**Department of Energy**
Field Office, Albuquerque
Los Alamos Area Office
Los Alamos, New Mexico 87544

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ENVIRONMENT DEPARTMENT
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OFFICE OF THE SECRETARY

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Ron K
Do you Concur?

TA-54

Barbara Driscoll
RCRA Permits Branch
Hazardous Waste Management Division
U.S. Environmental Protection Agency, Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

no time to review adequately - 10/19/94

Dear Ms. Driscoll:

~~Enclosed are~~ proposed modifications to the Work Plan for Operable Unit 1148, which was approved by your office on December 14, 1993. If approved, the modifications would result in cost savings without altering the scope or quality of the investigation.

Since last discussed with you, proposed modification #1 has been changed slightly, and we now propose to use the mobile radiation van instead of the Fidler and sodium iodide detector instrumentation. This change will allow for better detection limits and more rapid turnaround in sending samples for analysis.

If you have questions, please call Mike Gilgosch at 505-667-5794 or me at 505-665-7203.

Sincerely,

T. J. Taylor

Theodore J. Taylor
Program Manager
Environmental Restoration Program

Enclosure

cc w/ enclosure:
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# OPERABLE UNIT 1148
# PROPOSED RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION WORK PLAN MODIFICATIONS

## Proposed Modification #1: Channel sediment samples

Section 5.1.4.2.5 of the work plan and the NOD Response to EPA Comment #8 describe acquisition of nine shallow (1-6 in deep) sediment samples from the primary drainage channel from MDA J for analysis of contaminants The nine samples are to be taken from the runoff channel to determine potential contaminant concentrations and transport in the surface environment. Similarly, Sections 5.2.4.2 (MDA H), 5.3.4.2 (MDA L), and 5.4.4.2 (MDA G), and the NOD Response, describe the same sampling approach of nine samples per runoff channel at each of the other MDAs. The number of *nine* samples was appropriate to the use of the grid sampling approach first proposed for the channels; however, judgemental sampling from within the streambeds was finally preferred by EPA and DOE in the approved NOD Response. The choice of nine samples per channel is a hold-over from the grid approach and is inappropriate for the stream channels being investigated. In addition, the short channel length (<400 ft) and steep gradient of the upper reaches of the channels severely limits the areas of active sediment deposition, making fewer samples the appropriate choice.

We propose instead that (1) a *minimum* of four samples per channel be collected for the analyses in the Phase I investigation, (2) that sample depth be limited to 0-6 inches at most locations and to a maximum of 0-12 inches at a few locations, to get young, potentially contaminated sediments, and (3) that their locations and depths be pre-determined by geomorphic analysis of catchment areas and sediment collection points within each streambed emanating from the MDAs. Following the geomorphic analysis, we propose to sample each location, then screen the samples through the Los Alamos National Laboratory mobile radiation detection laboratory that will measure gross alpha, gross beta, gamma and gamma spectrometry. Values on sediments in drainage channels will be compared to a baseline determined from background values measured on sediments in drainage channels at Mesita del Buey with no history of waste disposal, using the same mobile radiation van. We propose to ship for fixed lab analyses those samples whose measured values exceed the baseline value by three standard deviations, which will account for uncertainty in accuracy and precision in the field measurements. All such locations will be sampled and may result in collection of more than four samples from a single drainage channel. If no locations measure above the threshold, then samples will be taken from among the highest readings in the field measurements, with consideration of the locations relative to the "upstream" Material Disposal Areas.

In this modification, we also recommend that contaminants analyzed for be restricted to those which have a reasonable pathway and mechanism for transport and deposition within the channels. We propose analyzing for metals, PCBs, and radionuclides, while eliminating VOAs, SVOAs, cyanide, and pesticides.

## Proposed Modification #2 - Deep Boreholes at MDA L

Proposed work plan Modification #2 concerns deep vertical boreholes located near inactive disposal units at MDA L, described on pp. A-37 and A-38 of the Pilot Extraction Study Plan for the Organic Vapor Plume at MDA L (PESP; Appendix A of the work plan). Figure 1 shows locations for three boreholes (54-1007, 54-1008, and 54-1009) originally planned to investigate contamination to a depth of 500 ft. Because of the non-indurated tuffs and sedimentary rocks encountered in nearby holes at depths below 150 ft, however, these three boreholes were drilled and sampled to a depth of 150 ft. This drilling plan change was approved by your office in a conference call with DOE/LAAO on October 19, 1993. The three 150 ft holes accomplished the

objective of sampling near the source areas of the subsurface organic vapor plume and other potential contamination; chemical and radiological analyses of those core samples is proceeding. The following proposal applies to the follow-on drilling program to further investigate the presence or absence of contamination deep beneath the disposal units at MDA L.

