



MICHELLE LUJAN GRISHAM
GOVERNOR

JAMES C. KENNEY
CABINET SECRETARY

January 24, 2023

M. Lee Bishop, Director
DOE Environmental Management
Los Alamos Field Office
1200, Trinity Drive, Suite 400
Los Alamos, NM 87545

Robert Macfarlane, Program Manager
Environmental Safety, Health and Quality
Newport New Nuclear BWXT-Los Alamos
1200, Trinity Drive, Suite 150
Los Alamos, NM 87544

**RE: APPROVAL
REQUEST TO USE AN EQUIVALENT U.S. ENVIRONMENTAL PROTECTION AGENCY METHOD FOR
MEASUREMENT OF POTENTIOMETRIC PH IN THE WASTE PROCESSES IN DOME 231
LOS ALAMOS NATIONAL LABORATORY
EPA ID#NM0890010515
HWB-LANL-MISC**

Dear Mssrs. Bishop and Macfarlane:

NMED received the United States Department of Energy (DOE) and the Newport New Nuclear BWXT-Los Alamos (N3B) (collectively the Permittees) *Request to Use an Equivalent U.S. Environmental Protection Agency Method for Measurement of Potentiometric pH in the Waste Processes in Dome 231 for the Los Alamos National Laboratory Hazardous Waste Facility Permit* (Request) dated and received January 13, 2023 and referenced by N3B-2023-0006.

The Permittees requested to use an equivalent method to EPA SW-846 9040C as allowed by Permit Attachment C, Subsection C.3.2.4.1. The Permittees proposed to use a Hanna Instruments HI98191 Professional Waterproof Portable pH/ORP/ISE Meter for potentiometric pH measurements to establish the initial and final pH during permitted neutralization processes.

NMED has reviewed the alternative pH method, and hereby approves Permittees' request to use Hanna Instruments HI98191 Professional Waterproof Portable pH/ORP/ISE Meter for potentiometric pH measurements at Technical Area 54, Dome 231, in accordance with the Permit Section C.3.2.4.1 of the Permit that allows use of an alternative method, if approved by NMED.

Please note that the approval is only applicable to the method mentioned above. In future, if the Permittees' wish to use another equivalent method, NMED's approval must be obtained prior to use.

If you have any questions regarding this letter, please contact Siona Briley of my staff at (505) 690-5160.

Sincerely,

Rick Shean

Digitally signed by Rick
Shean
Date: 2023.01.23
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Rick Shean
Chief
Hazardous Waste Bureau

cc:

N. Dhawan, NMED HWB
S. Briley, NMED HWB
M. Schatz, NMED HWB
C. Stone, NMED HWB
L. King, US EPA Region 6
K. Armijo, NA-LA
A. Duran, EM-LA
C. Maupin, N3B
K. Ellers, N3B
J. Payne, Triad
J. Murdock, N3B
P. Padilla, Triad
P. Maestas, N3B
W. Alexander, N3B
locatetesteam@lanl.gov
epccorrespondence@lanl.gov
emla.docs@em.doe.gov
n3brecords@EM-LA.DOE.GOV
Regdocs@em-la.doe.gov

File: 2023 LANL TA 54, Approval to Use EPA Equivalent pH Method at TA-54 Dome 231
LANL-MISC

Enclosure

**Response to Administratively Incomplete Determination Part A and General Part
B of the Resource Conservation and Recovery Act (RCRA) Permit Renewal
Application Los Alamos National Laboratory
July 22, 2021**

NMED Comments on Permittees Responses: 1, 3, 5, 6, 7, 8, 9, 10a, 16, 19a, 19b and 19c:

The Permittees have provided sufficient information to address NMED's comments and NMED accepts the response. However, following comments need further information/clarifications. To facilitate the review, NMED numbered original Comments and DOE responses are included here.

2. NMED 1 Comment (March 2021):

40 CFR 270.14 (b)(11), Facility Location:

Facility location information:

(i) In order to determine the applicability of the seismic standard (40 CFR 264.18(a)) the owner or operator of a new facility must identify the political jurisdiction (e.g., county, township, or election district) in which the facility is proposed to be located.

(ii) If the facility is proposed to be located in an area listed in appendix VI of part 264, the owner or operator shall demonstrate compliance with the seismic standard.

Los Alamos National Laboratory is located in the Los Alamos County, which is an area listed in Appendix VI of 40 CFR 264, therefore, the Permittees must provide geologic data which demonstrates compliance with the seismic standard (see 40 CFR 270.14 (b)(11) for more information). The Permittees must provide seismic information for the three (3) waste treatment units proposed to be included in this permit (i.e., Technical Area (TA) 16-388, 36-8, and 39-6).

The Permittees have stated that these units are not newly built, however, these units have existed and operated only as interim status units. For NMED to consider these units to be included in the permit the Permittees must demonstrate that these units meet all requirements of the permitted units, including compliance with the seismic standard.

