U.S. DEPARTMENT OF ENERGY

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Date: **JUL 21 2021**

Mr. Ricardo Maestas, Acting Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6313

Subject: 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 EPA ID#NM0890010515, HWB-LANL-20-001

Dear Mr. Maestas:

The U. S. Department of Energy (DOE) and its field offices, the National Nuclear Security Administration Los Alamos Field Office (NA-LA), the Environmental Management Los Alamos Field Office (EM-LA), along with Triad National Security, LLC (Triad), and Newport News Nuclear BWXT-Los Alamos, LLC (N3B), collectively the Permittees, provide this response to the New Mexico Environment Department-Hazardous Waste Bureau (NMED-HWB) letter dated March 23, 2021. The NMED-HWB letter, *Administratively Incomplete Determination Part A and General Part B of the RCRA Permit Renewal Application Los Alamos National Laboratory EPA ID#NM0890010515, HWB-LANL-20-001,* was issued after initial review of the Permittees' submittal of the *Los Alamos National Laboratory (LANL) General Part A Permit Application, Revision 10.0*; and Volumes 1 and 2 of the *Part B Permit Application for Renewal of the Los Alamos National Laboratory Hazardous Waste Facility Permit* (Permit Renewal Application). This additional information and the supporting documents make up the Permittees' Permit Renewal Application for the Los Alamos National Laboratory (LANL or the Facility) Hazardous Waste Facility Permit (Permit). The Permittees are optimistic that this will facilitate completion of the NMED-HWB's Administrative Review. We look forward to next steps including Technical Review and ultimate issuance of the Draft Permit. An extension of time request was submitted and approved for response to the determination letter. The approval extended the submittal date to July 22, 2021.

Enclosure 1 provides the Permittees' responses to the NMED-HWB comments. The attachments to the enclosure provide supplemental information and revised content as requested by the NMED-

HWB. The enclosure includes nine attachments.

- Attachment 1 includes a crosswalk of NMED determinations to the response location and a brief summary of the changes to aid in review.
- Attachment 2 includes maps of groundwater contamination plumes at LANL.
- Attachment 3 includes seismic information for three interim status hazardous waste management units.
- Attachment 4 includes a revised version of Sections 1 through 8 of the Part B Permit Application for replacement in the Permittees' Permit Renewal Application. The attachment includes red editing marks for revisions within the document. However, the replacement certification page within Section 8 has been updated with the current certifying officials to meet the requirements at Title 40 of the Code of Federal Regulations §270.11, and does not include red editing marks.
- Attachment 5 includes 5-year average wind roses for day and night over the years 2016 through 2020.
- Attachment 6 includes a revised Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11,* for replacement in the Permittees' Permit Renewal Application.
- Attachment 7 includes a revised Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan.*
- Attachment 8 includes a revised Supplement 4-1, *Assessment of Alternatives for Open Detonation and Open Burning Activities*.
- Attachment 9 includes a revised Appendix 1, *Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit.*

Three hard copies and one electronic copy of the response are provided to the NMED-HWB. The hard copies include Enclosure 1 and all attachments and maps/plates. The electronic copy, which is only be provided to the NMED-HWB, contains a reproduction of the hard copy in portable document format (pdf) along with word processing files, analytical data sets, and other information as required by the response document.

If you have questions or comments concerning this submittal for Triad, please contact Karen E. Armijo (NA-LA) at (505) 221-3664 or Patrick L. Padilla (Triad) at (505) 412-0462.

If you have questions or comments concerning this submittal for N3B, please contact Arturo Duran (EM-LA) at (505) 257-7907 or Emily Day (N3B) at (505) 695-4243.

Sincerely,

Theodore A. Wyka
Digitally signed by Theodore A. Wyka
Date: 2021.07.21 14:42:18 -06'00'

Theodore A. Wyka
Manager
National Nuclear Security Administration
Los Alamos Field Office
U.S. Department of Energy

Sincerely,

Stephen G. Hoffman
Digitally signed by Stephen G. Hoffman
Date: 2021.07.14 17:55:02 -06'00'

Stephen G. Hoffman
Acting Manager
Environmental Management
Los Alamos Field Office
U.S. Department of Energy

Enclosure(s): 1) Response to Administratively Incomplete Determination Part A and General Part B of the RCRA Permit Renewal Application Los Alamos National Laboratory EPA ID#NM0890010515, HWB-LANL-20-001

CC w/enclosures:
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RECEIVED
JUL 22 2021
NMED Hazardous Waste Bureau

Date: JUL 2 1 2021

Mr. Ricardo Maestas, Acting Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6313

Subject: 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 EPA ID#NM0890010515, HWB-LANL-20-001

Dear Mr. Maestas:

The U. S. Department of Energy (DOE) and its field offices, the National Nuclear Security Administration Los Alamos Field Office (NA-LA), the Environmental Management Los Alamos Field Office (EM-LA), along with Triad National Security, LLC (Triad), and Newport News Nuclear BWXT-Los Alamos, LLC (N3B), collectively the Permittees, provide this response to the New Mexico Environment Department-Hazardous Waste Bureau (NMED-HWB) letter dated March 23, 2021. The NMED-HWB letter, *Administratively Incomplete Determination Part A and General Part B of the RCRA Permit Renewal Application Los Alamos National Laboratory EPA ID#NM0890010515, HWB-LANL-20-001,* was issued after initial review of the Permittees' submittal of the *Los Alamos National Laboratory (LANL) General Part A Permit Application, Revision 10.0*; and Volumes 1 and 2 of the *Part B Permit Application for Renewal of the Los Alamos National Laboratory Hazardous Waste Facility Permit* (Permit Renewal Application). This additional information and the supporting documents make up the Permittees' Permit Renewal Application for the Los Alamos National Laboratory (LANL or the Facility) Hazardous Waste Facility Permit (Permit). The Permittees are optimistic that this will facilitate completion of the NMED-HWB's Administrative Review. We look forward to next steps including Technical Review and ultimate issuance of the Draft Permit. An extension of time request was submitted and approved for response to the determination letter. The approval extended the submittal date to July 22, 2021.

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ENCLOSURE 1

Response to Administratively Incomplete Determination Part A and General Part B of the RCRA Permit Renewal Application Los Alamos National Laboratory EPA ID#NM0890010515, HWB-LANL-20-001

Date: JUL 21 2021

Response to Administratively Incomplete Determination Part A and General Part B of the RCRA Permit Renewal Application Los Alamos National Laboratory EPA ID#NM0890010515, HWB-LANL-20-001

Introduction

On June 29, 2020, the United States Department of Energy (DOE), Newport Nuclear-BWXT (N3B), and Triad National Security, LLC (Triad), collectively known as the Permittees, submitted to the New Mexico Environment Department- Hazardous Waste Bureau (NMED-HWB) the *Los Alamos National Laboratory (LANL) General Part A Permit Application, Revision 10.0*; and Volumes 1 and 2 of the *Part B Permit Application for Renewal of the Los Alamos National Laboratory Hazardous Waste Facility Permit* (Permit Renewal Application). This Permit Renewal Application is in support of the 10-year Resource Conservation and Recovery Act (RCRA) Permit Renewal for hazardous and mixed waste storage and treatment at the Los Alamos National Laboratory (LANL) under the LANL Hazardous Waste Facility Permit (Permit). On March 23, 2021, NMED-HWB issued a letter titled, *Administratively Incomplete Determination Part A and General Part B of the RCRA Permit Renewal Application Los Alamos National Laboratory EPA ID#NM0890010515, HWB-LANL-20-001* and requested the Permittees file a response within 60 days. On April 8, 2021, the Permittees and NMED-HWB staff held a virtual meeting to discuss clarifications regarding the NMED-HWB's determination and the Permittees' anticipated responses. The Permittees subsequently requested an extension of time on May 23, 2021, to respond to the determination letter. The NMED-HWB approval of that extension provides for a final submittal date of the response on July 22, 2021.

Below, each numbered NMED-HWB determination is presented verbatim with the Permittees' response following each determination. There are nine attachments to this response document. Attachment 1 includes a crosswalk of the NMED-HWB Determinations and the location of the Permittees' response as well as a summary of the changes for ease in review. Attachment 2 includes maps of groundwater contamination plumes at LANL. Attachment 3 includes seismic information to demonstrate compliance with facility locations standards for each of the three proposed permitted unit locations. Attachment 4 consists of a redline version of the Permit Renewal Application text for Sections 1-7 including a new certification page signed by all Permittees in Section 8. Attachment 5 is 5-year averaged wind roses for day and night at LANL. Attachment 6 is a revised Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11*. Please note, that Attachment 6 (revised Supplement 1-1) is recreated utilizing the most recent word processing file received from the NMED-HWB in June 2021. Attachment 7 is a revised Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*. Please note, that Attachment 7 (revised Supplement 1-3) is recreated utilizing the most recent word processing file received from the NMED-HWB in June 2021. Attachment 8 includes a revised Supplement 4-1, *Assessment of Alternatives for Open Detonation and Open Burning Activities*. Attachments 4, 6, 7, 8, and 9 are designed to provide replacement pages within the Permit Renewal Application, Part B Application, Volumes 1 and 2.

Additional changes are also proposed in Permit Section 3.14.3 (within Attachment 6) associated with the soil vapor monitoring conducted under the Permit. Descriptions and justification for changes have been included with red editing marks in Permit Renewal Application Section 6.2, *Other Permit Changes* in Attachment 4 and are included in Attachment 9, *Revised Appendix 1 - Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit*.

NMED-HWB

General Part A

1. 40 CFR 270.14(c)(4), Extent of Groundwater Contamination Plume:

A description of any plume of contamination that has entered the ground water from a regulated unit at the time that the application was submitted that:

(i) Delineates the extent of the plume on the topographic map required under 270.14(b)(19) of this section;

(ii) Identifies the concentration of each appendix IX, of part 264 of this chapter, constituent throughout the plume or identifies the maximum concentrations of each appendix IX constituentin the plume.

The United States Department of Energy (DOE), Newport Nuclear-BWXT (N3B), and Triad National Security, LLC. (Triad), collectively the Permittees, have not provided maps depicting the extent of the existing ground water plumes at the LANL Facility (Facility, as defined in 40 CFR 260.10) in accordance with the above requirements. Maps 2 and 3 show National Pollution Discharge Elimination System (NPDES) site locations and other groundwater monitoring wells, however, these maps do not provide contaminant plume boundaries. Include maps depicting extent of plumes and maximum concentration of contaminants on a topographic map as required by 40 CFR 270.14(b)(19).

Response:

There is no evidence of groundwater contamination associated with the regulated units at LANL; therefore, a map of groundwater contamination plumes is not included within the Permit and was not included within the Permit Renewal Application. As described in Permit Renewal Application Section 2.16, *Groundwater Monitoring*, groundwater at LANL is monitored under the 2016 Consent Order by the LANL Interim Facility-Wide Groundwater Monitoring Plan. There are no changes proposed to Permit Section 11.3.1, *Groundwater Monitoring* presented in the Permit Renewal Application Section 2.16. All known groundwater plumes are from SWMUs/AOCs, and are addressed under the Consent Order. As a courtesy, the most recent published plume maps for chromium and RDX are attached to this response (Attachment 2). These plume maps have already been provided in the *Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2020 Quarter 4,* submitted to NMED-HWB February 26, 2021, and *Investigation Report for Royal Demolition Explosive in Deep Groundwater*, submitted to NMED-HWB on August 29, 2019, located in the N3B electronic reading room, https://ext.em-la.doe.gov/eprr/readingroom.aspx?room=2. It should be noted that concentration/plume maps will change based upon data results.

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2. 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 electiondistrict) 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 oroperator 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 the 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.

Response:

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-HWB

Part B-Volume 1

3. Section 2.7.5, Preventing Undue Exposure of Personnel, page 2-7:

The information provided by the Permittees 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 undue exposure to personnel. The Permittees must revise this section to include additional information about the Permittees' plan to prevent undue exposure to personnel during treatment activities at the proposed OB and OD units. Additionally, the Permittees have not provided copies of the DOE Standard referenced in this section, *Industrial Hygiene Practices,* DOE-STD-6005-2001. This section must be revised to include information about steps that would be taken to prevent personnel exposure.

Response:

The revised Section 2.7.5, *Preventing Undue Exposure of Personnel*, includes the steps that are taken to prevent personnel exposure at all of the proposed permitted units and incorporates reference to where more detailed information is available for open detonation and open burning units. Attachment 4 of this response contains the revised section with red editing marks to highlight proposed changes to the section. The reference to the DOE Standard has been removed as it was inadvertently included in the Permit Renewal Application and is superseded by the requirements outlined in Title 10, Code of Federal Regulations, Part 851, *Worker Safety and Health Program*. There are no planned changes to the safety program at LANL or changes necessary to the Permit (other than those already proposed to Permit Attachment A) to incorporate the interim status units into the Permit as they fall under the same safety program as the other currently permitted hazardous waste management units.

NMED-HWB

4. 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 theatmosphere. 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 this information to NMED and the public.

Response:

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-HWB

5. Section 2.10.1 Seismic Standard, page 2-11:

See NMED Determination #2.

Response:

Please see response to #2.

NMED-HWB

6. Section 2.10.3, page 2-12:

See NMED Determination #1.

Response:

Please see response to #1.

NMED-HWB

7. Section 2, Figure 2-3 Wind Roses (Day and Night), page 2-24:

The Permittees have not provided adequate information regarding the wind roses referenced in Sections 4, 5, and Supplements 4-3 through 4-9, -12, and -13. It is unclear when the data used to generate these wind roses was collected, and how many total days of data are compiled in the figure (e.g., a single year of data, or the average of five years of data). The Permittees must revise this Application to provide additional details on what year or years are represented by the day and night wind roses. Wind roses appear to have been calculated based on data from meteorological stations distant from the proposed OB/OD units. Please provide a rationale explaining why these monitoring locations are representative of conditions at the proposed OB/OD units.

Response:

Permit Renewal Application Figure 2-3 is revised (in Attachment 4) to include the year and total days that the wind roses were based upon. These wind roses were drafted based on winds from all 365 days of 2018. In general, wind roses from different years are almost identical in terms of the distribution of wind directions, indicating that wind patterns are constant when averaged over a year. As detailed in the Los Alamos Climatology 2016 Update (http://permalink.lanl.gov/object/tr?what=info:lanl-repo/eprr/ESHID-602502), there are four meteorology towers on the mesa tops at LANL at TA-6, TA-49, TA-53, and TA-54. The TA-53 location was not included in the Permit Renewal Application figures because it was deemed to be too far from any of the hazardous waste management units within the Permit or units in interim status. The other three meteorology towers are included in the Permit Renewal Application because they are the closest towers to the permitted and interim status hazardous waste management units. The distance for the TA-6 tower to the interim status units is: TA-36-8, ~4.26 miles; TA-39-6, ~5.5 miles; and TA-16-388, ~1.4 miles. The distance from the TA-49 tower to the interim status units is: TA-36-8, ~1.13 miles; TA-39-6, ~2 miles; and TA-16-388, ~3 miles. For completeness and comparison, the day and night 5-year averaged wind roses for 2016 through 2020 are included as Attachment 5 of this response. The 5-year wind rose data further illustrate that the wind rose information for each of the towers demonstrate very little difference with the exception of the 2018 window roses that show slightly more intense winds over the single year average compared to the 5-year average.

NMED-HWB

8. Section 3 Specific Unit Information Requirements, page 3-1:

The Permittees have failed to include two units which are permitted to treat by neutralization and the proposed OB/OD units in this section. Revise this section to include additional subsections listing neutralization treatment units and thermal treatment units.

Response:

Permit Renewal Application Section 3.3, *Treatment in Containers*, included within Attachment 4 of this response is revised to include the updated name of the section and the locations of the two neutralization units: "TA-54, Area G, Pad 9, Dome 231 Perma-Con" and "TA-54, Area G, Pad 1, Building 412." Permit Renewal Application Sections 4.0 and 5.0 and subsections include the specific information requirements for open detonation units and the open burning unit, respectively.

Further, information is provided in Section 1.1, *Permit Application Overview*, where there is a discussion of the overall layout of the Permit Renewal Application. This section directs the reviewer to facility-wide, as well as site-specific unit information that is found within the Permit Renewal Application. This section refers to Section 3.0, *Specific Unit Information Requirements*, where the subsections describe the location of specific information requirements for each of the units that are included within the current Permit. The information requirements are broken down by unit type (e.g., container storage unit, stabilization in containers, etc.,) and identify the locations of that unit type.

NMED-HWB

9. Supplement 1-1, Redline Permit Parts 1-11, Table of Contents, page 5:

The revised table of contents is missing subsections; Permit Parts 5 and 6.

Response:

The revised table of contents is included in Attachment 6 of this response document.

NMED-HWB

10. Supplement 1-1, Redline Permit Parts 1-11, Section 5.1, page 99:

a. Supplement Permittees Statement: The Permittees shall conduct OD operations in accordance with this Permit Part, Attachment A (Technical Area Unit Descriptions), 40 CFR 265, Subpart P, 40 CFR§§ 268.7(b) and 40 CFR Part 270, which are incorporated by reference.

NMED Comment: The Permittees' reference to 40 CFR 265, Subpart P is incorrect since the Permittees are proposing to permit these units and not retain them as interim status units. However, NMED notes that 40 CFR 264 Subpart X does not have the same specificity as 40 CFR 265 Subpart P. Please revise this section to include a reference to 40 CFR 264 Subpart X Miscellaneous Units, 40 CFR 264 Subpart BB Air Emissions Standards for Equipment Leaks, as well as to other air quality permits relevant to the Permitted Unit.

Response:

A reference to 40 CFR 264, Subpart X, Miscellaneous Units, is included in the revised text in Attachment 6 the Permit Renewal Application Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11*, revised Section 5.1, *Management of Open Detonation Units*.

A reference to 40 CFR 264, Subpart BB, *Air Emissions Standards for Equipment Leaks*, is not added because the section is not applicable to the open detonation treatment operations located at LANL. 40 CFR 264.1050, *Applicability,* requires that there be equipment that "contains or contacts hazardous waste with organic concentrations of at least 10 percent by weight"; there is no equipment utilized in the operations that meet that definition. No pumps, compressors, pressure relief devices, sampling connection systems, valves, or lines are utilized in supplying hazardous waste to the units or holding waste at the units.

Additionally, the Permittees did not revise the application to include reference to other air quality permits because there are no relevant air quality permits for these units to add. Both open burning and open detonation activities at LANL fall well below the insignificant activity thresholds for Title V permitting under the New Mexico Administrative Code for Air Quality Operating Permits (20.2.70 NMAC). In Section 20.2.70.7.Q for Definitions, "insignificant activity" thresholds means those activities which have been listed by the department and approved by the administrator as insignificant on the basis of size, emissions or production rate. The determination of insignificant activities for operating permits is based on the descriptions and methodology outlined in the List of Insignificant Activities provided by NMED- Air Quality Bureau for the Operating Permit Program dated March 24, 2005. Specifically open burning and open detonation determinations for emissions were evaluated based on Subsection D.6 of 20.2.70.300 NMAC (1.a and 1.b) as described in the NMED List of Insignificant Activities.

NMED-HWB

b. 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 Guideline*s Section 2.2.5 recommends prohibiting thermal treatment of biologic or chemical warfare weaponry, depleted uranium, and small arms ammunition up to 50 calibers.

Include the information on wastes that will be prohibited from treatment at the OD units.

Response:

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-HWB

11. 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 OD operations 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.

Response:

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-HWB

12. 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 units. Please provide a rationale for this frequency and propose a similar deadline for the OD unit.

Response:

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-HWB

13. Supplement 1-4, Permit Attachment D, Section 2, page D-16:

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).

Response:

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-HWB

14. Supplement 1-5, Permit Attachment E.4.1, page E-10:

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 check list) 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.

Response:

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 then 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-HWB

15. 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 timeframe, the proposed analytical suite must be expanded to account for lack of this knowledge.

Response:

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-HWB

Part B-Volume 2

General Comments-Supplement 4:

16. The Permittees state that waste is determined to be HE waste but have not provided documentation on how this waste determination was made, and what test or criteria were used by waste personnel to make this determination. In particular NMED is interested in the methods used, or will be used, to determine if HE contamination exists on combustible and non-combustible debris.

Response:
The waste determinations including testing and criteria for explosives and explosives-contaminated waste streams are included in the Permittees proposed changes to Permit Attachment C, *Waste Analysis Plan*, as referenced Section 4.2, *Waste Characterization and Acceptance*, and Section 5.2, *Waste Characterization and Acceptance*, within the Part B Application, Volume 1 of the Permit Renewal Application. Specific information regarding waste characterization for explosives waste streams is included in the proposed changes to Section C.3.1.4, *Characterization of Waste to be Treated by Open Burning and Open Detonation*, of the Waste Analysis Plan. No changes are made to the Permit Renewal Application to address this comment; however, the Permittees have removed proposed change to Permit Attachment C to address any prohibited wastes as required by NMED-HWB Determination 10b. The content within Appendix 4, *Open Detonation and Open Burning Information*, and the supplements provided in this appendix should not be reviewed without the context provided in Section 4.0, *Open Detonation Treatment* and Section 5.0, *Open Burning Treatment,* within Volume 1 of the Part B Application. The main sections within the Permit Renewal Application provide the intent of the technical information within Appendix 4 and the supplemental information provided.

NMED-HWB

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

a. 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.

Response:
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 then 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-HWB

b. Table 1-2 provides quantities of explosives treated at TA 36-8 and TA 39-6 OD Units from 2012-2020 by waste stream. 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.

Response:

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

	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	1025	0	0	0	0	0	0	0	1025
2012	206	12	0	0	0	0	0	0	218
2013	274	0	0	0	0	0	0	20	294
2014	5	2	0	0	0	0	0	0	6
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

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-HWB

18. 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.