Knowledge of the subsurface geology at Mesita del Buey was developed from six boreholes located east of MDA L that were drilled in 1993 to depths ranging from 290 feet to 340 feet. The locations of the six boreholes (54-1001 to 54-1006) are shown on Figure 1, and structural information is presented in the geologic cross-section in Figure 2. The nonindurated geologic materials in the depth interval from approximately 140 to 300 feet include tuff, ash falls, clays, silts, and sands. Basalt was encountered at a depth of approximately 300 feet in the boreholes except in borehole 54-1004, which was drilled to a depth of 340 feet without hitting basalt. The lower section of this borehole is projected on to the cross-section in Figure 2. Borehole 54-1005 stopped above the predicted depth for the basalt because clayey sediments in the Puye Formation were binding up the hollow-stem augers used for drilling.

The thick section of nonindurated materials between 140 and 300 feet raises concerns for drilling deep boreholes at MDA L as described in the PESP. The deep boreholes require use of air-drilling methods, and the high pressure of the drill air can erode the incompetent materials, creating large diameter "washouts" that are difficult or impossible to seal with cement grout. Holes drilled with air through the non-indurated materials may thus become pathways for downward migration of contaminants. Because of these concerns, we recommend that the deep zone below MDA L be investigated by drilling angle boreholes from sites located in Canada del Buey for the purpose of investigating the vertical extent of the vapor plume beneath MDA L. Figures 1 and 3 show the proposed alignments for two proposed boreholes (54-015 and 54-016). The boreholes are drilled at an angle of approximately 30 degrees from vertical to a total length of about 580 feet. The proposed boreholes would characterize contamination present beneath the inactive disposal units in the interval from 400 to 600 feet below ground surface. Borehole 54-1015 investigates contamination present below the western cluster of inactive disposal shafts, and borehole 54-016 investigates contamination present below the center of Pit A and the inactive disposal shafts located in the southeastern area of the MDA. Borehole 54-016 extends below several shafts which received wastes before the Laboratory began the practice of adding absorbents or placing a layer of crushed tuff between each layer of drums. These shafts may also have received wastes that were not containerized or liquids that were released because of structural failure of containers as the shafts were filled. Based on available analyses from the nine holes drilled from the mesa top, we also recommend limiting our analytical suite to those analytes that were found in the mesa-top holes, rather than a full suite of analytes now known to be superfluous. That is, we recommend the Canada del Buey cores be analyzed for moisture and VOAs.

Drilling Method: The angled boreholes will be drilled with air rotary and ODEX methods to collect core samples and install casing. ODEX casing of 8.75 in outside diameter will be installed to the top of the basalt, which is projected to be at a depth of 300 feet below the top of the mesa. Samples will not be collected from geologic materials present above the basalt. Air rotary coring will begin at the top of the basalt. The ability to recover core samples from the basalt and the interlayered Puye Formation is not known. Sufficient coring will be performed to collect samples for analyses and to describe the subsurface geology. The drilling method in the basalt will include installation of ODEX casing of 6.75 in outside diameter to stabilize the borehole walls. The ODEX casing will be advanced to the total depth of each borehole to provide protection for running borehole geophysical logs and for installation of monitoring ports. A tracer gas (sulfur hexafluoride) will be injected into the compressed air supply of the drill rig to evaluate the persistence of drill air introduced into subsurface formations.

The boreholes will be completed with monitor ports located in discrete zones in the depth interval from 350 feet to the bottom of the borehole. Information from drilling will be used to determine the optimum depth interval for each monitor port and the total number of monitor ports to be installed in each borehole, as well as materials and methods for installation. There will be a minimum of four monitor ports in each borehole. Figure 3 shows a typical placement of six monitor ports on 50 feet centers with an collection interval of 15 feet for each port . The intervals between ports are sealed with grout, as is the borehole above the monitoring zone. The monitor ports will be used to measure subsurface air pressure and for the collection of gas samples. Gas samples will be collected on a quarterly schedule as described in General Response No. 3 of the NOD. The sampling program will include measurement of the concentration of sulfur hexafluoride, the tracer gas added to the drill air.