Permittees Response (June 2021):

Attachment 3 includes maps and seismic location information for the proposed open burning and open detonation units at TA-16-388, TA-36-8, and TA-39-6. Text reflecting the addition of the seismic location information is added to the Permit Renewal Application Section 2.10.1, Seismic Standard in Attachment 4 of this response. Although the seismic investigation included in Attachment 3 demonstrates that there has been no direct evidence observed for Holocene faulting within the required radius of the facility, it is noted within the seismic report that field reconnaissance may be required to confirm the determination, as field activities are delayed due to COVID 19 safety restrictions.

NMED Response (January 2022):

NMED notes that the Permittees do not have sufficient information to evaluate if the lineaments within the Pajarito fault system (PFS) have been active within the Holocene. NMED notes that near TA-16-388, the lineaments associated with the PFS, have had at least one earthquake on the Eastern edge of TA-16,

that have not been investigated within the 3,000-foot boundary of TA-16-388. NMED notes that the lineaments at 36-8 and 39-6 have not been investigated for faults. The Permittees must perform a geologic investigation of lineaments within the 3,000-foot boundary and provide a revised Attachment 3 with the results of the investigation. NMED understands that this will require some time for the Permittees to plan and implement these investigations; please provide an estimated schedule of when this will be completed. The results of the investigation will be reviewed by NMED through the technical review process.

4. NMED Comment (March 2021):

Section 2.7.6, Preventing Releases to the Atmosphere, page 2-7:

The information provided is not adequate because it does not address modifications required for the proposed thermal treatment units (open burn and open detonation (OB/OD)) to prevent releases to the atmosphere. The Permittees must revise this section to include additional information about how releases to the atmosphere will be prevented or mitigated at the three new thermal treatment units, and how releases will be monitored and how would the Permittees communicate information to NMED and the public.

Permittees Response (June 2021):

Section 2.7.6, Preventing Releases to the Atmosphere, is revised (in Attachment 4) to include references to the sections where these considerations are documented for the proposed open detonation and open burning treatment units. The requested information is specifically addressed in the Permit Renewal Application Sections 4.7.6, Preventing Releases to the Atmosphere and 5.7.6, Preventing Releases to the Atmosphere.

Unexpected releases or operational upsets will be reported to the NMED-HWB and the public utilizing the reporting requirements in Permit Section 1.9.12, 24 Hour and Subsequent Reporting, or Permit Section 1.9.13, Written Reporting of a Non-threatening Release, as appropriate. All monitoring reports will be provided to NMED-HWB and the public via official submittals and entry into the LANL Public Reading Rooms. Additionally, any monitoring that may be required after an unplanned release will be conducted as outlined in Section D.7, Unplanned Nonsudden Releases.

NMED Response (January 2022):

The Permittees have provided cross-references but have not addressed how releases from OB/OD units will be measured, and how those releases will be communicated to the public other than contingency plan implementation communications to NMED (Attachment D) or general emergency response services. Please provide the detailed information required by this comment.

10.b NMED Comment (March 2021):

1-1, Redline Permit Parts 1-11, Section 5.1, page 99

The information is missing from this section regarding waste which is prohibited from treatment at the OD units. The 2002 EPA Region 3 *Draft Final Open Burning/Open Detonation Permitting Guidelines* Section 2.2.5 recommends prohibiting thermal treatment of biologic or chemical warfare weaponry, depleted uranium, and small arms ammunition up to 50 caliber. Include the information on wastes that will be prohibited from treatment at the OD units.

Permittees Response (June 2021):

The Permittees added a Section addressing prohibited wastes to the suggested changes to Permit Part 5, Treatment by Open Detonation, included in Attachment 6 of this response. The prohibited wastes section

includes wastes that do not meet the definition of waste explosives per 40 CFR §265.382, Open burning; waste explosives, materials containing beryllium, materials containing perchlorate-based propellants or explosives, and polychlorinated biphenyls (PCBs). Additionally, the Permittees removed reference any waste stream descriptions that are not consistent with the waste explosives definition from the suggested changes in Supplement 1-3, Permittees' Proposed Changes to Attachment C, Waste Analysis Plan, included as Attachment 7 of this response. The waste streams removed were "small arms ammunition" and "black powder and gun powder."

NMED Response (January 2022):

The Permittees are proposing to only treat waste that meets the definition of reactive (D003). The Permittees have stated that the OB/OD units will not treat waste that contains Be, Perchlorates, or PCBs. However, the Permittees have not addressed NMED's concerns based on Open Burning/Open Detonation Permitting Guidelines Section 2.2.5 which recommends explicitly prohibiting the thermal treatment of biologic or chemical warfare weaponry, depleted uranium, and small arms ammunition up to 50 calibers. Permittees must revise this section to explicitly state that the thermal treatment of biologic or chemical warfare weaponry, depleted uranium, and small arms ammunition up to 50 calibers will be prohibited. The Permittees must also provide information on how prohibited waste will be evaluated and prevented from treatment at OB/OD units.

