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Date: April 30, 2001  
Refer to: ER2001-0337



Mr. Carl Will  
NMED – Hazardous Waste Bureau  
P.O. Box 26610  
Santa Fe, NM 87502

**SUBJECT: PROPOSED REDUCTION IN UNSATURATED ZONE MONITORING AT MATERIAL DISPOSAL AREAS (MDAs) G AND L AT TECHNICAL AREA (TA)-54**

Dear Mr. Will:

Los Alamos National Laboratory (LANL) has conducted quarterly pore gas monitoring of the volatile organic chemical (VOC) vapor phase plumes at MDAs L and G since 1985. Since 1990, this quarterly monitoring program has been required as a Special Permit Condition, pursuant to Section C.5, Unsaturated Zone Monitoring, of Module VIII of the LANL's Hazardous Waste Facility Permit (1994, 44146). The purpose of the collection of this information was to obtain sufficient data for the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) to determine nature and extent of contamination. Data from the monitoring program shows consistent constituent detection and concentration distribution and indicates that the VOC plumes at MDAs L and G are at near steady state conditions, in both size and concentration. The monitoring locations and results are presented as an appendix to each Environmental Restoration (ER) Quarterly report submitted to the New Mexico Environment Department - Hazardous Waste Bureau (NMED-HWB). A Fact Sheet summarizing the sampling approach and results to date and describing details of the proposed semi-annual interim-monitoring plan is attached.

Based on these results, the LANL ER Project believes that the intent of this permit provision has been satisfied, since Section C.5 of Module VIII states clearly that this quarterly monitoring program was intended primarily to provide direction for the RFI, which has since been completed. LANL is therefore requesting to reduce the frequency of monitoring of the VOC plumes from a quarterly to a semi-annual basis beginning in Fiscal Year (FY) 2002 (October 1, 2001) until the final remedy is selected for MDAs G and L based on the Corrective Measures Study.

It is our goal to begin implementing this interim-monitoring plan at the beginning of FY02 in October 2001. Based on the fact that NMED is currently in the process of revising the Laboratory's Hazardous Waste Facility Permit, please consider incorporating this interim monitoring program as part of the draft permit. If you have any questions or

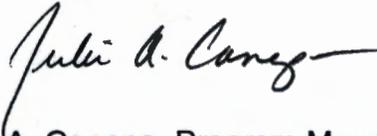


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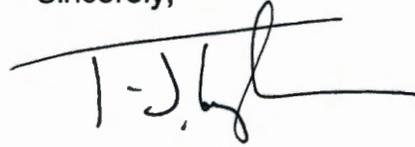
require any additional information please contact John Hopkins at (505) 667-9551 or Dave McInroy at (505) 665-4557.

Sincerely,



Julie A. Canepa, Program Manager  
Los Alamos National Laboratory  
Environmental Restoration

Sincerely,



Theodore J. Taylor, Project Manager  
Department of Energy  
Los Alamos Area Office

JC/TT/JH/ev

Enclosure: Fact Sheet

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**FACT SHEET (ER2001-0337a)**  
**PROPOSED REDUCTION IN UNSATURATED ZONE MONITORING AT MATERIAL  
DISPOSAL AREAS (MDAs) G AND L AT TECHNICAL AREA (TA)-54**

Los Alamos National Laboratory (LANL) has conducted quarterly pore gas monitoring of the volatile organic chemical (VOC) vapor phase plumes at MDAs L and G since 1985. Since 1990, this quarterly monitoring program has been required as a Special Permit Condition, pursuant to Section C.5, Unsaturated Zone Monitoring, of Module VIII of the LANL's Hazardous Waste Facility Permit (1994, 44146) to obtain sufficient data for the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) to determine nature and extent of contamination.

In 1997, real time field screening of Environmental Restoration (ER) Project boreholes for trichloroethane (TCA) and trichloroethylene (TCE) at MDAs L and G was standardized using the B&K monitoring system in order to collect comparable data, which characterizes plume behavior. Field screening results have been confirmed with fixed analytical laboratory data from pore gas samples collected in SUMMA canisters each quarter as required by the permit. The field screening was expanded in 1999 to include samples from LANL Facility Waste Operations (FWO) performance assessment monitoring (PAMG) boreholes at MDA G. Currently 187 ports are available for monitoring from 32 multi-port boreholes located throughout MDAs L and G. The monitoring locations and results are presented as an appendix to each ER Quarterly report submitted to the New Mexico Environment Department - Hazardous Waste Bureau (NMED-HWB).

