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Reading file
mailed
9/28/04
E.L.

**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

September 28, 2004

David Gregory, Federal Project Director
Los Alamos Site Office
Department of Energy
528 35th Street, Mail Stop A316
Los Alamos, NM 87544

G. Pete Nanos, Director
Los Alamos National Laboratory
P.O. Box 1663, Mail Stop A100
Los Alamos, NM 87545

**RE: NOTICE OF DISAPPROVAL FOR THE INVESTIGATION WORK PLAN FOR
MATERIAL DISPOSAL AREA T, SOLID WASTE MANAGEMENT UNIT 21-
016(a)-99 AT TECHNICAL AREA 21
LOS ALAMOS NATIONAL LABORATORY, NM0890010515
HWB-LANL-04-003**

Dear Messrs. Gregory and Nanos:

The New Mexico Environment Department (NMED) has received the United States Department of Energy (DOE) and the Regents of the University of California (collectively, the Permittees) document titled *Investigation Work Plan Material Disposal Area T, Solid Waste Management Unit 21-013(b)-99 at Technical Area 21*, dated February, 2004, and referenced by LA-UR-04-0559 (ER2004-0023). NMED has reviewed this document and hereby issues this notice of disapproval. The Permittees must respond to all comments and propose locations for any required additional borings within thirty (30) days of receipt of this letter unless otherwise noted.

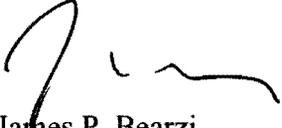


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Mr. David Gregory and Mr. Pete Nanos
September 28, 2004
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Should you have any questions, please feel free to contact me at (505) 428-2538.

Sincerely,



James P. Bearzi
Chief
Hazardous Waste Bureau

cc: J. Bearzi, NMED HWB
C. Voorhees, NMED DOE OB
S. Yanicak, NMED DOE OB, MS J993
L. King, EPA 6PD-N
J. Ordaz, DOE OLASO, MS A316
B. Ramsey, LANL RRES/DO, MS M591
D. McInroy, LANL E/ER, MS M992
N. Quintana, LANL E/ER, MS M992
file: Reading and LANL TA-21 [21-166(a)-99; 21-016(a-c); 21-011(a, b, d, e, f, g, i, j); 21-011(c); 21-010(a, h); C-21-002; 21-028(a), C-21-034; C-21-035; C-21-036, C-21-037; 21-001, 21-011(h); C-21-005; C-21-007; C-21-003; C-21-009; and C-21-012]

ATTACHMENT

GENERAL COMMENTS

1. Any disclaimers regarding testing, monitoring, or reporting of radionuclide data should include a statement that the Permittees will collect, sample, and analyze for radioactive constituents in accordance with the August 26, 2004, letter from Everet Beckner (NNSA Deputy Director) to NMED Secretary Ron Curry, and that these data will be regularly reported to NMED.
2. The Permittees must resubmit the work plan for MDA T. The resubmittal must include required text changes, additions, and revisions of all tables and figures that incorporate the comments in this notice of disapproval (NOD). The resubmittal must follow the format and function described in Section XI of the proposed Consent Order (Consent Order).
3. The Permittees must include a table of regulatory criteria, with summaries, and the most applicable cleanup levels for each contaminant for which analyses are conducted.
4. The Permittees must submit updated figures that include locations of underground utilities that may impact subsurface investigations and potential contaminant migration.
5. The Permittees propose the use of angled boreholes. In this case, NMED discourages the use of angled boreholes to ascertain the extent of contamination. While the Permittees may use angled boreholes, additional vertical boreholes are required since the current proposed boreholes do not provide adequate coverage to characterize the extent of contamination.
6. Numerically modeled behavior (e.g., Sections 3.2.2 and 3.2.2.1) of contaminants and moisture in the subsurface cannot be verified or reproduced by the NMED, the public, or other stakeholders. More importantly, field data indicating that contaminants have migrated in the subsurface are more reliable than numerical models in determining the nature and extent of contamination. NMED deems such models irrelevant in this case, and the Permittees should therefore remove such references in the resubmitted work plan.
7. Most of the discussion of historic processes, releases and contaminants associated with MDA T focuses on radiological constituents. The Permittees must identify and discuss nonradiologic constituents, such as inorganic and organic compounds, that were utilized or may have been used at the site and are known or suspected chemicals contained in the wastewater. In addition, the Permittees must discuss the non-radioactive composition of the sludge produced at buildings 21-35 and 21-257 treatment facilities. Some of the sludge wastes were mixed with cement and pumped into corrugated metal pipes (CMPs), placed in the retrievable waste storage area and removed at a later date. Other wastes were mixed with cement and injected into the shafts at MDA T. Still other wastes were apparently containerized in another manner and sent

for disposal at a different (e.g., another technical area or offsite) location. If the disposal location is not MDA T, then identify the disposal location of the sludge. The Permittees must provide estimated volumes of sludge wastes disposed at the various locations.