11. NMED Comment (March 2021):

Supplement 1-1, Redline Permit Parts 1-11, Section 5.2.3.2 Weather Conditions, page 100:

The Permittees have proposed to use red flag conditions to determine when open detonation will not be performed, but have not provided the information on what constitutes red flag conditions for the units. The Permittees must revise this section to include details on weather conditions (e.g., precipitation, wind speed) under which detonation operations will be prohibited.

Permittees Response (June 2021):

The Permittees revised Permit Renewal Application Supplement 1-1, Permittees' Proposed Changes to Permit Parts 1-11, Permit Section 5.2.3.2, Weather Conditions, to include weather conditions under which treatment activities are prohibited. The list includes when lightning is detected within a six mile radius of the open detonation units, icy roads (for transport), winds greater than 20 miles per hour, and during precipitation events. Additionally, all treatment operations are prohibited during "Red Flag conditions" that indicate warm temperatures, very low humidity, and winds above 10 miles per hour specifically in accordance with the guidelines outlined in the "LANL Fire Danger Matrix":

<https://www.lanl.gov/resources/emergency/fire-danger-matrix.php>. This condition provides that treatment operations are prohibited when the fire danger is in the "Extreme" category and winds are in excess of 10 miles per hour. However, since these conditions are more subjective and cannot be rephrased to be an enforceable permit condition, it has been removed from the weather conditions restrictions in the suggested changes for Permit Parts 5 and 6 (Attachment 6) of this response document.

NMED Response (January 2022):

The Permittees' response to this comment indicated that red flag conditions are based on wind speeds greater than 10 mph during dry conditions. However, the text in Section 5.2.3.2 (page 102) only restricts OB/OD activities when winds are greater than 20 mph. The Permittees must revise this Section to be consistent and also address dry condition restrictions.

12. NMED Comment (March 2021):

Supplement 1-1, Permit Parts 1-11, Permit Part 6.4 Alternative Assessment, page 107:

The Permittees have proposed submitting an alternative treatment assessment report for the permitted OB units to NMED by no later than 8 years after the effective date of the OB permit, but have not provided a similar deadline in Permit Part 5 for the proposed permitted OD unit. Please provide a rationale for this frequency and propose a similar deadline for the OD unit.

Permittees Response (June 2021):

The Permittees have removed the proposed language in Permit Part 6.4 from the revised Supplement 1-1, Permittees' Proposed Changes to Permit Parts 1-11, (Attachment 6), because the proposal to submit an alternatives assessment report was left in the redline language as an oversight and should not have been included as a proposed change. The intention of the Permittees was to include the assessment in the application. Permit Renewal Application, Supplement 4-1, Assessment of Alternatives for Open Detonation and Open Burning Activities, presents the Permittees' assessment of alternative technologies as referenced by #12. An updated version of this assessment is included as Attachment 8 of this response.

NMED Response (January 2022):

For clarity, NMED is directing the Permittees to retain the deadline for alternative treatment assessment report for the permitted OB in Permit Part 6 and provide a similar deadline for the OD units in Permit Part 5.

13. NMED Comment (March 2021):

Permittees must revise Permit Attachment D, Section 2 to indicate how spills or off-site contamination from OB/OD operations will be monitored and reported to NMED and communicated to the public to prevent harm to human health or the environment as required by 40 CFR 270.32(b).

Permittees Comment (June 2021):

Any spill or release of hazardous waste at the open detonation or open burning treatment units will be reported in the same manner as a spill or release at the current permitted units utilizing the reporting requirements at Permit Section 1.9.12, 24 Hour and Subsequent Reporting, or Permit Section 1.9.13, Written Reporting of a Non-threatening Release, as appropriate. As outlined in Section D.4.2, Decontamination Verification, any spills or releases at the units will be decontaminated or removed. Additionally, any monitoring that may be required after an unplanned release will be conducted as outlined in Section D.7, Unplanned Nonsudden Releases. Permit Attachment D, Contingency Plan, outlines actions that will be taken in the event of an emergency or release of hazardous waste to prevent harm to human health or the environment and has not been modified. Attachment D, Section D.2, Emergency Equipment and Communications, includes information regarding the equipment that may be used by the Permittees in case of an emergency.

NMED Response (January 2022):

Since this is a different treatment activity from stabilization or neutralization, NMED expects that additional spill/release response measures would be implemented by the Permittees for OB/OD units. This section must be revised to include additional details specific to the OB/OD units and how spills or off-site contamination from OB/OD operations will be monitored and reported to NMED and communicated to the public to prevent harm to human health or the environment as required by 40 CFR 270.32(b).

14. NMED Comment (March 2021):

The Permittees must include details on how the Facility will notify the fire department, or emergency medical responders, one day prior to performing treatment at the OD unit. NMED notes that other RCRA

permitted OD units also require documentation (e.g., pre-treatment inspection checklist) that OD/high explosive (HE) personnel contacted a meteorology team to get a predicted forecast for the day of the planned event prior to conducting operations.

