



**DEPARTMENT OF ENERGY**  
Environmental Management Los Alamos Field Office (EM-LA)  
Los Alamos, New Mexico 87544

EMLA-24-BF31-2-1

November 2, 2023

Mr. Rick Shean  
Designated Agency Manager  
Hazardous Waste Bureau  
New Mexico Environment Department  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, NM 87505-6313



Subject: Response to the Review, Periodic Monitoring Report for 2022 Vapor-Sampling Activities at Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50 (May 2023)

Dear Mr. Shean:

On September 19, 2023, the New Mexico Environment Department (NMED) issued comments to the U.S. Department of Energy (DOE) Environmental Management Los Alamos Field Office (EM-LA) in review of the "Periodic Monitoring Report for 2022 Vapor-Sampling Activities at Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50," submitted to NMED on May 16, 2023. Enclosed please find the response to NMED's comments.

If you have any questions, please contact Brenda Bowlby (360) 930-4353 (brenda.bowlby@em-la.doe.gov) or Cheryl Rodriguez at (505) 414-0450 (cheryl.rodriguez@em.doe.gov).

Sincerely,

**ARTURO  
DURAN**

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ARTURO DURAN  
Date: 2023.11.01  
18:49:41 -06'00'

Arturo Q. Duran  
Compliance and Permitting Manager  
U.S. Department of Energy  
Environmental Management  
Los Alamos Field Office

Enclosure(s):

1. Two hard copies with electronic files:  
Response to the Review, Periodic Monitoring Report for 2022 Vapor-Sampling Activities at Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50 (May 2023), Los Alamos National Laboratory, EPA ID NM0890010515, HWB-LANL-23-033, Dated September 19, 2023 (EM2023-0752)

cc (letter emailed):

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Public Reading Room (EPRR)  
PRS website

**Response to the Review, Periodic Monitoring Report for 2022 Vapor-Sampling Activities at  
Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50 (May 2023),  
Los Alamos National Laboratory, EPA ID #NM0890010515, HWB-LANL-23-033,  
Dated September 19, 2023**

## **INTRODUCTION**

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. The U.S. Department of Energy (DOE) Environmental Management Los Alamos Field Office responses follow each NMED comment. All information associated with analysis of radionuclides is voluntarily provided to NMED in accordance with DOE policy.

## **COMMENTS**

### **NMED Comment**

1. ***Table 5.2-1, Detected Tritium Results in Pore-Gas Samples at MDA C Vapor-Monitoring Wells, First 2022 Sample Round, pg. 33.***

*NMED notes the presence of tritium in the pore-gas samples collected from most boreholes, with a high concentration exceeding 2,500,000 pCi/L in borehole location 50-603470 at a depth of 83 feet below ground surface.*

### **DOE Response**

1. The results for location 50-603470 at 83 ft are consistent with past results from 2010 to 2022, which have typically been in the range of 2,000,000 pCi/L to 3,000,000 pCi/L. The "Periodic Monitoring Report for 2022 Vapor-Sampling Activities at Material Disposal Area C, Solid Waste Management Unit 50-009, at Technical Area 50" (hereafter, the PMR) discusses how this port generally has the highest activity. Activities decrease with depth at location 50-603470, and all but one result below 83 ft from 2010 to 2023, including all results at 600 ft below ground surface (bgs), are less than the maximum contaminant level of 20,000 pCi/L (the fall 2022 result of 49,463 pCi/L decreased later in 2022 to be consistent with previous results).

### **NMED Comment**

2. ***Figure D-1.0-2, Lateral and vertical extent of the MDA C TCE plume, pg. D-12.***

*Reduce the number of neighboring points used for interpolation of iso-contours. The iso-contours are erratic and inconsistent with iso-contour maps from previous reports concerning the VOC vapor plume. Provide the revised Figure D-1.0-2.*

### **DOE Response**

2. The interpolation methodology for creating the plume maps has been consistent for the past three PMRs. The figures are based on all vapor-monitoring sample results from each monitoring round. The data set consists of 80 vapor samples from 80 sampling ports within 18 boreholes. These same locations are sampled in the spring and fall. The two plume maps presented in Figure D-1.0-2 were created using the same software and same methodology as used in previous PMRs. Pore-gas

concentrations change over time, and when the concentrations are near the edge of the range of the particular concentration band, the colors can change from one round to the next. For instance, the trichloroethene (TCE) concentration at location 50-603471 at the depth of 209 ft was 11,000  $\mu\text{g}/\text{m}^3$  in the spring and 42,000  $\mu\text{g}/\text{m}^3$  in the fall (see Figures 1 and 2). The net difference is 31,000  $\mu\text{g}/\text{m}^3$ , which results in changes to the shape and colors of the plume.

