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December 3, 2009

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David McInroy Remediation Services Deputy Project Director Los Alamos National Laboratory P.O. Box 1663, MS M992 Los Alamos, NM 87545

RE: NOTICE OF DISAPPROVAL FOR THE INVESTIGATION REPORT FOR UPPER LOS ALAMOS CANYON AGGREGATE AREA LOS ALAMOS NATIONAL LABORATORY EPA ID #NM0890010515 HWB-LANL-09-020

Dear Messrs. Gregory and McInroy:

The New Mexico Environment Department (NMED) has received the United States Department of Energy (DOE) and the Los Alamos National Security, LLC (LANS) (collectively, the Permittees) Investigation Report for Upper Los Alamos Canyon Aggregate Area (Report), dated May 2009 and referenced by LA-UR-09-3325/EP2009-0238. At the request of Los Alamos County (LAC), NMED conducted an expedited review of solid waste management units (SWMUs) and areas of concern (AOCs) located at former Technical Area (TA)-32. A Notice of Disapproval (NOD) for the sites specific to TA-32, was sent on July 29, 2009 (TA-32 NOD). NMED completed review of the remaining sites included in the Report and hereby issues this NOD for the entire document, including sites located at TA-32.

General Comments:

- 1. During evaluation of the data to identify contaminants of potential concern (COPCs), the Permittees excluded some chemicals as COPCs, when the detected concentration or the detection limit was above the background reference datum, but the detected concentration



was within the range of background concentrations. Further, chemicals were not retained as COPCs because the sample concentrations were less than two or three times the maximum background concentration. These are not appropriate methods for excluding a chemical as a COPC. A statistical comparison of the data sets must be conducted to determine if the site data are statistically different from the background. To compare site data to the background, the Permittees must follow procedures outlined in NMED's approval letter for Investigation Report for Middle Cañada del Buey Aggregate Area, Revision 1 (April 27, 2009). The Permittees must revise the Report and use appropriate methods for identification of COPCs.

2. While calcium, sodium, and potassium may be relatively non-toxic, studies have shown there to be an upper intake limit for iron. The United States Department of Agriculture Food Safety and Inspection Service and the National Academy of Science Food and Nutrition Board have developed upper intake levels (ULs), which should be applied in determining a soil screening level (SSL) that, in turn, should be used in assessing essential nutrients toxicity. If site concentrations of iron are below this SSL, then the concentrations may be eliminated from further consideration in the risk assessment. The Permittees must revise the Report accordingly.
3. For the evaluation of mercury in the risk assessments, a SSL for mercury as an inorganic salt was applied for the residential and industrial scenarios, although a datum for elemental mercury was applied for the construction worker. Unless specific analytical data are available to confirm the presence of mercury as an inorganic salt, screening data for elemental mercury are typically applied. In addition it is noted that background data based on elemental mercury are applied, resulting in conflicting data and evaluation of mercury. While the application of a SSL based on elemental mercury would not significantly change the conclusions of the risk assessments, the Permittees must discuss the rationale for using SSLs for mercury as an inorganic salt for the residential and industrial scenarios and revise the screening assessments as appropriate.
4. For the residential, industrial, and construction worker screening evaluations where lead was retained as a noncarcinogen, a hazard quotient was calculated and summed with other noncarcinogens. The result is an overestimation of noncarcinogenic risk, as inclusion of lead in the hazard index is incorrect. Lead SSLs are based upon blood lead levels, unlike most noncarcinogens which have SSLs based on more traditional toxicological data (e.g., no-observed adverse effect levels) and should be evaluated independently. The Permittees must revise the assessments accordingly for all the SWMUs/AOCs where lead was identified as a COPC. This comment was included in the TA-32 NOD.
5. There is an inconsistency in how chromium is evaluated in the screening assessments. For example, at SWMU 32-001, the industrial and residential scenarios evaluated total chromium but the construction worker scenario applied data for hexavalent chromium. It is not clear from the data that speciation of chromium is available. As such, if the speciation is unknown, or if site data are not available to justify speciation, then data for hexavalent chromium should be applied. The Permittees must revise the screening assessments as appropriate.

