LANL TA 54

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CERTIFIED MAIL
RETURN RECEIPT REQUESTED

September 28, 2004

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

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

SUBJECT: APPROVAL WITH MODIFICATIONS
INVESTIGATION WORK PLAN
MATERIAL DISPOSAL AREA L (MDA L)
LOS ALAMOS NATIONAL LABORATORY
EPA ID# NM0890010515
LANL-03-010

Dear Messrs. Nanos and Gregory:

In previous correspondence, the New Mexico Environment Department (NMED) determined that the Department of Energy and the University of California (collectively, the Permittees) document titled *Investigation Work Plan for Material Disposal Area L, Solid Waste Management Unit 54-006, at Technical Area 54 at Los Alamos National Laboratory*, submitted August 31, 2003 and referenced by LA-UR-03-5998 was inadequate. A Notice of Deficiency (NOD) was issued to the Permittees on November 18, 2003.

The Permittees submitted a revised document titled *Investigation Work Plan for Material Disposal Area L, Solid Waste Management Unit 54-006 at Technical Area 54, Revision 1* dated December, 2003, and referenced by LA-UR-03-9120 (ER2003-0766). NMED hereby approves this document with the modifications described in Attachment 1 of this letter.

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The Permittees must now implement the work plan, including the modifications contained in this letter. If the Permittees fail to implement the modified work plan, this approval will be automatically rescinded.

The Permittees must document in the Investigation Report for MDA L (Report) all activities conducted pursuant to this approval, including the modifications outlined in Attachment 1. In addition, all required supplemental information required in Attachment 1 must be submitted with the Report, now due no later than September 13, 2005.

If you have any questions regarding these comments, please contact Cheryl Frischkorn of my staff at (505) 428-2550.

Sincerely,

James P. Bearzi
Chief
Hazardous Waste Bureau

JPB:caf

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file: Reading and LANL TA-54 (SWMU 54-006)

ATTACHMENT 1
MDA L INVESTIGATION WORK PLAN, REVISION 1

The Permittees must implement the modifications to the work plan described in this attachment and document them in the Investigation Report.

COMMENT 1----GENERAL
The Permittees must submit the MDA L Volatile Organic Compound (VOC) indoor air-monitoring plan [supplement to Area L industrial hygiene monitoring referenced in the LANL's response to the Notice of Deficiency (NOD) dated November 18, 2003, Comment 4] in the report. NMED understands that the Permittees will include tritium indoor air monitoring activities (sampling, analysis, and reporting) pursuant to the August 26, 2004, letter from Everet Beckner (NNSA Deputy Director) to NMED Secretary Ron Curry.

COMMENT 2---GENERAL
The Permittees must include in the report a table or tables with summaries of regulatory criteria and the most applicable cleanup or screening levels for comparison. Values for soil must be applied to subsurface tuff. Ambient air quality standards shall be used for comparison to pore gas values. This information may be included with the corresponding analytical data tables or on a separate table. Clean up and screening levels for this work are defined in Section VIII of the proposed Consent Order.

COMMENT 3---GENERAL
The status of some Phase I RFI boreholes, ground water monitoring wells, and pore-gas monitoring boreholes is vague. The ER Quarterly Technical Report July-September 2003, dated November 12, 2003, states that data from boreholes 2087, 2088, and 2089 will be omitted from the pore-gas sampling analysis because these wells had soil gas interaction between ports, in addition to interaction from the subsurface to the atmosphere. Well 2014 may also have problems resulting from well construction. These wells and any other wells or boreholes considered unfit for monitoring must be properly plugged and abandoned in accordance with Section X.D of the proposed Consent Order and, if deemed necessary by NMED, replaced. The Permittees must submit the status of every borehole or well that has been drilled at MDA L in the report. In addition, the Permittees must assess whether plugged and abandoned monitoring points should be replaced and, if so, the Permittees must begin implementation of well replacement.