Response:
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-HWB

19. Supplement 4-4 :

- **a.** The Permittees have not provided standard sampling information with this submittal, such as field notes, chain of custody, and copies of the third-party laboratory analysis which is typically provided with data, please review Permit Part 11.10.2.14, Documentation of Field Activities for the requirements.
- **b.** The Permittees have not provided adequate descriptions of sampling procedures and have instead referenced internal standard operating procedures. The Permittees have not provided copies of those procedures, in accordance with Permit Part 11.10.2.9, Sample Handling, and Permit Parts 11.10.3.3, Blanks, Field duplicates, Reporting Limits and Holding Times. It is unclear if the samples were collected in accordance with EPA SW-846 methods. The sampling procedures must be revised to provide more detail to demonstrate that sample were collected in accordance with current EPA SW-846 methods.
- **c.** The Permittees statement "Data were collected following the standard data collection procedures" does not provide adequate description of data collection methods or quality controls utilized by the Permittee or analytical laboratory as described in Permit Part 11.10.3.
- **d.** 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 tohuman 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.

Response:

In response to the technical information requested, the Permittees provide the following information:

a. With respect to documentation of field activities, in Supplement 4-4 the Permittees have summarized and described the collection of the samples, shipment of the samples, and the third-party analyses of those samples. Copies of available documentation (chains of custody with field notes and analytical data packages) are provided as part of the electronic copy of this response to aid in the technical review of this supplemental information.

b. Although procedures were not provided to the NMED-HWB for review, the processes for sample handling are described within the summary report, as is the collection of blanks and field duplicates. The samples were not collected in accordance with SW-846 methods, as the media sampled was not waste. The air sampling procedures described within the summary indicate adherence to the U.S. Environmental Protection Agency (EPA) TO-9A method and described the process for dioxin and furan sample collection in detail and the standard operating procedure referenced in the summary report was utilized for all high volume air samples collected at the time.

c. As stated in the response to Item #19a., the descriptions in the summary report include the data collection methods and quality controls utilized in the process of sampling. Additionally, the specific third-party analytical laboratories are named within the summary report to aid with identifying the integrity of the chemical analysis. Lastly, the Excel files included within the electronic copy of the Permit Renewal Application include information on the adherence to quality control and quality assurance requirements during chemical analyses.

d. 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*.

Permit Renewal Application Section 4.18.3, *Protection of Atmosphere,* provides context for the sampling and analysis information included within Supplement 4-4, *Air Sampling at Open Detonation Units*, and the information should be reviewed together. The supplement was drafted as part of the permit application process and not as a proposed environmental investigation, corrective action, or sampling or monitoring to be conducted under the LANL Hazardous Waste Facility Permit. Therefore, review and approval by the NMED-HWB was not sought, and Permit Section, 11.10, *Methods and Procedures*, was not implemented as part of the drafting of this document in 2011. As input to the application process, the Permittees utilized best available air sampling technology to test if parameters of concern could be measured in the air to provide additional data to the air modeling. The method for air emissions estimation is recommended by EPA guidance. The information is provided as background information only, because the air modeling assessment provides the information necessary for compliance.

NMED-HWB

20. **Supplement 4-*5***

a. ***Laboratory Analysis and Reporting* pages 1 and 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 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 PCB 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.

b. ***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 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.

Response:

In response to the technical issues above, the Permittees provide the following information:

a. 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.

b. 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-HWB

21. Appendix 4: Supplement 4-6 Soil Sampling Results Summary Report for the OD Unit at TA 39-6

a. *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 soil as noted in the 2011 sampling report. The Permittees must provide additional information to address the following issues are noted by NMED:

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

Response:

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-HWB

22. Appendix 4: Supplement 4-7 Open Detonation Unit at Technical Area 36 Human Health and Ecological Risk-Screening Assessments

a. ***Executive Summary* page ii:**
The risk assessment does not address the potential for contaminants in 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 soil to groundwater results.

b. **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 riskassessment.

Response:
The Permittees provide the following to address the technical issues above:

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

It should be noted that the Permit Renewal Application includes three open detonation risk assessments for completeness to the administrative record. Supplement 4-7, *Open Detonation Unit at Technical Area 36 Human Health and Ecological Risk-Screening Assessments*; Supplement 4-8, *Open Detonation Unit at Technical Area 39 Human Health and Ecological Risk-Screening Assessments*; and Supplement 4-9, *Revision of 2011 Open Detonation Risk Assessment*, were all included to provide an overall assessment of all the open detonation units and the respective associated risks at the units, and to summarize the soil monitoring that has occurred at the units to date. Permit Renewal Application Section 4.18.2.2, *Soil Surface Monitoring,* provides context for the risk assessments and soil monitoring activities conducted at each of the sites and the information should be reviewed together for an overall assessment at the open detonation units. Supplements 4-7 and 4-8 provide the current monitoring (and associated risk) at each of the open detonation units. Additionally, because the NMED-HWB had previously provided comments to the 2011 version of Supplement 4-9 (*Notice of Disapproval Permit Modification Request Open Detonation Units at Technical Areas 36 and 39 Attachments E and G*, HWB-LANL-11-052), the Permittees determined that a revised version of the risk assessment was appropriate and necessary for the completeness of administrative record.

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

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

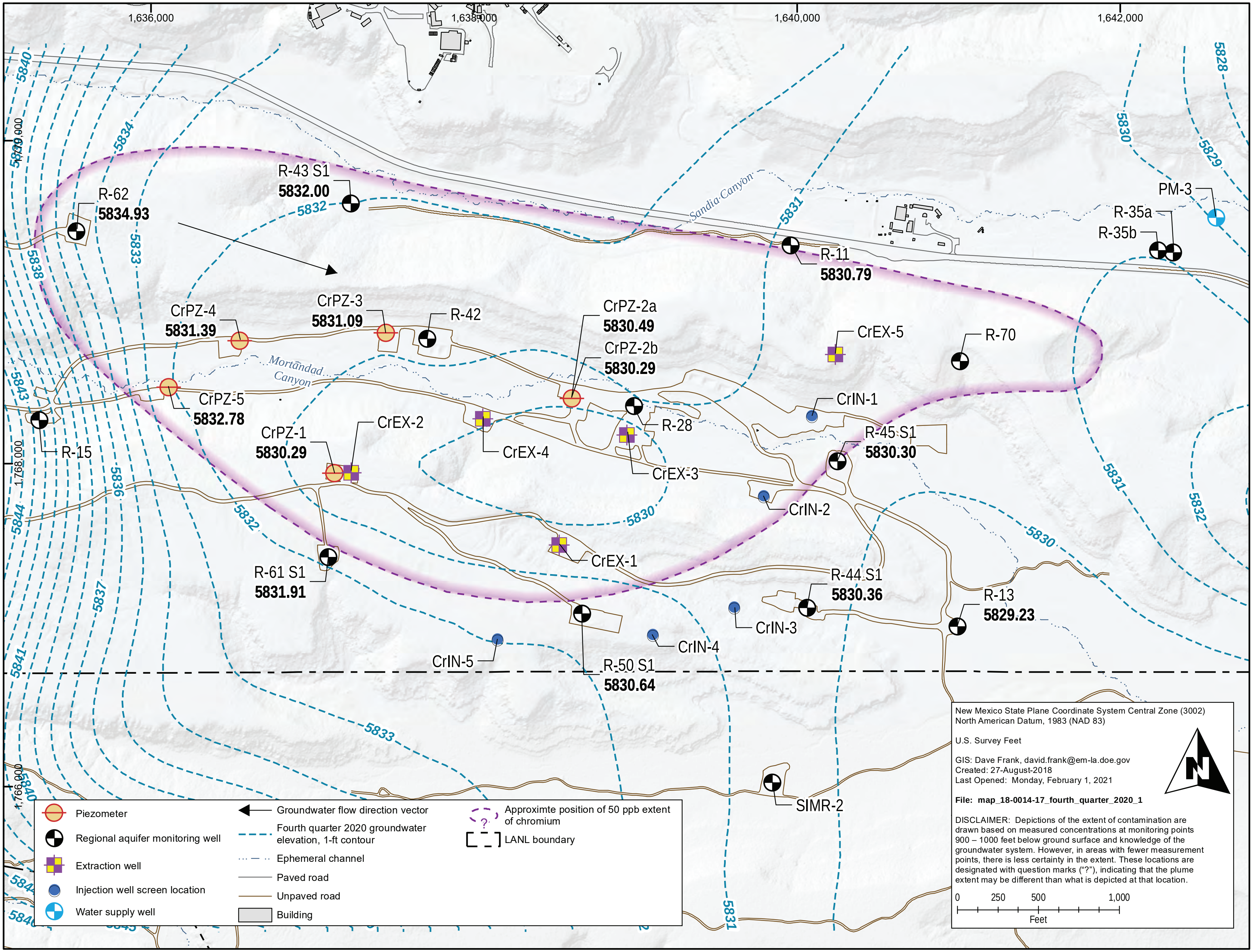
NMED Determination	Response Location	Summary of Changes
General Part A		
1	Attachment 2	No changes proposed.
2	Attachment 3; Permit Renewal Application (Application) Section 2.10.1 page 2-13 (Attachment 4)	The Permittees provide a seismic report for the proposed open burning and open detonation units at TA-16-388, TA-36-8 and TA-39-6 to address 40 CFR 270.14 (b)(11) .
Part B – Volume 1		
3	Attachment 4, Permit Renewal Application Section 2.7.5, page 2-7	The Permittees revised the Permit Renewal Application (Application) to include steps that are taken to prevent personnel exposure at all of the proposed permitted units.
4	Attachment 4, Permit Renewal Application Section 2.7.6, pages 2-8 and 2-9	The Permittees revised to Application to provide references in Section 2.7.6 pointing to where releases to the atmosphere information is presented in the specific sections for the proposed open burning and open detonation units in Sections 4.7.6 and 5.7.6.
5		See response to NMED Determination 2.
6		See response to NMED Determination 1.
7	Attachment 4, Permit Renewal Application, Figure 2-3, page 2-22 and Attachment 5	Figure 2-3 now includes the year and total days the wind roses were based on. Attachment 5 includes the day and night 5-year averaged wind roses from 2016 through 2020.
8	Attachment 4, Permit Renewal Application Section 3.3, page 3-2	Section 3.3 is revised to include the updated name of the section and the locations of the two neutralization units: TA-54, Area G, Pad 9, Dome 231 Perma-Con and TA-54, Area G, Pad 1, Building 412.
9	Attachment 6, Proposed Changes to Permit Parts 1- 11, pages 1-21	The revised Table of Contents is provided with subsections for Permits Part 5 and 6.
10a	Attachment 6, Proposed Changes to Permit Parts 1- 11, section 5.1, page 100	A reference to 40 CFR 264, Subpart X, Miscellaneous Units was added to the Application.

NMED Determination	Response Location	Summary of Changes
10b	Attachment 6, Proposed Changes to Permit Parts 1-11, Section 5.2, pages 100-101 and Attachment 7, Proposed Changes to Waste Analysis Plan, Section C.1.2.1, Table C-5, and Table C-9	A section regarding prohibited waste was added to the suggested changes in Permit Part 5 and references to waste streams that are not consistent with the waste explosives definition are removed from Supplement 1-3, Permittees' Proposed Changes to Attachment C, Waste Analysis Plan.
11	Attachment 6, Proposed Changes to Permit Parts 1-11, 1; Permit Section 5.2.3.2, pages 101-102	Descriptions of weather conditions under which treatment activities are prohibited are added to the revised sections of the application. Reference to the "Red Flag" conditions have been removed.
12	Attachment 6, Proposed Changes to Permit Parts 1-11, 1; Permit Part 6	Proposed language regarding alternatives assessment is removed from revised proposed Permit Part 6 (Supplement 1-1; Attachment 6). Application Supplement 4-1 presents the Permittees' alternatives assessment. The updated assessment is included as Response, Attachment 8.
13	Response document	No changes proposed.
14	Attachment 4, Permit Renewal Application Section 4.12.2, pages 4-10 and page 4-12	Revised language regarding how notifications are conducted and how meteorological data is accessed at the proposed open detonation units. Attachment 4 revised in redline to include additional information. No changes made to Attachment E.
15	Response document	No changes proposed.
Part B – Volume 2		
16	Attachment 7, Proposed Changes to Waste Analysis Plan, Section C.3.1.4	No changes are made to the Permit Renewal Application to address this comment.
17a	Attachment 8, Revised Assessment of Alternatives, Section 6.3 and Table 6-3	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.
17b	Response document	No changes proposed.
18	Response document	No changes proposed. Raw data included in electronic format as part of Response document.
19a	Response document	No changes proposed. Documentation of field sampling and analysis provided in electronic format with the Response document.
19b	Response document	No changes proposed.

NMED Determination	Response Location	Summary of Changes
19c	Response document	No changes proposed.
19d	Response document	No changes proposed.
20a	Response document	No changes proposed.
20b	Response document	No changes proposed.
21	Response document	See response to #20 regarding 2018 PCB data. See response to #22 for information regarding the drafting or reorganization of risk assessments within the Permit Renewal Application.
22a	Response document	No changes proposed.
22b	Response document	See response to #20 and explanation provided as part of response.

Attachment 2

Maps of Groundwater Contamination Plumes at LANL



Ground Water Elevation Contour and Approximate Extent of 50 ppb Chromium Plume Map, Mortandad Canyon, CY 2020, Quarter 4

From: Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835 (EM2021-0056)

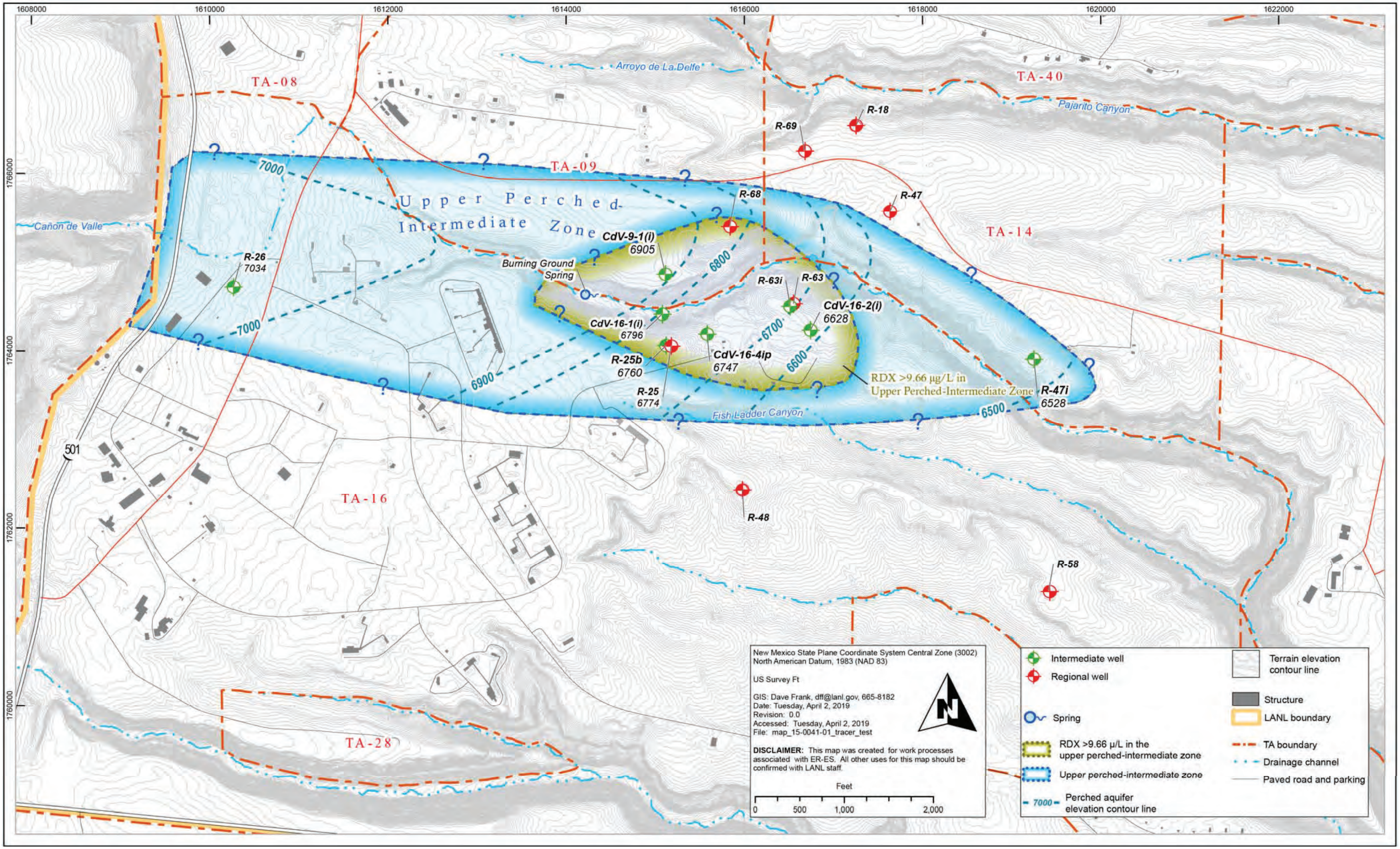


Figure 3.1-3 Map showing RDX extent and water table contours for the upper perched-intermediate groundwater zone at TA-16

Note: Green inner zone is extent of RDX contamination >9.66 µg/L in the upper perched-intermediate groundwater (LANL 2015, 600535).

Attachment 3

Seismic Location Standards Evaluation for three open burning / open detonation locations under consideration for permitting under the Resource Conservation and Recovery Act at Los Alamos National Laboratory: Technical Areas 16, 36, and 39

To: Oral Saulters, EPC-WMP
Luciana Vigil-Holterman, EPC-WMP
Patrick Padilla, EPC-WMP
From: Emily Schultz-Fellenz, EES-14
Anita Lavadie-Bulnes, EES-14
Elizabeth Miller, EES-14
Date: May 21, 2021

Seismic Location Standards Evaluation for three open burning / open detonation locations under consideration for permitting under the Resource Conservation and Recovery Act at Los Alamos National Laboratory: Technical Areas 16, 36, and 39

1 Introduction

To address the New Mexico Environment Department's comments to the Resource Conservation and Recovery Act (RCRA) permit renewal application, incorporating three long-standing open burning and open detonation units at the facility, this memorandum summarizes geologic investigations at and around three separate sites of the Los Alamos National Laboratory (LANL or "the Laboratory") in Los Alamos County, New Mexico. These sites include:

- an open burning treatment unit - the "Flash Pad" site at Technical Area (TA) 16 (TA-16-388);
- an open detonation unit - Minie Site at TA-36 (TA-36-8); and
- a second open detonation unit - Point 6 at TA-39 (TA-39-6).

Portions of new facilities where treatment of hazardous waste occur must adhere to seismic location standards as identified in the Code of Federal Regulations, Title 40 (40 CFR), Part 264.18. Part of these requirements include that such facilities will not be located within 200 ft (61 m) of a fault that has experienced displacement in the Holocene time period, i.e., within the last 11,700 years. The guidelines used to demonstrate compliance with the aforementioned location standard are presented in 40 CFR, Part 270.14(b)(11).

Context and details on the construction, relevant operational history, and intended use under RCRA permit guidelines can be found in the Permittees Permit Renewal Application, consisting of the *Los Alamos National Laboratory (LANL) General Part A Permit Application, Revision 10.0*; and Volumes 1 and 2 of the *Part B Permit Application for Renewal of the Los Alamos National Laboratory Hazardous Waste Facility Permit.*

In this memorandum, we address the three sites' adherence to the seismic location standard through presentation and summarization of published geologic data. We begin with a brief overview of the general geologic setting of the Laboratory, including a Pajarito Plateau-scale map of faults and lineaments to provide context for the geologic structural (faults) setting at each of the three sites. Next, we summarize pertinent regional-scale geologic studies and lineament mapping from the mid-1980s to the early 1990s; these studies provided important control on the known extent of possible faults in the TA-16, TA-36, and TA-39 areas. Then we present regional- and local-scale geologic studies near each of the three sites from best available published studies for purposes of evaluating Holocene seismic surface rupture potential at the three sites. In the case of more recent geologic investigations at TA-16 in particular, these studies examined whether previously mapped lineaments were surface-rupturing faults or fractures. We also include geospatial analyses of aerial photography covering a 5-mile (8 km), 3000 ft (915 m), and 200 ft (61 m) radius of each facility and conclude with a brief summary of observations and geologic site characteristics.

1.1 Definitions

The following technical terms are used frequently throughout this document, and merit consistency in their definition and use. Definitions are taken from The Dictionary of Geological Terms (Bates and Jackson, eds., 1984).

Displacement: a general term for the relative movement of the two sides of a fault, measured in any chosen direction; also, the specific amount of such movement. Within this report, "displacement" and "offset" are interchangeable terms.

Holocene: an epoch or time interval of the Quaternary period, from the end of the Pleistocene, approximately 8 thousand years ago (ka) (*sic*; Ogg et al. (2008) have updated the beginning of the Holocene to 11.7 ka) to the present time.

Fracture: a crack, joint, fault, or other break in rocks.

Fault: a fracture or fracture zone along which there has been displacement of the sides relative to one another parallel to the fracture.

Lineament: a linear topographic feature of regional extent that is believed to reflect crustal structure. Examples are fault lines, aligned volcanoes, and straight stream courses.

Note: the definition of "lineament" does not imply that such an identified feature is actually a surficial manifestation of crustal structure with recent tectonic activity (e.g., a fault) until the local geology is evaluated. Additionally, unless otherwise clarified through detailed field examination or other means, the definition of "fault" does not imply a tectonic mechanism for genesis and/or growth; the definition also does not imply that each "fault" is independently seismogenic. Features defined as faults through geologic mapping must be considered in the context of the surrounding geology before their mechanism of formation is determined.

2 General Geologic Setting of the Laboratory

The Pajarito Plateau is a high volcanic tableland in north-central New Mexico, bounded on its western edge by the Pajarito fault system (PFS). The PFS is a 30-mile-long (50-km-long) system of normal faults, including the down-to-the-east Pajarito fault (the master fault) and subsidiary down-to-the-west Rendija Canyon, Guaje Mountain, and Sawyer Canyon faults (Figure 1). This fault system is thought to form the local active western margin of the Rio Grande rift near Los Alamos. The Pajarito fault system is thought to have been active since approximately the middle Miocene epoch, or approximately 14 ka (Kelley, 1979; Lewis et al., 2009). The Pajarito, Rendija Canyon, and Guaje Mountain faults of the PFS exhibit evidence of at least one earthquake (or probable movement) during the Holocene (Gardner et al., 1990; Wong et al. 1995; Kelson et al. 1996; McCalpin 1998, Wong et al., 2007; Lewis et al., 2009; Lettis Consultants International, 2019). It should be noted that data are lacking across the PFS that temporally correlates paleoearthquake activity across multiple segments (LCI, 2020).