6. In reviewing the risk assessments, several sites had volatile organic compounds (VOCs) retained as COPCs. Use of the Regional Soil Screening Levels (RSLs) and the New Mexico SSLs are appropriate for the pathways defined in their derivations. However, if additional exposure pathways not addressed in the SSLs are complete, risks via exposure from these pathways must be evaluated and assessed in conjunction with the risks/hazards determined through comparison of the SSLs. The presence of VOCs indicates that inhalation of indoor air via the vapor intrusion scenario is a complete pathway and must be addressed. The Permittees must revise the assessments where VOCs were retained as COPCs to address the vapor intrusion scenario. This comment was included in the TA-32 NOD.
7. A thorough review of available ecological toxicity has not been conducted, resulting in the omission of several COPCs from being qualitatively evaluated in the ecological assessments. Only data that are currently provided in the ECORISK database were applied. NMED has repeatedly commented that exclusion of data from the ECORISK database is not sufficient justification for exclusion of the evaluation of a COPC. At a minimum, a discussion of the uncertainties associated with COPCs not quantitatively evaluated should be provided for each ecological analysis. The Permittees must revise ecological risk assessments accordingly.
8. It is noted that aluminum was excluded as a COPC in all of the ecological risk assessments. It is known that aluminum is soluble and biologically available in acidic soil (pH < 5.5) and inactive in circumneutral to alkaline (pH 5.5 - 8.0) conditions. Above a pH of 8.0, the solubility of aluminum increases, although the bioavailability is uncertain. Section G-3.2.1 of the report states that the pH within the Upper Los Alamos Canyon Aggregate Area (ULACAA) varies from 4.9 to 9.1. Given that areas within the ULACAA may have soil pH in a range rendering aluminum bioavailable (between pH 4.9 and 5.5), it appears that a blanket exclusion of aluminum in the ecological risk assessments may not be appropriate. The Permittees must address soil pH and bioavailability of aluminum at each AOC and SWMU addressed in this Report.
9. The Investigation Work Plan (IWP) for ULACAA included analytical results that were considered decision level data. Additional samples were proposed based on data gaps identified in the IWP. The Permittees did not include results from the previous investigations for some of the sites when defining nature and extent or conducting risk evaluations. For example, the data from previous investigations conducted at SWMUs 01-001(o), 01-001(s), 01-001(u), 01-003(a), 01-003(d), 01-007(a), and 01-007(b) were not included. The Permittees must either include data from the previous investigation or provide an explanation for not including it in risk evaluations.
10. The Permittees included the discussion on analytical results, identification of COPCs, and nature and extent of contamination in Appendix F. The conclusions were summarized and presented in the main text of the Report. To facilitate review of the report, the Permittees must include all information on data analysis and nature and extent of contamination in the main text of the report and eliminate Appendix F (Data Review) in future submittals.

11. The Permittees provided 'Analytical Suites and Results and Analytical Reports' (Appendix D) on three DVDs. NMED uses Microsoft Office Excel 2003 but the Permittees used a newer version of Microsoft Excel. To access the data the files had to be converted to Microsoft Office Excel 2003 version and some of the data was lost in the process. The entire data file could not be opened because of 2003 version does not support data that has more than 65,536 rows and 256 columns. At this time, NMED does not anticipate an upgrade to its current software, therefore, the Permittees must provide the data in files that are compatible with Microsoft Office Excel 2003 version.

**Specific Comments:**

1. **Section 4.4, Collection of Soil, Fill, Tuff, and Sediment Samples, Page 16:** The Permittees state that a stainless-steel scoop and bowl were used to homogenize samples prior to transferring them to sterile sample collection jars or bags. Section IX.B.2.b.ii of the 2005 Consent Order states "Homogenization of discrete samples collected for analyses other than for VOC and SVOC analyses shall be performed by the analytical laboratory, if necessary." The Permittees must clarify if all samples were homogenized prior to being shipped to the analytical laboratory and explain why homogenization was conducted in the field rather than at the laboratory.
2. **Section 12.1, Summary of Nature and Extent, Page 95:** In Sections 12.1.1 and 12.1.2, the Permittees' have provided information on the conclusions reached regarding nature and extent of contamination at 47 SWMUs/AOCs included in the ULACAA. NMED does not agree with these conclusions for some of the sites. NMED's comments are included under the specific comments provided in this letter for individual SWMUs/AOCs. The Permittees must review the NOD comments and revise their conclusions as appropriate.
3. **Section 13, Recommendations, Page 98:** The Permittees have requested certificates of completion for SWMUs and AOCs that have been determined to pose no potential risk to human health or to the ecological receptors under current and projected future land use. The Permittees must submit their request for Certificates of Completion under separate cover.