8. Investigations of several sites located at the Los Alamos National Laboratory facility (Facility) provide evidence that fractures and surge beds influence subsurface contaminant migration. At the 21-57 AST diesel spill, at least 50,000 gallons of diesel fuel migrated to depths of 150 to 165 feet below ground surface (bgs). According to the Permittees, this happened within a few months of the release, suggesting that saturated conditions may not be necessary for subsurface contaminant migration. Considering the volume of effluent released to the MDA T absorption beds, contaminant migration to depths greater than 165 feet is likely. In addition, historic investigations at MDA T identified subsurface migration of plutonium and americium to at least 100 feet bgs. In addition, perchlorate has migrated to depths of at least 280 feet bgs based on analyses of core samples collected from LADP-4. The concentrations of perchlorate observed in samples obtained from LADP-4 reportedly ranged between 200 and 1000 ppb. These data indicate movement of perchlorate in the subsurface to the north and east of MDA T. Therefore, NMED requires that the boreholes investigating the extent of contamination around the absorption beds extend to a minimum depth of 280 feet bgs. At a minimum, fractures, "moist" zones, fracture fill material, and surge beds/higher permeability intervals must be targeted for offsite fixed analytical laboratory analyses.

9. Data collected during historic Environmental Restoration Program investigations were often of substandard quality (e.g., mobile laboratory data, use of Permittees in-house laboratories, poor documentation, incorrect lamp usage in photo-ionization detectors). While the Permittees may include such information in work plans and reports, NMED considers much of these data suspect and will not base regulatory decisions on them.

10. The Permittees must provide the disposal location (pit, trench, and/or shaft numbers) and dates of disposal of the corrugated metal pipes (CMPs) that were removed from the retrievable waste storage area. In addition, the Permittees must also provide all waste characterization forms and other waste analyses documentation regarding the disposal of the CMPs.

11. The Permittees are required to investigate the extent of saturation in DP Canyon in the Los Alamos and Pueblo Canyons investigation work.

12. It is not clear that the proposed investigations will cover all SWMUs and AOCs listed in the Work Plan. The Permittees must provide a cross-reference listing the proposed investigation activities for each of the associated SWMUs and AOCs covered in the Work Plan.

SPECIFIC COMMENTS

13. **Page 3: Section 2.2 Waste Inventory**

The statement that the only wastes that remain at Material Disposal Area (MDA) T are found in the disposal shafts is not accurate. Untreated and treated industrial wastewater from TA-21 was discharged to the absorption beds located at MDA T. Contaminants that were suspended and dissolved in the effluent now reside in the subsurface. The Permittees shall correct the inaccuracy in the statement in the resubmitted work plan.

14. Page 3: Section 2.3, Relationship to Other SWMUs and AOCs

The Permittees shall include a brief discussion of the nature of the contamination found at the adjacent SWMUs and areas of concern AOCs. For example, the chemicals of concern (COCs), the release mechanisms, estimated volumes released, and how they impacted or may have impacted the SMWUs and AOCs addressed in this work plan must be discussed. The Permittees must include in the resubmitted work plan periods of operation for each of the SWMUs and AOCs identified in this section.

15. Page 20: Section 3.2.2.1, Absorption

See comment #8.

16. Page 21: Section 3.2.2.2, Perched Intermediate Waters

DP Spring discharges between the contact of stream gravels and Bandelier Tuff unit Qbt-1g indicating the presence of perched groundwater in DP Canyon. Contaminants, including tritium and strontium-90, have been identified in DP Spring discharge. The Permittees shall include, in the resubmitted work plan, text indicating the occurrence of perched groundwater in DP Canyon as exhibited by DP Spring and discuss contaminants, including non-radiologic constituents, that have been identified in the spring discharge.