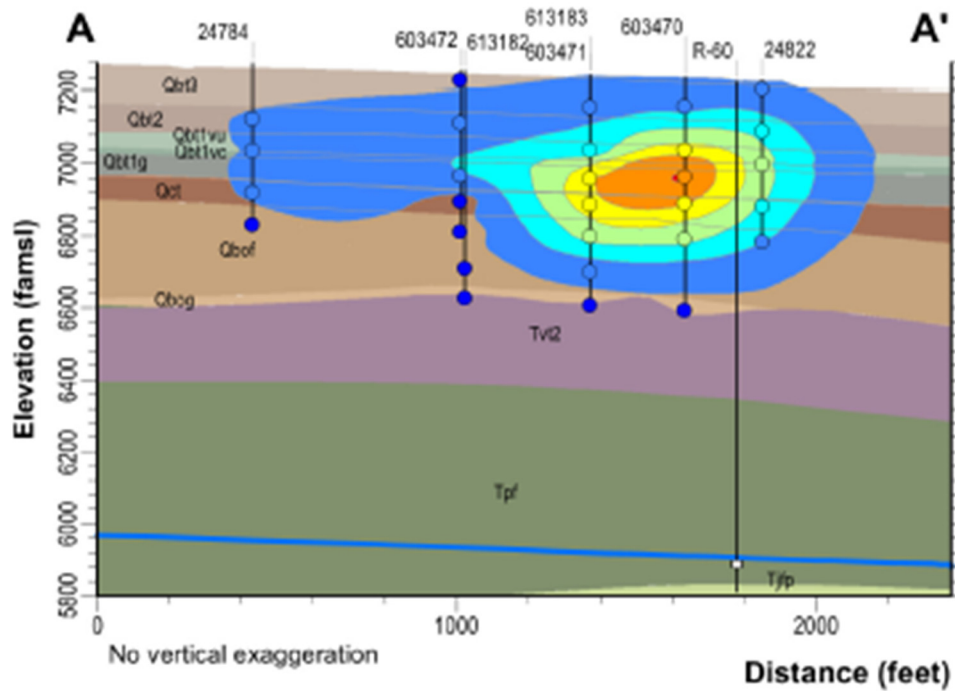


Figure 1 Spring 2022 TCE concentrations

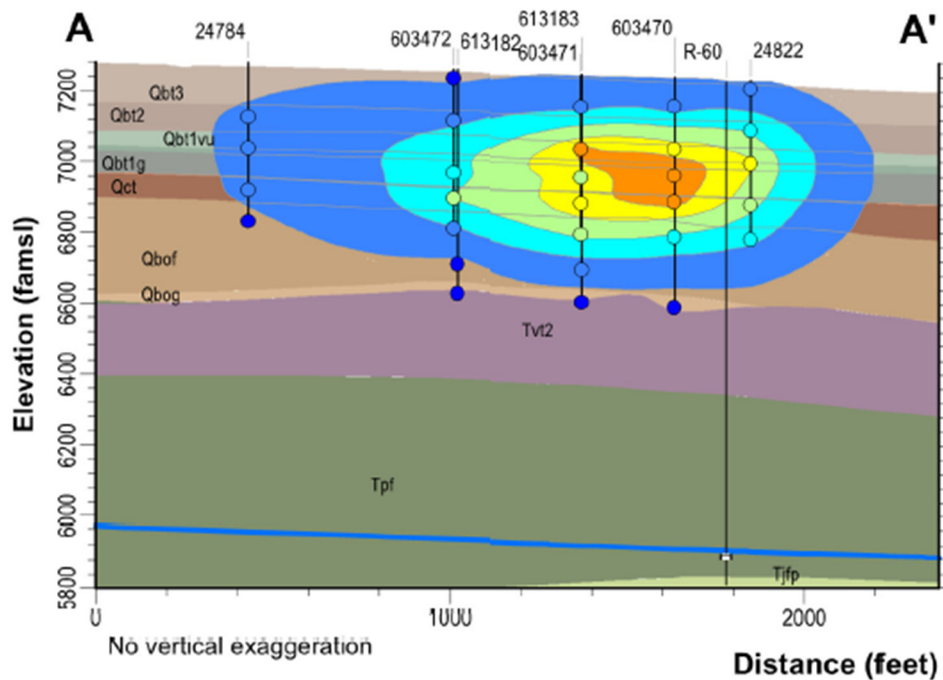
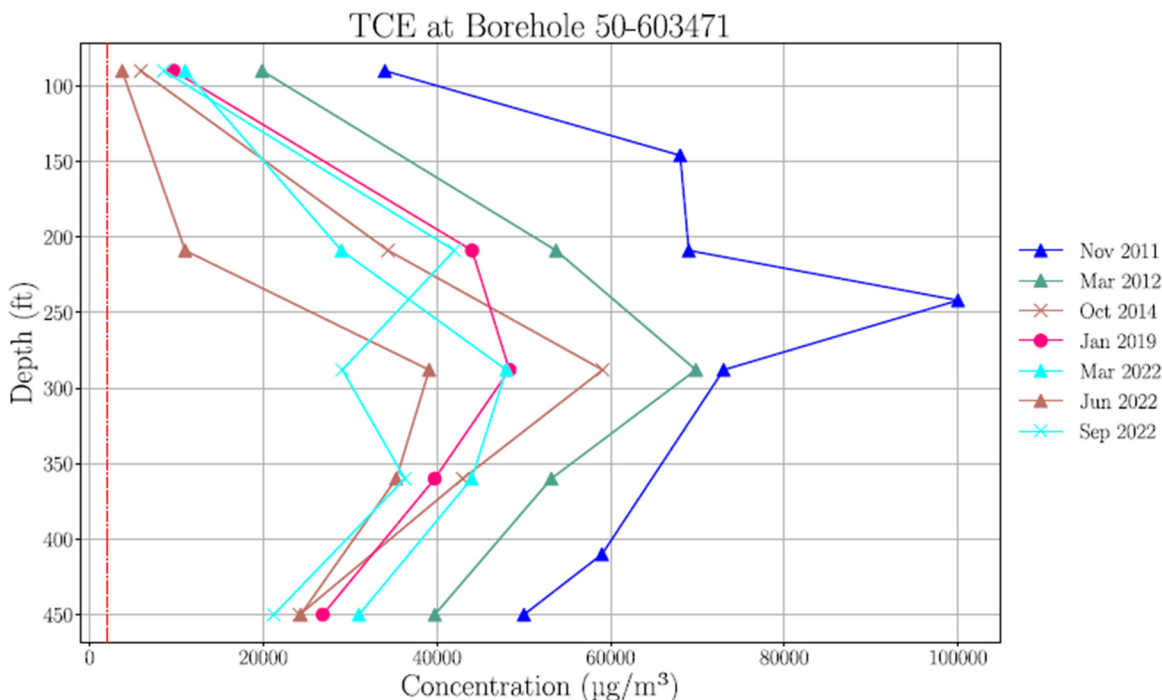


