Response to the Notice of Disapproval for the Investigation Report for S-Site Aggregate Area, Los Alamos National Laboratory, EPA ID No: NM0890010515, HWB-LANL-10-071, Dated December 22, 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. *The construction worker scenario was not included in the risk assessment. The reasonable foreseeable future use of sites in the S-Site Aggregate Area is industrial (Section 4.1); these areas include Solid Waste Management Units (SWMUs) 16-004(a), 16-004(e), and 16-029(d). It is plausible to assume that at some point in the future, intrusive activities may occur in these areas, and as such, the risk assessments must demonstrate that residual contaminant concentrations are protective of a future construction worker. An evaluation of residential risk does not always equate to an assumption of protectiveness for all receptors. In several cases, the screening levels for metals for a construction worker are more conservative than those for a resident. As inorganic chemicals that typically drive inhalation risk to the construction worker were not detected at the three SWMUs, the residential screening assessment is deemed protective of a future construction worker. However, when assessing risk for SWMUs where additional characterization is needed, this assumption may not hold true. In future assessments and specifically for the remaining SWMUs to be evaluated in the S-Site Aggregate Area, the construction worker receptor must be evaluated.*

LANL Response

1. The S-Site aggregate sites for which risk assessments were conducted were evaluated to determine which scenarios were applicable for the current and reasonably foreseeable future land uses. The construction worker scenario was determined not to be applicable for any of the sites for the following reasons. Solid waste management units (SWMUs) 16-004(a), 16-004(e), 16-017(p)-99, and 16-029(d) are not scheduled for any demolition and decommissioning or do not have any remediation activities proposed now or in the foreseeable future. The risk assessment for SWMU 16-026(b) has been deleted from the report because additional sampling will be conducted to define extent in the Phase II investigations. However, because the risk assessment indicated that remediation is warranted at SWMU 16-026(b), the construction worker scenario will be evaluated in the Phase II report. The remaining SWMUs and areas of concern (AOCs) will also be evaluated in the Phase II report to determine which scenarios are applicable.

NMED Comment

2. *Sampling was conducted downgradient of the S-Site Aggregate Area in the Fishladder Canyon subarea and in Martin Spring Canyon. The report indicated that the purpose of the sampling was to determine whether there is migration into the adjacent canyon areas. Therefore, neither human health nor ecological risk was evaluated for either the Fishladder Canyon subarea or the Martin Spring Canyon Drainages. Based on a review of the data, it appears that there may be contamination above risk-based levels as well as potential elevated ecological risk. It is not clear whether the Permittees intend to investigate these areas further under a separate investigation; the report mentions several times that these two areas are not specifically defined in the Report as a SWMU or an Area of Concern (AOC). However, risk assessments must be conducted to evaluate contamination in both the Fishladder Canyon subarea and in Martin Spring Canyon.*

LANL Response

2. Once the Phase II investigations are completed and all data received, risk will be evaluated either as part of the Phase II report and/or as part of the south canyons investigations. Sections 10.2.5, 10.2.6, 10.3.6, and 10.3.7 have been revised to reflect this approach.

NMED Comment

3. *Six S-Site Aggregate SWMUs [16-006(h), 16-013, 16-017(q)-99, 16-017(r)-99, 16-017(s)-99, and 16-017(t)-99] are located within the V-Site Courtyard Area. The report indicates that historic preservation restrictions prohibit the Permittees from sampling within this area, thereby preventing the determination of the nature and extent of contamination for the sites. NMED approved the Permittees' proposal to move sampling to the periphery of the V-Site Courtyard. However, by sampling at the periphery, the Permittees will only be able to determine whether any contaminants are migrating off-site. Because of the historic nature of the Courtyard Area, the Permittees occasionally conduct tours for the public to view the area. To ensure that the public is protected during site visits, the area was evaluated for potential human health risk using the recreational scenario to represent site visitors. While the risk assessment concludes that residual levels are within recreational screening levels, this conclusion is based upon contaminants potentially migrating off-site, and not upon contaminant levels present on-site and in the visiting areas. In addition, the Permittees must not conclude that there is no risk to visitors to this site as Section 9.15.4 of the report clearly states that the nature and extent of contamination has not been defined. NMED cautions the Permittees about opening this area to the public, as risks to an on-site tourist have not been defined. Further, additional sampling and risk evaluation is warranted to assess levels of contamination outside of the Courtyard Area for exposure to other receptors (e.g., industrial) during the Phase II of investigations.*

LANL Response

3. As presented in the investigation report, it was not possible to collect samples within the V-Site Courtyard Area because of the historic nature of the structures and the courtyard itself (i.e., the site is considered a potential National Park Service National Historic Landmark). Samples were collected (with NMED approval) around the historic area of the courtyard "periphery." As stated in section 9.15.5.4, extent was not defined (lateral and vertical extent at several locations). Additional sampling will be proposed as part of the Phase II investigation work plan.

   Potential human health risk and doses were evaluated in the report (Appendix H), and no potential unacceptable risks or doses were found for the recreational scenario. While the data used in the risk

assessments are from peripheral locations around the courtyard, the courtyard itself, the remaining structures, and the footprint of former structures around the courtyard (asphalt or concrete) serve as barriers to exposure to any possible contamination that may lie beneath them. The results of the risk assessments indicate that unacceptable exposures are not occurring to visitors while on public tours of the sites, and maintenance of the physical barriers will ensure that this remains to be the case. Furthermore, potential exposures during the tours are much less than those projected in the risk assessments; the formal public tours are supervised and occur only two times a year for a few hours versus the 1 h and 200 events per yr for the recreational scenario. Additional informal tours (also supervised) occur at other times throughout the year for small groups. In all cases, tour participants must meet all of the requirements for access to the Technical Area 16 explosives exclusion area, including being 18 years of age (i.e., exposure to children is not an issue). Visitors are instructed to not stray from the group, not to touch anything, and to avoid contact with any of the historic features. Therefore, the Laboratory believes that the public tours are adequately protected from any potential unacceptable exposures to contaminants, and the tours will continue as evaluation of the area progresses.

Because historic preservation efforts will continue at this site, it is unlikely that additional samples can be collected from within the courtyard or near structures. However, all of these potential constraints will be evaluated in the future preparation of the Phase II work plan. The combination of engineering controls (the existing barriers to any surface and/or subsurface contamination) and institutional controls (the historic preservation requirements and restrictions) currently provide adequate protection to site visitors. Additional sampling will be conducted as proposed in the report to define the extent of contamination around the courtyard area. The sites within this area will also be sampled as allowed by historic preservation staff. No additional risk assessments are warranted for other receptors (e.g., industrial) because the worker scenarios are not applicable to this area. Because there are no Laboratory workers present at the sites, an assessment of an industrial exposure is not warranted, and as indicated in the response to General Comment 1, construction worker activity is either restricted or not anticipated.

Text has been added to sections 9.15.5.4 and 9.15.6 to further explain the site conditions.

NMED Comment

4. *Analytical data from off-site sample locations 16-01457 and 16-609215 at SWMU 16-026(b) indicate off-site migration of SWMU-related contamination. The data also indicate that the contaminant migration is resulting in increasing concentrations for inorganic and organic constituents of potential concern (COPCs). Therefore, the extent of contamination has not been defined for COPCs that have migrated off-site, and additional sampling is warranted to determine the extent of off-site migration. In addition, a risk evaluation is needed to assess whether corrective action or other controls may be warranted to mitigate contamination that has migrated beyond the SWMU 16-026(b) boundary.*

LANL Response

4. Locations 16-01457 and 16-609215, although downgradient from SWMU 16-026(b), are associated with the Shared Drainages (section 8.16 and Figure 8.16-1). As such, these and other Shared Drainages locations are influenced by other features and sources, including HE Road. Therefore, the data for these locations may indicate higher concentrations than the samples directly related to a SWMU or AOC, and/or they may indicate additional contaminants. In the case of locations 16-01457 and 16-609215, inorganic chemical concentrations decreased downgradient to these locations and/or were below the maximum background concentrations at these locations. The exception is cobalt,

which was not detected above background in any samples within SWMU 16-026(b). A similar relationship is shown for the organic chemicals, i.e., concentrations decreased downgradient to these locations. The exceptions are some polycyclic aromatic hydrocarbons (PAHs) at location 16-609215, which are at concentrations slightly above the maximum concentrations within the SWMU boundary. The PAH concentrations are likely influenced by runoff from HE Road to the south and east of the SWMU. In addition, location 16-609216, which is further down the Shared Drainages (Figure 8.16-1) and downgradient of SWMU 16-026(b), has lower inorganic and organic chemical concentrations than location 16-609215. Therefore, the extent of contamination has been defined for chemicals of potential concern (COPCs) that have potentially migrated off-site, and additional sampling is not warranted to determine the extent of off-site migration from SWMU 16-026(b). However, additional sampling within the Shared Drainages will be proposed as part of the Phase II investigations. Risk assessments of SWMU 16-026(b) and of the Shared Drainages will be conducted following Phase II investigations. The text in section 8.8.5.4 has been revised to clarify the extent of contamination that may have migrated beyond the SWMU 16-026(b) boundary.