Permittees Response (June 2021):

Additions to the Permittees revised descriptions of how treatment activities are conducted at the units, are included in Section 4.12.2, Operating Requirements, for open detonation units, and include specifics regarding the notifications and access to meteorological data before and during these activities, as requested. These sections also provide the precautions, restrictions, notifications, and clearance activities conducted under interim status at each of the units. Attachment 4 includes a redline version of the additional information in the Permit Renewal Application text. No changes were made to Permit Attachment E, Inspection Plan, that outlines the inspections conducted at each of the hazardous waste management units to meet the general inspection requirements outlined in 40 CFR §264.15 and to ensure that communication and equipment for use in case of an emergency are in working order.

Inspections conducted on the day of treatment are included in the changes proposed to incorporate the open detonation units, and include requirements to inspect the area in and around the units on the day of treatment events to ensure that there is no deterioration or vegetation in the area that could catch fire. The Permittees follow a robust proceduralized and documented process for each treatment that involves a detailed hazard analysis for each treatment activity to be conducted as well as review by a safety review committee prior to treatment activities. A specific pre-treatment checklist (other than inspection record form) is not currently used to conduct open detonation operations.

The procedures for conducting treatment are outlined in the Operating Requirement sections for each unit type. Prior to the day of treatment, as part of the pre-treatment protocol, the composition of each treatment is reviewed for a hazard analysis that is then presented to a safety committee with representation from various safety groups (including Access Control and the Emergency Operations Support Center) to ensure that all required notifications and analysis of the treatment to take place have been made prior to performing each treatment at the open detonation units. This safety review committee conducts a thorough review during planning for any explosives work conducted on the firing range, including waste treatment detonations. The committee is tasked with assessment of the potential risk of the activity and the effects of weather, temperature, and dryness conditions. The Permittees welcome the opportunity to discuss specific technical requirements associated with pre-treatment activities and to discuss the development of any additional actions that the NMED-HWB recommends be documented prior to conducting treatment activities at the open detonation units.

NMED Response (January 2022):

The Permittees have made changes to Attachment E which addresses the need for required documentation in the pre-treatment Inspection Checklist that high explosive (HE) personnel contacted a meteorology team to get a predicted forecast for the day of the planned event prior to conducting operations documented. The Permittees must revise Attachment E and include these procedures provided in the Response, in the pre- and post-inspection checklist in Attachment E.

15. NMED Comments (March 2021):

Supplement 3-1, Closure Plans, G.2, G.3 and G.28:

The closure plans for the proposed thermal treatment units do not account for the limited available documentation of RCRA hazardous waste treatment activities during the units' operational history, specifically prior to 1980 when the units became interim status units. The closure plans must be modified to address the limited knowledge of waste treated at these units prior to 1980. Since the Permittees have not been able to provide documentation of waste treatment activities for that time frame, the proposed analytical suite must be expanded to account for the lack of this knowledge.

Permittee Response (June 2021):

The Permittees proposed analytical suites within each of the unit closure plans are based on all known past activities at the units (treatment or otherwise) and have been presented within previously approved drafts of closure plans included within the current Permit. The constituents proposed include high explosives and associated compounds, toxic metals, semi-volatile organic compounds, volatile organic compounds, as well as other constituents of concern like perchlorate, dioxins/furan congeners (open burning unit), and kerosene (open burning unit). The Permittees welcome the opportunity to discuss technical issues regarding the potential addition of analytical suites for site closure.

NMED Response (January 2022):

The Permittees have not included additional analytical suites to the closure plans for the OB and OD units, and have not adequately addressed NMED's concern. To address the limited available knowledge and documentation of RCRA hazardous waste management practices prior to 1980, the constituents of potential concern (COPCs) must be revised to include the following text and COPCs and with updated sampling methods as applicable

This Sampling and Analysis Plan (SAP) is designed to verify decontamination of surfaces, equipment, and materials; and determine whether a release of hazardous constituents to any environmental media has occurred. The SAP shall include:

- a. Target analyte list (TAL) metal analysis for 24 analytes using *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846)* Methods 6010B, 6020 (inductively coupled plasma – mass spectrometry), and 7471A;
- b. Dioxins/Furans analysis using EPA Method 8290A;
- c. High explosives analysis for 20 target compounds using EPA Method 8330B or 8321A with a modification to add explosive compounds generated specifically at LANL listed in Tables 2 and 4 of the Closure Plan;
- d. Analysis for SVOCs using EPA Method 8270C;
- e. Analysis for VOCs using EPA Method 8260B;
- f. Perchlorate anion (ClO_4^-) by EPA Method 6850 or 6860;
- g. DRO and GRO by EPA Method 8015B; and
- h. Nitrates by EPA Method 9056A.