The local bedrock at LANL is the Bandelier Tuff, which formed in two eruptive pulses from the Valles caldera, located approximately 4.67 miles (7.5 km) west of TA-16-388 at LANL. The older member of the Bandelier Tuff, the Otowi Member (Qbo), has been dated at 1.61 million years (Ma) (age from Izett and Obradovich 1994). The younger member of the Bandelier Tuff, the Tshirege Member (Qbt), has been dated at 1.256 Ma (age from Phillips et al. 2007) and is widely exposed as the mesa-forming unit around Los Alamos. Tephras and volcaniclastic sediments of the Cerro Toledo interval (Qct) separate the two members of the Bandelier Tuff. Several discrete subunits comprise the Tshirege Member of the Bandelier Tuff (Figure 2); these subunit contacts have been used by LANL geologists to confirm the presence or absence of faults in specific areas. Broxton and Reneau (1995) and Lewis et al. (2009) describe in detail the commonly accepted stratigraphic nomenclature of the Tshirege Member of the Bandelier Tuff. Since the Pajarito fault system has been active since approximately 14 ka, the Pajarito fault system predates the deposition of the Bandelier Tuff (Kelley, 1979; Lewis et al., 2009).

2.1 Geologic Setting of TA-16

TA-16 sits between Cañon de Valle and Water Canyons in the southwestern portion of LANL (Figure 1). The Qbt subunits exposed in the TA-16 area are predominantly Qbt3, Qbt3T, and Qbt4. Much of the mesa tops within TA-16 also include younger geomorphic units, such as older alluvium. Select areas of these mesa-top regions of TA-16 also preserve primary and reworked deposits of the El Cajete pumice, or Qec. Qec is the youngest known eruptive unit produced by the Valles-Toledo caldera complex , and its age has been most recently constrained at 74 ka (Zimmerer et al., 2016). Based on subsurface geologic analysis, the presence and position of these major canyons is thought to pre-date the deposition of the Bandelier Tuff (D. Broxton, unpublished data).

At the southwestern corner of the Laboratory, at the western side of TA-16 adjacent to West Jemez Road (NM State Road 501), the Pajarito fault and its subsidiary faults are prominent. TA-16 lies at the base of the main, 400-foot (122-m) high escarpment formed by the Pajarito fault. From the escarpment, faulting and related deformation extend at least 5000 ft (1,524 m) to the east. However, most of the structural deformation east of the main escarpment occurs within a zone that is about 2000 ft (610 m) wide. Much of the TA-16 region has been mapped at 1:1200 scale by LANL geologists (Gardner et al., 2001; Lewis et al., 2009).

The TA-16-388 site is adjacent to Material Disposal Area (MDA) P. This region, along with the TA-16-260 outfall area (a site not under consideration within this memorandum) have been geologically characterized in detail by a number of studies undertaken by the former LANL Environmental Restoration (ER) program (e.g., Broxton et al., 1996, 2002; Warren et al., 1997; LANL ER Project, 1998). These studies focused on constraining subsurface geologic parameters for the purpose of constructing a three-dimensional subsurface stratigraphic model in support of removal of waste items and clean-up activities. These studies did not focus on identification of faults, their ages of activity, or surface rupture potential.

2.2 Geologic Setting of TA-36

TA-36 sits within Fence Canyon, between Potrillo Canyon to the north and Water Canyon to the south, in the south-central part of LANL (Figure 1). The site is situated near the Fence Canyon headwaters region. The local bedrock is the Bandelier Tuff, with primary exposures of units Qbt3 and Qbt2. This technical area is included within 1:24,000 scale geologic quadrangle mapping. This site is located 2.4 mi (3.8 km) E of the main Pajarito fault, and approximately 3.1 miles (5 km) SSE of the southernmost mapped extent of the antithetic Guaje Mountain fault (Figure 1).

2.3 Geologic Setting of TA-39

TA-39 sits within Ancho Canyon in the southeastern portion of LANL (Figure 1). The local bedrock is the Bandelier Tuff, with primary exposures of units Qbt1 and Qbt2. This technical area is included within 1:24,000 scale geologic quadrangle mapping. TA-39-6 is the easternmost site within LANL considered for possible RCRA permit, located 2.5 mi (4 km) east of the main Pajarito fault, and approximately 4.67 mi (7.5 km) SSW of the southernmost mapped extent of the antithetic Sawyer Canyon fault (Figure 1).

3 Regional-Scale Geologic Studies, mid-1980s to early 1990s

This section reviews pertinent regional-scale geologic studies and lineament mapping that have been conducted on the Pajarito Plateau in order to provide context for site-specific studies discussed later in this memorandum.

3.1 Geologic Quadrangle Mapping

Goff et al. (2001) completed geologic and structural mapping of the Frijoles quadrangle at 1:24,000 scale. The Frijoles quadrangle covers much of the LANL campus, except for the easternmost regions. Goff et al. (2001) identified no surficial geologic faults in the vicinity of TA-16-388 or TA-36-8. From the mapping at this scale, the geology of TA-16-388 includes Qbt, older Quaternary alluvium, and the El Cajete pumice. At TA-36-8, the site geology at the site includes Qbt and Quaternary alluvium.

Dethier (1997) completed geologic and structural mapping of the White Rock quadrangle at 1:24,000 scale. The White Rock quadrangle covers the easternmost portions of LANL. The map identifies approximately three small faults on the southern side of Ancho Canyon near its intersection with the Rio Grande Gorge at White Rock Canyon. However, it must be noted that due to edge effects between the quadrangle boundaries, portions of TA-39, including the specific TA-39-6 site, are not included on either the Frijoles or White Rock geologic quadrangle maps.

3.2 Lineament Mapping via Aerial Photographs

Early geologic studies, performed before the fine detail of the Bandelier Tuff subunits were well-understood and before any high-resolution geologic mapping was performed, noted prominent lineaments identified through aerial photographic analysis (Dransfield and Gardner, 1985; Vaniman and Wohletz 1990; Wong et al. 1995; Olig et al. 1996; Rogers et al. 1996). These aerial photographic lineaments project through the central and eastern sectors of LANL. It is not clear whether these lineaments correlate with surface exposures or subsurface projections of the Rendija Canyon, Guaje Mountain, and Sawyer Canyon faults. Dransfield and Gardner (1985) hypothesizes that the lineaments could correlate to surficial manifestations of eroded fracture zones propagating upward from the subsurface trace of the faults. At the time of Dransfield and Gardner's publication, LANL had not yet undertaken a detailed surficial mapping campaign to verify the southern extent of surface traces of these antithetic components of the Pajarito fault system. It has also been hypothesized that these lineaments may be subsurface paleotopographic features related to either old faulting (cf. Lewis et al., 2002) or deposition of geologic units, e.g., the Cerros del Rio basalts in the eastern and central portions of LANL, that predate the deposition of Qbt and Qbo (cf. WoldeGabriel et al., 2001) and are unrelated to recent fault activity.

4 Regional- and Local-Scale Geologic Studies, early 1990s to present

Site-specific geologic studies provide important constraints on the location, size, distribution, and implications of known faults located proximal to TA-16, TA-36, and TA-39. However, the presence of high-hazard category facilities in select areas of LANL have resulted in detailed site-specific local geologic studies only within certain LANL technical areas. As such, detailed geologic investigations have taken place at TA-16 but geologic investigations focused specifically at TA-36 and TA-39 are minimal. This section summarizes key results from local geologic studies that are pertinent to these three sites. Given TA-16's proximal location to the main Pajarito fault, the following summaries focus on fault presence and rupture potential within this zone.

4.1 Kolbe et al. (1994): Evaluation of the Potential for Surface Faulting at the Proposed Mixed Waste Disposal Facility, TA-67

This study's detailed investigations at this site are the closest site-specific studies conducted to TA-36-8 (2.2 mi/3.6 km SSE from TA-67) and TA-39-6 (4.3 mi/6.9 km ESE from TA-67). This study excavated numerous trenches on Pajarito Mesa across the southern extent of the Rendija Canyon fault near TA-67. These trenches show evidence for several near vertical faults within a zone 100 ft (30 m) wide roughly coincident with an aerial photographic lineament along the strike of the easternmost trace of the southern Rendija Canyon fault; displacement is less than 2 ft (0.6 m) down-to-the-west and does not offset the most recent Valles caldera eruptive deposits (e.g. El Cajete pumice). Kolbe et al. (1994) concluded that active faulting on Pajarito Mesa near TA-67 has been absent for at least the last 50-60 ka.

4.2 Reneau et al. (1995): Surficial Materials and Structure at Pajarito Mesa

Similar to the study by Kolbe et al. (1994), the investigations of Reneau et al. (1995) at TA-67 are the closest site-specific studies conducted to TA-36-8 (2.2 mi/3.6 km SSE from TA-67) and TA-39-6 (4.3 mi/6.9 km ESE from TA-67). A proposed mixed waste disposal facility at Pajarito Mesa prompted geologic surface mapping, high-precision total station mapping, and exploratory trenching around TA-67. At the time of this study, it was postulated that young surface faulting associated with the Rendija Canyon fault might trend southward from the Los Alamos townsite, directly through TA-60, TA-48, and TA-64. Previous studies (including Dransfield and Gardner, 1985) had shown southern projections of the Rendija Canyon and Guaje Mountain faults through Pajarito Mesa. The geological mapping and trenching of

Reneau et al. (1995) showed that faulting had affected Pajarito Mesa in the past, but the faulting is more complicated than previously inferred by Dransfield and Gardner (1985). Both down-to-the-east and down-to-the-west faulting is seen at Pajarito Mesa. These small faults were identified through conventional geologic mapping and mesa-edge investigations. Their lateral continuity could not be constrained, so these small faults are identified on maps as point-locations of offset on Tshirege Member subunits (cf. Plate 1). A full paleoseismic history was not determined through the trenching investigations of this study, but it was determined that faults did not affect geologic units younger than 50-60 ka. No increase in fracture density across the projections of the Rendija Canyon or Guaje Mountain faults was seen, and a detailed geodetic survey of pyroclastic surge beds showed no displacement of the Bandelier Tuff subunits along the Rendija Canyon fault projection.

4.3 Self et al. (1996): Field excursions to the Jemez Mountains, New Mexico

The bulletin report of Self et al. (1996) compiles information from two separate but interrelated field guides of the Jemez Mountains into a single document. Information presented in Self et al. (1996) includes a field guide developed to support the 1989 International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI), complete with stop locations and information on geologic observations and conditions at those locations. This road log included three specific stops along NM Highway 4 at and near Ancho Canyon, and adjacent to the public highway access to LANL's TA-39. These road logs indicate that in this area, Qbt thickens from a few meters to over 200 m thick over a lateral distance of less than 1 km, due to paleotopography. At the NM Highway 4 road cut south of the TA-39 access road, correlative with IAVCEI's Stop 21, the oldest Qbt subunit is exposed, which is expressed as a bedded, crystal-rich tuff occurring between welded and vapor-phase altered horizons. The road log neither notes nor describes any faults or related geologic structures at the Ancho Canyon locations.

4.4 Reneau and McDonald (1996): Landscape History and Processes on the Pajarito Plateau, Northern New Mexico

Reneau and McDonald (1996) developed a guidebook in support of a field trip organized by the Friends of the Pleistocene. This guidebook offers a broad summary of studies related to the recent geologic and geomorphic history of the Pajarito Plateau. Within the Day 1 road log, a number of stops describe details of the geology and geomorphology near Ancho Canyon and TA-39. The field guide notes that Ancho Canyon within TA-39 exposes both the Tshirege and Otowi Members of the Bandelier Tuff, and dacite-rich alluvial deposits exist between those units in some canyon wall exposures. Similar to that reported by Self et al. (1996), Reneau and McDonald (1996) describe in additional detail the paleodrainage systems preserved in outcrop, as well as the classic roadcut exposure of Qbo, a thin colluvial soil, the Tsankawi Pumice, and the nonwelded Tshirege Member subunit Qbt1-g. Within Qbt1-g at this location are distinct zeolitized zones, thought to have formed due to hydrolysis of the vitric ash in a saturated environment shortly after deposition. The zeolitization expressed at this particular roadcut is not isolated to this location, but is thought to be prevalent across the Pajarito Plateau. The road log neither notes nor describes any faults or related geologic structures at the Ancho Canyon locations; other portions of the road log and field guidebook include extensive discussions on faults in other locations.

4.5 Gardner et al. (2001): Geology of the Pajarito fault zone in the vicinity of S-Site (TA-16), Los Alamos National Laboratory, Rio Grande rift, New Mexico

Gardner et al. (2001) gathered structural geologic data for the TA-16 region of LANL using high-precision geologic mapping, conventional geologic mapping, stratigraphic studies, drilling, and petrologic studies. This study found that in the TA-16 region, the Pajarito fault is comprised of four clearly definable sets of structures: north trending faults and one large monocline marking the main zone of deformation of the Pajarito fault system, and defining a graben in the southwestern corner of the technical area; north-northeast trending faults and fissures which bound the eastern side of the graben; northeast trending structures, dominated by two down-to-the-west monoclines; and an east-southeast trending fault. These structural elements are similar to those identified and mapped farther north along the Pajarito fault system by Gardner et al. (1999). In addition, the study recognized similar variable styles of deformation on structures as reported by Gardner et al. (1999), and as such, Gardner et al. (2001) interpreted all structures in the study area to be related to deeper seated normal faulting. In general, the structural setting of TA-16 appears similar in many respects to the setting of TA-3 to the north (Gardner et al., 1999). At both locations a relatively narrow graben, about 1000 feet wide, lies at the base of and parallel to the main escarpment of the Pajarito fault. Structure to the east of the narrow graben is dominated by north-northeast and northeast trending normal faults and monoclines, all of which show significant net down-to-the-west displacements on Bandelier Tuff. To the west of TA-16, the main Pajarito fault exhibits evidence for approximately 400 ft (122 m) of displacement in the last 1.256 million years.

4.6 Lewis et al. (2002), Geology of the Western Part of Los Alamos National Laboratory (TA-3 to TA-16), Rio Grande Rift, New Mexico

Lewis et al. (2002) collected data to improve the understanding of the geology, stratigraphy, geomorphology, and geologic structure of LANL from TA-3 to TA-16 using similar methods to those employed by Gardner et al. (2001), including high-precision geologic mapping, conventional geologic mapping, stratigraphic studies, drilling, and petrologic studies. This study also included logging of a gas pipeline trench at TA-9, on the north side of Canon del Valle from TA-16-388. This study produced a detailed geologic and structural map of the TA-3 to TA-16 area, and found that in northern TA-16, faulting is present but distributed, and includes short-length, small-displacement subparallel segments oriented predominantly north-south.

4.7 Lewis et al. (2009), Fault interaction and along-strike variation in throw in the Pajarito fault system, Rio Grande rift, New Mexico

This study aggregated, synthesized, and published in a peer-reviewed journal the detailed geologic mapping performed by Gardner et al. (1999, 2001), Lewis et al. (2002), and others. Furthermore, the study analyzed the variation in fault displacement, or throw, at different locations along the fault's length from its southern termination near Cochiti to its northern boundary near Santa Clara Canyon, in order to assess the interaction of the Pajarito fault system with neighboring fault systems within the Rio Grande rift. The paper also presented previously unpublished analyses on past earthquake timing and recurrence on the Pajarito fault system.

4.8 Lettis Consultants International, Inc. (2019), Pajarito Fault System Paleoseismic Trenching Project: Phase 1 Report, Los Alamos, New Mexico

Under subcontract to LANL, Lettis Consultants International Inc. conducted a paleoseismic trenching project that involved detailed geologic and geomorphic mapping for trench siting, trench excavation and logging, and detailed post-fielding analysis including samples to establish ages of paleoseismic events identified in the trenches. The report includes discussion on two trenches excavated in the extreme western portions of TA-16, approximately 8,200 ft (2.5 km) SSW of TA-16-388, on an antithetic down-to-the-west fault facing the main Pajarito fault. Both trenches at the TA-16 site contained evidence for a single Holocene paleoearthquake at this site, but the timing of this most recent event (MRE) at this site is poorly constrained using optically-stimulated luminescence age dating techniques on quartz grains taken from within and above the fault plane. The stratigraphic and relative age data developed within the two trenches at the TA-16 site suggest the MRE occurred less than 5.7 ka, and involved approximately 5.9 - 7.9 in (15-20 cm) of dip displacement across the fault at this location. The study also includes discussion of scientific analyses and assessments from four additional trenches in two separate sites west of West Jemez Road/NM Highway 501. In contrast to the conclusions of Lewis et al. (2009), the work of Lettis Consultants International Inc. concludes that paleoseismic analyses from modern trenches on multiple strands of the main Pajarito fault shows evidence for only one Holocene earthquake.

4.9 Microseismic Monitoring and Analyses

The Los Alamos Seismic Network (LASN), owned and operated by Los Alamos National Laboratory's Seismic Hazards Program, maintains 14 seismic stations in and around Los Alamos County (Figure 3). The most recent update to the LASN catalogue includes events recorded through 2013 (ref?). All earthquakes identified in the LANL area via the LASN have magnitudes of 3 or less, and most appear to cluster in two zones: (1) the northern part of the Pajarito fault system, where the fault becomes broadly distributed into a "horsetail" splay of small-displacement subparallel segments, and (2) east of Los Alamos through the Rio Grande Basin, possibly associated with the Rio Grande rift. No earthquake epicenters are mapped within 3000 ft (914 m) of any of the three locations considered for permit within this memorandum. The closest earthquake epicenter to any of the three sites is located approximately 8,200 ft (1.6 mi; 2.5 km) WSW of TA-39-6. This event, recorded on 29 July 2013, was a M 0.2 at 7.1 mi (11.4 km) depth, and is not correlated to a mapped geologic fault.

5 Local Geologic and Faulting Conditions at TA-16, TA-36, and TA-39

This section describes a series of figures [plates] focused around each of the three facilities under consideration. These figures [plates] include the facility intended for permitting, mapped surface faults, and various distance buffers around the facility per 40 CFR 270.14(b)(11)(A)(2). Facility-specific discussions on the information shown in these figures are included below.

Plate 1 shows the three sites proposed for permit with 5-mile (8 km) buffers plus mapped surficial faults (Lewis et al. 2009). The surficial faults shown on Plate 1, published by Lewis et al. (2009), represent the most recent and detailed state of knowledge of the surficial expression of the Pajarito fault system near LANL. Mapping of the Pajarito fault system was done at 1:1,200 scale by personnel with a detailed knowledge of structural geology and Bandelier Tuff Tshirege Member subunits, and represents a culmination of many years of research, verification, and updating by the LANL Seismic Hazards Geology Team. Large portions of the Pajarito fault system fall within five miles of TA-16-388 and TA-36-8, according to the buffers shown on Plate 1. Fewer faults fall within the five-mile buffer surrounding TA-39-6. Lineaments identified by Vaniman and Wohletz (1990) and Wong et al. (1995) fall within 3000 ft (914 m) of each site (Plates 2, 3, and 4).

5.1 Local Geologic and Faulting Conditions at TA-16-388

Plate 2 presents TA-16-388 with a 3000 ft (914 m) and 200 ft (61 m) buffers surrounding the site (as mandated by 40 CFR 270.14(b)(11)(A)(2)), plus mapped surficial faults (Gardner et al., 2001; Lewis et al., 2002; Lewis et al. 2009), mapped lineaments (Vaniman and Wohletz 1990; Wong et al. 1995), and any other identified point-location offsets on geologic contacts. The data are shown atop both orthoimagery and digital elevation model base data. Numerous faults, a mapped lineament, and point-location offsets fall within the 3000 ft (914 m) buffer; no lineaments, faults, or offsets are mapped within the 200 ft (61 m) buffer. The local geology consists of the uppermost subunits of Qbt and old alluvium (Qoal), as well as regions of colluvium (Qc) and disturbed lands..

The faults mapped by Lewis et al. (2002) that fall within the 3,000 ft buffer have varying displacement directions, with some faults expressing down-to-the-west motion while others express down-to-the-east motion. Maximum displacement of any fault within the 3,000-ft buffer is 5 ft (1.5 m). The 3,000-ft buffer region also includes an observed synclinal hinge, a small U-shaped fold or geostructural low with linear continuity that rocks on either side dip toward.

Identified point-location offsets on Bandelier Tuff Tshirege Member subunits from Lewis et al. (2002) fall within the 3,000 ft buffer. These identified offsets were measured using the high-precision geologic contact mapping methods described in that study, and are shown as point-locations because those particular faults were found to have trace lengths of 16 ft (5 m) or less, and lacked stratigraphic observations to estimate displacement and lateral continuity. The faults have various senses of displacement (both down-to-the-east and down -to-the-west), but the majority of faults within the 3,000-ft buffer have down-to-the-west displacement. The greatest amount of displacement (in any sense) within the 3,000-ft buffer is 3 ft. This map shows no mapped faults within the 200-ft buffer.

5.2 Local Geologic and Faulting Conditions at TA-36-8

Plate 3 presents TA-36-8 with a 3000-ft (914-m) and 200-ft (61-m) buffers surrounding the site (as mandated by 40 CFR 270.14(b)(11)(A)(2)), plus mapped surficial faults (Lewis et al. 2009), mapped lineaments (Vaniman and Wohletz 1990; Wong et al. 1995), and any other identified point-location offsets of geologic contacts. Three mapped lineaments fall within the 3000 ft (914 m) buffer; these lineaments trend primarily NNW-SSE and are located to the north and east of TA-36-8. No lineaments, faults, or offsets are identified or mapped within the 200 ft (61 m) buffer. This technical area has not been mapped in detail by LANL geologists.

5.3 Local Geologic and Faulting Conditions at TA-39-6

Plate 4 presents TA-39-6 with a 3000-ft (914-m) and 200-ft (61-m) buffers surrounding the site (as mandated by 40 CFR 270.14(b)(11)(A)(2)), plus mapped surficial faults (Lewis et al. 2009), mapped lineaments (Vaniman and Wohletz 1990; Wong et al. 1995), and any other identified point-location offsets of geologic contacts. Only a single mapped lineament falls within the 3000 ft (914 m) buffer; this lineament is west of TA-39-6 and oriented predominantly N-S. No lineaments, faults, or offsets are mapped within the 200 ft (61 m) buffer. This technical area has not been mapped in detail by LANL geologists.

