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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

August 12, 2010

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**RE: NOTICE OF DISAPPROVAL
INVESTIGATION REPORT FOR SITES AT TECHNICAL AREA 49
OUTSIDE THE NUCLEAR ENVIRONMENTAL SITE BOUNDARY
LOS ALAMOS NATIONAL LABORATORY (LANL)
EPA ID #NM0890010515
HWB-LANL-10-041**

Dear Messrs. Rael and Graham:

The New Mexico Environment Department (NMED) has received the United States Department of Energy (DOE) and the Los Alamos National Security, L.L.C.'s (collectively, the Permittees) *Investigation Report for Sites at Technical Area 49 Outside the Nuclear Environmental Site Boundary* (Report), dated May 2010 and referenced by LA-UR-10-3095/EP2010-0134. NMED has reviewed the Report and hereby issues this Notice of Disapproval (NOD).

General Comments:

- 1) Overall, the statistical analysis and scatter plots discussed in Sections 4.1 and 4.2 and presented in Appendices H and I are technically adequate. However, reliance solely on these methods to determine constituents of potential concern (COPCs) for both nature



and extent of contamination and for risk assessment purposes may result in unacceptable uncertainties. A primary concern is that uncertainty in background may be used as a line of evidence to dismiss inorganics that may drive risk (human health, ecological, or both), which is not acceptable. If the use of the background reference values for Qbt 2,3,4 are not appropriate, additional Qbt 4 background samples must be collected and an appropriate background data set must be established for Qbt4 for use at TA-49.

- 2) There are several sample locations on Plate 5 (*Area 6 West [SWMU 49-004] inorganic chemical concentrations detected above background values*) that have no sample IDs. NMED acknowledges that these locations had no detections above background (for inorganics) and that Plate 4 provides the sample IDs for all sampling locations at Area 6 West. However, it facilitates NMED's review if all sample IDs are identified on the same Figure or Map. The Permittees must revise all applicable Plates to include *all* sample location IDs.
- 3) Throughout the Report, the Permittees state that detection limits (DL) were greater than the soil and tuff background values (BV) for inorganic constituents. The Permittees must explain why the DLs were greater than the BVs for inorganic constituents and revise the conclusions accordingly.
- 4) NMED acknowledges that the Plates in the Report only depict concentrations of inorganics and radionuclides above BV. In many cases the deepest sampling interval does not appear at a sampling location on the Plate because there were no detections above BV for inorganics or radionuclides and no detections for organics. However, there is no way to know that a sample was collected from a deeper interval without consulting the approved Work Plan or the "All-Analyses" tables. Without this knowledge, it would appear that the Permittees have not defined the vertical extent of several constituents. To facilitate NMED's review of the Report, the Permittees must revise the Plates to include the total depth (TD) of each sampling location.
- 5) Area 6 (solid waste management unit (SWMU) 49-004) consists of a landfill and former burn area. The Permittees assert that no hazardous waste was burned or buried at this site. However, based upon the low level organics detected in soil and pore-gas samples, this assumption is not fully justified. It is not clear from the description in the Report if the burning activities occurred in the area defined as the landfill or whether burning activities occurred in other portions of the SWMU. If burning was not limited to the landfill area, additional characterization is required.

Secondly, burning material containing chlorine could result in the formation of dioxin/furan congeners. The approved Work Plan did not include a requirement for analysis of dioxin/furans. Because of the low-level organics detected, it is likely that dioxin/furans are present at this site. Additionally, the forest fire that affected this area likely contributed to low-level detections of dioxin/furans. The Permittees have not sampled for dioxins and furans at this site. Therefore, the Permittees must conduct

additional sampling at SWMU 49-004 for dioxins and furans. The Permittees must propose additional sampling locations in the Phase II Investigation Work Plan.

- 6) Risks were within acceptable target levels for all receptors with the exception of the construction worker scenario at SWMU 49-004 at Area 6 West. Manganese was the primary driver with cobalt and aluminum having smaller contributions to the overall hazard index. The concentrations of these metals are likely representative of Qbt4 background (*see* General Comment # 1). Upon completion of the background data set specific to Qbt 4, the concentrations of aluminum, cobalt, and manganese detected at SWMU 49-004 must be re-evaluated.

Specific Comments:

1. Section 6.2.3.4, Nature and Extent of Soil and Rock Contamination at AOC 49-005(b), Inorganic Chemicals, page 24, paragraph 2:

a) Permittees' Statement: "Nitrate was detected at borehole location 49-610488 at a concentration of 1.7 mg/kg. The concentration of nitrate is likely naturally occurring. The lateral and vertical extent of nitrate are defined."

