three groundwater samples were collected from a borehole 10 ft downgradient (southeast) of the tank using a Teflon core-barrel sampler." and, "One permanent well (well M-11) was installed for groundwater monitoring (LANL 1995, 052183, pp. 4-52-4-57).

NMED Comment: Confirm that well M-11 is the same as well 18-MW-11 shown on Plan Plate 1 and, if confirmed, show the well location on all figures associated with the SWMU. Indicate that if the well is sampled in 2011, the groundwater monitoring data will be included in the IR.

LANL Response

21. The reference to well M-11 in section 4.11.1 of the text has been changed to well 18-MW-11, the current Laboratory designation for the well. Figures 4.11-1 and 4.11-2 have been revised to indicate well 18-MW-11.

As indicated in the revised text (section 8.1), groundwater data are reported through other documents, including periodic monitoring reports. Groundwater data from wells within the Lower Pajarito Canyon Aggregate Area will be evaluated as appropriate when preparing the investigation report and may be summarized in the context of the investigation. Groundwater data will not be presented except in the appropriate periodic monitoring report for the Pajarito Canyon watershed.

NMED Comment

22. Section 4.11.3, Scope of activities at SWMU 18-003(g), first paragraph, last line, page 30:

Permittees' Statement: "A third sample depth is included at some locations to investigate the potential of contaminants migrating to greater depths."

NMED Comment: The Permittees must describe what step(s) will be taken in the event groundwater is encountered during field activities at the SWMU.

LANL Response

22. The text in section 7.4 has been revised to include a discussion of the method of isolating boreholes from groundwater if it is encountered during drilling or sampling.

NMED Comment

23. Section 4.12, SWMU 18-003(h), Septic system, first paragraph, page 30,

The septic system is first described as being in active use; however, the last sentence indicates septic system waste has been pumped to the SWSC since 1992. The two descriptions may contradict each other. Review the SWMU descriptions and revise as needed, clarifying how the system is used today, and what constitutes "active use".

LANL Response

23. The text in section 4.12 has been revised to clarify the current status of the septic system, which is currently inactive, and the paragraph has been updated to reflect current knowledge of the site.

NMED Comment

24. Section 4.12, SWMU 18-003(h), Septic System, first paragraph, fourth, fifth and sixth lines, second paragraph, last line, page 30, and Figures 4.11-1 and 4.11-2, pages 97 and 98:

Permittees' Statement: "From 1967 to the present, the septic system has been receiving sanitary waste from building 18-147. In 1969, SWMU 18-003(h) was connected to the site sewer system that routed effluent to the sanitary sewage lagoons, changing the function of the tank to a settling pit. Since 1992, the septic system waste has been pumped to the SWSC plant at TA-46." and, "Based on a review of past site operations at building 18-30, the [Resource Conservation and Recovery Act] (RCRA) Facility Investigation] RFI work plan identified SVOCs, VOCs, plutonium, and uranium as [chemicals of potential concern] COPCs for SWMU 18-003(h) (LANL 1993, 015310, p. 5-11)."

NMED Comment: The associated figures indicate there are no sewer lines connecting SWMU 18-003(h) to building 18-30. The text indicates the septic system received sanitary wastes from building 18-147. Therefore, it is unclear how or why site operations at building 18-30 are relevant to this SWMU. Review the statements and figures and revise as needed.

LANL Response

24. The text in section 4.12 referring to building 18-30 has been removed; therefore, no additional text revision is necessary. Also, no revisions to the associated figures are necessary.

NMED Comment

25. Section 4.12.3, Scope of Activities for SWMU 18-003(h), first paragraph, last line, page 31:

Permittees' Statement: "A third sample depth is included at some locations to investigate the potential of contaminants migrating to greater depths."

NMED Comment: Section 4.12.1 (Summary of Previous Investigations for SWMU 18-003(h)) indicates that collection of one or more groundwater samples was planned during the September 1993 and August 1994 RFI; however, the samples were not collected due to accidental penetration of the sewer line with the hollow-stem auger.