5.4 Summary

Based on the available data presented here, small faults are present within 3,000 ft of TA-16-388 (Plate 2). The fault segments within this 3,000 ft buffer have short along-strike lengths, and as such they empirically are not independently seismogenic (*cf*. Wells and Coppersmith, 1994). No earthquake epicenters have been identified on those fault segments (Figure 3). The detailed geologic mapping data from Lewis et al. (2002; 2009) suggests that the undisturbed geologic materials present at the TA-16-388 site are much older than the Holocene time period, and as such the determination of Holocene fault activity on the fault strands within the 3,000 ft buffer would be difficult to impossible to achieve through further field investigations.

It does not appear that faults, or lineations that suggest the presence of a fault, are present within 3,000 feet of TA-36-8 and TA-39-6.

We emphasize that for determining the presence of Holocene faults, conventional field geologic mapping must be employed or consulted to confirm (1) that a lineament is truly a fault, and (2) that it has recent tectonic movement. This validation of regionally-mapped or remotely-observed lineaments in finer scale mapping products is, writ large, the objective of field-based fault investigations, and is underscored locally by Olig et al. (1998) when discussing lineament mapping done by Wong et al. (1995): "The lineaments were identified on aerial photographs or observed during an aerial reconnaissance and field-checked at a reconnaissance level. However, this generalized map [by Wong et al, 1995] …should be considered preliminary in nature until a more comprehensive and detailed surficial mapping of LANL is completed." Therefore, the comprehensive geologic observations of Reneau and McDonald (1996), Self et al. (1996), and the detailed geologic mapping of Gardner et al. (2001), Lewis et al. (2002), and Lewis et al. (2009) clarify the geologic and faulting conditions of the area.

6 Field Reconnaissance at TA-16, TA-36, and TA-39

As of the production of this technical memorandum, no site-specific geologic field-based reconnaissance has been performed at TA-16-388, TA-36-8, or TA-39-6, due to staff availability and COVID fieldwork limitations. It is understood that reporting on field reconnaissance for sites to be permitted may be required to clarify the published geologic data, aerial reconnaissance, and aerial photographic analysis (per 40 CFR 270.14(b)(11)(A)(2)) presented earlier in this memorandum. It is expected that future easing of COVID restrictions will allow these field reconnaissance activities to take place at a later time if required, with a summary to be provided following that activity.

The reconnaissance at these sites will consist of a traverse around the site perimeter and specifically along any identified faults or lineaments, in order to observe geologic features in the area. The reconnaissance will look for surficial disturbances or modifications that may have removed or otherwise altered any geologic units younger than the Bandelier Tuff. Pristine preservation of young geologic deposits are required to directly assess whether faults have Holocene-age activity. At LANL, such young geologic materials that could preserve evidence of Holocene fault activity, in sufficient quantities to be observed along faults, are extremely sparse and rarely preserved.

7 Discussion

Geologic investigations show the greatest amount of faults and geologic complexity is present near TA-16-388. Several small (both in length and total displacement) fault segments and lineaments are identified within the 3000 ft (914 m) buffer around TA-16-388 (Gardner et al., 2001; Lewis et al., 2002; Lewis et al., 2009), which represents distributed deformation within the hanging-wall east of the main Pajarito fault. Overall displacement across all structures within 3000 ft of TA-16-388 is approximately a net of zero; the region includes both down-to-the-west and down-to-the-east faults of nearly identical displacement, with a maximum of 5 ft (1.5 m) offset on single segments. Displacements mapped as discrete point-locations are present within 3,000 ft of TA-16-388; these are represented as such because they cannot be traced through the stratigraphic section, they cannot be traced laterally across mesa-tops through conventional geologic mapping, and are not found to displace geologic units younger than the Bandelier Tuff. The closest mapped lineament (from Vaniman and Wohletz, 1990) is located northwest of TA-16-388 within the 3000 ft buffer, and projects southwest, away from the facility. No faults or offsets have been mapped within the 200 ft buffer. Most post-Bandelier Tuff sediments have been stripped from the mesa-top within the technical area. The absence of undisturbed post-Bandelier Tuff sediments makes it difficult to assess Holocene surface rupture at this location.

While neither TA-36-8 nor TA-39-6 have mapped faults within 3000 ft of those locations, the sites have not been mapped at the same level of detail as TA-16, but other nearby geologic investigations provide descriptions of the geologic settings that can apply to those locations (e.g., . While TA-39-6 falls in a gap area not covered by larger-scale geologic quadrangle mapping, published geological field trip guidebooks and road logs (Self et al., 1996; Reneau and McDonald, 1996) describe the geology of Ancho Canyon, including within TA-39. The detailed geologic information from these road logs and trip stops in the Ancho Canyon region neither mention nor note the presence of faults or geologic structure in the vicinity of TA-39. Both sites have mapped lineaments that project within 3000 ft of the facility, but no geologic faults or lineaments are present within 200 ft of the facilities. The positions of TA-36 and TA-39 several miles east of the Pajarito fault system significantly reduces the likelihood that faults with Holocene seismic surface rupture are present at either of those two locations.

8 Conclusions

Geologic structures, including segments of the Pajarito fault, have been identified near TA-16-388 by previous geologic studies of the LANL site. Within the 3000 ft (914 m) buffer and northwest of the facility, the Pajarito fault segments exhibit evidence of approximately 3-5 ft (1 - 1.5 m) of variable down-to-the-east and down-to-the-west displacement; however, total net displacement of the faults in this area is approximately zero, as the sum of the down-to-the-east and down-to-the-west displacement is nearly equal. A small synclinal axis is present northwest of TA-16-388 and south of Cañon del Valle. Surrounding the TA-16-388 facility and within the 3000 ft (914 m) buffer, subunit offsets of less than 5 ft (1.5 m) were measured by Lewis et al. (2002). The detailed geologic mapping of Lewis et al. (2002) suggests that the geologic materials near TA-16-388 are old, and would not contain the types of materials necessary to determine Holocene activity on the fault segments within some of the most recent paleoseismic analyses of the Pajarito fault system have occurred in other portions of TA-16. In far western TA-16, near NM Highway 501, paleoseismic trenching analyses suggest that a single Holocene paleoearthquake has occurred on at least one segment of the Pajarito fault. However, these paleoseismically-investigated faults fall outside of the 3,000 ft buffer region for TA-16-388.

No mapped faults are identified near TA-36-8 or TA-39-6. Previous geologic studies as well as aerial reconnaissance and aerial photographic analysis do not suggest the presence of faults in these areas. Detailed-scale geologic investigations and field reconnaissance have not yet been performed at these sites.

9 Figure and Plate Captions

Figure 1. Overview of the Pajarito fault system in the vicinity of LANL (gray outline). Technical Areas (TA) 16, 36, and 39 are highlighted. The locations of the TA-16-388, TA-36-8, and TA-39-6 sites proposed for permitting are shown as red polygons. PF = Pajarito fault; RCF = Rendija Canyon fault; GMF = Guaje Mountain fault; SCF = Sawyer Canyon fault. Mapped geologic structures (faults; bold purple lines) from Lewis et al. (2009).

Figure 2. Generalized, schematic cross section of the Bandelier Tuff (modified from Broxton and Reneau, 1995).

Figure 3. Overview of the Los Alamos Seismic Network (green triangles) and local earthquakes (1973-2013) relative to the three locations considered for permit within this memorandum. The vicinity of Los Alamos National Laboratory is represented by the gray outline. TA-16-388, TA-36-8, and TA-39-6 are highlighted. PF = Pajarito fault; RCF = Rendija Canyon fault; GMF = Guaje Mountain fault; SCF = Sawyer Canyon fault. Structural mapping (bold purple lines) from Lewis et al. (2009).

Plate 1. Color orthophotography, mapped fault, and mapped lineaments within a 5-mile (8 km) and 3000 ft (914 m) buffer of the three facilities. Structural mapping (purple lines) from Lewis et al. (2009). Mapped lineaments from Vaniman and Wohletz (1990; pink lines) and Wong et al. (1995; blue lines). While TA-36 and TA-39 are east of the main trace of the Pajarito fault system, TA-16 falls within the hanging-wall (downthrown block) of the main Pajarito fault. See text for further discussion.

Plate 2. Mapped faults and lineaments in the area surrounding TA-16-388 as well as a 3000 ft (914 m) and 200 ft (61 m) buffer, overlain atop (a) digital elevation model and (b) orthoimagery. Faults published in Lewis et al. (2009; pink lines) include those mapped by Gardner et al. (2001) and Lewis et al. (2002). Lineaments from Vaniman and Wohletz (1990; blue lines). Five faults and one lineament fall inside or project into the 3000 ft (914 m) buffer around TA-16-388. None project within 200 ft (61 m) of the facility. Nine point-location offsets are identified within the 3000 ft (914 m) buffer and were mapped by high-precision geodetic studies (Lewis et al., 2002). While a small fault segment is co-located with the southern termination of the single mapped lineament, no offset locations fall along mapped lineaments. See text for further discussion.

Plate 3. Mapped faults and lineaments in the area surrounding TA-36-8 as well as a 3000 ft (914 m) and 200 ft (61 m) buffer, overlain atop (a) digital elevation model and (b) orthoimagery. Faults published in Lewis et al. (2009; pink lines); lineaments from Wong et al. (1995; blue lines). Three lineaments fall inside or project into the 3000 ft (914 m) buffer around TA-36-8. None project within 200 ft (61 m) of the facility. No mapped faults or point-location offsets are identified within the 3000 ft (914 m) buffer. See text for further discussion.

Plate 4. Mapped faults and lineaments in the area surrounding TA-39-6 as well as a 3000 ft (914 m) and 200 ft (61 m) buffer, overlain atop (a) digital elevation model and (b) orthoimagery. Faults published in Lewis et al. (2009; pink lines); lineaments from Wong et al. (1995; blue lines). One lineament falls inside the 3000 ft

(914 m) buffer around TA-39-6. None project within 200 ft (61 m) of the facility. No mapped faults or point-location offsets are identified within the 3000 ft (914 m) buffer. See text for further discussion.

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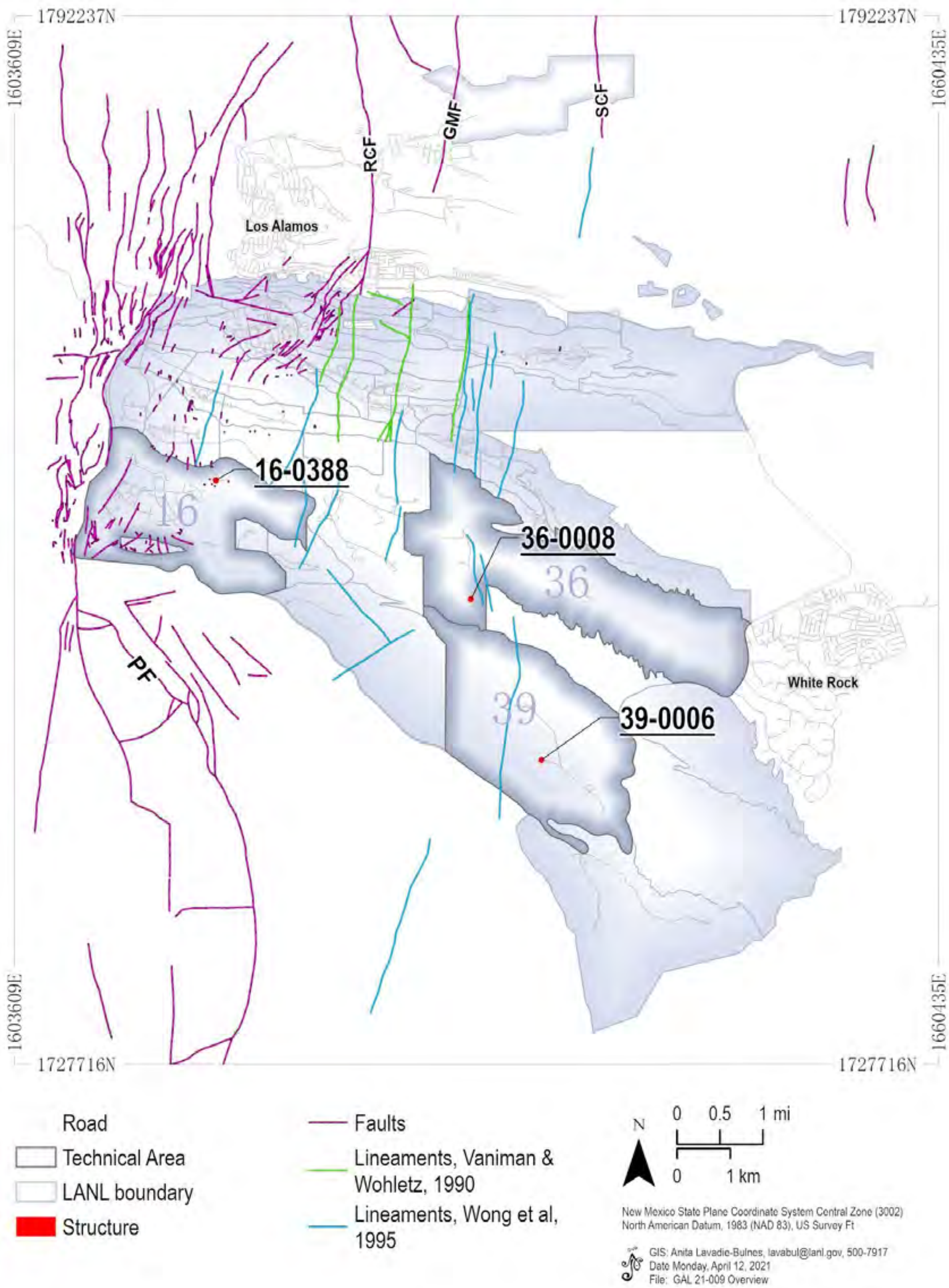
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Lineaments, Vaniman & Wohletz, 1990
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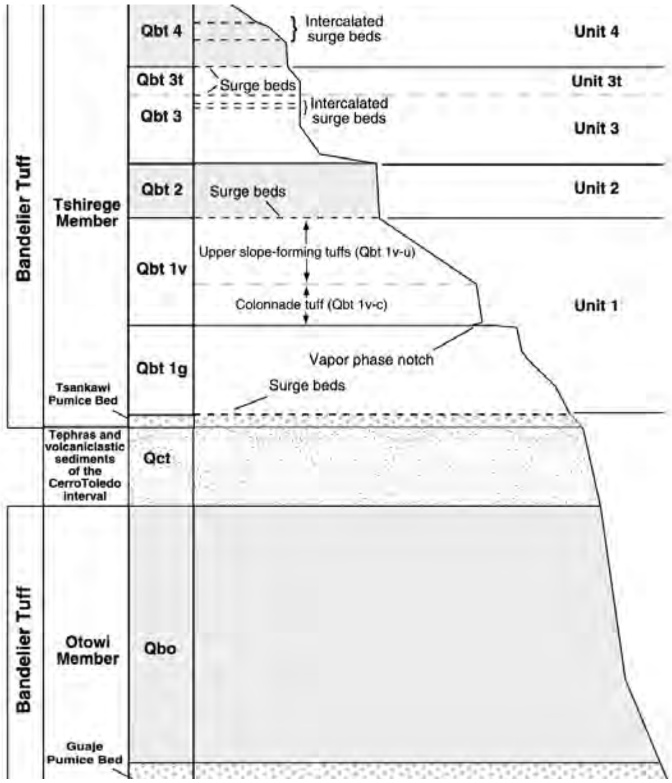
Figure 1.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Unit 4
Qbt 3t
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Surge beds
Unit 2
Qbt 1v
Upper slope-forming tuffs (Qbt 1v-u)
Colonnade tuff (Qbt 1v-c)
Unit 1
Qbt 1g
Vapor phase notch
Surge beds
Tsankawi Pumice Bed
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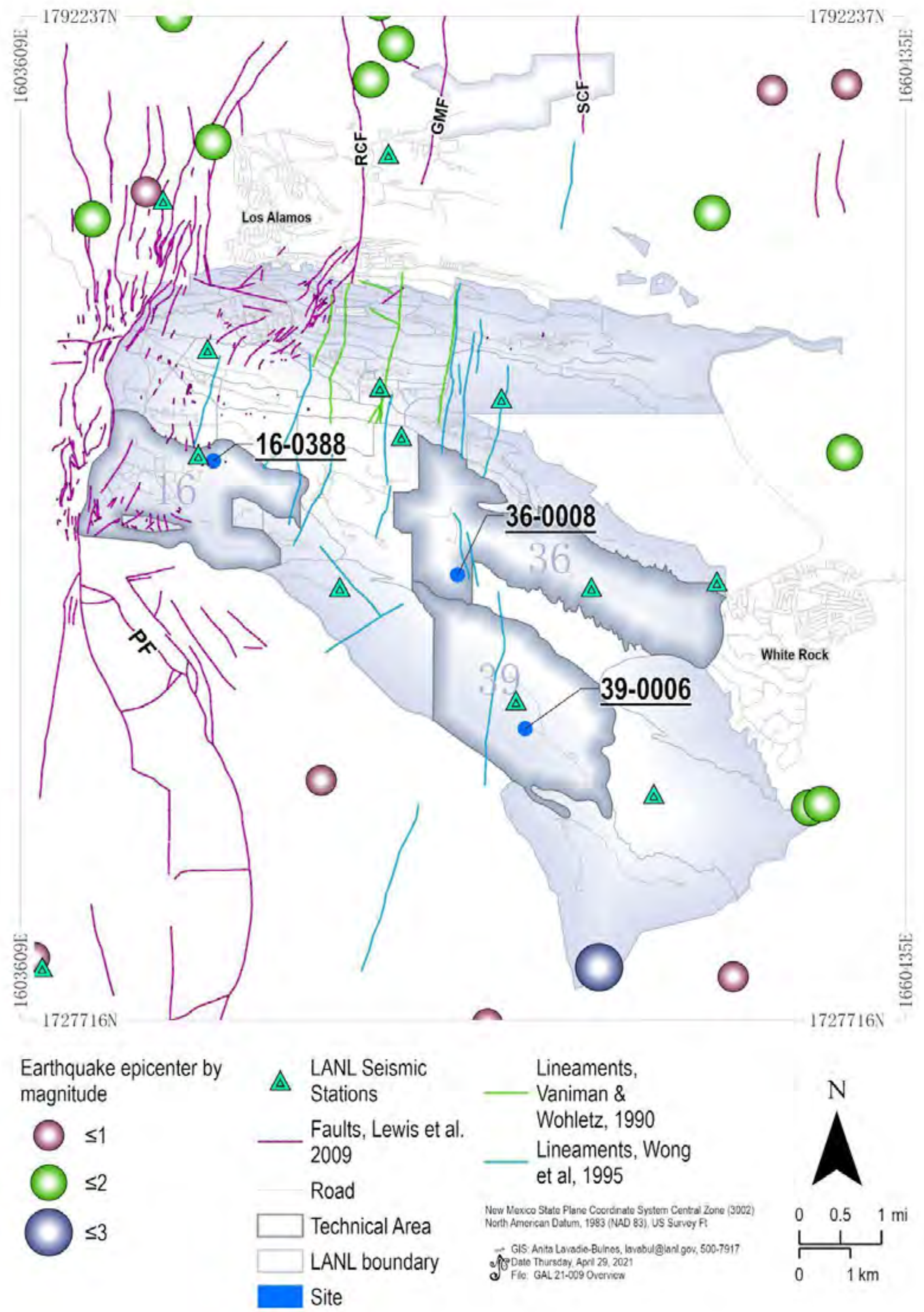
Otowi Member
Qbo
Guaje Pumice Bed

Figure 2.



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Earthquake epicenter by magnitude
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LANL Seismic Stations
Faults, Lewis et al. 2009
Road
Technical Area
LANL boundary
Site
Lineaments, Vaniman & Wohletz, 1990
Lineaments, Wong et al, 1995
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Figure 3.