COMMENT 4---GENERAL
In the MDA L Investigation Report and other future documents, the Permittees must report all vapor-phase concentrations as ug/m^3 instead of ppmv.

COMMENT 5---TITLE PAGE & PAGE 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.

COMMENT 6----SECTION 2.6.3, PAGE 12: PHASE I RFI RESULTS – NATURE AND EXTENT OF TRITIUM VAPOR PLUME

The Permittees response to NOD Comment 19 does not demonstrate that the tritium vapor plume is "bounded" nor does it demonstrate the Permittees have determined the vertical or horizontal extent of tritium contamination at MDA L. Tritium was detected in the Cerros del Rio Basalts in boreholes 54-01015 and 54-01016. These detections were low but, given the depths of detection, significant. Tritium was also detected at the bottom of several boreholes (54-01010, 54-01011, 54-01013, and 54-01014) at MDA L. The Permittees have committed to investigate and report the extent of the tritium and other radionuclides (including technetium-99) contamination in accordance with the August 26, 2004, letter from Everet Beckner (NNSA Deputy Director) to NMED Secretary Ron Curry. This can be accomplished by sampling all new and existing boreholes for tritium and other radionuclides to determine if additional monitoring points are needed both vertically and horizontally. In any event, drilling of all new boreholes must continue to 25 feet below the deepest detected contamination, which would include tritium or other radionuclides, to determine the extent of migration of releases from MDA L.

COMMENT 7----SECTION 3.2.3, PAGE 21: GROUNDWATER

The Permittees mention in this section that perched intermediate ground water has not been encountered nor is suspected to be encountered beneath Mesita del Buey at MDA L. In letters dated January 26, 1995 and April 7, 1995 the Permittees notified NMED of water encountered at a depth of 592 feet in Phase I RFI angled borehole 54-1016 at MDA L. The Permittees state "[t]he evidence indicates this is a small perched water horizon within the basalt section underlying the Bandelier Tuff." The Permittees must not only report all perched water encountered, but also must target known wet/moist or saturated zones during MDA L investigation activities.

COMMENT 8----SECTION 3.2.3, PAGE 22: GROUNDWATER - VADOSE ZONE

The last sentence in the second paragraph is erroneous. The sentence should read, "Although non-welded tuffs also have fractures, they are generally less abundant than in welded tuffs."

COMMENT 9----SECTION 4.2.1, PAGES 23-25: NUMBER, LOCATIONS, AND DEPTHS OF BOREHOLES

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 and may not be capable of detecting new releases from continuing drum failures at MDA L. This is especially crucial as ongoing drum failures can be a continuing source of contamination. NMED's review of the proposed borehole locations

and orientations reveals that some of the boreholes must be re-located and some must be drilled vertically. The Permittees must drill all wells in accordance with Sections IX and X of the proposed Consent Order. Boreholes must be drilled as follows:

- Proposed borehole A shall be re-located just south of Impoundment D and drilled vertically to the depth described in Comment 16 of this Attachment.
- Proposed borehole B shall be located between former boreholes 54-01013 and 54-01012 and drilled vertically to the depth described in Comment 16 of this Attachment.
- Proposed borehole C shall remain in its proposed location.
- Proposed borehole D shall remain in its proposed location.
- Proposed borehole E shall be replaced by at least three vertical boreholes in the area around the Eastern shaft field. One borehole shall be drilled between the Eastern shaft field and Pit A, another borehole shall be drilled south to southwest of the Eastern shaft field, and one borehole shall be drilled east of the Eastern shaft field. Each of these boreholes must be drilled to the depths described in Comment 16 of this Attachment.