Monitoring results from the last 15 quarters (from 2/1997 to 3/2001) for the VOC plumes at MDAs L and G are based on field screening with a Bruel & Kjaer model 1302 gas analyzer (B&K) and fixed analytical laboratory data from pore gas samples collected using SUMMA canisters. The SUMMA canister samples have been collected from ports located throughout TA-54 to define the nature and extent of the VOC plumes. The SUMMA results are consistent with B&K screening data for both TCA and TCE. TCA and TCE are the two primary VOCs present in the plumes, with respect to concentration and distribution.

Numeric modeling indicates that the VOC vapor plume at MDA L is characteristic of diffusive behavior (Subsurface Vapor-Phase Transport of TCA at MDA L: Model Predictions, Stauffer, 2000, LA-UR-00-2080). Simulations of future plume growth and of a potential catastrophic drum failure at MDA L indicate that it would not cause detectable changes in the plume in the pore gas-monitoring network for several years, if at all. Modeling at MDA L is analogous to the MDA G plumes with respect to diffusive behavior and future growth. Additionally, the MDA L modeling bounds the MDA G plumes because no drums of liquid were disposed of at MDA G and the MDA G plumes are orders of magnitude less in concentration than the MDA L plume. Therefore, the LANL ER Project believes that the intent of this permit provision has been satisfied, since Section C.5 of Module VIII states clearly that this quarterly monitoring program was intended primarily to provide direction for the RFI, which has since been conducted.

The expanded data set and the precision of the B&K 1302 analyzer has allowed for quantitative trend analysis of TCA and TCE concentrations using the Students T-test. The Students T-test tests the "significance" of any trends identified during linear regression. The test is given by  $t_r = r * \sqrt{(n-2)/(1-r^2)}$ ; if  $t_r$  is greater than  $t_c$  then the trend is "significant" ( $t_c$  is based on the level of confidence, which is a function of n). The statistical analysis is used to confirm the steady-state nature of the plumes. The continued semi-annual field screening of pore gas from all available ports at TA-54 with the B&K analyzer, will subsequently increase the confidence of the statistical analysis. Results of the trend analysis will be reported in the 3<sup>rd</sup> Quarter Monitoring Report for Fiscal Year 2001 when it is expected that sufficient data will exist for the analysis to be statistically significant.

Under the proposed interim monitoring program, B&K screening would be continued for all available ports at MDAs L and G on a semi-annual basis. Two SUMMA canister samples will be collected from ports adjacent to disposal units at MDA L to detect any significant changes in the subsurface environment and two more SUMMA canister samples will be collected from the perimeter for continued confirmation of the MDA L VOC plume boundaries. Since the number of boreholes available at MDA G is less than those at MDA L, four SUMMA canisters will continue to be distributed for VOC sample collection among all the boreholes at MDA G including the PAMG boreholes, to confirm B&K screening results and further define the nature of the relatively low concentration VOC plumes. Each semi-annual sampling event will require a total of eight SUMMA canister VOC samples. A proposed schedule for each year's SUMMA sampling, consisting of borehole ID, depth, and rationale (e.g. source), will be provided in the Annual Pore Gas Summary Report that is part of the annual September ER Quarterly Report.

Since the nature and extent of the VOC plume at MDA L has been determined and remains consistent, we are requesting that future SUMMA canister sampling be focused on the detection of any significant changes beneath MDA L and on confirming B&K 1302 gas analyzer monitoring at the vertical and lateral plume boundaries. The lower concentration VOC plumes associated with MDA G disposal units will continue to be sampled and monitored to confirm the diffusive behavior identified at MDA L, which will be accomplished through semi-annual monitoring and the collection of four SUMMA canister samples. It is anticipated that the number of PAMG boreholes available at MDA G will increase; further substantiating the statistical significance of the data set and confirming the diffusive VOC plume behavior.