The Permittees must revise the recommendations included in this section based on the NOD comments provided for specific SWMUs/AOCs. Further, the Permittees propose to develop a Phase II investigation work plan for collecting samples at the sites where the extent has not been defined and for removal of contaminated media at sites to reduce residual concentrations of the contaminants. The Permittees should have included a schedule for further action in accordance with Section XI.C.11 of the Order.

4. **Appendix F, Section-F-1.2, Page F-1:** The Permittees have identified inorganic COPCs by comparing site data with background values (BVs) and maximum concentrations in a background data set. The site data should not be compared with maximum concentrations of the background data set. If a particular value exceeds the BV, then a statistical comparison of data sets must be conducted to determine if detected concentrations are different from

background (see General Comment #1). Similar statements are made throughout the document. For example, for SWMU 0-017, a similar process is applied for not retaining chromium (soil/fill), arsenic (tuff), beryllium (tuff), iron (tuff), and vanadium (tuff) as COPCs. The Permittees must make appropriate changes and revise the Report.

#### Technical Area 00

5. **Section 5.3.3, Nature and Extent of Contamination, Page 21:** At SWMU 00-017, the Permittees concluded that nature of extent of contamination was defined for all inorganic, organic, and radionuclide COPCs except lead. The Permittees should also note that only a limited portion of 39,000 feet of the underground waste lines that comprise SWMU 00-017 was characterized during these investigations. The rest of the waste lines which are outside the scope of ULACAA will be addressed under other aggregate areas, and the corrective action decision will be deferred until entire SWMU has been characterized.
6. **Appendix F, Section-F-2.2.1, Inorganic Chemicals at AOC 00-031(a), Page F-8:** Selenium was identified as a COPC but was not included in Tables G-2.2-2 and G-4.2-2. Revise the Report accordingly.
7. **Appendix F, Section-F-2.2.5.2, Nature and Extent of Organic COPCs, Page F-9:** The text indicates that six organic chemicals including 1,2,4-trimethylbenzene were detected at location 00-604729 at AOC 00-031(a). Neither the Figure 5.4-2 nor Table 5.4-3 indicate that 1,2,4-trimethylbenzene was detected at this location. Resolve the discrepancy and revise the Report accordingly.
8. **Appendix G:** There are some discrepancies in the data provided for SWMU 00-031(a). The ProUCL files for the 0-5 foot (ft) below ground surface (bgs) and 0-10 ft bgs present the same data. However, the data presented in these files are not the same as the data provided in Figure 5.4-2 or summarized in Table 5.4-3. For example, the concentration for pentachlorophenol listed in both of the ProUCL spreadsheets for both soil intervals is 1.9 milligrams per kilogram (mg/kg); the maximum detected concentration for pentachlorophenol provided in the report is 0.49 mg/kg (J flag). As Section 2.3.1 of the report indicates that no previous sampling was conducted at SWMU 00-031(a), it is not clear from where the data provided in the ProUCL files were obtained. If the data in ProUCL represent detection limits but there were no positive detects, the data should not be included in the spreadsheets. The Permittees must resolve these discrepancies and revise the Report accordingly.

#### Technical Area 01

9. **Section 6.4, Site Contamination-SWMU 01-001(b), Page 26:** The results of three samples collected during previous investigations conducted in 1992 (i.e., locations 01-01162, 01-01168, and 01-01174) were not included in the screening evaluations. Several inorganic and organic chemicals were detected at the site and these results were reported in the IWP. The

results from previous investigations must be included in the Report or an explanation must be provided for excluding these results.