NMED Comment

5. *The Investigation Work Plan for S-Site Aggregate Area, Revision 1, December 2007 (IWP) proposed analysis of boron for the samples to be collected at all sites included in the K-Site Subaggregate. The review of text and tables indicates that boron analyses were not conducted. No explanation for this omission was included in Appendix C, where deviations from the approved work plan are documented. The Permittees must provide an explanation for not including boron analysis in the analytical suite.*

LANL Response

5. Boron was inadvertently omitted from the requested analytical suites for the K-Site Subaggregate, and section 6.1 of the main text has been revised to indicate the omission. Appendix C, section C-7.1 has been revised to indicate the omission as a deviation. Boron will be analyzed for as part of the Phase II investigations at the K-Site Subaggregate sites.

SPECIFIC COMMENTS

NMED Comment

1. Section 4.3, Ecological Screening Levels, page 19:

Section 4.3 references data from two versions of the EcoRisk database. Ecological Screening Levels (ESLs) were taken from the 2008 version of EcoRisk while all other chemical/physical data were from the 2009 version of EcoRisk. It is not clear why version 2.4 of EcoRisk (2009) was not used for obtaining the ESLs. The Permittees must clarify whether this is a typographical error and, if not, why the most current ESLs were not applied.

LANL Response

1. Version 2.4 of the ECORISK database was used throughout the ecological risk screening assessments presented in Appendix H. The text in section 4.3 has been revised to the correct reference citation for version 2.4.

NMED Comment

2. Section 6.6.2, Summary of Previous Investigations, page 36:

The Permittees state that one surface sample was collected within the outfall (location 16-05904) at SWMU 11-006(b) during the 1998 investigations. Tables 6.6-1 and 6.6-2 indicate that two sediment samples were collected from two locations in 1998 (locations 16-05903 and 16-05904). In addition, Figures 6.6-1, 6.6-2, and 6.6-3 do not depict sampling location 16-05903. The Permittees must clarify whether one or two sediment samples were collected during 1998 investigations and revise the appropriate text, tables, and figures in the Report accordingly.

LANL Response

2. Location 16-05903 was incorrectly associated with SWMU 11-006(b) in Tables 6.6-1 and 6.6-2. Tables 6.6-1 and 6.6-2 have been revised to eliminate references to location 16-05903 and the associated data at SWMU 11-006(b). Figures 6.6-1, 6.6-2, and 6.6-3 are correct and require no revisions. Note that location 16-05903 was also correctly associated with SWMU 11-006(c); no changes are necessary in that respect.

NMED Comment

3. Section 6.6.5.2, Organic Chemicals, pages 40-41:

Permittees' Statements:

a. HMX was detected at 13 locations. Concentrations increased with depth at location 11-608831 and downgradient (locations 11-608817 and 11-608816). Concentrations decreased with depth at all other locations. Therefore, the vertical extent of HMX is not defined, and the lateral extent is defined.

b. TATB was detected at locations 11-608826 and 11-608831.

NMED Comments:

a. Above statements appear to contradict each other. The lateral extent cannot be considered defined at SWMU 11-006(b), if the concentrations of high-melting explosives (HMX) increased downgradient. However, review of Table 6.6-3 indicates that the concentrations decreased downgradient (at locations 11-608817 and 11-608816). The Permittees must resolve the discrepancy and revise the text accordingly.

b. Table 6.6-3 indicates that triaminotrinitrobenzene (TATB) was detected in five samples from four locations, i.e., 11-608826, 11-608831, 11-608821, and 11-608823. Revise the text accordingly, or otherwise resolve the discrepancy.

LANL Response

3 a. The text in section 6.6.5.2 has been revised to state that vertical extent is not defined, and lateral extent is defined for HMX (1,3,5,7-tetranitro-1,3,5,7-tetrazocine).

b. Table 6.6-3 is correct. The text in section 6.6.5.2 has been revised to state that triaminotrinitrobenzene (TATB) was detected at four locations (11-608826, 11-608821, 11-608823, and 11-608831).

NMED Comment

4. Section 6.6.5.3, Radionuclides, page 41:

Permittees' Statement: *Uranium-234 was detected above the BV in three soil samples at locations 11-608817, 11-608824, and 11-608827. Concentrations decreased with depth and at the furthest locations downgradient. Therefore, the vertical extent of uranium-234 is defined, and the lateral extent is not defined.*

NMED Comment: *Above statements appear to contradict each other. Table 6.6-4 indicates that the concentrations decreased with depth and downgradient; therefore, both the vertical and lateral extent of uranium-234 is defined at SWMU 11-006(b). The Permittees must revise all applicable text accordingly.*

LANL Response

4. The text in sections 6.6.5.3 and 11.1.1 has been revised to state that the extent of uranium-234 is defined.

NMED Comment

5. Section 6.7.5.1, Inorganic Chemicals, page 44:

Permittees' Statement: *Chromium was detected above the Qbt 2, Qbt 3, and Qbt 4BV at five locations at locations 11-608748 and 11-608749.*

NMED Comment: *Chromium was detected above the Qbt 2, Qbt 3, and Qbt 4 background value (BV) at five locations, (11-608742, 11-608748, 11-608749, 11608750, and 11-611743). The Permittees must correct the above statement to clarify that chromium was detected above the BV at five locations and the concentrations increased with depth at only two locations (11-608748 and 11-608749) at SWMU 11-006(c).*

LANL Response

5. The text in section 6.7.5.1 has been revised to state that chromium was detected above the QBT 2, 3, 4 background value (BV) at five locations (11-608742, 11-608748, 11-608749, 11-608750, and 11-611743) and that concentrations increased with depth at locations 11-608748 and 11-608749.

NMED Comment

6. Section 6.9.5.1, Inorganic Chemicals, page 52:

Permittees' Statement: *Copper was detected at five locations above its soil and Qbt 2, Qbt 3, and Qbt 4 BVs. At locations 11-608751, 11-608752, and 11-608756, concentrations decreased with depth. At location 11-608757, concentrations increased with depth.*

NMED Comment: *Table 6.9-2 indicates that copper was detected above its soil BV and Qbt 2, Qbt 3, and Qbt 4 BVs at six locations at SWMU 11-005(c). The concentration of copper increased with depth at two locations (11-608757 and 11-611744). The vertical extent of copper is not defined. The Permittees must revise the text accordingly. In addition, chromium was detected above its Qbt 2, Qbt 3, and Qbt 4 BVs at only two locations, not three. Table 6.9-2 does not list detection of chromium at location 11-611744. The Permittees must resolve the discrepancies and revise the text or table accordingly.*

LANL Response

6. Table 6.9-2 was incorrect in the original report and has been revised. The text in section 6.9.5.1 has been revised for copper and for chromium.

NMED Comment

7. Section 6.12.5.1, Inorganic Chemicals, page 64:

Permittees' Statement: *Perchlorate was detected at location 11-608763.*

NMED Comment: *Table 6.12-2 indicates that perchlorate was detected at two locations (11-608763 and 11-608765). The omission does not change the conclusion that the extent of perchlorate is defined for SWMU 11-011(d) because the concentrations decreased with depth and downgradient. The Permittees must revise the Report accordingly.*

LANL Response

7. The text in section 6.12.5.1 has been revised to state that perchlorate was detected at locations 11-608763 and 11-608765.

