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NEW MEXICO ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

DAVE MARTIN
Cabinet Secretary

RAJ SOLOMON, P.E.
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

February 24, 2011

George J. Rael, Assistant Manager
Environmental Projects Office
Department of Energy/National
Nuclear Security Administration
Los Alamos Site Office
3747 West Jemez Road, MS A316
Los Alamos, NM 87544

Michael J. Graham, Associate Director
Environmental Programs
Los Alamos National Security, LLC
P.O. Box 1663, MS M991
Los Alamos, NM 87545

RE: NOTICE OF DISAPPROVAL
INVESTIGATION REPORT
POTRILLO AND FENCE CANYONS
LOS ALAMOS NATIONAL LABORATORY
EPA ID #NM0890010515
HWB-LANL-10-101

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, LLC (LANS) (collectively, the Permittees) *Investigation Report for Potrillo and Fence Canyons* (IR), dated December 2010 and referenced by LA-UR-10-8316/EP2010-0523. NMED hereby issues this notice of disapproval with the following comments.

General Comments:

1. Dioxins/furans were not included in the analytical suites for sediment samples collected at Potrillo and Fence Canyons. Due to the nature of activities conducted at technical area (TA)-15 and TA-36 (e.g., the detonation of open-air explosives and historical use of burn

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pits at TA-36), chemical releases of dioxins/furans are likely to have occurred. The lack of data on concentrations of dioxins/furans at reaches sampled within Potrillo and Fence Canyons constitutes a data gap in defining the nature and extent of contamination, and for completing the associated human and ecological risk assessments. As such, one of the objectives of this investigation should be to determine if dioxins/furans have migrated into Potrillo and Fence Canyons. NMED notes that the Permittees followed the approved *South Canyons Investigation Plan* (2006). The Permittees have proposed to collect samples for dioxin/furan analyses in the *Investigation Work Plan for Potrillo and Fence Canyons Aggregate Area, Revision 1*(IR), July 2009. If the results of investigations indicate releases of dioxins/furans from the solid waste management units (SWMUs) and areas of concern (AOCs) included in the Potrillo and Fence Canyons Aggregate Area, NMED may require additional investigations to determine if dioxins/furans have migrated off-site into the canyons.

2. The Permittees did not provide any figures in the IR that depict detected concentrations in individual canyon reaches. Tables with maximum detected concentrations within each reach are provided, but no figures were provided. It is difficult to review the report without the information on spatial distribution of chemicals of potential concern (COPCs) in each reach. Provide a figure for each investigated canyon reach depicting sampling locations and detected concentrations above background values to evaluate the spatial distribution of COPCs.

3. Data are reported in a manner that makes it difficult to determine if the results were not reported in the tables because no analyses were conducted, or because the detected values were below background values or method detection limits. For example, Table 6.2-2 indicates that triamino-trinitrobenzene (TATB) was detected in two reaches (FS-1 and F-2). The approved work plan required analyses of other high explosives (HE) such as 2,4,6-trinitrotoluene, nitrobenzene, 2,4/2,6-dinitrobenzene, 1,3,5-trinitrobenzene, HMX, RDX, and tetryl. It is not clear from the table if HE other than TATB were included in the analyses but were not reported, perhaps because they were not detected. Method 8321A, can be modified for analysis of some explosives; however, the list of constituents for which the method is applicable does not contain the HE discussed in the report or other commonly expected explosives. Clarify what explosive compounds Method 8321A modified is capable of detecting in the analysis of the sediment samples. Also clarify whether there are data gap(s) with respect to explosives potentially present in sediments. Include a "Samples Collected and Analysis Requested" table in the revised report.

Specific Comments:

4. **Section 3.1, Sediment Investigations, page 5**:
   Permittees Statement: The sediment investigations presented in this report focused on characterizing the nature, extent, and concentrations of COPCs in post-1942 sediment deposits in a series of reaches in the Potrillo and Fence watershed.

NMED Comment: The Permittees were directed to perform sampling of pre-1942 sediments to determine potential contaminant transport pathways in NMED 's *Approval with Modifications South Canyons Investigation Work Plan*, dated March 28, 2007. Provide a justification for not following the modification as specified in the Comment # 3 of the above mentioned letter.

5. **Section 5.4, Stormwater Comparison values, page 9**: A typographical error appears to be present in the list of sources used for the stormwater comparison values. The bulleted list indicates that values from Sections 20.6.4 and 20.4.6 of the New Mexico Administrative Code (NMAC) were used for stormwater comparison values. Values from the NMAC Title 20, Chapter 6, Part 4 (Standards for Intrastate and Interstate Surface Waters) are used as stormwater comparison values. Revise the list of sources as appropriate.