COMMENT 10----SECTION 4.2.3, PAGE 26: SUBSURFACE VAPOR SAMPLING

The Permittees claim that the spatial extent of the VOC plume has been fully defined is erroneous. Information from recent ER Quarterly Technical Reports show that VOCs have been detected in pore-gas monitoring boreholes 54-02034, 54-02021, 54-02031, 54-02023, 54-02020, 54-02030, and 54-02026. These data provide evidence that the Permittees have not yet determined the lateral extent of the vapor-phase plume at MDA L. The Permittees must sample all available vapor-phase monitoring ports to determine where additional boreholes must be installed to establish the full extent of the vapor-phase plume.

COMMENT 11----SECTION 4.2.4, PAGE 26: FIELD SCREENING

The Permittees suggest that field screening to identify sampling depths at this site is not appropriate because vapor-phase contaminants will diffuse to the bottom of the borehole and contamination may be advanced to greater depths. Although NMED believes the Permittees greatly overstate the potential problem, the use of packers to isolate discreet intervals within the boreholes, pumping subsurface air to the surface in sufficient quantities to ensure that formation air is sampled, and the use of a photoionization detector (PID) equipped with to sensitive lamp to analyze vapor samples in-situ should address this problem. Soil and rock samples, as well as subsurface vapor samples, must be collected from each boring at ten-foot intervals and from the bedrock directly below the base elevation of each pit or the deepest shaft in a shaft row as specified in Section IV.C.1.e.iv of the proposed Consent Order. A sample must also be obtained at the maximum depth of each boring as specified in Section IV.C.1.e.iv, number 8 of the proposed Consent Order. During subsurface explorations at MDA L, the Permittees must screen samples in the field for the presence of VOCs and radionuclides using methods

approved by NMED. In addition, the drill cuttings generated from each boring shall be screened for the presence of radionuclides during drilling activities.

If the Permittees do not field screen soil and/or rock samples as specified in the above paragraph, then down-hole vapor-phase sampling in the field must be performed at 10 foot intervals for all new boreholes.

COMMENT 12----SECTION 4.2.6, PAGE 28: ANALYTICAL SUITES
The Permittees have not supplied adequate justification for not sampling and analyzing rock, sediment, and soil samples for dioxins, furans, polychlorinated biphenyls (PCBs), and semi-volatile organic compounds (SVOCs). The Permittees must analyze at least two samples from each new borehole for VOCs, SVOCs, pH, PCBs, dioxins, furans, explosive compounds, nitrates, perchlorate, Target Analyte List (TAL) metals, cyanide, total uranium, and radionuclides (DOE has committed to test for radionuclides in accordance with the August 26, 2004, letter from Everet Beckner (NNSA Deputy Director) to NMED Secretary Ron Curry), as specified in Section IV.C.e.iv, number 6 of the proposed Consent Order.

COMMENT 13----SECTION 4.2.6, PAGE 28: ANALYTICAL SUITES
The Permittees state that 20% of the core samples will be submitted to an off-site contract laboratory for explosives compounds analysis. It is unclear if this means 20% of all core samples from a borehole or 20% of the core samples that field screen with the highest concentrations of HE. If it is the latter, the Permittees must ensure that at least two core samples be submitted to a laboratory for analysis of explosive compounds as specified in Section IV.C.e.iv, number 6 of the proposed Consent Order.

COMMENT 14----SECTION 5.0, PAGE 29: INVESTIGATION METHODS
The Permittees must collect and analyze ground water samples from regional wells R-20, R-21, R-22, R-23, and R-32 in accordance with Section IV.C.1.e.x of the proposed Consent Order. Ground water samples shall be collected from each saturated zone intersecting the monitoring wells for analysis of VOCs, SVOCs, explosive compounds, perchlorate, TAL metals, cyanide, and any other analytes specified by NMED.

COMMENT 15----SECTION 5.0, PAGE 29: INVESTIGATION METHODS
The Permittees must provide brief descriptions of all sampling and analysis procedures used for the investigation in the MDA L Report. Simply referencing the Permittees' Standard Operating Procedures (SOPs) and website does not comply with Section IX.A of the proposed Consent Order. The Permittees must provide in the report brief descriptions of all the sampling, analysis, and investigative methods used.