Figure 2 Fall 2022 TCE concentrations

Time series of TCE are presented in Figure D-2.0-18 (shown here as Figure 3) and illustrate the changes in variability for each port in the monitoring well from 2011 to 2022. Over time there is variability in concentrations within an individual port, but there is a consistent decreasing trend with depth.



**Figure 3 TCE concentration versus depth and time at borehole 50-603471**

DOE respectfully declines revising the figure and prefers to maintain consistency with previously presented and approved figures. Detailed changes in specific wells and sampling ports are presented in individual plots in Appendix D, Figures D-2.0-1 to D-4.0-18.

#### NMED Comment

#### 3. Section D-2.1, Borehole 50-24813, pg. D-3-.

*VOC vapor is detected in the lowest ports of the boreholes in the Tvt2 – Younger Tschicoma Dacite Formation at concentrations below screening levels. Concentrations of trichloroethylene (TCE) and total volatile organic compounds (VOCs) over time at 600 feet below ground surface (ft bgs) show a gradual increase over time.*

#### DOE Response

- The increase noted in NMED's comment is described in the PMR, Appendix D, which states, "Concentrations of TCE and total VOCs over time at 600 ft bgs are shown in Figure D-2.0-6 and show a gradual increase over time, although the results from October 2020 appear anomalously low and outside the range of previously detected concentrations." As described in the PMR, the TCE results at 600 ft bgs exceed the Tier I screening level but are less than the depth-dependent Tier II screening level, and concentrations decrease substantially with depth from the maximum concentrations at 241 ft bgs, consistent with diffusive transport.

## NMED Comment

### **4. Section D-2.3, Borehole 50-603064, pg. D-3.**

*VOC vapor is detected in the lowest parts of the boreholes in the Tvt2- Younger Tschicoma Dacite Formation at concentrations below screening levels. Concentrations of total VOC concentrations over time at 500 ft bgs show a gradual increase over time.*

## DOE Response

4. The increase noted in NMED's comment is described in the PMR, Appendix D, which states, "At 500 ft bgs, total VOC concentrations appear to be increasing gradually through time (Figure D-2.0-13). The results from July 2020 at 500 ft bgs appear anomalously low, significantly outside the range of previously detected concentrations." As described in the PMR, the recent TCE results at 500 ft bgs exceed the Tier I screening level but are less than the depth-dependent Tier II screening level, and concentrations decrease substantially with depth from the maximum concentrations at 213 ft bgs, consistent with diffusive transport.

## NMED Comment

### **5. Figure D-5.0-1, Lateral and vertical extend of the MDA C TCE plume, baseline (2010-2012 average) vs 2022 maximum measured concentration at each sample port, pg. D-43.**

*Reduce the number of neighboring points used for interpolation of iso-contours. The iso-contours are erratic and inconsistent with iso-contour maps from previous reports concerning the VOC vapor plume. Provide the revised Figure D-5.0-1.*

## DOE Response

5. The interpolation methodology for creating the plume maps has been consistent for the past three PMRs. The figures are based on all vapor-monitoring sample results from each monitoring round. The data set consists of 80 vapor samples from 80 sampling ports within 18 boreholes. Average values were calculated for each port and plotted using the same interpolation methodology as was used for the 2022 data set. The two plume maps presented in Figure D-5.0-1 were created using the same software and same methodology as used in previous PMRs.

DOE respectfully declines revising the figure and prefers to maintain consistency with previously presented and approved figures.