NMED Comment

8. Section 6.12.5.2, Organic Chemicals, page 64:

Permittees' Statement: *Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoroanthene, chrysene, fluoranthene, phenanthrene, and pyrene were detected in surface samples at one or two locations. Concentrations decreased with depth and downgradient. The extent of these organic chemicals is defined.*

NMED Comment: *Table 6.12-3 indicates that fluoranthene was not detected in the surface sample but was detected in the subsurface sample at SWMU 11-011(d) (location 11-608762). In addition, several discrepancies were found between the concentrations reported in the Table 6-12-3 and Figure 6.12-3. For example, HMX (0.0218 mg/kg) is reported on Table 6.12-3 but is not depicted on the Figure 6.12-3; two detections of HMX are indicated at location 11-608765. Similar discrepancies*

were noted for benzo(a)pyrene, benzo(b)fluoroanthene, chrysene, fluoroanthene, and isopropyltoluene[-4]. The Permittees must conduct a thorough review of the Report to ensure concentrations reported in the text, tables and figures are consistent.

LANL Response

8. Table 6.12.-3 was incorrect in the original report and has been revised. The text in section 6.12.5.2 and Figure 6.12-3 are correct and require no revisions.

   The text, tables, and figures have been reviewed, and all inconsistencies found have been corrected, including those in Table 6.12-3. Page-break problems with some tables were introduced during document assembly; these have been corrected.

NMED Comment

9. Section 7.7.5.2, Organic Chemicals, page 80:

Permittees' Statement: *Methylene chloride was detected at locations 16-608920 and 16-608921.*

NMED Comment: *Methylene chloride was detected at three locations, not two at Area of Concern (AOC) 16-024(u). It was detected at locations 16-608918, 16-608920 and 16-608921 (see Table 7.7-3). The Permittees must revise the text accordingly.*

LANL Response

9. The text in section 7.7.5.2 has been revised to state that methylene chloride was detected at locations 16-608918, 16-608920, and 16-608921.

NMED Comment

10. Section 7.12.5, Spatial Distribution, page 97:

Permittees' Statement: *Thirty-six samples were collected from 17 locations (Figure 7.12-1). Surface and subsurface samples were collected within the vicinity of the inactive drainlines and outfall. Seventeen surface samples were collected at an interval of 0.0–0.5 ft bgs, and 21 subsurface samples were collected at the following depth intervals: three samples at 3.0–3.5 ft bgs, one sample at 4.0–4.5 ft bgs, 15 samples at 5.5–6.0 ft bgs, and two samples at 9.0–9.5 ft bgs (Appendix C, section C-7.2.5).*

NMED Comment: *The Permittees collected 19, not 21, subsurface samples at SWMU 16-029(h). Thirteen samples, not 15, were collected at 5.5-6.0 ft bgs (see Table 7.12-1). The Permittees must revise the text accordingly.*

LANL Response

10. The text in section 7.12.5 has been revised to indicate the correct sample counts.

NMED Comment

11. Section 7.15.5.4, Summary of Extent, page 109:

Permittees' Statement: *The vertical extent is defined for all COPCs. No radionuclides were detected. Therefore, the overall extent of contamination at SWMU 16-004(a) is defined.*

NMED Comment: *The Permittees were not able to collect samples from one proposed location in the center and beneath the existing structure because the location was not accessible. The Permittees must collect additional samples underneath the structure to define the extent of contamination. The extent of contamination is not defined for SWMU 16-004(a). The Permittees may defer the investigations until the decontamination and decommissioning (D&D) of the structure when the location becomes accessible to collect samples.*

LANL Response

11. SWMU 16-004(a) is approximately 20 ft by 35 ft, with a total area of 700 ft^2. Given the small footprint of the Imhoff tank and the relatively flat area upon which it sits, samples collected at peripheral locations are sufficient to characterize the entire site. Therefore, additional samples underneath the Imhoff tank are not necessary, the extent of contamination is defined, and there is no need to delay investigations until removal of the Imhoff tank. Text has been revised in section 7.15.1 to include the site dimensions and in section 7.15.5 to include the basis for the adequacy of the sampling conducted.

NMED Comment

12. Section 7.16.5, Spatial Distribution, page 111:

Permittees' Statement: *Because the direction of potential contaminant migration is into the subsurface below the Imhoff tank, four boreholes were drilled surrounding the structure. Samples were collected at two depths between 20.0 and 30.0 ft bgs at each borehole. Because of the presence of underground utilities in the area of the tank, borehole locations were adjusted. The borehole to the southeast of the tank was moved out approximately 30.0 ft to the south.*

NMED Comment: *The paragraph appears to be copied directly from page 108 and is not relevant to the discussion of SWMU 16-004(b), which is a trickling filter, not the Imhoff tank. In addition, several discrepancies were noted between Figure 7.16-1, Section 7.16.5, and Section C-7.2.8. Figure 7.16-1 indicates that the borehole to the southwest (location 16-608687), not southeast, was moved and the borehole to the southeast (location 16-608686) was not moved; the borehole to the northwest of the trickling filter was also moved. The Permittees must resolve the discrepancies and revise the text or figure accordingly.*

The Permittees must also note that the sample in the center and beneath the trickling filter was not collected because of the accessibility issue. To complete the determination of extent, the Permittees must collect samples beneath the structure whenever it becomes accessible. The Permittees may defer the investigation of contamination beneath the structure until D&D of the structure. See Comment #11.

LANL Response

12. The text in section 7.16.5 has been revised to state that SWMU 16-004(b) is the trickling filter, not the Imhoff tank. The text regarding the relocation of boreholes 16-608684 and 16-608687 has been revised accordingly.

    Because the perimeter locations are sufficient to define nature and extent of accessible areas and will be sampled at a deeper depth as part of the Phase II investigations, it is not necessary to collect samples in the center of and beneath the trickling filter.

NMED Comment

13. Section 7.17.5, Spatial Distribution, page 114:

Permittees' Statement: *Because of the presence of the structure, the original five location points proposed, after communication with NMED, were changed to four location points (Appendix C, section C-7.2.9). One proposed location in the center of and beneath the existing structure was not sampled because the location was not accessible. Two samples had been planned from this location.*

NMED Comment: *The Permittees must collect the samples from the center of and beneath the existing structure when it becomes accessible to complete determination of the extent of contamination at SWMU 16-004(c). The Permittees may defer the investigation of contamination beneath the structure until D&D of the structure. See also Comment #11.*

In addition, the Permittees must revise the text in the first paragraph to indicate that the description in this section is applicable to the clarifier tank, not the Imhoff tank.

LANL Response

13. The text in section 7.17.5 has been revised to identify the SWMU as the clarifier tank rather than the Imhoff tank. SWMU 16-004(c) is approximately 20 ft by 20 ft, with a total area of 400 ft^2. Given the small footprint and the relatively flat area upon which it sits, the four peripheral sample locations characterize the site and define the nature and extent of contamination.

NMED Comment

14. Section 7.20.5, Spatial Distribution, page 122:

Permittees' Statement: *Because the direction of potential contaminant migration is into the subsurface below the Imhoff tank, four boreholes were drilled surrounding the structure. Samples were collected at two depths between 20.0 and 30.0 ft bgs at each borehole. Because of the presence of underground utilities in the area of the tank, borehole locations were adjusted. The borehole to the southeast of the tank was moved out approximately 30.0 ft to the south.*

NMED Comment: *The paragraph appears to be copied directly from page 108 and is not relevant to SWMU 16-004(f). SWMU 16-004(f) is an inactive sludge drying bed, not an Imhoff tank. The Permittees must revise the text and delete discussion of Imhoff tank.*

LANL Response

14. The text in section 7.20.5 referring to the Imhoff tank has been removed.

NMED Comment

15. Section 8.3.5.1, Inorganic Chemicals, page 132:

Permittees' Statements: *Mercury was detected above the soil BVs at all four locations. Mercury concentrations decreased with depth at all locations except at location 16-609174, where only one depth was sampled. Therefore, the extent of mercury is not defined.*

Zinc was detected above the soil and/or Qbt 2, Qbt 3, and Qbt 4 BVs at all four locations. Zinc concentrations decreased with depth except at location 16-609174, where only one depth was sampled. Therefore, the extent of zinc is defined.