6. **Section 6.2.1, Identification of Sediment COPCs, page 10:** This section explains that inorganics with nondetected results (and corresponding method detection limits) greater than their corresponding background values (BVs) are identified as COPCs. While some of the nondetected results are greater than their corresponding BVs were identified as COPCs in sediment at Portrillo and Fence Canyons, Tables 8.1-1 and 8.2-1 indicate that at many reaches, antimony, cadmium, and selenium were not identified as COPCs, despite having nondetected results greater than their corresponding BVs. The occasional inclusion or exclusion of COPCs with nondetected results greater than BVs is inconsistent. It is acknowledged that the results are non-detects, and detection limits of antimony, cadmium, and selenium are well below the residential soil screening levels. However, some of the detection limits are greater than the minimum ecological screening levels and would have been included on Table 8.1-1. The risk assessment should be consistent in its inclusion of COPCs with detection limits greater than BVs.

7. **Section 7.1.1, Inorganic chemicals in Sediments, page 13:**
   Permittees Statement: Four inorganic chemicals detected in sediment samples are important for assessing potential ecological risk, as discussed in section 8.1: cadmium, copper, selenium, and vanadium.

   NMED Comment: In addition to the four chemicals mentioned in the above statement, lead, manganese, and zinc were also detected above their respective sediment background and ecological screening values (*See* Table 6.2-1). Provide an explanation as to why lead, manganese, and zinc were not considered important for assessing potential ecological risk or include the analytes in the assessment of ecological risk.

8. **Section 7.1.1, Inorganic chemicals in Sediments, page 14:**
   Permittees Statement: Cadmium is an important COPC for evaluating potential ecological risk in Potrillo and Fence Canyons and has maximum detected concentrations exceeding the sediment BV of 0.4 mg/kg in three investigation reaches (PO-1, PO-2, and PO-3; Table 6.2-1).

Selenium is an important COPC for evaluating potential ecological risk in Potrillo and Fence Canyons and has maximum detected concentrations exceeding the sediment BV of 0.3 mg/kg in five investigation reaches (PO-2, PO-3, PO-4, F-1, FS-1; Table 6.2-1).

NMED Comment: According to the Table 6.2-1, cadmium was detected in two investigation reaches (PO-2 and PO-3) above the background values. The detection limits for cadmium were above the sediment background value in the rest of the seven reaches investigated. The Permittees must resolve the discrepancy and revise the text accordingly.

According to Table 6.2-1, selenium was detected above sediment background values in two reaches (PO-2 and PO-3). The detection limits for selenium were above the sediment background value in the rest of the seven reaches. Resolve the discrepancy and revise the text accordingly.

9. **Section 8.1.4, Results of the Screening Comparison for Soil, and Tables 8.1-1, 8.1-2, 8.1-3, pages 23 and 64-67:** The rationale for utilizing a hazard quotient (HQ) of 3.0 as a criterion to determine whether COPCs should be retained for further evaluation in the screening level ecological risk assessment is unclear and not justified. Los Alamos National Laboratory's (LANL's) (2004) *Screening Level Ecological Risk Assessment Methods Revision 2* states that an HQ of 0.3 should be used as a criterion for determining ecological COPCs. In addition, NMED's (2008) *Guidance for Screening Level Ecological Risk Assessments* states that an HQ of 0.3 for individual chemicals or a hazard index of one should be used for determining whether ecological COPCs should be evaluated further in the ecological risk assessment. It is acknowledged that previous assessments where site-specific biota studies were conducted, such as Los Alamos and Pueblo Canyons (LANL 2004, 087390, p. 8-2); Mortandad Canyon (LANL 2006, 094161, p. 96); Pajarito Canyon (LANL 2009, 106939, p. 64); and Sandia Canyon (LANL 2009, 107453, p. 77) utilized a HQ of 3.0 for determining ecological COPCs. Since a site-specific biota study has not been conducted at Potrillo and Fence Canyons, such an approach is not appropriate here. Revise the ecological risk assessment to be consistent with guidance and use hazard index (HI) of one (1) as the threshold value for determining whether ecological COPCs should be further evaluated in the ecological risk assessment.

10. **Section 8.1.4, Evaluation of Potrillo and Fence Canyons COPEC Concentrations for Biota Studies, page24:** Concentrations of ecological COPCs were compared with concentrations of COPCs from previous biota studies in other canyons at LANL where associated effects information indicated no unacceptable ecological risks. While this comparison may potentially provide relevant information for Potrillo and Fence Canyons, it should not take the place of a site-specific biota study or a refined ecological risk assessment using the methods outlined in LANL (2004) and NMED (2008). Refinement of the ecological risk assessment may include the use of area use factors, population area

use factors, and/or use of lowest-observed adverse effect levels (LOAELs). Comparisons with previous biota studies at other LANL sites could be included as additional evidence in a weight of evidence analysis, for example, at Potrillo and Fence Canyons. Revise the ecological risk assessment to incorporate above suggestions.