NMED Comment: The Permittees must provide additional information supporting the assertion that the concentrations of nitrate are naturally occurring at borehole location 49-610488.

2. Section 6.2.3.4, Nature and Extent of Soil and Rock Contamination at AOC 49-005(b), Inorganic Chemicals, page 25, paragraph 2:

Permittees' Statement: "Perchlorate was detected at borehole location 49-610488 at a concentration of 0.0065 mg/kg. Concentrations of perchlorate remain essentially the same with depth, are low, and are not indicative of a site release. Therefore, the extent is defined for perchlorate."

NMED Comment: The Permittees must provide additional information supporting the assertion that the concentrations of perchlorate are not indicative of a site release at borehole location 49-610488.

3. Section 6.4.3.4, Nature and Extent of Soil Contamination, page 33, paragraph 3:

Permittees' Statement: "The approved work plan (LANL 2008, 102215) incorrectly identified this as a data need for AOC 49-008(a). The data need is acknowledged; however, no subsurface investigations were prescribed in the work plan for AOC 49-008(a) nor are they warranted at this time for the site. Investigation of AOC 49-008(a) is deferred per Table IV of the Consent Order due to the presence of proximate firing sites."

NMED Comment: NMED acknowledges that area of contamination (AOC) 49-008(a) is deferred per the March 1, 2005 Order on Consent (Order); however, once operations cease at the adjacent firing sites, AOC 49-008(a) must be fully investigated.

4. Section 7.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 45, paragraph 4:

Permittees' Statement: "The vertical extent of copper at locations 49-608978 and 49-608998 are defined by deeper samples collected from nearby borehole location 49-609885."

NMED Comment: This paragraph discusses the detected concentrations of lead, not copper. The above sentence may have been intended to reference the lead concentrations at locations 49-608978 and 49-608998 rather than copper concentrations. The Permittees must revise the text to correct the error, or otherwise clarify this passage.

5. Section 7.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 46, paragraph 5:

Permittees' Statement: "Thallium was detected above the BV at surface samples 49-608979 and 49-608998."

NMED Comment: Thallium is not identified on Plate 5 as being detected at location 49-608998. The Permittees must revise the text to resolve this discrepancy.

6. Section 7.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 46, paragraph 6:

Permittees' Statement: "Uranium was detected above BV at borehole locations 49-06213, 49-06214, 49-06217, 49-06218, and 49-06219 and 18 surface locations across the site. Samples collected in 2009-2010 were not analyzed for total uranium."

NMED Comment: The Permittees must revise the text to provide an explanation as to why the 2009-2010 samples were not analyzed for total uranium.

7. Section 8.0, Area 10 Background and Field Investigation Results, page 49, paragraph 2:

Permittees' Statement: "During the 2009-2010 investigation, a field assessment of the AOC 49-002 calibration chamber and elevator shaft was conducted to determine whether the area could be safely sampled. The results of the field assessment identified several large (18 to 24 in.) shafts open to variable depths, exposed 6-in. casing broken off at ground surface, and partially buried wire and cable located in an area overgrown with grass and brush. The area was determined unsafe and was roped off to prevent field crews from stepping into or falling over the open shafts. No sampling was conducted near the shafts."

NMED Comment: The Permittees must revise Plates 8, 9, 10, and 11 to identify the locations of the open shafts, exposed casing, and partially buried wire and cable discovered during the field assessment at AOC 49-002.

8. Section 8.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 53, paragraph 2:

Permittees' Statement: "Antimony was detected above BV at location 49-07542 where only a surface sample was collected."

NMED Comment: The Permittees must specify which background dataset (soil or tuff) they are referring to in their explanations of nature and extent of contamination. One could interpret the above statement to be a comparison to either the maximum soil or maximum tuff background concentration. Depending on the dataset used for comparison, there would be several other detections at AOC 49-002 that exceeded the maximum background concentration for antimony. The Permittees must revise the text, where appropriate, to clarify the specific dataset being used for comparison.

9. Section 8.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 53, paragraph 5:

Permittees' Statement: "Cobalt was detected above BV in the deep sample at locations 49-609548 and 49-609560. The sample from location 49-609560 was a mixture of soil and tuff and the cobalt concentration is below the soil BV."

NMED Comment: Cobalt was also detected above the tuff BV at location 49-609988 at the 4-5-foot depth interval at a concentration of 4.9 mg/kg, and at location 49-609987 at two depths: 3-5-feet at a concentration of 6.4 mg/kg, and at 5-6.5-feet at a concentration of 3.2 mg/kg. NMED acknowledges that these detections are qualified as estimated (i.e., J-flag); however, that does not preclude them as detections. Furthermore, Section 8.3.3.4 states that the maximum concentration of barium detected at 49-005(a) was 165 mg/kg. This concentration is qualified as estimated (J+). To ensure consistency throughout the Report, the Permittees must revise the text, where appropriate, to include all detections above BV.