NMED Comment: *Both mercury and zinc were detected at location 16-609174, where only one depth was sampled. The Permittees concluded that extent was defined for zinc, but was not defined for mercury for SWMU 16-001(e). The Permittees must clarify why different conclusions were drawn for extent of zinc and mercury when the detection status was similar in both cases.*

LANL Response

15. The extent is defined for both mercury and zinc because samples collected from locations 16-609170, 16-609171, and 16-609172, which are within 10 ft of location 16-609174, had no detected mercury or zinc above BV at a deeper depth. The text in section 8.3.5.1 has been revised to state that the extent for mercury has been defined and to explain why the extent is defined for both mercury and zinc. The text in sections 8.3.5.4 and 11.1.3 has also been revised to delete the statement that mercury extent is not defined.

NMED Comment

16. Section 8.3.5.2, Organic Chemicals, page 134:

In Section 8.3.5.2, the Permittees determined that lateral extent of 2,4,6-Trinitrotoluene was not defined at SWMU 16-001(e). The Permittees did not mention 2,4,6-Trinitrotoluene in Section 8.3.5.4 and Section 11.1.3, where nature and extent of contamination is summarized. The Permittees must revise the Report accordingly.

LANL Response

16. The text in sections 8.3.5.4 and 11.1.3 has been revised to include 2,4,6-trinitrotoluene.

NMED Comment

17. Section 8.4.5.1, Inorganic Chemicals, page 136:

Permittees' Statement: *Thallium was detected above the soil BV at location 16-611884. Thallium was not detected in the footprint of the sump or the closest step-out location, and concentrations decreased with depth. Therefore, the extent of thallium is not defined.*

NMED Comment: *Section 8.4.5.1 indicates that the extent is defined for thallium at SWMU 16-003(d). The Permittees must clarify why extent of thallium contamination is considered undefined.*

LANL Response

17. The text in section 8.4.5.1 has been revised to state that the extent of thallium is defined. Text in sections 8.4.5.4 and 11.1.3 has been revised to delete the statement that extent of thallium is not defined.

NMED Comment

18. Section 8.7.5.2, Organic Chemicals, page 147:

Permittees' Statement: *Acenaphthene, anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, pyrene, phenanthrene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, and chrysene were detected at both locations (16-609186 and 16-609187).*

NMED Comment: *At SWMU 16-003(g), acenapthene and fluorine were detected only at one location (16-60918), not two. The concentrations of acenapthene and fluorine increased with depth at this location (see Table 8.7-3). The Permittees must revise the text accordingly.*

LANL Response

18. The text in section 8.7.5.2 has been revised to indicate that acenaphthene and fluorene were detected only at location 16-609186 and that concentrations increased with depth.

NMED Comment

19. Section 8.8.4.1, Inorganic Chemicals, page 149:

Permittees Statements:

a. Concentrations of barium decreased from location 16-609189, nearest the outfall, and location 16-01456 downgradient to locations 16-609190 and 16-01456.

b. Chromium was detected above the Qbt 2, Qbt 3, and Qbt 4 BV (7.14 mg/kg) in one sample with a maximum concentration of 23.6 mg/kg. Because there were less than 10 samples, statistical tests could not be performed. The maximum concentration was below the maximum background concentration (13 mg/kg). Chromium is not identified as a COPC in tuff.

c. Total cyanide was not detected above the BV in the deepest sample analyzed for total cyanide at location 16-609192.

NMED Comment:

a. The detected concentration of barium at location 16-01456 was 1190 mg/kg, which was the highest detected concentration at SWMU 16-026(b). The concentration of barium detected closest to the outfall was 161 mg/kg. Concentrations of barium increased, not decreased

downstream from the location closer to the outfall. The Permittees must revise the Report accordingly.

b. *The maximum detected concentration of 23.6 mg/kg is not below the maximum background concentration of 13 mg/kg. Therefore, chromium must be identified as a chemical of potential concern (COPC) for SWMU 16-026(b). The Permittees must make appropriate revisions to the Report.*

c. *Samples collected at location 16-609192 were not analyzed for total cyanide. The Permittees reported this as a deviation; cyanide was mistakenly omitted from the analytical suite (Section C-7.3.7). Cyanide was detected at a concentration slightly above the BV in a subsurface sample collected at location 16-609189. The Permittees must revise the Report accordingly.*

LANL Response

19. The text in section 8.8.4.1 has been revised to indicate that the extent of contamination at SWMU 16-026(b) is not defined. As a result, sections 8.8.4.2 and 8.8.5.1 have also been revised and no longer identify COPCs for this site.

    a. The extent of contamination is not defined because of cyanide; therefore, the text discussing barium results in section 8.8.4.1 has been deleted. The extent of barium is discussed in section 8.8.5.1, which states that extent for barium is defined and provides the rationale for reaching this conclusion. Barium concentrations decreased from the maximum detected concentration at location 16-01456 (1190 mg/kg) to the Shared Drainages locations 16-01457 and 16-609215.

    b. The extent of contamination is not defined because of cyanide; therefore, the discussion of chromium results in section 8.8.4.1 has been deleted. The extent of chromium is discussed in section 8.8.5.1, which states that the extent for chromium is defined and provides the rationale for reaching this conclusion.

    c. The vertical extent is not defined for cyanide. The text in sections 8.8.4.1 and 8.8.4.2 discussing the evaluation of COPCs has been deleted because the extent of cyanide is not defined. The extent of cyanide is discussed in section 8.8.5.1. Additional sampling for cyanide at location 16-609189 will be conducted as part of the Phase II investigations.

NMED Comment

20. Section 8.8.4.2, Organic Chemicals, page 150:

Section 8.8.4.2 does not list 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene as COPCs for SWMU 16-026(b). It is noted that the risk assessment in Appendix H included the evaluation of these two COPCs. The Permittees must revise Section 8.8.4.2 to include 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene as retained COPCs.

LANL Response

20. The text in section 8.8.4.2 has been revised to indicate that the extent of contamination at SWMU 16-026(b) is not defined and organic COPCs are no longer identified for this site.

    Section 8.8.5.2 has been revised to include the discussion 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene.

NMED Comment

21. Section 8.8.5.1, Inorganic Chemicals, page 150:

Permittees' Statement: *Barium was detected above the sediment and Qbt 2, Qbt 3, and Qbt 4 BVs at locations 16-609189 and 16-01456. Only surface samples were collected at locations 16-01654 and 16-01456. The deeper samples at locations 16-609192 and 16-609190 revealed that concentrations decreased with depth.*

NMED Comment*: According to Figure 8.8.2 and Table 8.8-2, samples were collected at 5-6 feet below ground surface, and barium was detected at this interval at location 16-01654 at SWMU 16-026(b). The Permittees must revise the text to state that surface and subsurface samples were collected at location 16-01654, and barium was detected in a subsurface sample. In reviewing Figure 8.8.2, it does not appear that the barium concentrations of deeper samples at location 16-609190 decreased with depth. Barium was not detected above background values (BVs) in the surface samples but was detected above BVs with increasing depth at locations 16-609190 and 16-609192. Revise the text accordingly.*

LANL Response

21. Table 8.8-2 was incorrect and has been revised. Text in section 8.8.5.1 has been revised to agree with the table. Barium was not detected above BV in the deepest sample collected from location 16-609192, which is also the deepest sample collected for SWMU 16-026(b).

NMED Comment

22. Section 8.8.5.2, Organic Chemicals, page 151:

NMED Comment*: Section 8.8.5.2 states that concentrations of many organic COPCs decreased downgradient at sample locations 16-01456 and 16-609190. However, the data indicate increasing concentrations downgradient at sample location 16-609190 for acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, phenanthrene, and pyrene. It appears that concentrations initially decrease downgradient from the source, but increase again towards the opposite end of the SWMU boundary. The Permittees must provide furthersupport for their assertion that the extent of contamination at SWMU 16-026(b) is defined.*

In addition, 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene were detected in the surface interval at SWMU 16-026(b). 2-Amino-4,6-dinitrotoluene was also detected in the subsurface at sample location 16-609189, and its concentration does not decrease with increasing depth. This section does not indicate whether the vertical or lateral extent of contamination for these chemicals is defined. The Permittees must revise the text to include discussion on whether the extent of contamination of 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene is defined at SWMU 16-026(b).