11. **Tables 6.2-2, Organic Chemicals in Potrillo and Fence Canyon Sediment Samples, page 57:** The residential soil screening level (SSL) for tert-butylbenzene is taken from USEPA (2007) Region 6 as indicated in the footnote. The USEPA (2007) Region 6 SSL tables are outdated and have been replaced by the Regional Screening Levels (RSLs). It is noted that use of the Region 6 SSL for tert-butylbenzene noted in Tables 6.2-2 and 8.2-1 does not change the overall conclusion of the assessment. No revision is necessary, but take care that the most current screening levels are applied in future risk assessments.

12. **Tables 8.1-3, HQs based on Maximum Detected Concentrations of Organic COPCs in Potrillo and Fence Canyon Sediment Samples and Soil ESLs, page 66**: The LANL (2010) ECORISK (v2.5) database indicates that Ecological Screening Levels (ESLs) for the American kestrel (top carnivore) are available for benzo(a)anthracene (64 mg/kg) and pyrene (460 mg/kg). However, ESLs for these compounds are not listed on Table 8.1-3 for the American kestrel. Revise Table 8.1-3 accordingly.

13. **Tables 8.1-9, Summary of Potrillo and Fence Canyons Soil COPECs Unbounded by Previous Canyons Biota Investigations, page 70:** Average concentrations of di-n-butylphthalate in reaches F-1 and FS-1 were compared to ESLs and to concentrations of di-n-butylphthalate evaluated in previous biota studies. The use of average values as exposure point concentrations for comparisons with screening levels is not an acceptable method for risk assessments and is inconsistent with both NMED and LANL guidance. Because there are insufficient numbers of detections of di-n-butylphthalate to calculate exposure point concentrations, the maximum detected concentration should be used as exposure point concentration. Discussion using an average concentration may be used in the uncertainty analysis; however, refinement of an ecological risk assessment should follow guidance and include the use of area use factors, population area use factors, and/or LOAELs. Revise the ecological risk assessment accordingly.

14. **Table F-2, Stormwater Comparison Values, page F-4:** The human health persistent stormwater comparison value for thallium (6.3 µg/L) presented on Table F-2 is inconsistent with the surface water standard (0.47 µg/L) listed in 20.6.4.900 (J) NMAC presented on the following website: http://www.nmcpr.state.nm.us/nmac/parts/title20/20.006.0004.htm. The Permittees must resolve this inconsistency and update Table F-2 to include the correct stormwater comparison value for thallium. Determine if the detected concentrations of thallium in stormwater at Potrillo and Fence Canyons exceed the surface water standard of 0.47 µg/L.

The Permittees must respond to these comments and submit a revised report no later than **March 28, 2011**. As part of the response letter that accompanies the revised Report, the Permittees must include a 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.

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

Sincerely,

James P. Bearzi
Chief
Hazardous Waste Bureau

cc: J. Kieling, NMED HWB
D. Cobrain, NMED HWB
N. Dhawan, NMED HWB
S. Yanicak, NMED DOE OB, MS J993
T. Skibitski, NMED DOE OB
L. King, EPA 6PD-N
W. Woodworth, DOE-LASO, MS A316
S. Veenis, EP-CAP, MS K490
File: LANL, Potrillo and Fence Canyons IR, 2011, LANL 10-101

References

LANL (Los Alamos National Laboratory), April 2004. "Los Alamos and Pueblo Canyons Investigation Report," Los Alamos National Laboratory document LA-UR-04-2714, Los Alamos, New Mexico. (LANL 2004, 087390)

LANL (Los Alamos National Laboratory), October 2006. "Mortandad Canyon Investigation Report," Los Alamos National Laboratory document LA-UR-06-6752, Los Alamos, New Mexico. (LANL 2006, 094161)

LANL (Los Alamos National Laboratory), August 2009. "Pajarito Canyon Investigation Report, Revision 1," Los Alamos National Laboratory document LA-UR-09-4670, Los Alamos, New Mexico. (LANL 2009, 106939)

LANL (Los Alamos National Laboratory), October 2009. "Investigation Report for Sandia Canyon," Los Alamos National Laboratory document LA-UR-09-6450, Los Alamos, New Mexico. (LANL 2009, 107453)