COMMENT 16----SECTION 5.1, PAGES 29-31: METHODS FOR DRILLING AND SAMPLING BOREHOLES A THROUGH C AND E
The Permittees must drill a minimum of 25 feet below the deepest detected contamination determined from field screening or previous investigations as specified in Section IV.C.1.e.iii, number 4 of the proposed Consent Order. This requirement will aid

in defining the current vertical extent of vapor-phase contamination in the area of newly drilled boreholes.

COMMENT 17----SECTION 5.1.1, PAGE 29: DRILLING PROTOCOL
The Permittees must allow all newly drilled wells to equilibrate before pore gases are sampled.

COMMENT 18----SECTIONS 5.1.2 & 5.2.2, PAGES 30 & 32: COLLECTION OF TUFF SAMPLES
The Permittees must ensure that a detailed log of each boring will be maintained and that the results of all field screening activities will be included in the corresponding boring log. This documentation shall be completed in accordance with Section IV.C.1.e.iv, number 4 of the proposed Consent Order.

COMMENT 19----SECTION 5.1.4, PAGE 33: BOREHOLE COMPLETION
The Permittees state in the work plan that only proposed borehole C will be completed as a vapor-monitoring borehole. Many boreholes in the immediate area of the disposal units have been plugged and abandoned or are poorly constructed resulting in inadequate coverage. The Permittees must complete each newly drilled borehole as a vapor monitoring well as specified in Section IV.C.1.e.iii, number 8 of the proposed Consent Order. The screened intervals, and methods and materials used to construct each vapor monitoring well must be based upon information obtained during drilling activities and open-hole vapor sample field screening results, and shall be approved by the NMED prior to well construction. In addition, the Permittees must properly plug and abandon all poorly constructed wells in accordance with Section X.D of the proposed Consent Order.

COMMENT 20----SECTION 5.2, PAGE 31: METHODS FOR DRILLING AND SAMPLING BOREHOLE D
The Permittees must allow proposed borehole D to stand and equilibrate before pore gases are sampled.

COMMENT 21----TABLE 3, PAGE 72
Much of the information the Permittees are using to demonstrate the extent of the tritium plume is either outdated, invalid and/or exhibits a high degree of uncertainty. Taking into account this level of uncertainty, the Permittees must completely investigate and determine the full extent of tritium in the subsurface by sampling all new and existing boreholes/wells for tritium in accordance with Section IX.B.2.g of the proposed Consent Order.

In addition, the Permittees state in their NOD response to Comment 25 that tritium pore gas samples will be collected as specified in Table 3. Tritium is not specifically mentioned in Table 3 of the work plan. The Permittees must provide clarification in the report.

COMMENT 22----FIGURE 13, PAGE 49: NORTH SOUTH CROSS-SECTION OF VOC PLUME

The Permittees must illustrate on these types of figures the 1 ug/m^3 or the (less than) detection limit contour line for organic contamination. Illustrating this would not only present a more meaningful depiction of the extent of VOC contamination at MDA L, but also the 10 ppmv iso-concentration contour would not be shown to flatten out at the Cerros del Rio Basalt contact. If the Permittees have not yet collected this information, they must to determine the full extent of the VOC plume. This requirement is in accordance with NMED's June 17, 1999 Position Paper regarding determination of extent of contamination. In the future, these figures must be constructed using ug/m^3 instead of ppmv values.

COMMENT 23----APPENDIX F

The Permittees must either supply all boring logs and well construction diagrams for the 2000 series wells at MDA L or include a reference (including section and page numbers) to the location of this information.

COMMENT 24----APPENDIX J: 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. Because the work plan does not include a description of IDW management (*see* Section IX.B.5 of the proposed Consent Order), the Permittees must include this description in the Investigation Report for MDA L.

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.