LANL Response

22. The data at location 16-609190 for acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, phenanthrene, and pyrene have been reviewed, and concentrations are indeed decreasing downgradient at location 16-609190. Higher concentrations were detected upgradient at locations 16-609189 and 16-01654 for each of these organic chemicals. Concentrations are also higher for all of these organic chemicals, except phenanthrene, at location 16-609192, which is also upgradient of

location 16-609190. Therefore, the assertion that the lateral extent of contamination at SWMU 16-026(b) is defined remains.

Section 8.8.5.2 has been revised to include 2-amino-4,6-dinitrotoluene and 4-amino-2,6-dinitrotoluene.

NMED Comment

23. Section 8.9.2, Summary of Previous Investigations, page 154:

Permittees' Statement: *Data from the 1995 RFI are screening-level data and are presented in Appendix E of the HIR (LANL 2008, 100693).*

NMED Comment: *In general, screening level data are not used for site evaluations. NMED notes that data from the 1995 RFI is included in associated figures and tables and was used for determination of extent of contamination at SWMU 16-026(c). The Permittees must clarify if the 1995 RFI data are decision-/or screening-level data.*

LANL Response

23. The 1995 data incorporated in this report are decision-level data, and the statement that the data are screening-level has been removed from section 8.9.2.

NMED Comment

24. Section 8.10.5.1, Inorganic Chemicals, page 159:

Permittees' Statements:

a. Cadmium and total cyanide were not detected above BVs but had detection limits above BVs. Therefore, the extent of cadmium and total cyanide is defined.

b. Copper was detected above the soil BV at location 16-611017 and above the Qbt 2, Qbt 3, and Qbt 4 BV at locations 16-01465 and 16-01656. Concentrations decreased with depth at all locations. Concentrations increased downgradient at location 16-611017. Therefore, the vertical extent of copper is defined, but the lateral extent is not defined.

c. Selenium was detected above the Qbt 2, Qbt 3, and Qbt 4 BV at location 16-609185. Selenium was not detected at other downgradient locations.

NMED Comment:

a. While the detection limits were above BVs, they were only slightly higher than the BVs. However, cadmium was detected above the BV at a concentration of 0.448 mg/kg at location 16-609182 at SWMU 16-026(d). The Permittees must revise the text accordingly.

b. Concentrations of copper increased with depth at locations 16-01465 and 16-01656. Therefore, the vertical extent of copper is also not defined. The Permittees must revise the text accordingly.

c. Selenium was detected in samples collected from locations 16-01465, 16-01656, and 16-609185. The Permittees must revise the text accordingly.

LANL Response

24 a. The discussions regarding cadmium and total cyanide have been revised within section 8.10.5.1. The extent of cadmium is defined.

b. The text discussing copper in section 8.10.5.1 was correct; however, Table 8.10-2 was incorrect and has been revised. The table and text now agree, and no revisions to the text are necessary.

c. The text discussing selenium in section 8.10.5.1 was correct; however, Table 8.10-2 was incorrect and has been revised. The table and text now agree, and no revisions to the text are necessary.

NMED Comment

25. Section 8.11.5.2, Organic Chemicals, page 168:

Permittees' Statement: *RDX was detected at three locations. Concentrations decreased with depth at all locations. RDX was detected in the deepest sample at location 16-609201 (5.5–6.0 ft bgs) but was not detected in nearby location 16-611819 at 8.5–9.0 ft bgs (within approximately 25 ft or less). Concentrations decreased downgradient. Therefore, the extent of RDX is defined.*

NMED Comment: *Two step-out samples were collected from location 16-611878, east of location 16-611814 at SWMU 16-026(e). RDX concentrations in samples collected (0.0-0.5 ft) from these two locations are higher by more than an order of magnitude in the step-out samples. The lateral extent to the east of location 16-611878 is not defined. The Permittees must propose to collect additional samples to define the lateral extent of RDX contamination.*

LANL Response

25. The discussion of RDX (hexahydro-1,3,5-trinitro-1,3,5-triazine) in section 8.11.5.2 has been revised to indicate that the lateral extent of RDX is not defined east of location 16-611878. Additional, samples will be proposed as part of the Phase II investigations. Sections 8.11.5.4 and 11.1.3 have been revised to indicate that the lateral extent of RDX is not defined.

NMED Comment

26. Section 8.12.5.2, Organic Chemicals, page 171:

Permittees' Statement: *Acetone was detected at locations 16-01453 and 16-609210. Concentrations did not change with depth at location 16-01453 and decreased with depth at location 16-609210. Acetone was not detected in the next sample location downgradient (16-609189); therefore, concentrations decreased downgradient. Therefore, the vertical extent of acetone is not defined, but the lateral extent is defined.*

NMED Comment: *It is not clear from the above statement why the Permittees believe that the vertical extent of acetone is not defined at SWMU 16-029(a). Acetone concentrations either did not change or decreased with depth. The Permittees must provide support for their conclusion that the vertical extent of acetone is not defined.*

LANL Response

26. The text in sections 8.12.5.2, 8.12.5.4, and 11.1.3 have been revised to correctly state that the extent of acetone is defined.

NMED Comment

27. Section 8.16.5.1, Inorganic Chemicals, pages 183-186:

Permittees' Statements:

a. Concentrations increased with depth at locations 16-01439 and 16-609221 (no nearby locations).

b. Concentrations decreased downgradient to location 16-01439. Therefore, the vertical extent of copper is not defined, but the lateral extent is defined.

c. Vanadium was detected above the sediment BV at five locations and above the Qbt 2, Qbt 3, and Qbt 4 BV at locations 16-01653 and 16-609219. Concentrations decreased with depth at location 16-01434. Only a surface sample was collected at locations 16-01436, 16-01437, 16-01438, and 16-01439. Location 16-609229, which is within approximately 25 ft of locations 16-01436, 16-01437, and 16-01438, had lower concentrations of mercury at deeper depths.

NMED Comment:

a. The Permittees state that concentrations decreased with depth at locations 16-01439 and 16-609221, samples were collected from only one depth, i.e., 0.0-0.5 ft at these locations (see Table 8.16-1). Similar statements are made throughout this section and in Section 8.16.5.2. The Permittees must revise the text to indicate that the vertical extent could not be determined because only surface samples were collected at these two locations.

b. Although concentrations of copper decreased downgradient to location 16-01439, the detected concentration of 90.8 mg/kg is approximately an order of magnitude higher than the BV (11.2 mg/kg). Only one surface sample was collected from location 16-01439, although several inorganic chemicals were detected above the BV (this is the most downgradient location sampled in the shared drainages). In addition, the concentrations of several inorganic chemicals increased significantly downgradient between location 16-609221 and the downgradient location 16-01439. The Permittees must collect an additional sample downstream of this location to define the lateral extent of inorganic chemicals in the drainage during Phase II investigations.

c. The Permittees must correct the typographical error. The discussion in this paragraph is for vanadium, not mercury.

LANL Response

27 a. The text in sections 8.16.5.1 and 8.16.5.2 has been revised accordingly.

b. Discussion of inorganic chemicals in section 8.16.5.1 has been revised to indicate lateral extent is defined by the upper Martin Spring Canyon samples as depicted on Plate 26. Therefore, collection of an additional sample downgradient of location 16-01439 is not necessary.

c. The typographical error in section 8.16.5.1 has been corrected by replacing the word mercury with the word vanadium.

NMED Comment

28. Section 9.2.5.4, Summary of Extent, page 197:

Several inorganic chemicals were detected above their respective BVs in the surface sample collected at location 16-611439. Bis(2-ethylhexyl)phthalate was also detected in the subsurface sample, indicating that vertical extent of contamination is not defined. The Permittees must propose to collect additional samples south of location 16-611439 to define the vertical and lateral extent of contamination during the Phase II investigations.