17. Page 22: Section 4.1, MDA T Field Investigations

The Permittees proposed two angled boreholes in the Work Plan; however, the borings may not be necessary to characterize fractures as several recent and historic investigations at adjacent sites may be cited. Instead, the Permittees must increase the number of proposed borings and use vertical rather than angled borings to determine nature and extent of contamination.

The five borings (three boreholes drilled to the Cerro Toledo interval) are proposed within the boundaries of MDA T are not likely to provide enough information to delineate the extent of contamination at MDA T. Additional borings should be advanced to adequately discern the extent of contamination. The additional borings should be located outside the boundaries of MDA T and be focused in directions and depths that follow typical fracture orientation, the old alluvium, and the paleotopography controlling the Cerro Toledo interval. In addition to a subset of samples collected from competent tuff, core from each boring marked for off-site laboratory chemical analyses should be selected based on higher permeability intervals such as surge beds, old alluvium, and fractures, as well as fracture fill materials.

Evidence of subsurface contaminant migration gathered from prior investigations lead NMED to conclude that boreholes must extend a minimum of 100 feet bgs.

See also comments #8, #23, #24, and #31.

18. Page 23: Section 4.1.2.1, VOCs

Field screening for volatile organic compounds (VOCs) should not be dismissed based on previous investigation results. As previously mentioned, NMED finds the quality of the previous sample collection and analyses is often questionable. NMED therefore requires that the Permittees screen for VOCs, and do so in accordance with Section IX.B.2.d. of the proposed Consent Order. The Permittees must report the results in accordance with Section XI.C of the proposed Consent Order.

19. Pages 23 and 24: Section 4.1.3, Sample Analysis

NMED requires the Permittees to collect samples for dioxins and furans, as required in Section IV.C.2.e.iv of the proposed Consent Order, from the subsurface in areas that are or were disturbed. In areas where fill material was imported during post-operational activities (i.e., the "Salamanders") at TA-21, the Permittees must also collect samples from the former surface rather than fill material.

20. Page 25: Section 4.4, Sampling and Analysis at Building 257

The Permittees do not sufficiently justify the proposal to drill angled boreholes surrounding Building 21-257 rather than utilizing vertical boreholes. NMED believes that the angled boreholes are not necessary in this situation. Rather, additional vertical boreholes to the east and southeast are needed to investigate subsurface contaminant migration via interflow (between fill material and tuff) and fracture flow (typical fracture orientation) towards DP Canyon, and to investigate lateral and vertical migration via the paleochannel to the east of Building 21-257. Vertical boreholes should be drilled adjacent to the structures to characterize extent until the building is decontaminated and decommissioned (D&D).

The Permittees must remove approximately 15 feet of piping that remains associated with the outfall [21-011(k)] and eliminate all potential for accidental releases to the environment from ancillary piping from the tanks that may be inadvertently opened. Vertical boreholes should be drilled adjacent to the structures to characterize contaminant extent until D&D activities commence.

The Permittees also must include a schedule identifying the D&D schedule for structure 21-257. NMED may require additional sampling once Building 21-257 and other associated structures are D&D.

21. Page 25: Section 4.4, Sampling and Analysis at Building 257

Rather than drilling one angled borehole to investigate releases from tanks 21-012 and 21-013, the Permittees must drill additional vertical borings surrounding the tanks to investigate potential releases from these structures. Some of the boreholes must follow the preferred orientation of the fractures characteristic of TA-21.

The Permittees must include a schedule identifying the D&D schedule for structures 21-012 and 21-013. NMED may require additional sampling once these and other associated structures are D&D.

See also comments #8 and #31.

22. Page 25: Section 4.5, Sampling and Analysis at Building 035

The Permittees must drill additional borings (minimum depth 40 feet) to determine the nature and extent of contamination in the area of the former leach field associated with Building 21-035. A 1957 H-7 Division Annual Report indicates that discharges from the treatment plant that did not meet current [1957] standards were either "recirculated or discharged to the tile field." Because these discharges were likely to the leach field associated with Building 21-035, the investigation of the septic tank and leach field require additional borings.

The Permittees must provide the current status (e.g., in-place or removed) and the dimensions of the septic tank and leach field associated with Building 21-035. The Permittees must advance additional borings to depths greater than the base of the septic tank around the former septic tank (inlet and outlet piping).

See also comments #8 and #31.