The Permittees must describe what step(s) will be taken in the event groundwater is encountered during field activities at the SWMU.

LANL Response

25. The text in section 7.4 has been revised to include a discussion of the method of isolating boreholes from groundwater if it is encountered during drilling or sampling.

NMED Comment

26. Section 4.14.3, Scope of Activities for SWMU 18-005(a), page 33:

The site description (Section 4.14, SWMU 18-005(a), Area of Potential Soil Contamination from Former Magazine 18-15) provided in the Plan (and the associated HIR) is limited. As such, it is not clear whether the magazine/soil-bermed wooden bunker was constructed at grade, below grade, or above grade (relative to pre-construction grades). The Permittees must propose collection of additional soil samples from interval(s) deeper than five feet unless more informative construction information indicates the structure was built at or above grade. The Permittees must provide the construction details for the bunker and propose additional sampling, as necessary.

LANL Response

26. Magazines at TA-18 were not constructed belowgrade. The structures were constructed at grade (on the surface) and surrounded by earthen berms. Therefore, the addition of deeper samples is not necessary. The text in section 4.1.4 has been revised to state that the magazine was constructed at grade. Samples will be collected from native soil and tuff from 0–1 ft and 4–5 ft as determined in the field.

NMED Comment

27. Section 4.15.1, Summary of Previous Investigations for AOC 18-006, first paragraph, first two lines, page 34 and Plan Plate 1:

Permittees' Statement: "An environmental investigation was conducted in the area surrounding AOC 18-006 in 1990. During the investigation, four shallow monitoring wells were drilled near structure 18-168 (one upgradient of the structure and the other three downgradient)."

NMED Comment: One well (18-MW-7) is shown on Plan Plate 1. Verify this well is one of the four wells mentioned above. In addition, include all well locations on Plan figures associated with this

AOC. The Permittees must describe what step(s) will be taken in the event groundwater is encountered during field activities at the AOC. If any site wells are sampled in 2011, the analytical data must be included in the IR.

LANL Response

27. Well 18-MW-7 is one of the four wells mentioned in section 4.15.1. The well has been added to Figures 4.15-1 through 4.15-4. The other well locations are not included on the plan figures because they are located 1100 ft downgradient of AOC 18-006, beyond the depicted map area. The text in section 7.4 has been revised to state what measures will be taken in the event that groundwater is encountered while advancing the boreholes.

As indicated in the revised text (section 8.1), groundwater data are reported through other documents, including periodic monitoring reports. Groundwater data from wells within the Lower Pajarito Canyon Aggregate Area will be evaluated as appropriate when preparing the investigation report and may be summarized in the context of the investigation. Groundwater data will not be presented except in the appropriate periodic monitoring report for the Pajarito Canyon watershed.

NMED Comment

28. Section 4.16.3, Scope of Activities for AOC 18-008, page 36:

The Permittees must describe what step(s) will be taken in the event groundwater is encountered during field activities at the AOC.

LANL Response

28. The text in section 7.4 has been revised to include a discussion of the method of isolating boreholes from groundwater if it is encountered during drilling or sampling.

NMED Comment

29. Section 4.17.3, Scope of Activities for AOC 18-010(b), penultimate sentence, page 37:

In light of the apparent fuel spill documented in a 1988 photograph, total petroleum hydrocarbons-diesel range organics (TPH-DRO) must be added to the analyte suite for all samples.

LANL Response

29. Analysis of total petroleum hydrocarbons–diesel range organics (TPH-DRO) has been added for all proposed samples at AOC 18-010(b). The text in section 4.17.3 and Table 4.17-1 have been revised to reflect this change.