LANL Response

28. Text in sections 9.2.5.1 and 9.2.5.4 has been revised to indicate that lateral extent is not defined for copper, lead, mercury, and zinc. Text for bis(2-ethylhexyl)phthalate already states that vertical extent is not defined. Text in section 9.2.5.2 has been revised to indicate that bis(2-ethylhexyl)phthalate concentrations increased with depth at location 16-611439. Additional samples will be proposed in the Phase II investigations to define extent.

NMED Comment

29. Section 9.5.5.1, Inorganic Chemicals, pages 205:

Permittees' Statements:

a. Barium was detected above the Qbt 2, Qbt 3, and Qbt 4 BV at six locations and above the soil BV at one location. Concentrations increased with depth at locations 16-03054, 16-03072, 16-03024, and 16-609477 and decreased with depth at locations 16-609473, 16-03077, and 16-03071. Concentrations decreased downgradient.

b. Nickel was detected above the Qbt 2, Qbt 3, and Qbt 4 BV at locations 16-03072, 16-03077, and 16-611771. Concentrations decreased with depth at locations 16-03072 and 16-03077 and decreased downgradient (location 16-609462). Therefore, the extent of nickel is defined at locations 16-03072 and 16-03077.

c. Silver was detected above the Qbt 2, Qbt 3, and Qbt 4 BV at 20 locations. Concentrations decreased with depth and downgradient. Therefore, the extent of silver is defined.

NMED Comments:

a. NMED could not find location 16-03024 in the associated table or figure for 16-029(x). The Permittees state that concentrations of barium decreased with depth at locations 16-03077 and 16-03071. According to Table 9.5-1, samples from only one depth were collected at these locations. In addition, sample RE16-98-0016 (location 16-05845) is not included in Plate 15. Barium was detected at a concentration of 4,200 mg/kg at this location in a sample collected from a depth of 3.5-4.5 ft. The Permittees must revise the Report accordingly.

b. The Permittees state that concentrations of nickel decreased with depth at location 16-03077; however, samples were collected from only one depth at this location. The highest detected concentration of nickel (471 mg/kg) was in a sample collected from this location; the vertical extent of nickel is therefore not defined at this location. The Permittees must revise the text accordingly.

c. Silver was detected at several locations where samples were collected from only one depth. No clear trends were evident. Silver was detected at 49.8 mg/kg at location 16-03174, where samples were collected only from one depth. The Permittees must propose to collect additional samples east of this location to define the lateral extent of silver contamination during the Phase II investigations. In addition, the sampling location 16-05845, where silver was detected at 68 mg/kg, is not depicted in the figure (see Table 9.5-2). The Permittees must revise the Report accordingly.

LANL Response

29 a. The reference to location 16-03024 in the text should be to location 16-03064. The text in section 9.5.5.1 has been revised to correct the mislabeled location and to note that samples were collected from only one depth at sample locations 16-03071 and 16-03077. Location 16-05845 was mistakenly associated with SWMU 16-029(x) and has been removed from Tables 9.5-1 and 9.5-2. Since this location was mistakenly associated with this SWMU, Plate 15 was correct by not including it. The text in sections 9.5.4.1, 9.5.4.2, 9.5.4.3, 9.5.5, and 9.5.5.1 have also been revised to eliminate the data from location 16-05845.

b. Text in section 9.5.5.1 has been revised to indicate that the vertical extent of nickel is not defined.

c. Text in section 9.5.5.1 has been revised to indicate that the vertical extent of silver is not defined. Silver concentrations decreased downgradient of location 16-03174, and therefore lateral extent is defined. Location 16-05845 was mistakenly associated with SWMU 16-029(x) and has been removed from Tables 9.5-1 and 9.5-2. No revision to Figure 9.5-1 is necessary.

Additional samples will be proposed as part of the Phase II investigations to define extent of barium, nickel, and silver.

NMED Comment

30. Section 9.8.4.3, Radionuclides, pages 218:

Permittees' Statement: *Four soil and six fill samples were collected and analyzed for gamma-emitting radionuclides, isotopic uranium, isotopic plutonium, and americium-241. There were no radionuclides detected or detected above BVs/FVs.*

NMED Comment: *The Permittees state that samples were collected and analyzed for radionuclides and that none were detected above background at SWMU 16-017(p)-99. However, Table 9.8-1 indicates that samples collected at the site were never analyzed for radionuclides. The Permittees must clarify whether samples were analyzed for radionuclides and revise the text accordingly.*

LANL Response

30. Table 9.8-1 is correct; samples at SWMU 16-017(p)-99 were not analyzed for radionuclides. The text in sections 9.8.4.3, 9.8.5.3, and 9.8.5.4 has been revised accordingly.

NMED Comment

31. Section 11.0, Conclusions, page 258:

The Permittees must revise their conclusions on nature and extent of contamination for SWMUs and AOCs included in the S-Site Aggregate Area based on comments provided above.

LANL Response

31. Section 11.0 has been revised according to the responses to comments and revisions to the report.

NMED Comment

32. Section 12.0, Recommendations, page 264:

The Permittees must revise their recommendations for SWMUs and AOCs included in the S-Site Aggregate Area based on comments provided above.

LANL Response

32. Section 12.0 has been revised according to the responses to comments and revisions to the report.

NMED Comment

33. Figure 7.18.1, Locations Sampled for SWMU 16-004(d), page 364:

The Figure 7.18-1 depicts the locations of two inactive sludge drying beds (SWMUs 16-004(d) and 16-004(f)). SWMU 16-004(d) is located northeast of SWMU 16-004(f). However, Figure 4.2-3 of the IWP (page 94) depicts SWMU 16-004(f) as located northeast of 16-004(d). The locations of these SWMUs appear to be reversed in the Report. The comment also applies to subsequent figures 7.18-2, 7.18-3, 7.18-4, 7.20-1, 7.20-2, 7.20-3, and 7.20-4. The Permittees must resolve the discrepancy and make appropriate changes to the Report.

LANL Response

33. The figures within the investigation report are correct. The figure within the investigation work plan is incorrect.

NMED Comment

34. Table 8.2-3, Summary of Organic Chemicals Detected at SWMU 16-026(z), page 568:

The Table 8.2-3 reports incorrect depths for some of the sampling locations. For example, the correct depth for sample RE16-10-2889 should be 5.5-6.0 ft, not 0.0-0.5 ft (see Table 8.2-1). Similar errors were noted for samples RE16-10-2890 and RE16-10-2894. The Permittees must revise the table to report correct depths for these samples.

LANL Response

34. Table 8.2-3 has been revised to include the correct sample depths.

NMED Comment

35. Table 8.3-1, Summary of Samples Collected and Analyses Requested at SWMU 16-001(e), page 569:

The sample collected at location 16-609174 was from 10.0-21.0 ft. In general discrete samples are collected from 1-3 ft intervals. The sample from 10.0-21.0 ft would be considered a composite sample. The Permittees must provide an explanation for selecting such a long depth interval for a discrete sample.

LANL Response

35. The large sample interval at location 16-609174 is the result of extremely poor recovery. The interval listed was required to recover enough material for the analyses requested.

NMED Comment

36. Table 8.8-2, Summary of Inorganic Chemicals Detected above BVs at SWMU 16-026(d), page 586:

The industrial, recreational, and residential soil screening levels (SSLs) listed in the table are incorrect for cyanide (total), fluoride, iron, nitrate, selenium, and uranium. It appears that the data may have been shifted to the right in the spreadsheet. It is noted that this inconsistency does not affect the tables in Appendix H and correction would not result in any changes to the results of the risk assessments. The Permittees must revise the table indicating appropriate SSLs values.

LANL Response

36. Table 8.8-2 has been revised to provide the appropriate soil screening level (SSL) values.

NMED Comment

37. Table 8.10-2, Summary of Inorganic Chemicals Detected above BVs or Detected with no BVs at SWMU 16-026(d), page 594:

The results for chromium, cobalt, and vanadium are discussed in the text but were not included in the table. The Permittees must revise the table to include the analytical results for chromium, cobalt, and vanadium. In addition, sediment BVs must be included in the table to provide reference values for reported sediment samples.

LANL Response

37. Table 8.10-2 has been revised to include the results for chromium, cobalt, and vanadium. Sediment background values have been added to Table 8.10-2.