Table 1-Hazardous Waste Constituents of Concern at Treatment Unit^a

Category	EPA Hazardous Waste Numbers	Specific Constituents
High explosives and associated compounds	D003	HMX, RDX, TNT, PETN, TATB, Tetryl, and mixtures of explosives including; ANFO, Composition B, Cyclotol, IMX-101, PBX 9404, PBX 9407, PBX 9501, PBX 9502, X0233, X0533, XTX 8003, XTX 8004, LX-02, LX-07, LX-10, and LX-14
Toxic Metals	D004, D005, D006, D007, D008, D009, D010, D011	Arsenic, Barium, Cadmium, Chromium, Lead, Mercury, Selenium, Silver
Semi-volatile Organic Compounds	D030, D036, F004	2,4-Dinitrotoluene, Nitrobenzene
Other constituents of concern		Dioxins/Furans, Perchlorate, PFAS, kerosene, and depleted uranium

^a Based on the Unit operating record 1980-2012.

PETN = pentaerythrioltetranitrate (2,2-bis[(nitroxy)methyl]-1,3-propanediol dinitrate)

HMX = cyclotetramethylenetetranitramine (octahydro, 1,3,5,7-tetranitro, 1,3,5,7-tetrazocine)

RDX = cyclonite (cyclo-1,3,5-trimethylene-2,4,6-trinitramine)

TNT = 2,4,6-trinitrotoluene

TATB = 1,3,5-triamino-2,4,6-trinitrobenzene

17a. NMED Comment (March 2021):

Supplement 4-1 Assessment of Alternatives for OD and OB Activities:

The Permittees have not evaluated the OB/OD technology and the alternative technologies for impacts to human health and the environment nor the clean-up costs associated with each technology.

Permittee Response (June 2021):

An assessment of the impacts to human health and the environment, as well as clean-up cost considerations associated with the technologies, are added to Permit Renewal Application, Supplement 4-1, Assessment of Alternatives for Open Detonation and Open Burning Activities (Attachment 8). The assessment and justification report includes a systemic evaluation of the available alternative treatment technologies, and, as discussed in Supplement 4-1, the conclusion is that the proposed permitted units are the most appropriate treatment technologies for treatment of wastes based on the LANL operational and

mission requirements. For clarification, evaluation criteria within Supplement 4-1 are adjusted to comparatively address human health and the environment, as well as relative costs to the extent practicable. In particular, Section 6.3 Focused Evaluation of Potential Alternative Technologies for alternative technologies which were initially screened, is modified to incorporate subject considerations as summarized in Table 6-3. Specific environmental performance considerations at the open detonation units and the open burning unit are located in Section 4.16, Environmental Performance Standards, and 5.16, Environmental Performance Standards, of Volume 1 of the Part B Application. These sections, along with the subsections and the supplements provided as part of Appendix 4 of the Permit Renewal Application, discuss the potential impact to human health and the environment through impact to groundwater, surface water, air, and soil pathways. Clean-up cost estimates for the units are not included in the application because LANL is a federally-owned facility and is exempt from the financial assurance requirements of 40 CFR Subpart H. However, general considerations are included within the assessment in Supplement 4-1.

NMED Response (January 2022):

The Permittees must modify Table 6-2 to include the benefits and drawbacks with regards to impacts on human health and the environment and cleanup costs, specific to each listed treatment option to facilitate comparisons of the treatment options. Currently, the table includes references to general discussions of impacts and cleanup costs that do not adequately address the issues raised in the original comment.

17b. NMED Comment (March 2021):

Supplement 4-1 Assessment of Alternatives for OD and OB Activities:

Table 1-2 provides quantities of explosives treated at TA 36-8 and TA 39-6 OD Units from 2012- 2020 by waste streams. The Permittees must separate waste volumes from the two different OD units, into two different tables. It is unclear from the table the volumes of waste that have been historically treated at each unit.

Permittee Response (June 2021):

The tables below provide waste treatment volumes by unit from 2011 through 2020. Information on estimated treatment volumes over the life of the unit is located within the proposed closure plan for each unit.

Open Detonation Treatment Activities at TA-36-8 (Minie) by Year in Pounds

[illegible]

2016	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0

Open Detonation Treatment Activities at TA-39-6 (Point 6) by Year in Pounds

	Excess explosives	Explosives contaminated debris	Detonators, initiators, and mild detonating fuses	Shaped charges and test assemblies	Projectiles and munitions larger than 50 caliber	Pressing molds	Small caliber ammunition	Black powder or gunpowder	Total
2011	523	0	0	0	0	0	0	0	523
2012	168	0	0	0	0	0	0	0	168
2013	82	0	0	0	0	0	0	0	82
2014	0	0	0	0	0	0	0	0	0
2015	0	0	0	0	0	0	0	0	0
2016	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0	0
2019	0	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0	0

NMED Response (January 2022):

Based on the information provided by the Permittees, two additional issues regarding the quantities of explosives treated at TA-36-8 and TA 39-6 were identified. First, the total pounds listed for 2014 is incorrect in the table entitled Open Detonation Treatment Activities at TA-36-8 (Minie) by Year in Pounds. The Permittees should review this information and correct any errors.