10. **Section 6.5, Site Contamination-SWMU 01-001(c), Page 27:** The approved IWP proposed to collect thirteen samples from six locations (see figure 4.4-2). The text indicates that a total of eleven samples were collected from five locations at SWMU 01-001(c). The Permittees did not include an explanation for the deviation in Section B-8.0 (Appendix B, Deviations from Work Plan), as required by the Section XI.C.7 of the Consent Order. Two additional samples that were proposed to be collected from location 2 were not collected. Additionally, analytical results for three samples collected during previous investigations were not included in the Report. Revise the Report to include previous sampling results or provide an explanation for not including these results and also for not following the approved IWP.
11. **Table 6.15-1, Samples Collected and Analyses Requested at SWMU 01-003(a), Page 352:** In response to NOD Comment #9, the Permittees indicated that at locations 00-603918 and 00-603919, samples would be collected from the surface and then every five feet (or less) until the fill/tuff interface was reached. However, at location 00-603918 both the samples were collected from fill. The Permittees must explain why fill/tuff interface was not sampled to investigate the vertical extent of contamination, in the revised Report.
12. **Appendix F, Section-F-3.1.5.4, Summary of Nature and Extent at SWMU 01-001(a), Page F-14:** As the title of the section indicates the discussion included in this section is for SWMU 01-001(a), not AOC 00-031(a). The Permittee must correct the typographical error and replace AOC 00-031(a) with SWMU 01-001(a) in the revised Report.
13. **Appendix F, Section-F-3.7.5, Summary of Nature and Extent at SWMU 01-001(g), Page F-35:** The Permittees conclude that the lateral and vertical extent of chromium is defined. The review of data indicates that lateral extent of chromium is defined but the vertical extent is not. At four of the five locations sampled detected chromium concentrations increased with depth. Similarly, the concentrations of nickel increased with depth at three of the five locations. The vertical extent of chromium and nickel is therefore not defined. The Permittees must propose additional samples to define the vertical extent of chromium and nickel contamination in the Phase II work plan.
14. **Appendix F, Section-F-3.11.1.1, Inorganic Chemicals at SWMU 01-001(u), Page F-49:** The review of data provided in Section F-3.11 as well as Table 6.13-2 indicates that copper is a COPC and was retained as a COPC; however, copper is not included in the risk evaluations provided in Appendix G (see Tables G-2.2-12 and G-4.2-26). The Permittees must include copper in the screening evaluations and revise the Report accordingly.
15. **Appendix F, Section-F-3.17.1.2, Inorganic Chemicals in Tuff, Page F-74:** Arsenic was detected above the BV in four out of ten samples collected at SWMU 01-006(a). The Permittees did not retain arsenic as a COPC because the detected concentrations were either less than or slightly above the maximum background concentration. The Permittees must conduct a statistical comparison of the detected arsenic concentrations to the background data

set to determine if arsenic must be retained as a COPC (see Comment #1) in the revised Report.

16. **Appendix F, Section-F-3.18.5.3, Nature and Extent of Radionuclide COPCs, Page F-82:** The Permittees state that the vertical extent for plutonium-239/240 is defined, but the lateral extent is not defined for SWMU 01-006(b). It is apparent from the review of the data that the concentrations of plutonium 239/240 decrease with depth, but the detected concentrations in deepest samples are high enough to warrant additional sampling to define the vertical extent of contamination. Plutonium 239/240 was detected at 113 mg/kg at location 00-604225 (1-2 ft) and at 40.3 mg/kg at location 00-60437 (4-5 ft). The Permittees must propose to collect additional samples at SWMU 01-006(b) to define the vertical and lateral extent of contamination in the Phase II work plan.
17. **Appendix F, Section-F-3.19.5.4, Summary of Nature and Extent at SWMU 01-006(c), Page F-85:** Two samples from one sampling location were collected at SWMU 01-006(c) during 2008-2009 investigations. There are no data available for the site from previous investigations. The Permittees state that lateral extent is defined for all inorganic and radionuclide COPCs except chromium, nickel and plutonium-239/240. The lateral extent of contamination cannot be determined from the results of one sampling location. The Permittees must revise the statement and propose to collect additional samples to define the vertical and lateral extent of contamination in the Phase II work plan.
18. **Appendix F, Section-F-3.21.5.1, Nature and Extent of Inorganic COPCs, Page F-89:** Concentrations of barium, chromium, and nickel increase with depth at two of the three sampling locations at AOC 01-006(e). The Permittees state that the vertical extent is defined for these metals because concentrations are only slightly above the BV or are below two times the BV. As stated in the General Comment #1, NMED does not consider this approach acceptable. The Permittees must propose to collect additional samples to define the vertical extent of contamination in the Phase II work plan.
19. **Appendix F, Section-F-3.26.5.2, Nature and Extent of Organic COPCs, Page F-104:** The Permittees state that at SWMU 01-007(a) the concentration of Aroclor-1260 decreases with depth at all locations where it was detected. Aroclor-1260 concentration does not decrease with depth at all locations since it increases with depth at location 00-604239. The Permittees must revise the statement in the Report.
20. **Appendix F, Section-F-3.28.5.1, Nature and Extent of Inorganic COPCs, Page F-111:** The Permittees state that lateral and vertical extent for chromium and nickel is defined at SWMU 01-007(c). At all four locations sampled, the concentration of nickel and chromium increased with depth. Comparing detected concentrations to twice the maximum BV to define the extent is not acceptable. The Permittees must propose further investigations to define the extent of contamination at the site in the Phase II work plan.
21. **Appendix G, Table G-4.2-3, Recreational Carcinogenic Screening for SWMU -01-001(b), Page G-131:** 2.57E+05 mg/kg is listed as a recreational SSL for chromium in Table