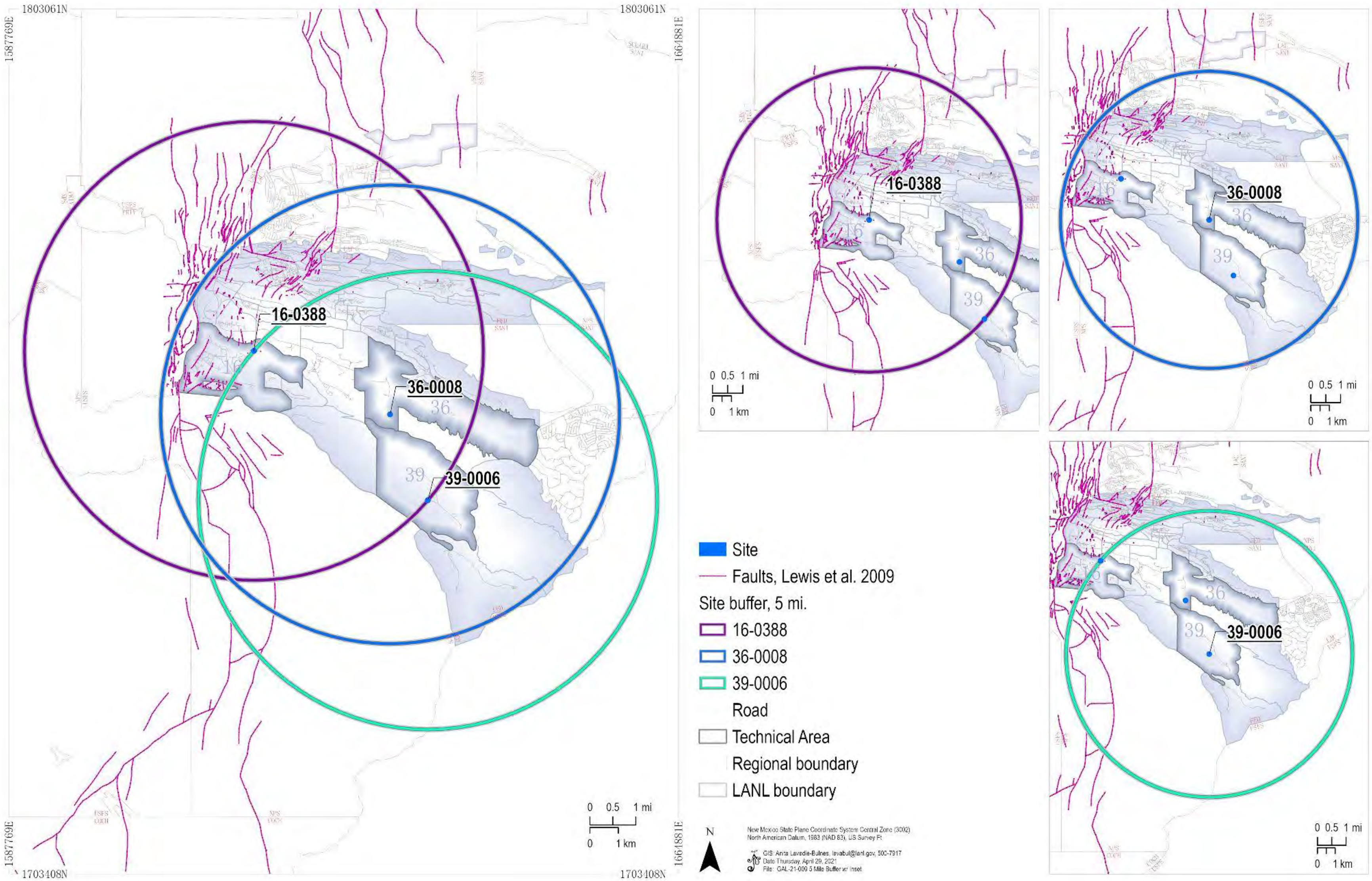
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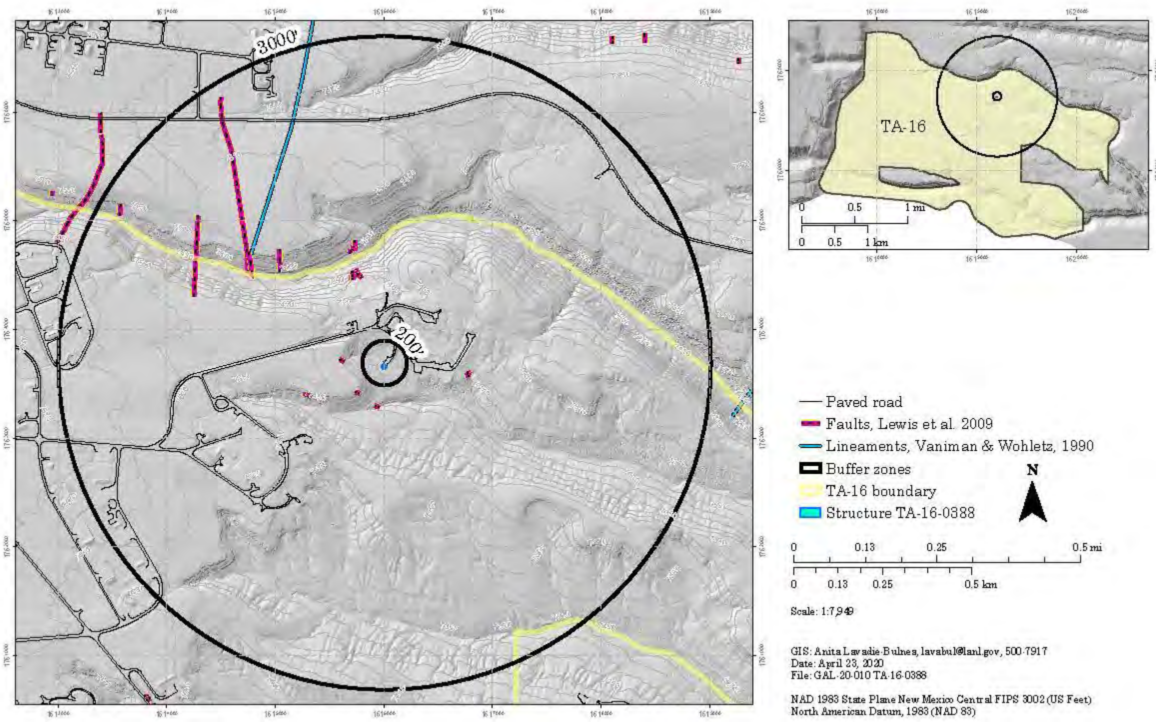
Plate 1.

(a)



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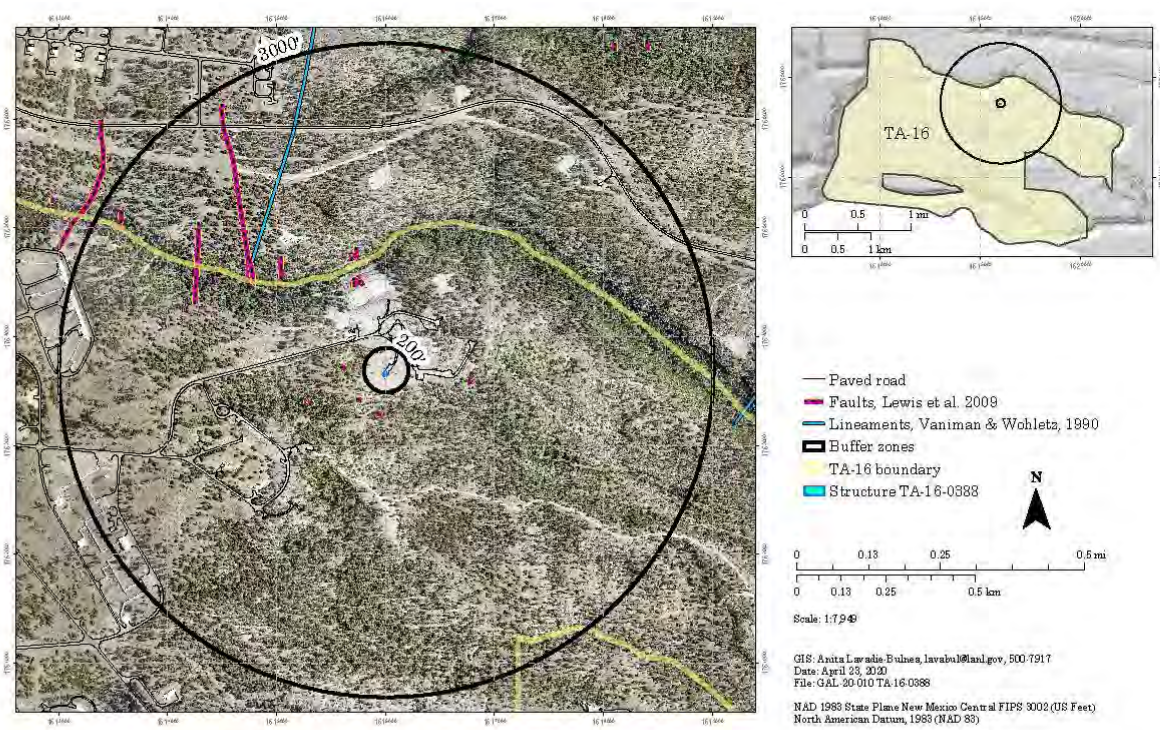

Plate 2. TA-16-388 (a) digital elevation model; (b) imagery.

(a)

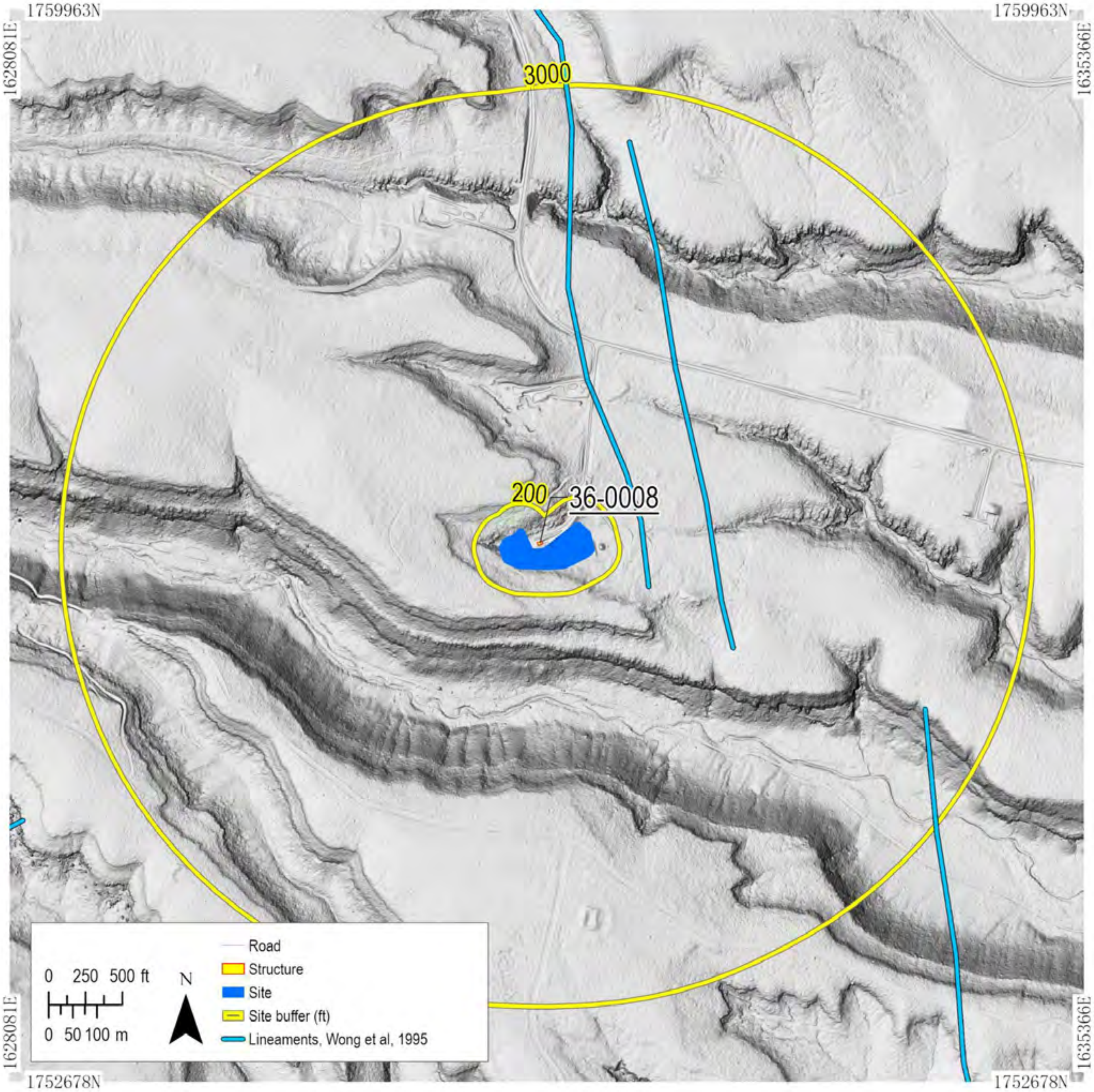

Plate 3. TA-36-8 (a) digital elevation model; (b) imagery.

(b)

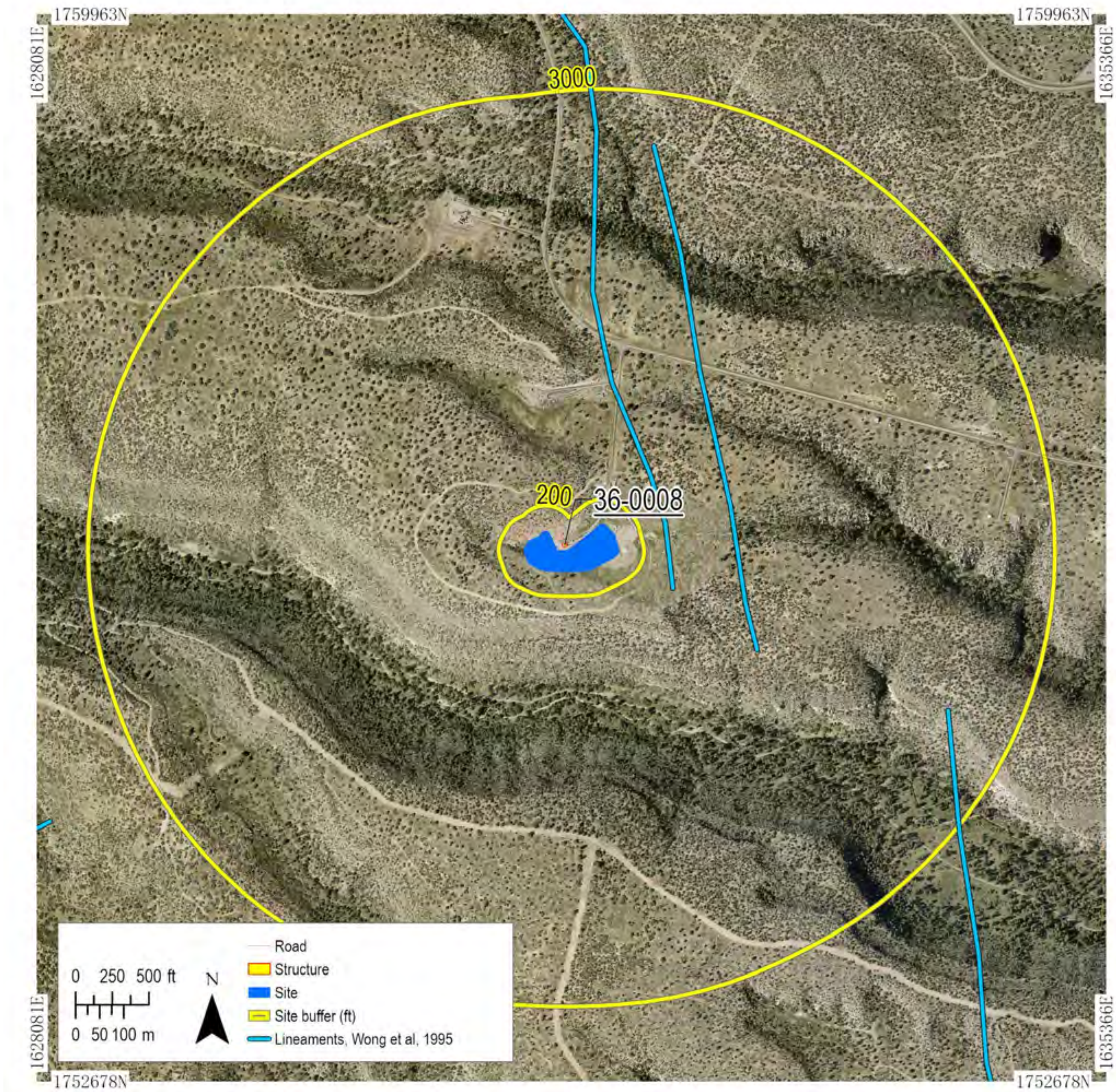

Plate 3. TA-36-8 (a) digital elevation model; (b) imagery.

(a)

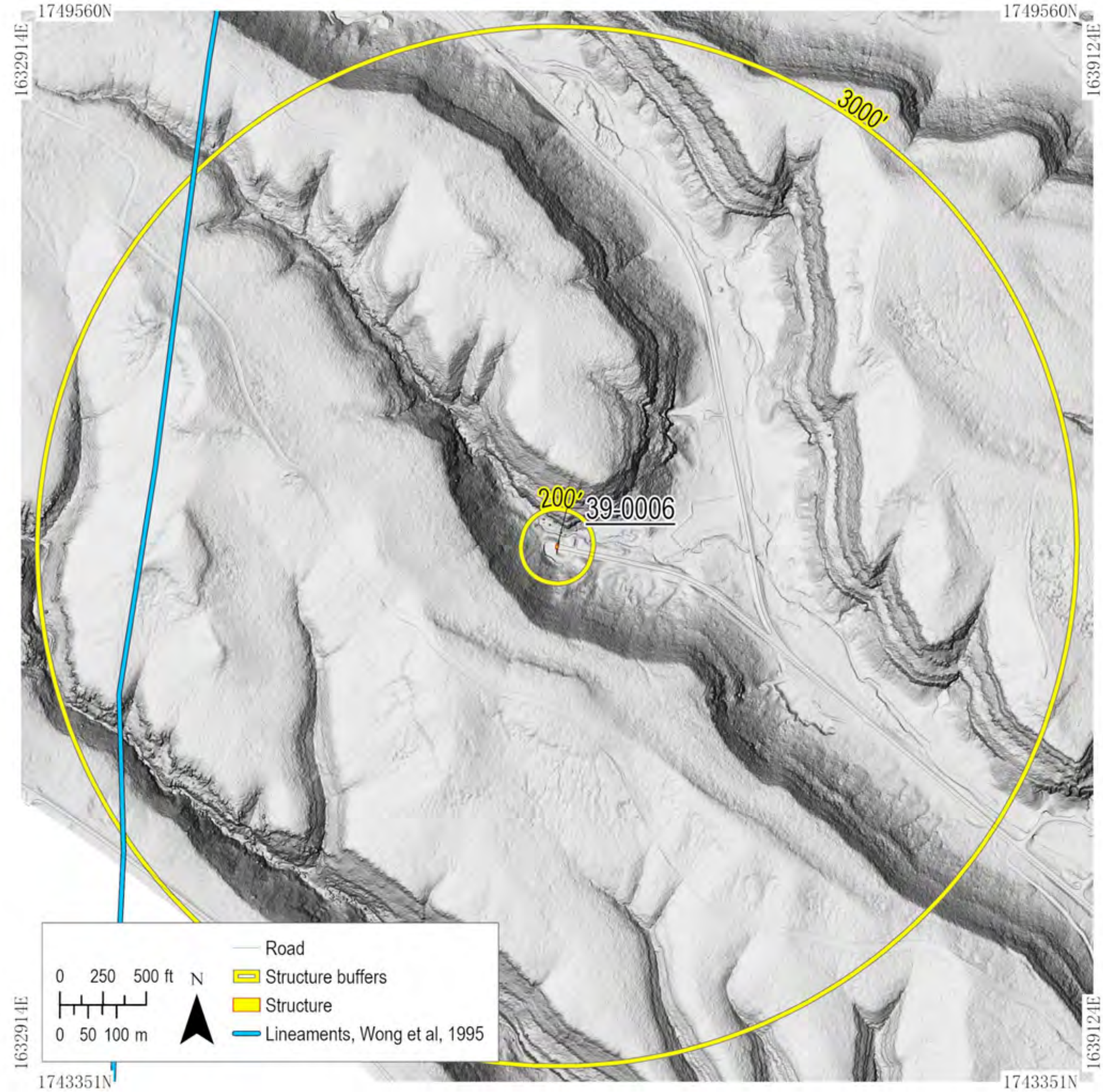

Plate 4. TA-39-6 (a) digital elevation model; (b) imagery.

(b)

Plate 4. TA-39-6 (a) digital elevation model; (b) imagery.

Attachment 4

Revised Sections 1-8 of the Part B Permit Application for Renewal of the Los Alamos National Laboratory Hazardous Waste Facility Permit

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1.0 INTRODUCTION

A research and defense institution located on the Pajarito Plateau, Los Alamos National Laboratory (LANL) occupies an area of approximately 40 square miles in Los Alamos County, New Mexico. LANL treats and stores hazardous and radioactive mixed waste, as authorized by a Hazardous Waste Facility Permit with U.S. Environmental Protection Agency (EPA) Identification Number NM0890010515 (hereafter referred to as the 2010 Permit). The 2010 Permit was issued by the New Mexico Environment Department (NMED) to the U.S. Department of Energy (DOE), the owner and operator of LANL; Triad National Security, LLC (Triad); and Newport News Nuclear BWXT-Los Alamos, LLC (N3B), co-operators (collectively “the Permittees”) with an effective date of December 30, 2010.

This Permit Renewal Application is submitted to meet the requirements of the New Mexico Hazardous Waste Act and New Mexico Hazardous Waste Management Regulations (HWMR) at New Mexico Administrative Code (NMAC) 20.4.1, *Hazardous Waste Management*. The New Mexico HWMR at NMAC 20.4.1.500 and 20.4.1.900 adopt federal regulations, respectively, at 40 CFR part 264 and 40 CFR part 270, and they are identified in this Permit Renewal Application by the applicable federal citation. Pursuant to these requirements, permitted hazardous waste management facilities must submit a Permit Renewal Application that addresses the general and specific part B information requirements at 40 CFR part 264 and 40 CFR part 270 as needed to continue hazardous waste management operations under a Hazardous Waste Facility Permit.

Pursuant to NMAC 20.4.1 and Permit Condition 1.6.5, *Duty to Reapply*, the term of the Permit is ten years from the date of issuance:

> *If the Permittees intend to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittees shall submit a complete application for a new permit at least 180 days before the expiration date of this Permit unless permission for a later date has been granted by the Department in compliance with 40 CFR 270.10(h) and 270.30(b).*

The Permit was effective on December 30, 2010; therefore, the Permittees’ application for permit renewal is due on or before July 1, 2020.

In this Permit Renewal Application, the Permittees seek authorization to continue to treat and store hazardous and radioactive mixed waste (hereinafter known as “hazardous waste”) in permitted hazardous waste management units authorized by the Permit. As described in Permit Condition 1.2, DOE-Triad and DOE-N3B manage and operate different permitted units, also known as hazardous waste management units. As managers of separate programs at LANL, Triad and N3B are solely responsible for operating their respective units and do not share responsibilities for these units. Under the Permit, DOE-Triad manages and operates 5 container storage units, 10 container storage/treatment units, one tank storage unit, and one stabilization treatment unit; DOE-N3B manages and operates 1 container storage unit and 9 container storage/treatment units.

Provided concurrently with this Permit Renewal Application is the Los Alamos National Laboratory General Part A Permit Application, Revision 10.0 (LANL 2020a), which includes the information required by 40 CFR §270.13, *Contents of part A of the permit application*. In addition, the Permit Renewal Application addresses the general part B information requirements of 40 CFR §270.14, *Contents of part B: General requirements,* and specific information requirements of 40 CFR §270.15, *Specific part B* *information requirements for containers;* 40 CFR §270.16, *Specific part B information requirements for tank systems*; and 40 CFR §270.23, *Specific part B information requirements for miscellaneous units*.