Secondly, the tables provided in the Permittees' response were not incorporated into Attachment 8, Revised Supplement 4-1, Assessment of Alternatives for Open Detonation and Open Burning Activities. The Permittees should revise Attachment 8 to include the tables provided in the facility response.

18. NMED Comment (January 2021):

Supplement 4-2:

The Permittees have not provided sufficient information on surface water and groundwater sampling data. To facilitate the review, the data must include the date the samples were collected at each location and provide the frequency of exceedances above the regulatory limits. Revise the table accordingly.

Permittee Response (June 2021):

A raw data from intellusnm.com containing the data summarized in the tables included in Supplement 4-2 has been provided as part of the electronic copy of this response. No specific sampling and analytical data

associated with surface water is included in the Permit Renewal Application. However, surface water is specifically described in Section 4.18.2.1.1, Hydrologic Assessment and Surface Water Flow. Summary of surface water protection can be found in Section 4.18.2, Protection of Surface Water/Wetlands/Soil Surface, its subsections, and Section 4.18.1, Protection of Groundwater/Vadose Zone, and subsections include information of groundwater in the area and monitoring and protection of groundwater by the Permittees. These sections are presented to demonstrate compliance with the environmental performance standards for surface water and groundwater protection. Sections 4.18.1 and 4.18.2 provide context for the technical information within Supplement 4-2, Open Detonation Unit Groundwater Monitoring and Surface Drainage Information, the sections and should be reviewed together, as the sections together may address NMED's concerns.

NMED Response (January 2022):

NMED clarifies that this comment is not requesting raw data on surface and groundwater sampling. NMED's is commenting that tables in Supplement 4-2, Open Detonation Unit Groundwater Monitoring and Surface Drainage Information, must be revised to include the date the samples were taken at each location and the frequency of exceedances above regulatory limits at each location. NMED clarifies that the Permittees must provide the complete data table as an Excel file in a CD attachment. The Permittees must revise Table 4.1-1, to include a column with the number of exceedances, and a column indicating the date the maximum was detected.

19d. NMED Comment (March 2021):

The Permittees conclusion section does not describe the detected analyte concentrations, nor does it make comparisons to background values, and EPA Region 6 air quality standards. At a minimum, the Permittees must provide a summary of the sampled results, gaussian comparisons within the data including 95% upper tolerance limit (UTL), the maximum values detected, and compare those results to current EPA screening level values. The Permittees have not provided adequate information to demonstrate that the air releases from OD sites do not pose a threat to human health or the environment, please see Permit Part 11.10.4, Site-Specific Human Health Risk; 11.5, Site-Specific Ecological Risk Assessment Methods; and 11.6 Determination of Background guidance on for general information on reporting requirements to NMED. NMED notes that this information from the sampling event does not appear to be included in Supplements 4-7 and 4-8, OD Unit 36 and 39, Human Health and Ecological Risk Assessment.

Permittees Response (June 2021):

The analytical data generated for this project and detailed within the summary report were directly compared to acute air inhalation exposure concentrations from the 2005 EPA Human Health Hazard Risk Assessment Protocol for Hazardous Waste Combustion Facilities, or the acute inhalation screening levels within the 1999 Air Toxics Hot Spots Program Risk Assessment Guidelines Part I The Determination of Acute Reference Exposure Levels for Airborne Toxicants, drafted by the Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency. These references provide the most applicable comparison levels for the short-term air impacts to the immediate area around the proposed hazardous waste management units. The air modeling report, Supplement 4-3, Screening Level Air Modeling Analysis and Risk Evaluation for Open Detonation Operations, more completely provides a discussion of the potential overall impact to air quality that may be caused by open detonation treatment activities. The air sampling summary report was not drafted with the intention of providing risk assessment, but as stated in Permit Renewal Application Section 4.18.3, Protection of Atmosphere, "the Permittees conducted air sampling at each of the open detonation units to determine if dioxins, furans, or

metals could be detected in the air after an open detonation treatment event.” Risk assessments associated with constituent soil level concentrations are included as Supplements 4-7, Open Detonation Unit at Technical Area 36 Human Health and Ecological Risk-Screening Assessments; 4-8, Open Detonation Unit at Technical Area 39 Human Health and Ecological Risk-Screening Assessments; and 4-9, Revision of 2011 Open Detonation Risk Assessment.

NMED Response (January 2022):

The Permittees have provided information that adequately addresses the issue and concerns raised in the original comment. The facility response provided for original comment 19d in Enclosure 1 clarifies the purpose of the air sampling event and comparative analysis described in Supplement 4-4 of the Part B permit application. In addition, the response distinguishes between the information in Supplement 4-4 and the analyses described in Supplement 4-3, Screening Level Air Modeling Analysis and Risk Evaluation for Open Detonation Operations.