- G-4.2-3. Table 3.1-1 lists a value of 14,300 mg/kg for chromium recreational SSL. Resolve the discrepancy and revise the tables and the screening evaluation accordingly in the Report.
22. **Table G-4.2-4, Recreational Noncarcinogenic Screening for SWMU 01-001(b), Page G-132:** The exposure point concentrations (EPCs) listed under the second column for the recreational scenario are incorrect. For example, EPC listed in Table G-2.2-3 for cadmium is 1.94 mg/kg, but Table G-4.2-4 lists it at 3.13 mg/kg. Bromomethane and isopropyltoluene[4] were not retained as COPCs in Table G-2.2-3, but are included in Table G-4.2-4. Further the values listed as recreational SSLs are different than the SSLs listed in Table 3.1-1. Resolve the discrepancies and revise the screening evaluation using correct EPCs and SSLs in the Report.
  23. **Table G-4.2-7, Residential Noncarcinogenic Screening for SWMU 01-001(b), Page G-133:** The footnote 'b' indicates that SSL for isopropylbenzene was used as a surrogate for isopropyltoluene[4-]. According to Table 3.1-1, the SSL for isopropylbenzene is 271mg/kg under residential scenario, not 389 mg/kg as listed in the Table G-4.2-7. The Permittees must revise the risk assessment using correct SSL value in the Report.
  24. **Table G-4.2-15, Construction Worker Carcinogenic Screening for SWMU 01-001(c), Page G-136:** Arsenic was retained as a COPC and an associated exposure point concentration was calculated (see Table G-2.2-8). The Permittees did not include arsenic in the screening evaluation. The Permittee must revise the table to include arsenic in the screening evaluation in the Report.
  25. **Table G-4.2-21, Residential Noncarcinogenic Screening Evaluation for SWMU 01-001(e), Page G-138:** 5,000 mg/kg is listed as a screening value for toluene under a residential scenario. However, Table 3.1-1 lists 252 mg/kg as a screening value for toluene for a residential scenario. Similar discrepancies were noted in risk assessments conducted for other sites where toluene was identified as a COPC. The Permittees must resolve the discrepancy and revise the risk assessments for all relevant SWMUs and AOCs in the Report.
  26. **Table G-4.2-26, Residential Noncarcinogenic Screening Evaluation for SWMU 01-001(u), Page G-139:** The residential screening value listed for trichloroflouromethane is 800 mg/kg. However, Table 3.1-1 lists 588 mg/kg as a screening value for trichloroflouromethane under a residential scenario. The Permittees must resolve the discrepancy and revise the Report accordingly.
  27. **Table G-4.2-28, Residential Noncarcinogenic Screening Evaluation for SWMU 01-002, Page G-141:** The residential screening value listed for butylbenzene[n-], butylbenzene[-sec], styrene, toluene, and xylene(total) are different than the values listed in Table 3.1-1. The Permittees must resolve the discrepancies and revise the risk screening evaluations accordingly in the Report.
  28. **Table G-4.2-31, Industrial Noncarcinogenic Screening Evaluation for SWMU 01-003(e), Page G-143:** The industrial SSLs used for the screening evaluation for certain chemicals are

different than those listed in Table 3.1-1. For example, the values used for butylbenzene[sec-] is 450 mg/kg, but Table 3.1-1 lists it at 60.6 mg/kg. Similar discrepancies were noted for propylbenzene[1-], isopropyltoluene[4-], styrene, toluene and trimethylbenzene[1,3,5-]. The Permittees must resolve these discrepancies and revise the risk screening evaluations in the Report.