The Permittees do not propose to modify any of the currently permitted hazardous waste management units. However, DOE-Triad seeks approval to permit one interim status open burning unit and two interim status open detonation units. These interim status hazardous waste management units conduct treatment processes to remove the characteristic of reactivity for waste explosives and explosive-contaminated waste. To facilitate review, this Permit Renewal Application addresses these interim status units separately under Section 4, *Open Detonation Treatment*, and Section 5, *Open Burning Treatment*.

In summary, the Permittees seek approval for the following new/revised changes below:

1) Obtain permitted authorization to treat waste explosives at one interim status open burning unit and two interim status open detonation units.
2) Simplify and streamline permit text to improve clarity by removing redundant and inconsistent text.
3) Update information and organization changes to facilitate implementation, remove redundant information, and simplify and streamline text in Permit Attachment A, *Technical Area Unit Descriptions;* Permit Attachment C, *Waste Analysis Plan*; Permit Attachment D, *Contingency Plan*; Permit Attachment E, *Inspection Plan;* and Permit Attachment F, *Personnel Training Plan*.
4) Update information and streamline figures in Permit Attachment D, *Contingency Plan,* and Permit Attachment N, *Figures.*
5) Propose changes to Permit text and Attachment G, *Closure Plans,* and Attachment J, *Hazardous Waste Management Units*, as a result of the settlement in *U.S. v. Curry*, DC NM Case No. 10-01251.
6) Update information to Attachment J, *Hazardous Waste Management Units,* to remove "Interim Status Unit" from the open burning and open detonation unit designations, as well as remove for clarity dated references to unit names that are no longer valid and cannot be traced to the current unit descriptions.
7) Remove unnecessary detail that does not support a Permit requirement or is not required by the New Mexico Hazardous Waste Regulations; and
8) Minor nonsubstantive permit text changes that would qualify as a Class 1 (e.g., typographical errors, editorial, and technical edits).

The Permit Renewal Application includes proposed changes to the text of the current Permit and Permit Attachments in redline/strikeout format, so all proposed changes are clearly identified. A table with a summary of these changes with supporting justification is included as Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit.* The summary table outlines proposed changes represented in the redline/strikeout version of the Permit and/or Permit Attachments within Supplements 1-1 through 1-8. The Permit Renewal Application includes all material that is being revised from the 2010 Permit. Portions of the 2010 Permit not being changed are not being resubmitted, as they are in NMED's administrative record for the current Permit. The renewal application indicates which sections of the 2010 Permit have been revised and included with this submittal or have not been revised and are not included.

The version of the Permit used to create the renewal application is the latest version the NMED posted on its website, dated August 15, 2019.

1.1 Permit Application Overview

The Permit Renewal Application is organized as follows and includes the following required information:

- Section 1 contains an overview of the renewal application, the pre-application public meeting as needed to satisfy the requirements of 40 CFR §124.31, and Table 1-1, *Regulatory Crosswalk*, which is intended to assist the reviewer in locating relevant information in the Permit Renewal Application.
- Section 2 contains the general part B information requirements under 40 CFR §§270.14(b)(1) through (b)(20), as well as the requirements for groundwater under 40 CFR §270.14(c) and solid waste management units (SWMUs) at 40 CFR §270.14(d).
- Section 3 contains the required specific part B information requirements for permitted units, including 25 container storage units, one storage tank, and one treatment (stabilization) unit under 40 CFR §§270.15, 270.16 and 270.23. In addition, this section addresses treatment of hazardous waste (via microencapsulation or stabilization within containers) at 16 units that are primarily utilized for storage as described below.
- Section 4 contains the general and specific information requirements at 40 CFR §270.14 and 40 CFR §270.23 necessary for NMED to review treatment of hazardous waste at two open-detonation units.
- Section 5 contains all of the general and specific information requirements at 40 CFR §270.14 and 40 CFR §270.23 necessary for NMED to review approve treatment of hazardous waste at one open burning unit.
- Section 6 contains the information necessary for NMED to review changes to Permit text and Permit Attachments proposed by the Permittees for other reasons.
- Section 7 includes references to the documents referred to throughout the Permit Renewal Application.
- Section 8 provides the certification required by 40 CFR §270.11.

1.2 Pre-Application Public Meeting

In accordance with 40 CFR §124.31, a pre-application public information meeting to obtain input on the 2020 Permit Renewal Application was held on December 4, 2019, at Cities of Gold Hotel & Casino Conference Center Tribal Room in Santa Fe, New Mexico. Evidence of completion of the required forms of public notice, per 40 CFR §124.31(d), are documented in Appendix 2, *Evidence of Public Notice, Summary of Comments, and Public Comment Response for Public Information Meeting on Los Alamos National Laboratory Permit Renewal Application* and summarized as follows:

- Public notice of the pre-application meeting was provided at least 30 days prior to the meeting.
- The Permittees provided public notice in the following forms:
  - The Notice of Public Meeting was published in the following newspapers:
    - *Rio Grande SUN*, October 31, 2019;
    - *Santa Fe New Mexican*, November 1, 2019;
    - *Los Alamos Monitor*, November 3, 2019;
    - *Journal North*, November 3–9, 2019; and
    - *Taos News*, October 31–November 6, 2019.

- A "Notice of Pre-Submittal Public Meeting" sign was posted outside Los Alamos National Laboratory's Communications and Community Partnerships building.
- A broadcast media announcement was run on KRSN AM 1490, beginning November 4, 2019, and ending on November 25, 2019.
- Proof of the newspaper notices will be submitted to NMED as Appendix 2 in the Permit Renewal Application.
- Additionally, notice of the public meeting was sent to the following state and local governments via LANL's mailing list:
    - City of Espanola; Los Alamos County; NM Dept. of Game & Fish; NMED; NMED - DOE Oversight Bureau; NMED – HWB; NMED/Solid Waste Bureau; Pueblo of Tesuque, Environment Dept.; Rio Arriba Board of Cty. Commissioners; and San Juan Pueblo/Office of Envir. Affairs.
    - The Governors of the Pueblos of Cochiti, Isleta, Jemez, Kewa, Laguna, Picuris, Pojoaque, Sandia, San Felipe, San Ildefonso, San Juan, Santa Ana, Santa Clara, Santo Domingo, Taos, and Zuni.

- The required notice also included the following:
    - The date, time, and location of the meeting.
    - A statement of what would be discussed at the public meeting and the purpose of the meeting.
    - A statement to notify the contact listed on the notice, at least 72 hours before the meeting, if special assistance was needed to participate in the meeting.
    - The notice included an address, telephone number, and electronic mail (e-mail) to contact with any questions.

Evidence of completion of 40 CFR §124.31(c) is documented in Appendix 2 and summarized as follows:

- A summary of the December 4, 2019, public meeting was compiled, along with a list of the attendees.
- Comments received during the December 4, 2019, public meeting were compiled and later responded to.

Although a single public meeting was held, the Permittee's continued to encourage comments from members of the public and received two additional comments after the meeting via e-mail. Comments received on December 9, 2019 and January 21, 2020, as well as responses to those comments are included within Appendix 2. A summary of the public meeting and a list of attendees and their comments will be submitted to NMED as Appendix 2 in the Permit Renewal Application.

Table 1-1

Regulatory Crosswalk

Regulatory Citation(s) (40 CFR)	Description of Requirement	Location in this Document
270.13(a)	Activities conducted by applicant that require a permit under RCRA	General Part A
270.13(b)	Name, mailing address, and location of facility	General Part A
270.13(c)	NAICS codes for a facility	General Part A
270.13(d)	Operator's name, address, telephone number	General Part A
270.13(e)	Owner's name, address, telephone number	General Part A
270.13(f)	Whether the facility is located on Indian Lands	General Part A
270.13(g)	New or existing facility	General Part A
270.13(h)	Drawings and photographs	General Part A
270.13(i)	Description and design capacity of processes for treating, storing, and disposing of hazardous waste	General Part A
270.13(j)	Specific wastes to be treated, stored, or disposed	General Part A
270.13(k)	All permits or construction approvals received or applied for	General Part A
270.13(l)	Topographic maps	General Part A
270.13(m)	Description of the nature of the business	General Part A
270.13(n)	Hazardous waste debris categories and contaminant categories	General Part A
270.14(b)(1)	General facility description	Section 2.1
270.14(b)(2)	Chemical and physical analyses	Section 2.2 and Appendix 1, Supplement 1-3
270.14(b)(3)	Waste Analysis Plan	Section 2.2 and Appendix 1, Supplement 1-3
264.13(a-b)	Development and implementation of Waste Analysis Plan	Section 2.2 and Appendix 1, Supplement 1-3
264.13(c)	Off-site waste analysis requirements	Section 2.2 and Appendix 1, Supplement 1-3
270.14(b)(4)	Security procedures and equipment	Section 2.3
264.14	Security	Section 2.3
270.14(b)(5)	General inspection requirements	Section 2.4 and Appendix 1, Supplement 1-5
264.15	General inspection requirements	Section 2.4 and Appendix 1, Supplement 1-5

Table 1-1

Regulatory Crosswalk (continued)

Regulatory Citation(s) (40 CFR)	Description of Requirement	Location in this Document
264.174	Container inspections	Sections 2.4, and Appendix 1, Supplement 1-5
264.193(i)	Tank inspections	Section 2.4 and Appendix 1, Supplement 1-5
264.195	Overfill control inspections	Section 2.4 and Appendix 1, Supplement 1-5
264.226	Surface impoundments monitoring and inspection	Not applicable
264.254	Waste pile monitoring and inspection	Not applicable
264.273	Land treatment design and operating requirements	Not applicable
264.303	Landfill monitoring and inspection	Not applicable
264.602	Miscellaneous unit inspection	Sections 2.4, 4.4, 5.4, 5.14, and Appendix 1, Supplement 1-5
264.1033	Closed-vent systems and control device standards	Appendix 1, Supplement 1-5
264.1052	Equipment leak air-emission standards	Section 2.4 and Appendix 1, Supplement 1-5
264.1053	Compressor standards	Not applicable
264.1058	Standards for pumps, valves, pressure relief devices, flanges, and connections	Appendix 1, Supplement 1-5
264.1083	Subpart CC waste determination procedures	Section 2.2 and Appendix 1, Supplement 1-3
264.1084	Subpart CC inspection and monitoring requirements - Tank air-emission standards	Section 2.4 and Appendix 1, Supplement 1-5
264.1085	Subpart CC inspection and monitoring requirements - Surface impoundment standards	Not applicable
264.1086	Subpart CC inspection and monitoring requirements - Container standards	Section 2.4 and Appendix 1, Supplement 1-5
264.1088	Subpart CC inspection and monitoring requirements - Closed vent systems and control devices	Not applicable
270.14(b)(6)	Request for waiver from preparedness and prevention requirements of 264 Subpart C	Section 2.5
270.14(b)(7)	Contingency Plan requirements under 264 Subpart D	Section 2.6 and Appendix 1, Supplement 1-4
264, Subpart D	Contingency Plan and emergency procedures	Section 2.6 and Appendix 1, Supplement 1-4

Table 1-1

Regulatory Crosswalk (continued)

Regulatory Citation(s) (40 CFR)	Description of Requirement	Location in this Document
264.227	Surface impoundment emergency repairs; contingency plans	Not applicable
264.200	Air-emissions standards for tanks	Section 2.6 and Appendix 1, Supplement 1-4
270.14(b)(8)	Preparedness and prevention	Section 2.7
264, Subpart C	Preparedness and prevention - applicability, design and operation; required equipment, testing and maintenance of equipment; access to communications or alarm systems; required aisle space; and arrangements with local authorities	Section 2.7
264.33	Testing and maintenance of equipment	Section 2.7.4
270.14(b)(8)(i)	Prevention of hazards in unloading operations (ramps and special forklifts)	Section 2.7.1
270.14(b)(8)(ii)	Runoff prevention with berms, trenches, and dikes	Sections 2.7.2, 4.7.2, and 5.7.2
270.14(b)(8)(iii)	Prevention of contamination of water supplies	Section 2.7.3
270.14(b)(8)(iv)	Mitigation effects of equipment failure and power outages	Sections 2.7.4, 4.7.4 and 5.7.4
270.14(b)(8)(v)	Prevention of undue exposure of personnel by use of personal protective equipment	Sections 2.7.5, 4.7.5, and 5.7.5
270.14(b)(8)(vi)	Prevention of release to the atmosphere	Sections 2.7.6, 4.7.6, and 5.7.6
270.14(b)(9)	Prevention of accidental ignition or reaction	Sections 2.8, 4.8, and 5.8
264.17	General requirements for ignitable, reactive, or incompatible wastes	Sections 2.8, 4.8, and 5.15
270.14(b)(10)	Traffic pattern, volume, and controls	Sections 2.9, 4.9 and 5.9
	Identification of turn lanes	Sections 2.9, 4.9 and 5.9
	Identification of traffic/stacking lanes	Sections 2.9, 4.9 and 5.9
	Description of road surface	Sections 2.9, 4.9 and 5.9
	Description of road load-bearing capacity	Sections 2.9, 4.9 and 5.9
	Identification of type and number of traffic controls	Sections 2.9, 4.9 and 5.9
270.14(b)(11)	Facility/unit location information	Section 2.10
264.18	Location standards	Section 2.10
270.14(b)(11)(i)	Seismic standard applicability [264.18(a)]	Section 2.10.1
270.14(b)(11)(ii)	Seismic standard requirements	Section 2.10.1

Table 1-1

Regulatory Crosswalk (continued)

Regulatory Citation(s) (40 CFR)	Description of Requirement	Location in this Document
270.14(b)(11)(ii)(A)(1-4)	No fault within 3,000 feet (ft.), with displacement in Holocene time	Section 2.10.1
270.14(b)(11)(ii)(B)	If faults which have displacement in Holocene time are present within 3,000 ft., no faults pass within 200 ft. of portions of the facility where treatment, storage, or disposal will be conducted	Section 2.10.1
270.14(b)(11)(iii)	100-year floodplain standard	Section 2.10.2
270.14(b)(11)(iv)	If facility is within 100-year floodplain	Section 2.10.2
270.14(b)(11)(iv)(A-C)	Engineering analyses of hydrostatic forces expected in a 100-year flood	Section 2.10.2
270.14(b)(11)(v)	Plan to show how the facility will be brought into compliance with 264.18(b)	Not applicable
270.14(b)(12)	Personnel training program	Section 2.11 and Appendix 1, Supplement 1-6
264.16	Personnel training	Section 2.11 and Appendix 1, Supplement 1-6
270.14(b)(13)	Closure and post-closure plans	Section 2.12 and Appendix 3, Supplement 3-1, Attachments G1-G30 of the 2010 Permit
264.112	Amendment of Closure Plan	Section 2.12 and Appendix 3, Supplement 3-1, Attachments G1-G30 of the 2010 Permit
264.118	Post-closure plan; amendment of plan	Not applicable
264.178	Closure/containers	Section 2.12 and Appendix 3, Supplement 3-1, Attachments G1-G30 of the 2010 Permit
264.197	Closure/tanks	Section 2.12 and Appendix 3, Supplement 3-1, Attachments G1-G30 of the 2010 Permit
264.228	Closure/post-closure/surface impoundments	Not applicable
264.258	Closure/post-closure/waste piles	Not applicable
264.280	Closure/post-closure/land treatment	Not applicable
264.310	Closure/post-closure/landfills	Not applicable
264.351	Closure/incinerators	Not applicable

Table 1-1

Regulatory Crosswalk (continued)

Regulatory Citation(s) (40 CFR)	Description of Requirement	Location in this Document
264.601	Miscellaneous unit closure	Sections 2.12, 4.11, and 5.11
264.603	Post-closure care	Section 2.12 and Appendix 3, Supplement 3-1, Attachments G.2, G.3, and G.28
270.14(b)(14)	Post-closure notices (264.119)	Not applicable
270.14(b)(15)	Closure cost estimate (264.142)	Section 2.14
	Financial assurance (264.143)	Section 2.14
270.14(b)(16)	Post-closure cost estimate (264.144)	Section 2.14
	Post-closure care financial assurance (264.145)	Section 2.14
270.14(b)(17)	Liability insurance (264.147)	Section 2.14
270.14(b)(18)	Proof of financial coverage (264.149-150)	Section 2.14
270.14(b)(19)	Topographic map requirements	Section 2.10.3 and General Part A
270.14(b)(19)(i)	Map scale and date	Section 2.10.3 and General Part A
270.14(b)(19)(ii)	100-year floodplain	Section 2.10.3 and General Part A
270.14(b)(19)(iii)	Surface waters	Section 2.10.3 and General Part A
270.14(b)(19)(iv)	Land use	Section 2.10.3 and General Part A
270.14(b)(19)(v)	Wind rose	Section 2.10.3 and General Part A
270.14(b)(19)(vi)	Map orientation	Section 2.10.3 and General Part A
270.14(b)(19)(vii)	Legal boundaries	Section 2.10.3 and General Part A
270.14(b)(19)(viii)	Access controls	Section 2.10.3 and General Part A
270.14(b)(19)(ix)	Wells	Section 2.10.3 and General Part A
270.14(b)(19)(x)	Buildings, treatment, storage, and disposal operations	Section 2.10.3 and General Part A
	Run-on/runoff control systems	Sections 2.10.3, 4.18.2, and 5.16.2

Table 1-1

Regulatory Crosswalk (continued)

Regulatory Citation(s) (40 CFR)	Description of Requirement	Location in this Document
	Storm sewer systems	Section 2.10.3 and General Part A
	Sanitary sewer systems	Section 2.10.3 and General Part A
	Process sewer systems	Section 2.10.3 and General Part A
	Loading/unloading areas	Section 2.10.3 and General Part A
	Fire control facilities	Section 2.10.3
270.14(b)(19)(xi)	Drainage barriers	General Part A
270.14(b)(19)(xii)	Location of operational units	Section 2.10.3 and General Part A
270.14(b)(20)	Other federal laws	Section 2.15
270.3(a)	Wild and Scenic Rivers Act	Section 2.15
270.3(b)	National Historic Preservation Act	Section 2.15
270.3(c)	Endangered Species Act	Section 2.15
270.3(d)	Coastal Zone Management	Section 2.15
270.3(e)	Fish and Wildlife Coordination Act	Section 2.15
270.3(f)	Executive Orders	Section 2.15
270.14(b)(21)	Notice of extension approval for land disposal facilities	Not applicable
270.14(b)(22)	Summary of pre-application meeting	Section 1.2 and Appendix 2
270.14(c)(1-8)	Groundwater monitoring requirements	Section 2.16
270.14(d)	SWMU	Section 2.17
270.14(d)(1)(i)	Location of SWMUs on topographic map	Section 2.17
270.14(d)(1)(ii)	Types of SWMUs	Section 2.17
270.14(d)(1)(iii)	Dimensions and descriptions of SWMUs	Section 2.17
270.14(d)(1)(iv)	Dates of operation	Section 2.17
270.14(d)(1)(v)	Waste types managed at SWMU	Section 2.17
270.14(d)(2)	Information on releases from SWMUs	Section 2.17
264.101	Corrective action for SWMUs	Section 2.17
270.15	Containers	Section 3.1
270.15(a)	Description of containment system	Section 3.1

Table 1-1

Regulatory Crosswalk (continued)

Regulatory Citation(s) (40 CFR)	Description of Requirement	Location in this Document
270.15(b)	Storage areas holding wastes that do not contain free liquids	Section 3.1
264.171	Condition of containers	Section 3.1
264.172	Compatibility of waste with containers	Section 3.1
264.173	Management of containers	Section 3.1
264.175(a-c)	Containment	Section 3.1
270.15(c)	Requirements for ignitable, reactive, and incompatible wastes	Section 2.8
270.15(d)	Requirements for incompatible wastes	Section 2.8
264.176	15-meter storage buffer for ignitable or reactive wastes	Section 2.8
264.177(a)	Incompatible wastes in containers	Section 2.8
264.177(b)	Incompatible wastes in containers	Section 2.8
264.177 (c)	Incompatible wastes separation or segregation	Section 2.8
264.17 (b)	Prevention of reactions	Section 2.8
264.17(c)	Documentation of precautions for ignitable, reactive, or incompatible waste	Section 2.8
270.15(e)	Information on air-emission control equipment	2010 Permit Section 2.4 & Appendix 1, Supplement 1-5
270.27	Air-emission controls for containers	2010 Permit Section 2.4 & Appendix 1, Supplement 1-5
270.16	Tank systems	Section 3.2
270.16(a)	Written assessment of tank, structural integrity, and suitability submitted by an independent, certified, registered professional engineer	Section 3.2
270.16(b)	Dimensions and capacity of each tank	Section 3.2
270.16(c)	Feed system description	Section 3.2
270.16(d)	Piping diagram	Section 3.2
270.16(e)	External corrosion protection description	Section 3.2
270.16(f)	New tank installation	Section 3.2
270.16(g)	Detailed description of secondary containment	Section 3.2
270.16(h)	Request for variance	Not applicable
270.16(i)	Description of procedures and controls to prevent spills and overflows	Section 3.2

Table 1-1

Regulatory Crosswalk (continued)

Regulatory Citation(s) (40 CFR)	Description of Requirement	Location in this Document
270.16(j)	Description of procedures for ignitable, reactive, or incompatible wastes	Section 3.2
270.16(k)	Information on air-emission control equipment	Sections 3.2
270.17	Surface impoundments	Not applicable
270.18	Waste piles	Not applicable
270.19	Incinerators	Not applicable
270.20	Land treatment facilities	Not applicable
270.21	Landfills	Not applicable
270.22	Boilers and industrial facilities	Not applicable
270.23(a)	Description of miscellaneous unit	Sections 3.2, 4.1, and 5.1
270.23(b)	Compliance with environmental performance standards at 264.601	Sections 3.2, 4.18, and 5.16
270.23(c)	Potential pathways of exposure of humans or environmental receptors	Sections 3.2, 4.18, and 5.16
270.23(d)	Effectiveness of treatment	Sections 4.13 and 5.13
270.23(e)	Additional information necessary for evaluation of compliance with environmental performance standards of 264.601	Sections 3.2, 4.18, and 5.16
264.601(a)	Prevention of release of contaminants to groundwater	Sections 3.2, 4.18.1, and 5.16.1
264.601(a)(1)	Volume and characteristics of waste-considering potential for migration through containing structures	Sections 3.2, 4.18, and 5.13
264.601(a)(2)	Hydrologic/geologic characteristics	Sections 3.2, 4.18, and 5.16
264.601(a)(3)	Quality of groundwater, including other sources of contamination and their cumulative impact on groundwater	Sections 3.2, 4.18, and 5.16
264.601(a)(4)	Quantity and direction of groundwater flow	Sections 3.2, 4.18, and 5.16
264.601(a)(5)	Proximity to and withdrawal rates of potential groundwater users	Sections 3.2, 4.18, and 5.16
264.601(a)(6)	Regional patterns of land use	Sections 3.2, 4.18, and 5.16
264.601(a)(7)	Potential for deposition and migration of waste constituents	Sections 3.2, 4.18, and 5.16
264.601(a)(8)	Potential for health risks caused by human exposure to waste constituents	Sections 3.2, 4.18, and 5.16