20a. NMED Comment (March 2021):

Supplement 4-5, Laboratory Analysis and Reporting, page 1-2

Polychlorinated biphenyls (PCBs) were not included in the analytical suites for the samples collected at TA 36-8. However, PCBs were detected in soil samples as noted in the 2011 sampling report, and PCBs were detected in three of the five whole-body field mice samples collected from TA 36. The Permittees must provide additional information to address the following issues:

- A discussion justifying why PCBs were not included for sample analyses when PCBs were detected in mice at TA 36.
- A discussion addressing the lack of current PCB data, and whether this constitutes a data gap and must evaluate whether additional sampling is needed.
- Please also see NMEDs comments on Supplement 4-7: at a minimum, the historic PCB soil data should be included in the current risk assessment.

Permittees Response (June 2021):

PCB soil data was collected in 2010 and 2011, because the soil monitoring conducted at that time was designed to be a baseline data set to begin an assumed soil monitoring program at each of the detonation units. Assessment of these data is included in Supplement 4-9, Revision of 2011 Open Detonation Risk Assessment, and a copy of the raw data set is included with the electronic copy of this response.

Constituents chosen for the 2018 sampling effort were based on the likelihood that current operational activities may contribute to deposition of the constituents.

PCB waste is not treated or used in association with the current operational activities at either of the units; therefore, PCBs should not be added to the soil surface since initial detection. Because of these reasons, the lack of 2018 PCB data should not be considered a data gap. At the time of closure of the units, PCBs should be evaluated based on the sites historic use. Please see the Permittees’ response to #22 for information regarding the drafting or reorganization of the three open detonation risk assessments within the Permit Renewal Application.

NMED Response (January 2022):

The Permittees have provided information that partially addresses the issues raised in the original comment. The Permittees have discussed why soil was not sampled for PCBs in 2018. The response further states that PCB waste is not currently treated or used at the open detonation (OD) units. The Permittees also state that a copy of the 2010 and 2011 PCB data set was included in the electronic response to original comment 20a. As of the date of this letter, the electronic data furnished by the Permittees has not been submitted.

20b. NMED Comment (March 2021):

Laboratory Analysis and Reporting page 3:

Soil samples were inadvertently analyzed for plutonium instead of isotopic uranium. The report states that previous sampling included uranium (U-234, U-235/236, and U238) and that the 2011 risk assessment addressed uranium. However, the current risk assessment does not include the uranium data. The Permittees must provide additional information to address the following issues:

- i. The Permittees have not included a complete list of constituents of potential concern (COPCs) analysis, at a minimum, the uranium data provided in the 2011 sampling report should be used in the current risk assessment. It is noted for TA 36-8 that all three isotopes of uranium were detected above background levels and were retained as COPCs in the 2013 risk assessment.
- ii. The Permittees must provide a discussion on whether any depleted uranium has been treated since the sampling was conducted in 2010. If any depleted uranium has been treated at TA 36-8, then the historical data likely underestimate potential concentrations and sampling must be conducted to fill this data gap. Previously the Permittees have treated depleted uranium at TA 36-8 and must clarify whether this has occurred since the last soil sampling event in 2010.

Permittee Response (June 2021):

The Permittees have not treated explosives-contaminated depleted uranium waste since the last soil sampling event in 2010. In 2011, Permittees determined appropriate constituents based on all historic activities at the unit. The units are used for treatment of high explosives and high explosives contaminated wastes, however, both units are primarily used for non-treatment related testing and other operational detonations. Therefore, uranium will be included in soil sampling and monitoring at the sites. The Permittees would like to emphasize that plutonium is not considered a constituent of potential concern at either of the open detonation treatment units, and was not detected in any of the samples analyzed for plutonium. It was mistakenly requested for analysis through a typographical error on the chain of custody documentation.

Permit Renewal Application Section 4.18.2.2, Soil Surface Monitoring, provides context for the soil analytical results presented in Supplement 4-5, Soil Sampling Results Summary Report for the Open Detonation Unit at Technical Area (TA) 36-8, and Supplement 4-6, Soil Sampling Results Summary Report for the Open Detonation Unit at Technical Area (TA) 39-6, and the information should be reviewed together for a complete overview of the soil sampling.

NMED Response (January 2022):

The Permittees have provided information that partially addresses the issues raised in the original comment. In the facility response, the Permittees have discussed why soil was not sampled for PCBs in 2018. The response further states that PCB waste is not currently treated or used at the open detonation (OD) units. The Permittees also state that a copy of the 2010 and 2011 PCB data set was included in the electronic response to original comment 20a. As of the date of this letter, the electronic data furnished by the Permittees has not been submitted.