29. **Table G-4.2-33, Recreational Carcinogenic Screening Evaluation for SWMU 01-003(e), Page G-144:** The screening values listed for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoroanthene, and chrysene for a recreational scenario are incorrect. The values do not match the values listed in Table 3.1-1. The Permittees must resolve these discrepancies and revise the Report accordingly.
30. **Table G-4.2-34, Recreational Noncarcinogenic Screening Evaluation for SWMU 01-003(e), Page G-145:** The recreational screening value listed for toluene is 54,100 mg/kg for a residential scenario. However, Table 3.1-1 lists 252 mg/kg as a screening value for toluene for a recreational scenario. Similar discrepancies were noted for butanone[-2], butylbenzene[sec-], propylbenzene[1-], styrene, and trimethylbenzene[1,3,5-]. The Permittees must resolve discrepancies such as these throughout the Report and revise the Report accordingly.
31. **Table G-4.2-37, Residential Noncarcinogenic Screening Evaluation for SWMU 01-003(e), Page G-147:** The residential screening values listed for beryllium, butylbenzene[sec-], propylbenzene[1-], styrene, and toluene are incorrect. The Permittees must compare these values with those listed in Table 3.1-1 and make appropriate revisions to the Report.
32. **Table G-4.2-55, Residential Noncarcinogenic Screening Evaluation for SWMU 01-007(c), Page G-153:** The residential screening values listed for butylbenzene[n-], butylbenzene[sec-], isopropyltoluene[4-], styrene, and toluene are incorrect. The Permittees must compare these values with the value listed in Table 3.1-1 and make appropriate revisions to the Report.

### Technical Area 03

33. **Appendix F, Section-F-4.2.5.1, Nature and Extent of Inorganic COPCs, Page F-124:**  
The data indicates that the vertical extent of inorganic chemicals is not defined at SWMUs 03-038(a) and 03-038(b). At most of the locations, the highest detected concentrations were in the deepest samples. For example, the highest detected concentrations for barium, calcium, chromium, copper, lead, and nickel were from deepest sample collected at location 00-604258. The Permittees must conduct further investigations to define the vertical extent of contamination at the site and propose additional samples in the Phase II work plan.
34. **Appendix F, Section-F-4.3.5.1, Nature and Extent of Inorganic COPCs, Page F-127:**  
The review of data indicates that the vertical extent of zinc is not defined at SWMUs 03-055(c). At most of the locations where samples were collected from more than one depth, the detected concentrations of zinc increased with depth. The Permittees must conduct

further investigations to define the vertical extent of contamination and propose additional samples in the Phase II work plan.

35. **Table G-4.2-74, Recreational Carcinogenic Screening Evaluation for SWMU 03-055(c), Page G-160:** The recreational screening values listed for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoroanthene and chrysene for a recreational scenario are incorrect. The values differ from the values listed in Table 3.1-1. The Permittees must resolve the discrepancies and make appropriate revisions to the Report.
36. **Table G-4.2-75, Recreational Noncarcinogenic Screening Evaluation for SWMU 03-055(c), Page G-160:** The Permittees must provide a source for the screening value listed for methylanthralene[2-] in the Table G-4.2-75. Further, Table G-4.2-75 lists a screening value of 15.8 mg/kg for Aroclor-1260. The value for Aroclor-1260, under a recreational scenario, is listed at 10.5 mg/kg in Table 3.1-1. The Permittees must resolve the discrepancy and revise the Report accordingly.
37. **Table G-4.2-77, Residential Carcinogenic Screening Evaluation for SWMU 03-055(c), Page G-161:** The screening value reported for ethylbenzene is 57 mg/kg in Table G-4.2-77 and 128 mg/kg in Table 3.1-1. Resolve the discrepancy and revise the Report accordingly.
38. **Table G-4.2-78, Residential Noncarcinogenic Screening Evaluation for SWMU 03-055(c), Page G-162:** The screening values reported for benzoic acid, toluene, xylene[1,2-], and xylene[1,3-]+xylene[1,4-] in Table G-4.2-77 and Table 3.1-1 are different. Resolve the discrepancies and revise the Report accordingly.

**Technical Area 32** (These comments were included in the TA-32 NOD)

39. **Table 8.4-2, Inorganic Chemicals above BVs at SWMU 32-002(a), Page 419:** Table 8.4-2 indicates that magnesium was detected at a concentration of 830 mg/kg at sample location 32-06353. Review of the data indicates that it was manganese not magnesium that was detected at 830 mg/kg at location 32-06353. Revise the Report accordingly.
40. **Section F-5.1.1, Inorganic Chemicals at SWMU 32-001, Page F-128:** Lead, manganese and sodium were detected above their respective background values but were not identified as COPCs because the detected values were less than the maximum background concentrations. It is not appropriate to compare site specific concentrations with maximum background concentrations to identify COPCs. The Permittees must conduct a statistical comparison of site data to background data to evaluate COPCs. Cadmium must also be evaluated in a similar manner in the revise Report.
41. **Appendix F, Section-F-5.1.2, Organic Chemicals at SWMU 32-001, Page F-130:** Dioxin and furan congeners were detected at most of the sites within the former TA-32. However, these constituents were excluded from further assessment based on the rationale that the levels are similar to levels at other locations within the LANL boundary (specifically TA-21). However, a qualitative comparison to other areas is not sufficient justification for exclusion