Table 1-1

Regulatory Crosswalk (continued)

Regulatory Citation(s) (40 CFR)	Description of Requirement	Location in this Document
264.601(a)(9)	Potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents	Sections 3.2, 4.18, and 5.16
264.601(b)	Prevention of release of contaminants to surface water	Sections 3.2, 4.18, and 5.16
264.601(b)(1)	Volume and characteristics of the waste	Sections 4.2, 5.2, and Appendix 1, Supplement 1-3
264.601(b)(2)	Effectiveness and reliability of containment, confinement, and collection systems and structures	Sections 3.2, 4.18, and 5.16
264.601(b)(3)	Hydrologic characteristics of the unit and local area	Sections 3.2, 4.18, and 5.16
264.601(b)(4)	Regional precipitation patterns	Sections 3.2, 4.18, and 5.16
264.601(b)(5)	Quantity, quality, and direction of groundwater flow	Sections 3.2, 4.18, and 5.16
264.601(b)(6)	Proximity of the unit to surface water	Sections 3.2, 4.18, and 5.16
264.601(b)(7)	Current and potential uses of nearby surface waters and water quality standards for those waters	Sections 3.2, 4.18, and 5.16
264.601(b)(8)	Quality of surface waters and soils, including other sources of contamination and their cumulative impact on surface waters and soils	Sections 3.2, 4.18, and 5.16
264.601(b)(9)	Regional patterns of land use	Section 2.1
264.601(b)(10)	Potential for health risks caused by human exposure to waste constituents	Sections 3.2, 4.18, and 5.16
264.601(b)(11)	Potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents	Sections 3.2, 4.18, and 5.16
264.601(c)	Prevention of release of contaminants to air	Sections 3.2, 4.18, and 5.16
264.601(c)(1)	Volume and characteristics of waste, including its potential for emission	Sections 3.2, 4.18, and 5.16
264.601(c)(2)	Effectiveness and reliability of systems/structures to reduce/prevent emissions of hazardous constituents to the air	Sections 3.2, 4.18, and 5.16
264.601(c)(3)	Operating characteristics of the unit	Sections 4.12 and 5.12
264.601(c)(4)	Characteristics of the unit and the surrounding area	Sections 3.2, 4.18, and 5.16
264.601(c)(5)	Existing quality of the air, including other sources of contaminants and their cumulative impact on the air	Sections 3.2, 4.18, and 5.16

Table 1-1

Regulatory Crosswalk (continued)

Regulatory Citation(s) (40 CFR)	Description of Requirement	Location in this Document
264.601(c)(6)	Potential health risks caused by human exposure to waste constituents	Sections 3.2, 4.18, and 5.16
264.601(c)(7)	Potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents	Sections 3.2, 4.18, and 5.16
265.370	Other thermal treatment	Sections 4.12.5 and 5.12.7
265.373	Thermal treatment general operating requirements	Sections 4.12.5 and 5.12.7
265.375	Thermal treatment waste analysis	Sections 4.2, 5.2, and Appendix 1, Supplement 1-3
265.377	Thermal treatment monitoring and inspections	Section 5.12.2 and Appendix 1, Supplement 1-5
265.381	Thermal treatment unit closure	Section 2.12 and Appendix 3, Supplement 3-1
265.382	Open burning; waste explosives	Sections 4.2, 4.16, 5.2, and 5.12.2
270.24	Process vents	Not applicable
270.25	Equipment for compliance with part 264, subpart BB requirements	Not applicable
270.26	Drip pads	Not applicable
270.28	Post-closure permits	Not applicable
264.75	Biennial report	2010 Permit Section 2.12.5
264.76	Unmanifested waste report	2010 Permit Section 2.12
264.77	Additional reports	2010 Permit Section 2.12

2.0 PART B GENERAL INFORMATION REQUIREMENTS

Section 2 of the Permit Renewal Application addresses the part B general information requirements under 40 CFR §§270.14(b) through (d) for permitted hazardous waste management units under the current Permit. This section describes compliance with the part B information requirements under 40 CFR §§270.42(b)(1) through (b)(20), the requirements for groundwater under 40 CFR §270.42(c), and requirements for SWMUs at 40 CFR §270.42(d). Not included in this part are the following: (1) pre-application meeting requirements under 40 CFR §270.42(b)(22), which are addressed above in Section 1.2, *Pre-Application Public Meeting*; and (2) DOE-Triad's request to permit interim status treatment units for two open detonation units and one open burning unit, which are addressed below in Section 4, *Open Detonation Treatment*, and Section 5, *Open Burning Treatment*.

Also addressed in this Section are proposed changes to Permit text and Permit Attachments that fall within part B general information requirements. These changes are also summarized and justified in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit,* and represented in Supplements 1-1 through 1-8.

Permit Section 1.2, *Permittees and Permitted Activity,* describes the different hazardous waste management units operated separately by DOE-Triad and DOE-N3B. The Permittees are not proposing to change these permitted units in this Permit Renewal Application. In total, the Permittees currently treat and/or store hazardous waste in 27 hazardous waste management units. DOE-Triad and DOE-N3B also treat hazardous waste (via microencapsulation or stabilization within containers) at 16 storage units managed by the Permittees.

DOE-Triad stores and/or treats hazardous waste at the following hazardous waste management units:

- Technical Area 3, Building 29, Container Storage/Treatment Unit
- Technical Area 50, Building 69, Indoor Container/Treatment Storage Unit
- Technical Area 50, Building 69, Container Storage/Treatment Outdoor Pad
- Technical Area 54 West, Building 38, Container Storage Unit
- Technical Area 54, West, Outdoor Container/Treatment Storage Unit
- Technical Area 55, Building 4, Container Storage/Treatment Unit, B40
- Technical Area 55, Building 4, Container Storage Unit, B05
- Technical Area 55, Building 4, Container Storage Unit, K13
- Technical Area 55, Building 4, Container Storage/Treatment Unit, B45
- Technical Area 55, Building 4, Container Storage Unit, B13
- Technical Area 55, Building 4, Container Storage Unit, G12
- Technical Area 55, Building 4, Container Storage Unit, Vault
- Technical Area 55, 0355 Pad, Container Storage/Treatment Unit
- Technical Area 55, Container Storage Outdoor/Treatment Pad
- Technical Area 55, Tank Storage and Stabilization (Treatment) Unit
- Technical Area 63, Transuranic Waste Facility (TWF), Container/Treatment Storage Unit

DOE-N3B stores and/or treats hazardous waste at the following hazardous waste management units:

- Technical Area 54, Area G, Pad 1, Container Storage/Treatment Unit

- Technical Area 54, Area G, Pad 3, Container Storage/Treatment Unit
- Technical Area 54, Area G, Pad 5, Container Storage/Treatment Unit
- Technical Area 54, Area G, Pad 6, Container Storage/Treatment Unit
- Technical Area 54, Area G, Pad 9, Container Storage/Treatment Unit
- Technical Area 54, Area G, Pad 10, Container Storage/Treatment Unit
- Technical Area 54, Area G, Pad 11, Container Storage/Treatment Unit
- Technical Area 54, Area G, Storage Shed 8, Container Storage Unit
- Technical Area 54, Area G, Building 33, Container Storage/Treatment Unit
- Technical Area 54, Area L, Container Storage/Treatment Unit

2.1 General Facility Description

The general information requirements at 40 CFR §270.14(b)(1) provide that a part B permit application for hazardous waste management facilities includes "a general description of the facility."

The Permittees are not proposing to change the facility description in the Permit and the LANL General Part A Permit Application, Revision 10.0 (LANL 2020a) provided concurrently with this renewal application. The central mission included within the application states as follows:

> *The central mission of Los Alamos National Laboratory is the reduction of global nuclear danger supported by research that also contributes to conventional defense, civilian, and industrial needs. This includes programs in nuclear, medium energy, and space physics; hydrodynamics; conventional explosives; chemistry; metallurgy; radiochemistry; space nuclear systems; controlled thermonuclear fusion; laser research; environmental technology; geothermal, solar, and fossil energy research; nuclear safeguards; biomedicine; health and biotechnology; and industrial partnerships.*

LANL is located in Los Alamos County in north-central New Mexico. It is approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. LANL's mailing address is P.O. Box 1663, Los Alamos, New Mexico, 87545. LANL is owned by DOE and is operated jointly by the DOE National Nuclear Security Administration Field Office and Triad. Additionally, the Los Alamos Legacy Cleanup Contractor, N3B, conducts corrective action and legacy waste cleanup activities on behalf of DOE's Environmental Management Los Alamos Field Office. LANL is divided into technical areas as depicted on revised Figure 2 included in Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*. Situated on the Pajarito Plateau, LANL occupies an area of approximately 40 square miles, as well as the associated residential and commercial areas of Los Alamos County that occupy an area of approximately 109 square miles. Major roads, neighboring communities, and other surrounding land uses are located on Figures 1-3 within *Permit Attachment N, Figures*. These figures are proposed to be updated as summarized in the Attachment N portion of Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit* with updates included in Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures.*

2.2 Waste Analysis Plan

The general information requirements at 40 CFR §§270.14(b)(2) and (3) provide that the part B permit application must have a Waste Analysis Plan developed to include the "chemical and physical analysis of the hazardous waste and hazardous debris to be handled at the facility. At a minimum, this analysis shall contain all the information which must be known to treat, store, or dispose of the wastes properly in accordance with part 264 of this chapter."

A copy of the Permittees' Waste Analysis Plan is currently contained as Permit Attachment C, *Waste Analysis Plan*. The plan describes the procedures used to analyze hazardous waste received at the facility, including any waste that may be received from offsite of the facility (40 CFR §264.13(c)). The Permittees are proposing minor, nonsubstantive text changes to the Waste Analysis Plan, including typographical errors, technical edits, rearrangement of information, updates for characterization of transuranic waste, removal of repetitive information, and minor text clarifications. These changes are identified and summarized in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit*; a revised version that meets the requirements at 40 CFR §264.13 is attached to this Permit Renewal Application within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.

2.3 Security

The general information requirements at 40 CFR §270.14(b)(4) provide that the Part B permit application must include "a description of the security procedures and equipment required by 40 CFR §264.14, or a justification demonstrating the reasons for requesting a waiver of this requirement." This requirement is intended to ensure that the Permittees prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active hazardous waste management units at LANL, in accordance with the requirements at 40 CFR §264.14.

The Permittees ensure the security at active hazardous waste management units by implementing the following measures as required by Permit Section 2.5, *Security*:

1. 24-hour surveillance system that continuously monitors and controls entry into the active hazardous waste management units at the Facility; or
2. controlled entry into the active hazardous waste management units at all times via gates, stations, or other means (e.g., attendants, locks, and prohibited or controlled roadway access).

The Permittees maintain all security fences, entry gates, and entry stations surrounding the active hazardous waste management units as required by the Permit. Figures that represent security features at each of the units are included in Permit Attachment N, *Figures* and have been updated in this Permit Renewal Application. Applicable figures include newly numbered, revised, and added Figures 3-13 in Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*.

The Permittees propose minor nonsubstantive changes to the access and security description within Permit Attachment A, *Technical Areas Unit Descriptions* of the Permit. The updates include removal of references to security fences or entry gates at Technical Area (TA) 50 that are not relevant for the active hazardous waste management units at TA-50, Building 69 (TA-50-69). These changes are also summarized in Appendix 1, *Summary Table of Proposed Changes to 2010 the Los Alamos National*

Laboratory Hazardous Waste Facility Permit and included in Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11.*

2.3.1 Warning Signs

Per the requirements stipulated in 40 CFR §264.14(c) and Permit Section 2.5.1, *Warning Signs*, warning signs are posted at each active hazardous waste management unit. In Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*, the Permittees propose to remove the warning sign requirement from the individual permit sections within Permit Attachment A, *Technical Area Unit Descriptions,* which address warning sign requirements at hazardous waste management units. The requirement in individual sections is duplicative and, in some cases, inconsistent with the warning sign requirements in Permit Section 2.5.1. Warning signs will still be posted at hazardous waste management units.

2.4 Inspections

The general information requirements at 40 CFR §270.14(b)(5) stipulate a part B permit application to include "a copy of the general inspection schedule as required by §264.15(b), and, where applicable, the inspection schedule must address the requirements at §§264.174, 264.193(i), 264.195, 264.226, 264.273, 264.303, 264.602, 264.1052, 264.1053, 264.1084, 264.1086 and 264.1088 of this part."

A copy of the Permittees' inspection plan is included as Permit Attachment E, *Inspection Plan.* A revised version is attached to this Permit Renewal Application as Supplement 1-5, *Permittees' Proposed Changes to Permit Attachment E, Inspection Plan*, to meet the requirements of 40 CFR §270.14(b)(5). Permit Section 2.6, *General Inspection Requirements,* requires the Permittees to conduct inspections in compliance with the 2010 Permit. The plan addresses the inspection requirements for all hazardous waste management units to meet applicable requirements under 40 CFR Part 264.

The Permittees propose minor, nonsubstantive changes to the 2010 Permit, including updates to the arrangement of the inspection plan and to the inspection forms. These changes are identified and justified in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit,* and are included within Supplement 1-5, *Permittees' Proposed Changes to Permit Attachment E, Inspection Plan*.

2.5 Waivers for Preparedness and Prevention

The general information requirements at 40 CFR §270.14(b)(6) stipulate that a part B permit application include "a justification for any request to waive the preparedness and prevention requirements of part 264, subpart C."

No waivers of the preparedness and prevention requirements under Part 264, subpart C are being sought by the Permittees.

2.6 Contingency Plan

The general information requirements at 40 CFR §270.14(b)(7) stipulate the part B permit application to include a "copy of the Contingency Plan to meet the requirements of 40 CFR Part 264, Subpart D and, as applicable, the requirements of 40 CFR §§264.227, 264.255, and 264.200."

The Permittees do not manage hazardous waste in waste piles, surface impoundments, land treatment units, or landfills. Therefore, the requirements from §§264.227, 264.254, 264.273, and 264.303 are not applicable.

Permit Section 2.10, *Preparedness and Prevention*, requires the Permittees to develop and have ready for implementation a Contingency Plan that describes the actions carried out by the Permittees to (1) ensure appropriate response to any threat to human health and the environment as a result of fire, explosion, or any unplanned sudden or nonsudden release of hazardous waste or hazardous waste constituents to the air, soil, or surface water and (2) that the threat is mitigated. A copy of the revised Permit Attachment D, *Contingency Plan,* is included in this Permit Renewal Application in Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*, to meet the requirements of 40 CFR §270.14(b)(7). The Permittees do not propose any substantive changes to the plan. Changes are associated with the general rearrangement of the plan, updating terminology associated with emergency preparedness activities, and making organizational changes to facilitate implementation, provide clarity, and remove redundant information. The plan includes information on internal local response activities in accordance with 40 CFR §264.52 as well as arrangements with outside emergency response personnel and services in the area to meet the requirements of 40 CFR §264.37. Required emergency equipment located at the Facility and at the individual hazardous waste management units is listed within Permit Attachment D, *Contingency Plan,* at the proposed reorganized Tables D-3 through D-15. This equipment is referenced by and maintained in accordance with Permit Section 2.10 and the requirements at 40 CFR Part 264, Subpart C, *Preparedness and Prevention*. There are no proposed changes to the actions to be taken in the event of an emergency or reductions in the emergency equipment available at any of the active hazardous waste management units. Evacuation plans are developed for each of the hazardous waste management units for which evacuation may be necessary, as required by Permit Section 2.11.2(6).

2.7 Hazards Prevention

The following sections discuss how the Permittees perform prevention and preparedness under requirements within 20 CFR Part 264, Subpart C, and the application requirements from 40 CFR §§270.14(8)(i-vi).

2.7.1 Waste Handling and Preventing Hazards in Unloading/Loading

The general information requirements for 40 CFR §270.14(8)(i) stipulate that the part B permit application contains a description of procedures, structures, or equipment used at the Facility to "prevent hazards in unloading operations (for example, ramps, special forklifts)."

The following is a description of the procedures used to manage hazardous waste containers in a manner that minimizes risks to the containers and workers in the waste management units. Small containers (e.g., boxes, bags, plastic buckets, and cardboard containers) of waste are handled manually or with hand trucks or a dolly. Light drums may be handled manually or with a dolly. The use of proper handling equipment, appropriate to a container's size and weight, helps prevent hazards while moving containers. Forklift operators may use an auxiliary boom, if necessary, to improve handling capabilities. For larger containers, personnel can use a boom or, at TA-50-69 and various locations at TA-54 and TA-55, personnel can use bridge cranes or mobile cranes. At TA-54, waste containers (e.g., fiberglass reinforced plywood crates, drums, and large boxes) are generally handled with forklifts, overhead cranes, or frictionless air pallets. Only a single crane is used at one time. Trained spotters may assist with container movement during forklift or crane operations. To protect the integrity of waste containers received, only equipment designed for moving waste containers is used. Where necessary, each hazardous waste management unit is equipped with structures and equipment to facilitate safe loading, unloading, and movement of waste containers.

Flatbed trucks, trailers, forklifts, or other appropriate vehicles may be used to transport waste containers to and from the hazardous waste management units at LANL. When receiving waste at the hazardous waste management units, waste containers are inspected to ensure that (1) there is no damage or leaking material and that (2) they are properly labeled. For transport, the containers of waste are secured. Wastes are transported to and from hazardous waste management units by appropriately trained and authorized personnel in an appropriate vehicle. Qualified personnel unload waste from the vehicle and place it in an unloading area or directly into storage at the unit. Visual examination is conducted after unloading to ensure that containers are not damaged or leaking and are otherwise in good condition and that no waste remains in the transport vehicle. Waste management personnel are trained for safe-handling operations in accordance with Section 2.11, *Personnel Training,* of this Permit Renewal Application.

2.7.2 Control of Runoff

The general information requirements for 40 CFR §270.14(8)(ii) stipulate the part B permit application to describe procedures and controls used to “prevent runoff from hazardous waste handling areas to other areas of the facility or environment, or to prevent flooding (for example, berms, dikes, trenches).”

The Permittees propose no change in the manner in which runoff is prevented from leaving the hazardous waste management units to the facility or environment where applicable, or to prevent flooding as described in the Permit Section 3.12.2, *Preventing Runon and Runoff*, and within Attachment A, *Technical Area Unit Descriptions*, proposed renumbered Sections A.6.1 (and subsections), A.6.5 (and subsections), A.7, and A.8.8 within Supplement 1-2, *Permittees’ Proposed Changes to Attachment A, Technical Area Unit Descriptions*.

2.7.3 Preventing Water Supply Contamination

The general information requirements for 40 CFR §270.14(b)(8)(iii) stipulate the part B permit application to “describe procedures to prevent contamination of water supplies.”

The hazardous waste management units are located, designed, constructed, operated, and maintained in a manner that ensures the prevention of water supply contamination. No hazardous waste disposal activities will occur at the site. Waste storage involving any potential liquids occurs only with secondary containment and under cover, if outdoors. A stated above, hazardous waste management units at the facility are designed or operated to minimize runoff from the waste storage areas. In the event of a spill or contamination, the provisions of Permit Section 3.12.2, *Preventing Runon and Runoff* and the provisions of the *Contingency Plan*, included as Supplement 1-4, *Permittees’ Proposed Changes to Permit Attachment D, Contingency Plan*, and the *Inspection Plan*, included as Supplement 1-5, *Permittees’ Proposed Changes to Permit Attachment E, Inspection Plan*, will provide protection to prevent potential contamination from reaching potable water supplies. Water supply lines at LANL are under pressure and are equipped with backflow prevention devices to prevent potential contamination of potable water supplies.

2.7.4 Mitigate the Effect of Equipment Failure and Power Outages

The general information requirements for 40 CFR §270.14(b)(8)(iv) stipulate the part B permit application to describe procedures to "mitigate equipment failure and power outages."

The Permit addresses the required mitigation procedures at Permit Section 2.10.1, *Required Equipment,* and Permit Section 2.10.2, *Testing and Maintenance of Equipment*. Permit Section 2.10.1 requires that "at permitted units where equipment is necessary to mitigate the effects of a power outage, batteries, generators, or some other form of backup power supply capable of operating equipment including evacuation alarms, emergency communication equipment, automatic fire suppression system, and emergency lights."

The Permittees propose one minor change to Permit Section 2.10.2, *Testing and Maintenance of Equipment*. If during an inspection a system, device, or equipment is found in need of maintenance, repair, or replacement, the situation may be mitigated until such time as the equipment is returned to normal operating conditions, in addition to the options currently included in Permit Section 2.10.2. Mitigation could include use of substitute equipment, fire watch, or limiting operations in the immediate area. The proposed change to the LANL 2010 Permit within Section 2.10.2, *Testing and Maintenance of Equipment,* is to allow for other mitigating measures when equipment is found to be out of service or requires maintenance or replacement. Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit,* and Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11*, includes the specific changes requested to the 2010 Permit.

2.7.5 Preventing Undue Exposure of Personnel

The general information requirements for 40 CFR §270.14(b)(8)(v) stipulate the part B permit application to describe procedures to "prevent undue exposure of personnel to hazardous waste (for example, protective clothing)."

To prevent undue exposure of personnel to hazardous or mixed waste at the permitted and interim status hazardous waste management units, workers follow LANL-wide and facility-specific safety procedures. Prevention and control measures include administrative as well as active controls at the sites.