Information to be gathered from the two deep angled boreholes includes:

- Core will be collected for description of lithology;
- Geotechnical tests performed on core samples include
  - Saturated hydraulic conductivity;
  - Moisture content, bulk density, and porosity;
  - Moisture characteristic curve with data in the in situ moisture range;
  - Specific gravity (particle density);
  - Specific surface (BET method); and
  - Air permeability.
- Gamma-gamma (density) and neutron (moisture) logs will be collected in at least one borehole.
- Core samples will be analyzed for moisture and volatiles only. Table 1 presents the approximate depth intervals for analyses on core. Actual depth intervals will be determined by field screening information and core recovery during drilling.

**Proposed Modification #3: Passive Air Sampling at MDAs J, L, and G.**

Proposed Modification #3 concerns the following sections of the work plan: Section 5.1.4.4, Passive Air Sampling at MDA J; Section 5.3.4.5, Passive Air Sampling at MDA L; Section 5.4.4.5, Passive Air Sampling at MDA G.

The proposal is to perform only one passive air sampling event on grids at each MDA. The work plan includes two sampling events for the grid locations at each MDA. We request elimination of the second grid sampling event because the results of the passive soil gas surveys will only be used to screen the MDAs for the presence of buried wastes that contain VOCs, and the results will not be used to quantitatively determine the flux rate of contaminants released from the subsurface to the atmosphere. The decision to use the results for screening and not for quantitative assessment is discussed in Specific Response No. 10 to the NOD.

In place of the second passive soil gas survey, we propose to use the results from the first survey to identify locations for 120 additional surface measurements with the EMFLUX method. The locations would be selected to (1) verify results from the grid survey, (2) to refine boundaries of areas with high concentrations, and (3) to help characterize the variation that occurs over time in areas with high concentrations. The original grid survey was performed in August, 1993, and the laboratory analysis of samples was completed in September, 1993. We propose to complete the field studies with the additional 120 measurements by September, 1994. The results from the passive air sampling will be used to evaluate the requirement to perform a Phase II characterization with flux chamber methods that are approved by the EPA.

**Proposed Modification #4: Existing Vapor Well Sampling**

The work plan modification described herein is for the following sections: Section 5.3.4.4, Existing Vapor Monitoring Wells Sampling at MDA L; and Section 5.4.4.4, Existing Vapor Monitoring Wells Sampling at MDA G.

The vapor well sampling procedures described in the EPA-approved response to the NOD for the OU 1148 work plan eliminates the need to perform the sampling described in these sections of the work plan. The objective of the sampling was to ensure that a sufficient volume of pore gas was purged from discrete ports before samples were collected on resin tubes. The procedures described in General Response No. 3 to the NOD accomplish this objective by repeated analysis of gas samples from discrete ports through use of a portable instrument at the monitor well. Samples for laboratory analysis are collected on carbon resin tubes after the field instrument indicates either a steady state or a maximum concentration of 1,1,1-trichloroethane during continuous flow from a port. We request approval from EPA to modify the OU 1148 work plan to replace sections 5.3.4.4 and 5.4.4.4 because the vapor well sampling procedures described in General Response No. 3 of the NOD accomplish all the objectives of the original activities

**Proposed Modification #5: Tritium Soil Sampling**

This modification is simultaneously being considered by the DOE since it concerns a radioactive component. It is presented here primarily for your information, however any comments you have are welcome.

The modification requested herein is a change to the schedule for the Phase I sampling described in the following work plan sections: Section 5.1.4.5, Soil Sampling for Tritium at MDA J; and Section 5.4.4.7, Tritium Soil Sampling at MDA G. We request that the tritium sampling in surface soils at MDAs J and G be postponed until September, 1995, in order to evaluate analytical results from similar programs that are being conducted at MDA G by the Laboratory's Environmental Protection group (ESH-8) and the Waste Management group (CST-7).

ESH-8 has collected surface soil samples from MDA G for tritium analysis. The samples were collected from a depth interval of 0-6 in on a grid with dimensions of 200 ft by 200 ft. The field sampling program is completed but not all analytical results are available.

CST-7 has performed flux measurements for tritium at 150 locations within MDA G over the period from June to September, 1993. The measurements were taken with EPA-approved methods to quantify the release of tritium from shallow soils to the atmosphere. The analytical results from the flux measurements were reported to CST-7 in September, 1993. CST-7 will perform additional flux measurements for tritium at MDA G during Summer, 1994, and results from this program should be available by October. We request a postponement to FY 1995 of the Phase I tritium sampling program at MDA J and MDA G to provide a period of time to evaluate the analytical results from the programs in progress at MDA G and to make appropriate changes to the Phase I characterization. The changes will be described in a future work plan modification.