from further analysis. The Permittees must provide additional lines of evidence (to include quantitative evaluations, statistical analyses, and site history) to support the conclusion that the detected levels at the former TA-32 are representative of anthropogenic levels. Either provide sufficient lines of evidence to support exclusion of dioxins/furans or revise the risk evaluations contained in Appendix G to include these constituents. In addition, when presenting data for dioxin/furan/polychlorinated biphenyl congeners, a table showing the derivation of the toxicity equivalent concentration (or TEQ) should always be provided. The Permittees also must revise the Report to include a table showing the determination of the dioxin/furan TEQs.

42. **Appendix F, Section-5.1.2.1, Organic Chemicals in Soil and Fill, Page F-130:** Aroclor-1260, cis-1,2-dichloroethene, tetrachloroethene, and trichloroethene are identified as COPCs for soil and fill at SWMU 32-001. However, none of the risk evaluations contained in Appendix G include these constituents. The Permittees must revise the risk evaluations for SWMU 32-001 in the Report to include all identified COPCs.
43. **Section F-5.2.5.1, Nature and Extent of Inorganic COPCs, Page F-136-137:** At SWMU 32-002(a), concentrations of barium increased with depth at several locations indicating that the vertical extent of barium is not defined. Concentrations of chromium and nickel increased with depth at most of the locations where samples were collected from two depths. The vertical extent of chromium and nickel also is not defined. Selenium was detected in four not two samples at the site as reported. Zinc was detected at concentrations above background in more than the one sample reported. The Permittees must revise the Report accordingly.
44. **Section F-5.3.1, Inorganic Chemicals at SWMU 32-002(b), Page F-138:** Cadmium was detected at concentrations exceeding the background value and must be retained as a COPC. Similarly, calcium must be retained as a COPC and carried forward in the screening assessment. The Permittees must revise the Report accordingly.
45. **Section F-5.3.5.2, Nature and Extent of Organic COPCs, Page F-143:** A typographical error was noted on page 143. Methylene chloride was detected at locations 00-603594 and 00-603599, not 00-603948 and 00-603599 at SWMU 32-002(b). Revise the Report accordingly.
46. **Attachment G-1 ProUCL Input Files for TA-32.** Several discrepancies were noted between the input files provided in Attachment G-1 and the TA-32 data tables provided in the main text of the report. Specifically, the Permittees must address the following in the revised Report:
  - SWMU 32-001, inorganics at 0-1 foot (ft) below ground surface (bgs): Table 8.3-2 lists positive detections for manganese above the background soil level and detection limits above the background soil levels for cadmium; however, neither cadmium nor manganese are retained as potential COPCs and thus are excluded from the exposure point calculations and subsequent risk analysis. It is noted that

Appendix F-5.1.1.1 indicates that because the detections (and elevated non-detects) are below the maximum detected background concentration, cadmium does not need to be retained as a constituent of potential concern. However, comparison to a maximum background datum will not show slightly elevated levels across a site; a statistical comparison of site concentrations to the background population must be conducted. The Permittees must either provide additional discussion to justify excluding cadmium and manganese from additional review or include cadmium and manganese in the risk analysis. This comment also applies to the determination of the exposure point concentrations (EPCs) for SWMU 32-001 inorganics at 0-5 ft bgs and 0-10 ft bgs.

- SWMU 32-001, organics at 0-1 ft bgs: Table 8.3-3 shows positive detections for several constituents including trichloroethene, tetrachloroethene, several dioxin and furan congeners, and Aroclor-1260. However, none of these constituents are retained for the risk analysis and determination of EPCs. Sufficient justification has not been provided to demonstrate that these constituents are not potentially site related, and as such, must be retained for risk analysis. The Permittees must revise the EPCs for SWMU 32-001 to include these constituents. In addition, the Permittees must address polychlorinated biphenyls (PCBs) detected at this site and revise the EPCs to include PCBs. This comment also applies to the determination of the EPCs for SWMU 32-001 in organics at 0-5 ft bgs and 0-10 ft bgs.
- SWMU 32-004, inorganics at 0-1 foot (ft) bgs: Table 8.7-2 shows positive detections for cadmium above the background soil levels; however, cadmium is not retained as potential contaminant of concern and thus is excluded from the exposure point calculations and subsequent risk analysis. While it is noted that the concentrations do not appear to be significantly elevated when compared to background, they are still elevated. The Permittees must either provide additional discussion to justify excluding cadmium from additional review or include cadmium in the risk analysis. This comment also applies to the determination of the EPCs for SWMU 32-001, inorganics at 0-5 ft bgs and at 0-10 ft bgs.