Attachment 1, Crosswalk of Changes to the Part A and General Part B of the Resource Conservation and Recovery Act (RCRA) Permit Renewal Application Los Alamos National Laboratory, notes that no changes were made to Supplement 4-5 in response to original comment 20a. However, the Permittees have provided changes to the Part B permit application in response to the original comment. Attachment 6,

Revised Supplement 1-1, Permittees' Proposed Changes to Permit Parts 1-11; Section 5.2, *Waste Streams to be Treated at the Open Detonation Units*, states that the Permittees will not treat PCBs by open detonation. However, the discussion does not identify any controls and/or procedures in place to ensure PCBs are not treated at the OD units.

The Permittees must provide documentation justifying the elimination of PCBs from the 2018 soil sampling event to Supplement 4-5. In addition, Attachment 6, Section 5.2, should be revised to include a discussion of the controls and/or procedures in place to ensure that PCBs are not treated at the OD units.

21. NMED Comment (March 2021):

Appendix 4: Supplement 4-6 Soil Sampling Results Summary Report for the OD Unit at TA 39-6, *Laboratory Analysis and Reporting* pages 1 and 2:

PCBs were not included in the analytical suites for the samples collected at TA 39-6. However, PCBs were detected (minimally) in the soil as noted in the 2011 sampling report. The Permittees must provide additional information to address the following issues that are noted by NMED:

- A discussion of why PCBs were not included for sample analyses.
- A discussion of whether the lack of current PCB data constitutes a data gap and must evaluate whether additional sampling is needed.
- Please also see comments on Supplement 4-8: at a minimum, the historic PCB soil data should be included in the current risk assessment.

Permittee Response (June 2021):

Please see response to #20 with regards to the lack of 2018 PCB data. Please see the Permittees' response to #22 for information in regards to the drafting or reorganization of risk assessments within the Permit Renewal Application.

NMED Response (January 2022):

The facility response to original comment # 21 submitted by the Permittees is acknowledged. However, issues remain with the Permittees' response to original comment # 20a. Once the Permittees adequately address those remaining issues, the issue identified in original comment # 21 will also be resolved.

22a. NMED Comment (March 2021):

Appendix 4: Supplement 4-7 Open Detonation Unit at Technical Area 36 Human Health and Ecological Risk-Screening Assessments, *Executive Summary* page ii

The risk assessment does not address the potential for contaminants in the soil to migrate to groundwater (refer to Section 4 of the New Mexico Environment Department Soil Screening Guidance (NMED SSG). As noted in Table 4.2-1 of Supplement 4-2, several constituents have been detected in groundwater at levels above action levels. Revise the assessment to address the potential leaching of contaminants from the vadose zone to groundwater and correlate detections in the soil to groundwater results.

Permittee Response (June 2021):

The potential for the open detonation units to impact groundwater in the area and monitoring and protection of groundwater by the Permittees are presented in the Permit Renewal Application to demonstrate compliance with the environmental performance standards for groundwater protection within Section 4.18.1, Protection of Groundwater/Vadose Zone and relevant subsections. Information included within Supplement 4-2, Open Detonation Unit Groundwater Monitoring and Surface Drainage Information, should be reviewed with the context provided by Section 4.18.1 of the Permit Renewal Application.

NMED Response (January 2022):

The Permittees have provided information in the response that does not address the issue raised in original comment # 22a. In the response, the Permittees reference Attachment 4, Section 4.18.1, Protection of Groundwater/Vadose Zone. The referenced discussion provides information on hydrogeology and groundwater monitoring. No information on the soil-to-groundwater exposure pathway and its potential to impact the OD units were found in the referenced material. Examination of Supplement 4-7 (and Supplement 4-8) indicates that no discussion of the soil-to-groundwater pathway is provided. The potential for soil contaminants to reach groundwater and lead to possible exposures must be addressed to ensure the conceptual site model for each OD unit reflects consideration of all potential exposure pathways and inclusion or exclusion of a pathway is based on defensible lines of evidence. The Permittees must revise Supplement 4-7 (and Supplement 4-8) to address the potential for contaminants from the vadose zone to migrate to groundwater at the OD units. The discussion should correlate detections in the soil to groundwater sampling results. NMED recommendations on the type of information to be considered in determining if the soil-to-groundwater pathway is complete or incomplete at the OD units are provided in the last paragraph of Section 4.9, Summary of the Migration to Groundwater Pathway SL-SSLs, of the NMED SSG.

22b. NMED Comment (March 2021):

Section 2.2.1 Sampling and Analysis Data page 2:

PCBs were not included in the analytical suites for the samples collected at TA-36-8. However, PCBs were detected in soil as noted in the 2011 sampling report and PCBs were detected in three of the five whole body field mice samples collected from TA 36. Address this potential data gap. At a minimum, revise the report to include the historic PCB soil data in the current risk assessment.

Permittee Response (June 2021):

Please see response to #20 for information addressing PCBs within the soil at the open detonation units.

NMED Response (January 2022):

The facility response to original comment # 22b submitted by the Permittees is acknowledged. However, issues remain with the Permittees' response to original comment # 20a. Once the Permittees adequately address those remaining issues, the issue identified in original comment # 22b will also be resolved.