23. Page 25: Section 4.6, Sampling and Analysis for Absorption Bed Area/Shaft Area/RWSA Area

The Work Plan states that air rotary drilling methodologies will be utilized for deeper boreholes; however, the Permittees must utilize hollow stem auger to the point of refusal in an attempt to minimize impacts to the subsurface conditions so that representative field screening and soil/sediment/rock samples may be collected. Boreholes with depths greater than 300 feet in similar geologic conditions have been drilled around the Facility (e.g., MDA H and 260 Outfall investigations) utilizing hollow stem auger drilling methods.

24. Page 25: Section 4.6, Sampling and Analysis for Absorption Bed Area/Shaft Area/RWSA Area

The Work Plan identifies five boreholes designated to investigate the extent of contamination at the absorption beds that comprise part of MDA T. Two of the five proposed boreholes are to be angled at 45° to a depth of 385 feet bgs. NMED requires that the Permittees delineate the nature and extent of contamination utilizing vertical boreholes. The Permittees must propose additional vertical borings surrounding the absorption beds to a minimum depth of 280 feet or 25 feet below the last detected contamination in accordance with Section IX.B.2.b.i of the proposed Consent Order.

Additional shallow borings (minimum depth targeting base of old alluvium) must be proposed to investigate the paleochannel (apparently trending to the southeast) as a contaminant transport pathway.

Although the Permittees must advance borings surrounding the absorption beds, the borings should focus on the dominant fracture orientation and the paleochannel. If contamination is not bound by the advancement of the required boreholes, then the Permittees shall move farther away from the source and last detected contamination above background, fallout values or detection limits until the vertical and lateral extent of contamination is established.

See also comments #8, #17 and #31.

25. Page 26: Section 4.7, Sampling and Analysis for Perched Water and Vadose Zone Characteristics

If contamination is discovered at the targeted Cerro Toledo interval (roughly 350 feet bgs), the Permittees must either proceed with drilling through the Cerro Toledo interval or complete the boring in the Cerro Toledo and advance another boring beyond the Cerro Toledo adjacent to the other borings to determine the extent of contamination.

See also comment #31.

26. Page 26: Section 4.7, Sampling and Analysis for Perched Water and Vadose Zone Characteristics

The Permittees must describe how "representative" subsurface carbon dioxide and oxygen "conditions" will be determined in regard to purging the well prior to vapor phase sampling.

27. Page 26 and 27: Section 5.0, Investigation Methods

The Permittees may not list standard operating procedures in lieu of a brief description of how samples will be collected, or how field instruments will be utilized and calibrated. As stated in section IX.A of the proposed Consent Order, the Permittees may not substitute a reference to their SOPs for a description of its procedures. At a minimum, a brief description of referenced procedures must be included in the resubmitted work plan.

28. Page 27: Section 5.1, Drilling Methods

See comment #23.

29. Page 27 and 28: Section 5.1, Drilling Methods

See comments #8 and #32.

30. Page 28: Section 5.2 Methods of Collecting Soil and Rock Samples

In addition to those samples selected for offsite fixed laboratory analyses using field screening methods, NMED requires that material surrounding fractures, fracture fill material, and higher permeability units such as surge and pumice beds must also be targeted for off-site fixed laboratory analyses.

31. Page 28: Section 5.2 Methods of Collecting Soil and Rock Samples

The Permittees must extend borings a minimum of 25 feet beyond the last contaminant detection based on appropriate field screening and/or laboratory analyses. Radiological field screening may not be indicative of the presence of all contamination at the site (e.g., where organic and inorganic chemicals were discharged). Therefore, before cessation of drilling and properly abandoning the boreholes, the Permittees should receive confirmation with analytical data that the borehole extends at least 25 feet past the last confirmed contaminant detection in accordance with Section IX.B.2.b.i of the proposed Consent Order.

32. Page 29 Section 5.3, Collection of Geotechnical Data

Unless the quality and/or validity of the hydraulic conductivity, matrix potential, porosity, Kd and bulk density data of previously collected from around the laboratory of each Bandelier Tuff unit is in question, NMED recommends that these data (from competent tuff samples) not be collected again. In addition, NMED is not requiring the collection of chloride data from these boreholes and recommends not collecting this information. Actual subsurface contaminant data will provide information regarding subsurface contaminant transport.

33. Page 30: Section 5.5, Borehole Abandonment

The backfilling of boreholes with cuttings produced from the drilling activities will not be permitted. All drill cuttings must be containerized and analyzed before disposal. Depending on the concentrations, NMED may consider a "contained in" determination of drill cuttings if the cuttings contain listed or characteristic waste. As a reminder, land disposal restrictions may still apply to this type of investigation-derived waste (IDW).