NMED Comment

30. Section 4.18.3, Scope of Activities for AOC 18-010(c), first and second sentences, page 38 and Table 4.18-1, page 169:

Permittees' Statement: "Twenty surface and subsurface samples will be collected from one location at the outfall, seven locations in the drainage below the outfall, and two locations in the main Pajarito

Canyon drainage channel (Figure 4.18-2). Samples will be collected from two depths (0–1 ft and 2–3 ft bgs).”

NMED Comment: Provide the proposed sample interval information for the 20 samples that will be collected in the vicinity of the outfall location. Revise Table 4.18-1 to match the text statement.

LANL Response

30. Twenty samples are not proposed at the outfall location, but 20 samples total are proposed for the site. The text in section 4.18.3 has been revised to clarify that samples are proposed from 2 depth intervals (0–1 ft and 2–3 ft bgs) at each of 10 locations—1 location at the outfall, 7 locations in the drainage, and 2 locations in the main channel. No revision to the table is necessary.

NMED Comment

31. Section 4.19.3, Scope of Activities for AOC 18-010(d), first and second sentences, page 38 and Table 4.19-1, page 170:

Permittees’ Statement: “Twenty surface and subsurface samples will be collected from one location at the outfall, seven locations in the drainage below the outfall, and two locations in the main Pajarito Canyon drainage channel (Figure 4.19-2). Samples will be collected from two depths (0–1 ft and 2–3 ft bgs).”

NMED Comment: Provide the proposed sample interval information for the 20 samples that will be collected in the vicinity of the outfall location. Revise Table 4.19-1 to match the text statement.

LANL Response

31. Twenty samples are not proposed at the outfall location, but 20 samples total are proposed for the site. The text in section 4.19.3 has been revised to clarify that samples are proposed from 2 depth intervals (0–1 ft and 2–3 ft bgs) at each of 10 locations—1 location at the outfall, 7 locations in the drainage, and 2 locations in the main channel. No revision to the table is necessary.

NMED Comment

32. Section 4.20.3, Scope of Activities for AOC 18-010(e), first and second sentences, page 39, Figure 4.20-2, page 115, and Table 4.20-1, page 171:

Permittees’ Statement: “Twenty surface and subsurface samples will be collected from one location at the outfall, seven locations in the drainage below the outfall, and two locations in the main Pajarito Canyon drainage channel (Figure 4.20-2). Samples will be collected from two depths (0–1 ft and 2–3 ft bgs).”

NMED Comment: Provide the proposed sample interval information for the 20 samples that will be collected in the vicinity of the outfall sample location and revise Table 4.20-1 to match the text statements. NMED assumes the outfall location where 20 sample intervals are proposed is location 10e-1 on Figure 4.20-2; however, as illustrated on Figure 4.20-2, the area designated as the AOC (outfall) location does not indicate that a sample location exists. Revise the text and the figure for clarity.

LANL Response

32. Twenty samples are not proposed at the outfall location, but 20 samples total are proposed for the site. The text in section 4.20.3 has been revised to clarify that samples are proposed from 2 depth intervals (0–1 ft and 2–3 ft bgs) at each of 10 locations—1 location at the outfall, 7 locations in the drainage, and 2 locations in the main channel. Figures 4.20-1 and 4.20-2 have been revised such that the AOC 18-010(e) label is now at proposed sample location number 10e-1, which is the actual location of the outfall. The accurate location of the outfall was confirmed through field verification. No revision to the table is necessary.

NMED Comment

33. Section 4.23.3, Scope of Activities for SWMU 18-012(a), second paragraph, first and second sentences, page 42 and Table 4.23-1, page 173:

Permittees' Statement: "Eighteen surface and subsurface samples will be collected from one location at the outfall and nine locations in the drainage below the outfall (Figure 4.23-2). Samples will be collected from two depths (0–1 ft and 2–3 ft bgs)."

NMED Comment: Provide the proposed sample interval information for the 18 samples that will be collected in the vicinity of location 12a-3 (the outfall location). Revise Table 4.23-1 to match the text statement.