#### Technical Area 41

47. **Section F-6.1.1.1, Inorganic Chemicals in Tuff, Page F-150:** Aluminum was detected at concentrations above the BV in 4 of 26 tuff samples, not 2 of 26 tuff samples at SWMU 41-001. The Permittees have repeatedly used twice the maximum background concentration for comparison purposes to identify COPCs, which is inappropriate. See General Comment #1. The Permittees must identify COPCs based on statistical comparison of site data with the background data in the revised Report.
48. **Table G-4.2-100, Recreational Carcinogenic Screening Evaluation for SWMU 41-001, Page G-173:** The recreational screening values listed for benzo(b)fluoranthene,

benzo(k)fluoroanthene, and chrysene are different from those listed in Table 3.1-1. Resolve the discrepancies and revise the risk evaluation in the Report.

#### **Technical Area 43**

49. **Section F-7.2.5.1, Nature and Extent of Inorganic COPCs, Page F-163:** Review of the data indicates that lateral extent is not defined for copper, chromium, and zinc at AOC C-43-001. The detected concentrations were in general higher in samples collected from the two downslope locations (i.e., 00-604846 and 00-604847). The Permittees must conduct further investigations to define the lateral extent of contamination for copper, chromium, zinc, as well as lead and propose additional samples in the Phase II work plan.
50. **Table G-4.2-106, Recreational Carcinogenic Screening Evaluation for AOC 43-001(b2), Page G-176:** The screening values listed for benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoroanthene, butylbenzylphthalate, methylene chloride, and chrysene for a recreational scenario are inconsistent. The values are different than the values listed in Table 3.1-1. The Permittees must resolve the discrepancies and revise the risk evaluation in the Report.
51. **Table G-4.2-107, Recreational Noncarcinogenic Screening Evaluation for AOC 43-001(b2), Page G-177:** The screening values listed for Aroclor-1260 and styrene for a recreational scenario are inconsistent. The values are different from the values listed in Table 3.1-1. The Permittees must resolve the discrepancies and revise the risk evaluation in the Report.
52. **Table G-4.2-110, Residential Noncarcinogenic Screening Evaluation for AOC 43-001(b2), Page G-179:** The screening values listed for carbon disulfide and styrene for a residential scenario are inconsistent. The values are different from the values listed in Table 3.1-1. The Permittees must resolve the discrepancies and revise the risk evaluation in the Report.

#### **Technical Area 61**

53. **Section F-8.1.3.1, Nature and Extent of Organic COPCs, Page F-165:** Review of the data indicates that the vertical and lateral extent of Aroclor-1260 is not defined for SWMU 61-007. Although the detected concentration of Aroclor-1260 is highest in the sample collected from the center of the site (1200 mg/kg), the detected concentrations in samples collected from the north (560 mg/kg) and south (700 mg/kg) of the center are relatively quite high. The screening level in soil for Aroclor is 1.12 mg/kg. The Permittees must propose additional step out samples from the north and the south of the site to define the lateral extent of PCB contamination in the phase II work plan.

The Permittees must address all comments and submit a revised Report by February 2, 2010. As part of the response letter that accompanies the Report, the Permittees must include a

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December 3, 2009  
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table that details where all revisions have been made to the Report and that cross-references NMED's numbered comments. All submittals (including maps and tables) must be in the form of two paper copies and one electronic copy in accordance with Section XI.A of the Order. In addition, the Permittees must submit a redline-strikeout version that includes all changes and edits to the Report (electronic copy) with the response to this NOD.

In addition, the Permittees must submit a Phase II investigation work plan after receiving notification of the final agency action on the revised Report. Further direction, including the schedule for submittal, will be included in the notification.

Please contact Neelam Dhawan of my staff at (505) 476-6042 should you have any questions.

Sincerely,



James P. Bearzi  
Chief  
Hazardous Waste Bureau

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