NMED Comment

38. Table 8.10-3, Summary of Organic Chemicals Detected at SWMU 16-026(d), page 595:

NMED Comment: *The data provided in the table are incomplete; several organic chemicals were omitted. For example, the data for benzoic acid, dibenz(a,h)anthracene, di-n-butylphthalate,*

diethylphthalate, naphthalene, 2,4,6-trinitrotoluene were not included in the table. In addition, the RDX concentration for the sample collected at location 16-01467 is not reported in the table. It is difficult to follow the discussion of extent of contamination provided in Section 8.10.5.2 with incomplete data in the table. The Permittees must revise the table to include all data discussed in the text.

LANL Response

38. Table 8.10-3 has been revised to include all data discussed in the text of section 8.10.5.2.

NMED Comment

39. Table 8.17-1, Summary of Samples Collected and Analyses Requested at Liquid Waste Trunk Line, page 619:

It is not clear why several samples collected from the same depth are assigned different media codes. For example, samples RE16-10-11753 and RE16-10-2967 were both collected from 5.5-6.0 ft at location 16-609232. Sample RE16-10-11753 is reported as a fill sample and sample RE16-10-2967 is reported as a soil sample. The Permittees must resolve or explain the discrepancies, and revise the table accordingly.

LANL Response

39. Because cyanide was not analyzed for in the original samples, the site was revisited and samples were collected for cyanide analysis at a later time. The discrepancy between the different media codes represents different interpretations of the sampling medium by different sampling teams. The data analysis is not impacted because fill and soil are both compared with the same BVs. No revisions to the table are necessary.

NMED Comment

40. Table 9.15-3, Summary of Organic Chemicals Detected at the Courtyard Periphery Area, page 685:

NMED Comment: *Table 9.15-3 presents an industrial SSL of 42.8 milligrams per kilogram (mg/kg) for 1,1-dichloroethene. This is inconsistent with the industrial SSL of 2,220 mg/kg listed in NMED's Background Document for Development of Soil Screening Levels, Revision 5.0 (December, 2009). It is noted that this inconsistency does not affect the tables in Appendix H and correction would not result in any changes to the overall conclusions of the risk assessments.*

Table 9.15-3 also lists an industrial SSL of 1,530 mg/kg for diphenylamine. This is inconsistent with the industrial Regional Screening Level (RSL) of 1,500 mg/kg. This analyte was not detected in the exposure intervals for the receptors evaluated at this site, and does not affect the results of the risk assessment. The Permittees must revise the table to report correct SSL values.

LANL Response

40. Table 9.15-3 has been revised to include the NMED industrial SSL for 1,1-dichloroethene.

    Table 9.15-3 has also been revised to include the correct U.S. Environmental Protection Agency (EPA) industrial regional screening level of 1500 mg/kg for diphenylamine.

NMED Comment

41. Tables 10.3-2 and 10.3-3, Summary of Inorganic and Organic Chemicals Detected at Martin Spring Canyon Drainages, pages 705 - 730:

The Permittees divided the data collected in the Martin Spring Canyon Drainages into four areas and depicted each area on a separate plate. However, the entire data set for the Martin Spring Canyon Drainages was provided in one table making it difficult to review the data. The Permittees must provide separate tables to correspond with plates for each of the four areas.

LANL Response

41. The data presented in Tables 10.3-2 and 10.3-3 have been separated to match the four areas that are each depicted on a separate plate. Inorganic chemicals above BV are presented in Tables 10.3-2 through 10.3-5. Organic chemicals detected are presented in Tables 10.3-6 through 10.3-9. Radionuclides detected or detected above BVs/FVs are presented in Tables 10.3-10 through 10.3-13.

NMED Comment

42. Appendix C, Section C-7.1.9, SWMU 11-011(b), page C-8:

Permittees' Statement: *The 5.5- to 6.0-ft-depth intervals were changed to 1.0–1.5 ft at location 11-608812, to 2.0–2.5 ft at location 11-608813, and to 2.5–3.0 ft at location 11-608814.*

NMED Comment: *The Permittees did not include an explanation for changing the 5.5 to 6.0-ft depth interval proposed in the work plan for samples collected at locations 11-608812, 11-608813, and 11-608814. The Permittees must always report the deviations from the approved work plan and include a reasonable and accurate explanation for the deviation.*

LANL Response

42. The text in section C-7.1.9 has been revised to explain that the depths were changed because of auger refusal.

NMED Comment

43. Appendix C, Section C-7.3.5, SWMU 16-003(f), page C-11:

Permittees' Statement: *Location 16-609166 did not originally plot near the associated sump as proposed. After field verification, the sampling point was relocated to immediately outside the sump to be sampled and surveyed.*

NMED Comment: *The Permittees proposed to collect two subsurface samples below each sump in the approved work plan. In Section 8.6.5 of the Report, the Permittees state that the function of the sump is such that leaks most likely migrate vertically in the unsaturated zone, and that lateral*

migration is not an expected transport pathway. It is not clear why the sampling point was relocated to outside the sump instead of directly beneath the sump. In addition, sampling location 16-609167 is located several feet away from the sump (Figure 8.6-1). This comment also applies to SWMU 16-003(d), 16-003(e), and SWMU 16-003(g).

LANL Response

43. The text in sections C-7.3.4 [SWMU 16-003(e)], C-7.3.5 [SWMU 16-003(f)], and C-7.3.6 [SWMU 16-003(g)] has been revised to clarify sample locations were moved because of utility interference. The approved investigation work plan (LANL 2007, 102216, section 4.3.2.4) did not indicate that these sample locations would be directly below the sumps; rather, the intent was to sample immediately adjacent at depths below the bottom of the sumps.

    The comment does not apply to SWMU 16-003(d) (section C-7.3.3), because there was no deviation to this sample location.

NMED Comment

44. Table H-2.3-1, EPCs at SWMU 16-004(e) for the Residential Scenario, page H-33:

The table indicates that nine analyses were conducted on nine samples at SWMU 16-004(e). This is inconsistent with Figure 7.19-2 which indicates that eight analyses were conducted on eight samples collected at SWMU 16-004(e). Similarly, Table H-2.3-2 indicates that five analyses were conducted within the sampling interval for ecological receptors, Figure 7.19-2 indicates that there were four samples collected and analyzed. Clarify these discrepancies.

LANL Response

44. The number of samples indicated in Figure 7.19-2 is correct; the tables were incorrect. Tables H-2.3-1 and H-2.3-2 have been revised to indicate eight and four samples were collected and analyzed, respectively.

NMED Comment

45. Tables H-2.3-3 and H-2.3-4, EPCs at SWMU 16-026(b) for the Industrial and Residential Scenarios, pages H-34 - H-38:

The table indicates that an upper confidence level (UCL) was not generated for dibenz(a,h)anthracene and that a maximum detected concentration of 0.19 mg/kg is used for both the industrial and residential exposure point concentrations (EPCs). However, Table H-4.2-5 lists the residential EPC as 0.092 mg/kg, resulting in a possible underestimation of risk. While it is noted that corrective action is proposed for this site due to elevated risk, this discrepancy should be clarified and the risk calculations revised.

LANL Response

45. As stated in the response to General Comment 4, because the extent of contamination for SWMU 16-026(b) is not defined, the risk assessment for this SWMU was removed from Appendix H. Tables H-2.3-3 and H-2.3-4 have been removed and the remaining tables renumbered in the revised

Appendix H. The corresponding text in Appendix H has also been revised to provide the renumbered table call-outs.

NMED Comment

46. Table H-2.3-5, EPCs at SWMU 16-026(b) for the Ecological Receptors, page H-37:

The table indicates that the maximum detected concentration of benzo(k)fluoranthene (0.86 mg/kg) is used as the EPC for ecological receptors at SWMU 16-026(b). However, the EPC presented on Table H-2.3-5 (0.502 mg/kg) is inconsistent with the maximum detected concentration of 0.86 mg/kg. Clarify this discrepancy and modify any impacted calculations and conclusions as warranted.