See also comment #43.

34. Page 54: Table 2, Summary of Proposed Borehole Drilling and Sampling at MDA T
See comment #19.

35. Page B-3: Section B-2.2, Historic Facility Descriptions

The Permittees must provide descriptions of SWMUs 21-010(c and d).

36. Page B-5: Section B-2.3, Operational History

The Permittees must provide, in the resubmitted work plan, a discussion of the chemical (non-radiologic) composition and description of the "solids," "semi solids," and raffinate wastes described in the section. If there are no chemical analyses of these wastes, the Permittees must provide a listing of the chemicals (inorganic and organic) that may comprise the wastes based on

process knowledge. If the solid, semi solid, and raffinate wastes were similar to sludge generated at TA-50, provide waste analysis forms for the waste sludge. For all wastes not disposed in the shafts at MDA T, provide a location of disposal and method of disposal for the wastes.

37. Page B-5: Section B—2.3.1, Untreated and Treated Waste Water

Identify and provide a reference a map depicting the location of the drainage(s) into DP Canyon that received the overflow from the absorption beds. It is not clear if Figure 11 represents the drainage discussed in the text.

38. Page B-5: Section B-2.3.1, Untreated and Treated Waste Water

Detailed discussion of the radionuclides present in the wastewater released to the absorption beds and DP has been provided; however, the Permittees must document the non-radiologic composition of the treated and untreated effluent. Historic monitoring of the releases and impacted alluvial groundwater and surface non-radiologic water quality should be discussed in order to provide a more accurate portrayal of the potential impacts to the environment. If the information is not available, the Permittees must identify the chemicals (inorganic and organic) used historically at TA-21 that may have been discharged via the absorption beds, directly to the canyon or through the industrial wastewater treatment plants.

See also comment #7.

39. Page B-7: Section B-2.3.4 Industrial Waste Treatment Processes at Building 035

The Permittees must provide a table identifying the applicable standards that applied to discharges when Building 035 was in operation.

40. Page B-7: Section B-2.3.4 Industrial waste Treatment Processes at Building 257

The Permittees must provide a table identifying the applicable standards that applied to discharges when Building 257 was in operation.

41. Page B-9: Section B-2.4.2, Cement-Treated Waste Treatment and Other Solid Waste Disposal

See comments #7 and #36.

42. Page B-79, Figure B-39 Data Interpretation Process

Certain chemicals of concern (COCs) may not be dropped from consideration simply because the Permittees believe a particular analyte is a common laboratory contaminant. The Permittees operate a facility with many analytical laboratories and a variety of "Common Lab Contaminant[s]" are expected as COCs. For example, methylene chloride and acetone are used throughout the facility and NMED considers it likely that the contaminants have been released to the environment.

43. Page C-1: Appendix C-1.0, Management of Investigation-Derived Waste

NMED does not approve the Permittees' plan for handling Investigation Derived Waste

(IDW). Specifically, the Permittees may not return cuttings or other environmental media to their point of origin. Rather, the Permittees must contain all IDW, and characterize it to ensure proper handling, including but not limited to, final disposal. The resubmitted work plan must include a description of IDW management (*see* Section IX.B.5 of the proposed Consent Order).

In their description of the methods and procedures used to characterize and manage all IDW, the Permittees may not substitute a reference to their SOPs for a description of its procedures (*see* Section IX.A of the proposed Consent Order).

Drill cuttings, purge and decontamination water, personal protective equipment (PPE), and all other environmental media must be containerized and characterized prior to disposal. Each container of waste generated must be properly labeled immediately following containerization. All IDW must be sampled and analyzed for hazardous contaminants that are suspected or detected prior to or during investigation activities. All suspected radioactively contaminated waste/material should be sampled or surveyed for radionuclides. All IDW must be disposed of properly at an appropriate disposal facility. The methods used to store, control, and transport each waste type and classification must be included in the investigation report.

The Permittees may not use previous sampling data for the purpose of characterizing newly generated waste streams. The Permittees must collect samples of all newly generated waste streams related to IDW and submit the samples for laboratory analysis.

The Permittees assume all the waste streams generated during the investigation of MDA T will be disposed of as low level waste (LLW) at TA-54 MDA G. Before disposal, the Permittees must characterize the waste. At that point, a determination can be made as to where the waste may be disposed.

See also comment #33.