LANL Response

33. Eighteen samples are not proposed at the outfall location, but 18 samples total are proposed for the site. The text in section 4.23.3 has been revised to clarify that samples are proposed from two depth intervals at each of nine locations—one location at the outfall, and eight locations in the drainage. No revision to the table is necessary.

NMED Comment

34. Section 4.24.3, Scope of Activities for AOC 18-012(c), first paragraph, first and second lines, third paragraph, first and second lines and Figure 4.11-2, Proposed sampling locations for SWMU 18-003(g), SWMU 18-003(h), and AOC 18-012(c) and Table 4.24-1, page 174:

Permittees' Statements: "Four surface and subsurface samples will be collected from two locations at the points where the two drainlines exit building 18-141 (Figure 4.11-2). Samples will be collected from two depths (0–1 ft and 2–3 ft bgs) and analyzed for TAL metals, nitrate, perchlorate, total cyanide, PCBs (20% of the samples), SVOCs, VOCs (except in surface samples), americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, and pH."

"Twelve surface and subsurface samples will be collected from one location at the outfall and four locations in the former drainage ditch that receives discharge from the outfall (Figure 4.11-2). Samples will be collected from two depths (0–1 ft and 2–3 ft bgs) and analyzed for TAL metals, nitrate, perchlorate, total cyanide, PCBs (20% of the samples), SVOCs, VOCs (except in surface samples), americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, and pH."

NMED Comments: The Plan does not indicate the depths of either drain line. As such, it cannot be determined if a sample interval of two to three feet will be deep enough to evaluate conditions

beneath the lines. Correct or add to the sample intervals as needed for the evaluation and revise the table to match the text statements. Provide the proposed sample interval information for the 12 samples that will be collected in the vicinity of the outfall location. In addition, the southern-most drain line appears to be mislabeled as "AOC 12-012(c)" on Figure 4.11-2; review and revise the figure as needed for clarity.

LANL Response

34. The text in section 4.24.3 and Table 4.24-1 have been revised to include two sample intervals—one immediately below the drainline and another 5 ft below the drainline.

The text has been revised to clarify that the 12 samples collected in the vicinity of the outfall will be collected from 6 separate locations, not at a single location in the vicinity of the outfall.

The label on Figure 4.11-2 has been corrected from "AOC 12-012(c)" to "AOC 18-012(c)."

NMED Comment

- 35. Section 4.25.3, Scope of Activities for SWMU 18-013, first and second lines, pages 43 and 44 and Table 4.25-1, page 175:**

***Permittees' Statement:** "Eight subsurface samples will be collected from one location beneath the pit and tank and three locations around the perimeter of the former pit and tank (Figure 4.15-4). Samples will be collected from two depths (immediately below the level of the pit and tank and 5 ft below the level of the line or tank) and analyzed for TAL metals, nitrate, perchlorate, total cyanide, PCBs, SVOCs, VOCs, americium-241, gamma-emitting radionuclides, isotopic plutonium, isotopic thorium, isotopic uranium, tritium, moisture content, and pH."*

***NMED Comment:** Provide the proposed sample interval information for the eight subsurface samples that will be collected beneath the pit and tank and revise the table to match the text statement.*

LANL Response

35. The text in section 4.25.3 has been revised to clarify that the eight samples collected in the vicinity of the pit and tank will be collected from four separate locations, not at a single location in the vicinity of the pit and tank. No revision to the table is necessary.

NMED Comment

- 36. Section 7.4, Subsurface Sampling, last line, page 49:**

***Permittees' Statement:** "If encountered, alluvial groundwater will be sealed off before advancing the borehole to the desired sampling depths."*

***NMED Comment:** The Permittees must describe how the "sealing" would be done and why it is needed.*

LANL Response

36. The text in section 7.4 has been revised to include a discussion of the method of isolating boreholes from groundwater if it is encountered during drilling or sampling.