LANL Response

46. As stated in the response to General Comment 4, because the extent of contamination for SWMU 16-026(b) is not defined, the risk assessment for this SWMU was removed from Appendix H. Table H-2.3-5 has been removed and the remaining tables renumbered in the revised Appendix H. The corresponding text in Appendix H has also been revised to provide the renumbered table call-outs.

NMED Comment

47. Tables H-2.3-8, H-2.3.9, H-2.3-10, H-4.2-11, and H-4.2-13, pages H-40 – H-43 and H-52 –H-53:

The maximum detected concentration (and EPC) of 0.0091 mg/kg listed for 2-methylnaphthalene in all five tables is inconsistent with the maximum detected concentration of 0.00877 mg/kg listed on Table 9.8-3 and Figure 9.8.3. The EPC of 0.0091 mg/kg that was used to estimate hazards is the more conservative of the two concentrations, and would not affect the overall conclusions of the risk assessment. However, the Permittees must resolve this inconsistency.

LANL Response

47. Tables H-2.3-5, H-2.3-6, and H-2.3-7 (formerly numbered as Tables H-2.3-8, H-2.3-9, and H-2.3-10); Tables H-4.2-7 and H-4.2-9 (formerly numbered as Tables H-4.2-11 and H-4.2-13); and Table H-5.4-3 (formerly numbered as Table H-5.4-5) have been revised to include the correct maximum detected concentration and exposure point concentration (EPC) for 2-methylnaphthalene.

NMED Comment

48. Tables H-4.2-3 and H-4.2-5, Industrial and Residential Screening for Carcinogens for SWMU 16-026(b), pages H-47 – H49:

2,4-dinitrotoluene is was not included as a carcinogen in Tables H-4.2-3 and H-4.2-5. The cumulative risk estimates have been slightly underestimated at SWMU 16-026(b) as the cumulative risk estimates currently do not include 2,4-dinitrotoluene. It is noted that addition of 2,4-dinitrotoluene to the carcinogenic risk calculations would most likely not affect the overall conclusions of the risk assessment at SWMU 16-026(b) since 2,4-dinitrotoluene would contribute only a small percentage of the cumulative risk. Nevertheless, the Permittees must revise Tables H-4.2-3 and H-4.2-5 to include 2,4-dinitrotoluene.

LANL Response

48. As stated in the response to General Comment 4, because the extent of contamination for SWMU 16-026(b) is not defined, the risk assessment for this SWMU was removed from Appendix H. Tables H-4.2-3 and H-4.2-5 have been removed and the remaining tables renumbered in the revised Appendix H. The corresponding text in Appendix H has also been revised to provide the renumbered table call-outs.

NMED Comment

49. Table H-4.2-4, Industrial Screening for Noncarcinogens for SWMU 16-026(b), page H-48:

The industrial SSLs for 4-amino-2,6-dinitrotoluene and 2-amino-4,6-dinitrotoluene appear to be switched. The industrial SSL for 4-amino-2,6-dinitrotoluene should be 1,900 mg/kg, and the industrial SSL for 2-amino-4,6-dinitrotoluene should be 2,000 mg/kg. Modify Table H-4.2-4 accordingly and revise the hazard quotient (HQ) and hazard index (HI) estimates to reflect this change.

LANL Response

49. As stated in the response to General Comment 4, because the extent of contamination for SWMU 16-026(b) is not defined, the risk assessment for this SWMU was removed from Appendix H. Table H-4.2-4 has been removed and the remaining tables renumbered in the revised Appendix H. The corresponding text in Appendix H has also been revised to provide the renumbered table call-outs.

NMED Comment

50. Table H-4.2-6, Residential Screening for Noncarcinogens for SWMU 16-026(b), page H-50:

The EPC for cyanide (1.1 mg/kg) is inconsistent with the EPC listed in Table H.2-3.4 (0.647 mg/kg) for the residential scenario. As the EPC used results in a more conservative estimate, the risk assessment results would not be affected by this inconsistency. However, clarify this discrepancy and revise Tables H-4.2-6 and H.2-3.4 for consistency.

LANL Response

50. As stated in the response to General Comment 4, because the extent of contamination for SWMU 16-026(b) is not defined, the risk assessment for this SWMU was removed from Appendix H. Tables H-4.2-6 and H-2-3.4 have been removed and the remaining tables renumbered in the revised Appendix H. The corresponding text in Appendix H has also been revised to provide the renumbered table call-outs.

NMED Comment

51. Table H-4.2-13, Residential Screening for Noncarcinogens for SWMU 16-017(p)-99, page H-53:

It is not clear why 2,4,6-trinitrotoluene was listed as a COPC for SWMU 16-017(p)-99 and included on Table H-4.2-13, as this chemical does not appear to have been detected at this site. Revise Table H-4.2-13 accordingly.

Footnote "e" should read "Isopropylbenzene used as a surrogate…" rather than "Pyrene used as a surrogate…" Revise the footnote accordingly.

LANL Response

51. Table H-4.2-9 (formerly numbered as Table H-4.2-13) has been revised to remove 2,4,6-trinitrotoluene and to correct the surrogate chemical information in footnote "e."

NMED Comment

52. Table H-4.2-15, Recreational Screening for Noncarcinogens for Courtyard Periphery Area, page H-54:

The recreational SSL for aluminum (79,100 mg/kg) is inconsistent with the recreational SSL listed in Technical Approach for Calculation Recreational Soil Screening Levels for Chemicals, Revision 1 (February, 2010) of 791,000 mg/kg. As this inconsistency results in a more conservative risk estimate, the overall conclusions are not affected. However, revise Table H-4.2-15 to correct this apparent typographical error. Also, revise the HQ and HI accordingly.

LANL Response

52. Table H-4.2-11 (formerly numbered as Table H-4.2-15) has been revised to include the correct recreational SSL for aluminum. The hazard quotient for aluminum and the hazard index for the site have been recalculated. In addition, the text in Appendix H has been revised accordingly. The corresponding text in Appendix H has also been revised to provide the renumbered table call-outs.

NMED Comment

53. Table H-5.4-1, Ecological Screening Levels for Terrestrial Receptors, page H-55:

The ESLs listed for acenaphthene are incorrect for the deer mouse, desert cottontail, and earthworm receptors. It appears the data are shifted to the right by one cell. However, it appears that the correct ESLs were applied in determination of the HQs in Table H-4.5-3. Update Table H-5.4-1 to show correct ESLs for these receptors.

LANL Response

53. Table H-5.4-1 has been revised to include the correct ecological screening levels for acenaphthene.

NMED Comment

54. Table H-5.4-4, HQ/HI Analysis for SWMU 16-026(b), page H-59:

Some of the HI estimates are miscalculated for the American kestrel (top carnivore), American robin (insectivore), and the plant receptor. For the American kestrel (top carnivore), the HI should be 10.7 (instead of the value of 21 presented on Table H-5.4-4); the HI for the American robin is 33 (instead of 45); the HI for the plant receptor is 121.8 (instead of 119). The Permittees must verify the calculation of HIs on Table H-5.4-4 and revise accordingly.

LANL Response

54. As stated in the response to General Comment 4, because the extent of contamination for SWMU 16-026(b) is not defined, the risk assessment for this SWMU was removed from Appendix H. Table H-5.4-4 has been removed and the remaining tables renumbered in the revised Appendix H. The corresponding text in Appendix H has also been revised to provide the renumbered table call-outs.

NMED Comment

55. Table H-5.4-7, Minimum ESL Comparison for Courtyard Periphery Area, page H-61:

Table H-5.4-7 indicates that the minimum ESL for flouranthene (10 mg/kg) is based on a montane shrew receptor. This is inconsistent with the information provided in Table H-5.4-1 and the LANL (2009) ECORISK database which indicates that the minimum ESL for flouranthene (10 mg/kg) is based on an earthworm receptor. Revise Table H-5.4.7 to display the appropriate receptor associated with this record.

LANL Response

55. Table H-5.4-5 (formerly numbered as Table H-5.4-7) has been revised to include the earthworm as the receptor for fluoranthene.

REFERENCE

LANL (Los Alamos National Laboratory), December 2007. "Investigation Work Plan for S-Site Aggregate Area, Revision 1," Los Alamos National Laboratory document LA-UR-07-8366, Los Alamos, New Mexico. (LANL 2007, 102216)