10. Section 8.2.3.4, Nature and Extent of Soil and Rock Contamination, Inorganic Chemicals, page 54, paragraph 2:

Permittees' Statement: "Copper was detected above BV at locations 49-07536, 49-07548, 49-609544, and 49-609560."

NMED Comment: According to Plate 9, copper was not detected above BV at location 49-07536. The Permittees must revise the text to resolve this discrepancy.

11. Section 8.3.3.4, Nature and Extent of Soil and Rock Contamination, page 58, paragraph 2:

Permittees' Statement: "Arsenic was detected above BV at four boreholes locations. Concentrations decreased with depth at three borehole locations and increased with depth at borehole location 49-07527. The concentration of arsenic at depth was of 3.1 mg/kg, which is below the maximum tuff background concentration (5 mg/kg)."

NMED Comment: It is unclear which sampling location the Permittees are referencing in the second sentence. The Permittees must revise the text to indicate that arsenic was detected at location 49-07527 at a concentration of 3.4 mg/kg and at location 49-609986 at a concentration of 3.1 mg/kg.

12. Section 8.3.3.4, Nature and Extent of Soil and Rock Contamination, page 59, paragraph 3:

Permittees' Statement: "Copper was detected above BV at five borehole locations, with a maximum concentration of 8.2 mg/kg."

NMED Comment: According to Plate 9, the maximum concentration of copper is 8.5 mg/kg. The Permittees must revise the text to indicate that the maximum concentration of copper at SWMU 49-005(a) was detected at location 49-609988 at a concentration of 8.5 mg/kg.

13. Section 9.1.2, Nature and Extent of Contamination, Area 6 West, page 62, paragraph 1:

Permittees' Statement: "The nature and extent of contamination in solid media at SWMU 49-004 are defined by existing data."

NMED Comment: See General Comment # 5.

14. Section 10.1, Recommendations, Additional Field Characterization Activities, page 64:

NMED Comment: NMED is aware that the Permittees did not propose to investigate the extent of contamination at the bottom of the 64-foot shafts associated with the Calibration Chamber Facility (AOC 49-002), and that NMED did not require such investigation in the Approval with Modifications of February 14, 2008. Nevertheless, the Permittees must propose to drill at least two boreholes, each within 10-feet, if possible, of the calibration shaft and the elevator shaft as part of the additional investigation activities proposed for AOC 49-002 (i.e., vertical extent of zinc contamination). The proposed sampling and borehole locations must be presented in the Phase II Investigation Work Plan.

15. Section 10.2, Recommendations for Corrective Action – Complete, page 65:

NMED Comment: NMED concurs that the nature and extent of contamination is defined at AOCs 49-005(b) and 49-006 in Area 5. To facilitate the review process and for administrative completeness, the Permittees must submit their request for Certificates of Completion under separate cover.

Additionally, NMED does not agree that the nature and extent of contamination are defined at SWMU 49-004 in Area 6 West. See General Comment # 5.

16. Section 11.0, Schedule for Recommended Activities, page 65:

NMED Comment: NMED will establish a due date for the Phase II Investigation Work Plan in its approval of the Report.

17. Table 1.1-1, Status of SWMUs and AOCs Located Outside the NES Boundary at TA-49, page 79:

NMED Comment: In the “Site ID” column of the Table, the Permittees identify site 49-008(b) in Area 6 East as a SWMU and site 49-005(a) in Area 10 as an AOC. However, the approved Work Plan identifies site 49-008(b) as an AOC and site 49-005(a) as a SWMU. The Permittees must revise Table 1.1-1 to resolve this discrepancy.

18. Plate 2, Area 5 [AOC 49-005(b), SWMU 49-006, and 49-008(a)] Organic Chemical Concentrations Detected:

NMED Comment: The Permittees must revise Plate 2 to include the boundary of AOC 49-008(a).

The Permittees must address all comments in this letter in a revised Report. The Permittees must submit the response to this NOD and the revised Report to NMED no later than **September 13, 2010**. All submittals (including maps) 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 shall submit a redline-strikeout version that includes all changes and edits to the Plan (electronic copy) with the response to this NOD.

Messrs. Rael and Graham
August 12, 2010
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Please contact Dave Cobrain at (505) 476-6055 should you have any questions.

Sincerely,



James P. Bearzi
Chief
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cc: J. Kieling, NMED HWB
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File: '10 LANL, TA-49 (SWMUs: 49-006, 49-008(b), and 49-004; AOCs: 49-005(b), 49-008(a), 49-002, and 49-005(a))