Administrative controls are maintained at all hazardous waste management units to control entry at the units, and to limit the number of personnel present during waste management and/or treatment activities. Worker exposure to potential hazardous and mixed waste is mitigated by containers being kept closed while in storage, most treatment activities being conducted in containment, or treatment outdoors being conducted remotely. See operations information included in Permit Application Sections 4 and 5 for specific information regarding pre-treatment and day of treatment protocols related to worker safety for open detonation and open burning hazardous waste management units.

Worker education, training, and involvement in planning activities also provide safety measures. Along with the facility-wide safety program established at LANL during hazardous waste management activities, operations at hazardous waste management units have safety requirements associated with safety in radiological or nuclear facilities (all currently permitted units) and at the open burning and open detonation units explosives safety and fire protection requirements which are discussed in detail in Permit Application Sections 4 and 5. All personnel involved in waste treatment activities will be required to have training appropriate for their work. Training requirements are presented in Permit Attachment F, *Personnel Training Plan*. Personnel will also be required to review job hazards prior to performing waste management or treatment activities. Additionally, hazard control plans (that address monitoring equipment), and work authorizations will be required, in accordance with LANL safety procedures.

Personal protective equipment (PPE) appropriate for use during the waste management and treatment activities will be worn by all on-site personnel. Hard hats, safety shoes or boots, safety glasses, hearing protection and gloves will be used, as appropriate based on Occupational Safety and Health Administration (OSHA) requirements depending on the associated work hazards identified in job-specific hazard control plans. The PPE will be compatible with the hazards present. The need for Personal Contamination Monitors (PCM, e.g., dosimeter, Draeger™ Tubes) will be established using the job hazard review process. All personnel that use PPE are trained and qualified to use the equipment properly.

Together, the established safety program, required training, plans, and work authorizations will help to prevent undue exposure to personnel~~The Permittees propose no change in the manner in which they prevent undue exposure of personnel to hazardous waste. Permit Attachment D, *Contingency Plan*, requires personnel protection equipment (PPE) by LANL workers to prevent undue exposure of personnel when handling waste. In addition, LANL personnel are required to meet applicableDOE Standard, *Industrial Hygiene Practices*, DOE-STD-6005-2001 (DOE 2001), which incorporates Occupational Safety and Health Administration requirements for PPE to prevent undue exposure of personnel when handling hazardous waste. Entry requirements exist at each of the active hazardous waste management units that are designed to present the minimum protection for entry at a hazardous waste management unit.~~.

2.7.6 Preventing Releases to the Atmosphere

The general information requirements for 40 CFR §270.14(b)(8)(vi) stipulate the part B permit application to "describe the procedures to prevent releases to the atmosphere."

The Permittees do not propose any changes in the manner in which they prevent releases to the atmosphere for waste stored in tanks or containers, or treatment activities at the permitted hazardous waste management units. Permit Parts 3, 4, 7, and 8 all have provisions that containers, tanks, or other treatment activities are kept closed during handling and storage, or contained while being treated (through glovebox operations or other containment).

In addition, this requirement is met through inspections as required by Permit Section 2.6 and Permit Attachment E, *Inspection Plan*. In summary, inspections are conducted to ensure the integrity of all stored containers and tanks. Hazardous waste stored in containers or tanks must meet requirements of 40 CFR Part 264, Subpart CC, *Air Emission Standards for Tanks, Surface Impoundments, and Containers,* ensuring that containers of hazardous waste be covered so that there are no detectable emissions of volatile organic compounds to the air. Compliance inspection and monitoring associated with container and tank monitoring are described in Permit Attachment E, *Inspection Plan*.

Because the three interim status units proposed for permitting in this Permit Renewal Application are open air treatment units, releases to the atmosphere are inherently not prevented. Precautions and evaluations of the impact to the atmosphere by the operations at these units are included in Sections 4.7.6, *Preventing Releases to the Atmosphere,* and 5.7.6, *Preventing Releases to the Atmosphere,* of this Permit Renewal Application.

2.8 Ignitable, Reactive, and Incompatible Waste Precautions

The general information requirements for 40 CFR §270.14(b)(9) stipulate the part B permit application to describe procedures to "prevent accidental ignition or reaction of ignitable, reactive, and incompatible wastes."

Permit Section 2.8, *Ignitable, Reactive, and Incompatible Waste*, addresses the requirements to prevent accidental ignition or reaction of ignitable, reactive, and incompatible hazardous wastes as required to demonstrate compliance with 40 CFR §264.17, including the requirements of 40 CFR §§264.17, 264.176, 264.177, 264.198, and 264.199. Documentation associated with the precautions taken for ignitatable, reactive, or incompatible waste at the Facility is kept I accordance with Permit Section 2.12.2, *Facility Operating Record*, and as required by 40 CFR §264.17(c).

Permit Section 2.8 requires precautions to be in place at hazardous waste management units to prevent reactions during the treatment or storage of ignitable or reactive waste, and the mixing of incompatible waste. Permit Section 2.8.1 requires ignitable, reactive, or incompatible waste to be separated and protected from sources of ignition or reaction, including but not limited to the following: open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. The Permittees recommend three changes to the requirements in Permit Section 2.8.1. The changes are summarized in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit,* and detailed in Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11*.

The proposed changes are associated with the use of nonsparking processes when nonsparking tools are not available, a clarification to the requirements for compatibility of a fire-suppression system, and the addition of the requirement to add "No Smoking" signs at a permitted unit where ignitable, reactive, or incompatible wastes are treated or stored. This change is suggested for completeness and to better mirror the language within the regulations.

Nonsparking tools are used for waste management operations wherever possible. If nonsparking tools are not available or are impractical for the activity, the activity will be evaluated and a "nonsparking process" will be planned and utilized. The Permittees propose the addition of this text to Permit Section 2.8.1(4). These practices have been successfully employed in the past in specific situations such as the addition of filters to mixed transuranic waste containers with nitrate salt waste. Careful evaluation will be conducted to ensure the safe management of any handling or opening of waste containers that hold ignitable and/or reactive waste.

The fire suppression system compatibility clarification is proposed to be added at Permit Section 2.8.1(9) and is also included in Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11*. The added language associated with fire suppression systems is necessary to allow for mitigation when a waste is determined to be incompatible with the fire suppression system.

2.9 Traffic Pattern, Estimated Volume, and Control

The general information requirements for 40 CFR §270.14((b)(10) stipulate the part B permit application to describe "traffic patterns, estimated volume (number, type of vehicles) and control (for example, show turns across traffic lanes and stacking lanes (if appropriate); describe access road surfacing and load bearing capacity; show traffic control signals)."

This section has been updated to address current traffic patterns, estimated volume, and controls. Traffic pattern information presented in this section is general in nature for the traffic at LANL and generally focuses around the hazardous waste management units.

The rugged topography of alternating mesas and canyons at LANL limits traffic circulation to only a few major arterial roads. Approximately 100 miles of paved roads are present within LANL. The major roads are shown on Figures 1 and 2 of Permit Attachment N, *Figures*. Revised versions of these figures are included in Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*. There are approximately 19 miles of highway, 22 miles of TA access roads, and 44 miles of roads within TAs at LANL.

The main access route to LANL is State Road 502; the majority of traffic to LANL approaches from the east on State Road 502 and East Jemez Road. Alternate access routes are available from the south and west on State Roads 4 and 501 (West Jemez Road). All persons entering LANL property must show identification in the form of a LANL-issued badge, valid federal- or state-issued identification, or be vouched for by an accompanying person who is a LANL badge holder or a person with other acceptable identification.

The pattern of east-west trending canyons at LANL prohibits north-south automobile travel in nearly all portions of LANL, with the exception of Diamond Drive and part of West Jemez Road. Los Alamos Canyon is spanned at Diamond Drive by an 820-ft.-long steel-arch bridge that was completed in 1951 and improved in 1993 and 2014. This bridge provides the main access between LANL facilities located on either side of Los Alamos Canyon.

Approximately 12,000 people are currently employed at LANL (including full-time, part-time, casual LANL personnel, and subcontractors). Roughly 6,000 people commute to LANL daily from communities outside Los Alamos County.

Hazardous waste is generated at TAs throughout LANL. Small quantities of waste are generally accumulated in containers at central accumulation areas or satellite accumulation areas and then packed in containers, such as drums, boxes, or crates, for transport to storage or treatment areas, as necessary. Bulk liquid waste is contained primarily in drums or tanks. Because hazardous waste may be generated throughout LANL, waste transport may occur on nearly all roads within LANL. Offsite wastes may be received at LANL on a limited basis, as described in Permit Section 2.2.1, *Hazardous Waste from Off-Site Sources*.

2.9.1 Routes of Travel

Primary travel routes to and from hazardous waste management units are minimized when possible. Containers received at units are also moved minimal distances on road surfaces along the routes.

TA-3-29 is located on Diamond Drive; however, waste delivered to and from the unit is not generally routed on Diamond Drive. Primary traffic routes used to transport hazardous waste to or from the TA-3-29 hazardous waste management unit include Pajarito Road, Pecos Drive, and State Road 502. Lesser-used traffic routes may include State Road 501 and Mesita del Buey Road (see Figures 1 and 2 in Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*).

Hazardous waste management units at TA-50, TA-54, TA-55, and TA-63 are located along the Pajarito corridor. Pajarito Road is a primary thoroughfare at LANL; the TAs located along this corridor include the following: TA-3, TA-18, TA-36, TA-48, TA-51, TA-54, TA-55, TA-63, and TA-66. Most of the Pajarito corridor is closed to the public. The units located along the corridor cannot be directly accessed via Pajarito Road, and other roads, as shown on Figures 1 and 2 in Permit Attachment N, are used for access to the units. Pajarito Road is a two-lane road built for 55-mile-per-hour traffic with no vehicle size restrictions, with only limited heavy truck and fuel-truck traffic prohibitions. Roads along Pajarito Road that might be used to transport hazardous waste to and from the hazardous waste management units along the Pajarito corridor include the following:

- Pecos Drive and Mesita del Buey Road at TA-50,
- Mesita del Buey Road at TA-54,
- Puye Road at TA-63, and
- Pecos Drive at TA-55.

As discussed in Section 2.7.1, *Waste Handling and Preventing Hazards in Unloading/Loading,* of this Permit Renewal Application, waste transportation may occur using flatbed trucks, trailers, forklifts, or other appropriate vehicles. Loading and unloading activities will be conducted in designated areas at each of the units. It is anticipated that forklifts will be the primary vehicle traffic at each of the units, with the only other vehicle traffic within the unit footprints (at outdoor storage units) being semi-trucks (for occasional placement and removal of characterization equipment/trailers), delivery trucks with specialty gases (for characterization and radiation protection equipment), and snow removal equipment. Snow removal equipment such as blade-equipped all-terrain vehicles may also be used. Snow removal equipment such as snow plows may be used for heavy snows, but those vehicles would not be used near waste containers stored outside. If snow removal within the vicinity of any stored waste containers is needed, snow shovels or a snow blower will be used. Other vehicles or equipment that may be required to perform maintenance at the units will also be escorted and speeds will be limited around waste operations in the area.

2.9.2 Traffic Volumes

Pajarito Road has an average daily traffic volume of approximately 4,000 vehicles per 24-hour day (LANL 2008). This road has since been closed to the public and only badge holders are permitted on the corridor. This includes vehicles traveling both northwest and southeast. Vehicle types include cars, light- and medium-duty trucks, and vans. Anticipated traffic volumes at each of the outdoor storage hazardous waste management units will be from one to several waste shipments by truck to or from loading/unloading areas per day, forklift traffic within the units, occasional delivery trucks for analytical gases and other supplies, and (rarely) waste characterization trailer movement (at applicable units). All parking areas are located well away from the location of hazardous waste management units.

2.9.3 Traffic Control Signals

Applicable traffic control signals at each of the hazardous waste management units are shown on site maps included within new renumbered Figures included in Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*.

2.9.4 Road Surfacing and Load-Bearing Capacity

Roads at LANL are generally two-lane roads with asphaltic concrete surfaces. Load-bearing capacity for these roads is 32,000 pounds per axle. These roads are typically constructed with a 6-inch-thick base course overlain with a 3-inch-thick asphaltic concrete surface. These roads were designed and constructed to meet Specification HS-20 of the American Association of State Highway and Transportation Officials.

2.10 Facility Location Information

The general information requirements for 40 CFR §270.14(b)(11) stipulate the part B permit application to describe compliance with the follow standards:

- the seismic standard;
- the floodplain requirements for 40 CFR §§270.14(b)(11) and 264.18; and
- the topographic map requirements at 40 CFR §270.14(b)(19).

2.10.1 Seismic Standard

The general information requirements for 40 CFR §270.14(b)(11) stipulate the part B permit application to address the seismic standard for 40 CFR §264.18(a) under certain circumstances. Proposed new or enlarged units are required to demonstrate compliance with the seismic location standard of 40 CFR 264.18(a) and 270.14(b)(11)(ii). 40 CFR §270.14(b)(11) requires Applicants to identify the political jurisdiction (e.g., county, township, or election district) in which the Facility is proposed to be located and, 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 for 40 CFR §264.18(a). The seismic standard requires that portions of new facilities where treatment, storage, or disposal of hazardous waste will be conducted must not be located within 61 meters (200 feet) of a fault that has experienced displacement in Holocene time.

LANL is located in Los Alamos County, New Mexico, which is a political jurisdiction listed in Appendix VI of part 264. Therefore, the seismic standard for 40 CFR §264.18(a) is applicable.

The Permittees demonstrated compliance with 40 CFR §264.18(a) for each of their permitted units. As required by 40 CFR §270.14(b)(11)(ii), this demonstration was made using either published geologic data or data obtained from field investigations carried out by the Permittees.

The Permittees are not proposing any new or enlarged units. The three interim status units (TA-16-388 Flash Pad, TA-36-8, and TA-39-6) the Permittees include in this Permit Renewal Application are exempt from the seismic standards in 40 CFR §§ 270.14(b)(11) and 264.18(a). The units have been in use since the 1940s; therefore, the units existed before the promulgation of the hazardous waste regulations. Consistent with the criteria provided in 40 CFR §§ 270.14(b)(11)(i) and 264.18(a), the hazardous waste management units at TA-16-388, TA-36-8, and TA-39-6 are not new units; thus, the seismic standard is not applicable. At the request of the NMED-HWB, seismic location standard information for the three interim status units (TA-16-388 Flash Pad, TA-36-8, and TA-39-6) is included as part of the Permittees' response to a letter received from the NMED-HWB on March 23, 2021 (LANL, 2021). The seismic investigation demonstrates that there has been no direct evidence observed for Holocene faulting within the noted radius of the facility.

2.10.2 Floodplain Standard

The general information requirements for 40 CFR §270.14(b)(11)(iii) stipulate the part B permit application to "identify whether the facility and hazardous waste management units are located within a 100-year floodplain."

None of the hazardous waste management units making up the LANL hazardous waste facility lie within a 100-year floodplain as defined in 40 CFR §264.18(b)(2)(i) and as regulated under §264.18(b)(1). Figures 2-1 and 2-2 within this Permit Renewal Application depict the 100-year floodplains at LANL and the locations of hazardous waste management units.

2.10.3 Topographic Maps

The general information requirements for 40 CFR §270.14(b)(19) (i) – (xii) stipulate a part B permit application to include topographic maps, figures, and drawings to meet the requirements of 40 CFR §§270.14(b)(19) and 270.13(l). For large facilities, the use of other scales is allowed on a case-by-case basis. The maps show the map scale, the date of preparation, and a north arrow. The maps and figures used to fulfill these regulatory requirements include the following:

- 100-year floodplain maps showing the location of each of the hazardous waste units at LANL is provided as Figures 2-1 and 2-2 of this Permit Renewal Application.
- Maps showing surface waters, including intermittent streams, near each of the hazardous waste management units are included on the TA-specific topographic maps within the concurrent submittal of the LANL General Part A Permit Application, Revision 10.0 (LANL 2020a).
- Surrounding land uses (e.g., residential, recreational) are depicted on updated Figures 1 and 3 within Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*.
- Wind roses for LANL are shown on Figure 2-3.
- A topographic map showing the legal boundaries of LANL is included within the concurrent submittal of the LANL General Part A Permit Application, Revision 10.0 (LANL 2020a).
- The access control features (fences, gates) applicable for each of the hazardous waste management units are shown on newly numbered Figures 3 through 13 in Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*.
- A map that includes supply wells, monitoring wells, test wells, springs, and surface-water sampling stations at LANL is included as Map 3 within the concurrent submittal of the LANL General Part A Permit Application, Revision 10.0 (LANL 2020a).
- The locations of buildings and structures, the hazardous waste management units, and the terrain for a distance of at least 1,000 feet beyond each of the hazardous waste management

units are all shown on the topographic maps for each of the TAs that house hazardous waste management unit that are included within the concurrent submittal of the *LANL General Part A Permit Application, Revision 10.0* (LANL 2020a).

- The locations of the Clean Water Act National Pollutant Discharge Elimination System discharge structures are included within Map 2 within the concurrent submittal of the *LANL General Part A Permit Application, Revision 10.0* (LANL 2020a).
- Storm, sanitary, and process sewer systems at LANL are shown on Map 2 within the concurrent submittal of the *LANL General Part A Permit Application, Revision 10.0* (LANL 2020a).
- Drainage control features, where appropriate, located at each of the hazardous waste management units are shown onsite maps included within the concurrent submittal of the *LANL General Part A Permit Application, Revision 10.0* (LANL 2020a).
- Natural surface drainages near the active hazardous waste management units are shown on the TA-specific topographic maps within the concurrent submittal of the *LANL General Part A Permit Application, Revision 10.0* (LANL 2020a).
- Fire stations serving LANL and the County of Los Alamos are shown on Figure D-2 within the revised Permit Attachment D, *Contingency Plan,* included as Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.
- All existing wells and boreholes at LANL are shown on Map 3 in the concurrent submittal of the *LANL General Part A Permit Application, Revision 10.0* (LANL 2020a).

Contour lines on all topographic maps are at intervals sufficient to detail natural drainage at LANL. As provided in 40 CFR §270.14(b)(19), LANL has submitted the maps to the NMED-HWB at these scales and contour intervals due to the size of the units, the extent of the LANL Facility, and the topographic relief in the area.

2.11 Personnel Training

The general information requirements for 40 CFR §270.14(b)(12) stipulate that the part B permit application have an "outline of both the introductory and continuing training programs by owners and operators to prepare persons to operate or maintain a hazardous waste management facility in a safe manner as required to demonstrate compliance with 40 CFR §264.16. A brief description of how training will be designed to meet actual job tasks in accordance with the requirements of 40 CFR §264.16(a)(3)."

A copy of the Permittees' personnel training program is included in the Permit as Permit Attachment F, *Personnel Training*, and a revised version of that plan attached to this Permit Renewal Application as Supplement 1-6, *Permittees' Proposed Changes to Attachment F, Personnel Training Plan*. The Training Plan is required for hazardous waste management activities or activities that have the potential to have contact with waste containers in a hazardous waste management unit in compliance with the requirements of 40 CFR §264.16. The Permittees are proposing minor, nonsubstantive changes to the plan that include updates to reflect revised terminology, updated standards, and deletion of repetitive language. These changes are summarized in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit,* and are included as Supplement 1-6, *Permittees' Proposed Changes to Permit Attachment F, Personnel Training Plan*.

2.12 Closure Plan

The general information requirements for 40 CFR § 270.14(b)(13) stipulate that the part B permit application have a "copy of the Closure Plan and, where applicable, the post-closure plan required by 264.112, 264.118, and 264.197. Include, where applicable, as part of the plans, specific requirements in 264.178, 264.197, 264.228, 264.258, 264. 280, 264.310, 264. 351, 264.601, and 264.603."

A copy of the Closure Plan for each of the 27 permitted hazardous waste management units is included in Permit Attachments G.1–G.30. Proposed changes to existing closure plans and additional closure plans are summarized in Appendix 3, *Summary Table of Proposed Changes to Hazardous Waste Management Unit Closure Plans,* and are included Supplement 3-1, *Permittees' Proposed Changes to Attachments G.1 through G.30 Closure Plans*, to meet the requirements of 40 CFR §§270.14(b)(13) and 264.112. All the plans within the 2010 Permit were approved in accordance with 40 CFR §§264.110 through 264.116, 264.178, 264.197, 264.601, and 265.381. In addition, the Permittees are proposing specific changes to closure plans in Permit Attachments G.1 through G.30, in accordance with the Settlement Agreement reached in *U.S. v. Curry*, DC NM Case No. 10-01251 (see Section 6.0, Permit Changes). These proposed changes to the closure plans are also summarized in Appendix 3.

Addition of closure plans are discussed in Sections 4.11 and 5.11 of this document.

2.13 Closure for Hazardous Waste Disposal Units

The general information requirements for 40 CFR §270.14(b)(14) stipulate that the part B permit application include "for hazardous waste disposal units that have been closed, documentation that notices required under 264.119 have been filed."

The Permittees do not have active hazardous waste disposal units under the Permit. Therefore, no notices required by 264.119 have been filed.

2.14 Cost Estimates, Insurance, Financial Mechanisms

The general information requirements for 40 CFR §§270.14(b)(15) – 270.14(18) stipulate that the part B permit application include, where appropriate, the most recent closure and post-closure cost estimate for the facility; a copy of insurance policy; and proof of coverage by a State's financial mechanism.

LANL is a federally owned facility and is exempt from the financial assurance requirements of 40 CFR subpart H, including cost estimates, liability insurance, financial mechanisms ,and proof of financial coverage under 40 CFR §§270.14(b)(15) – 270.14(18), incorporating the requirements of 40 CFR §§264.142-.150.

2.15 Other Federal Law

The general information requirements for 40 CFR § 270.14(b)(20) stipulate that a part B permit application include such information as necessary to enable the applicable regulator to carry out duties under other federal laws as required under 40 CFR §270.3 to be given consideration when applying for a hazardous waste facility permit. When any of these laws are applicable, its procedures must be followed:

The Wild and Scenic Rivers Act (16 United States Code [USC] 1273 et seq.). This act provides for a national wild and scenic rivers system and prohibits construction of any waterway that would have a direct adverse effect on the values for which a wild and scenic river was established.

The National Historic Preservation Act of 1966 (16 USC 470 et seq.). This act establishes a program to preserve historic properties throughout the country. The act has provisions that require mitigation of adverse effects to registered properties.

The Endangered Species Act of 1973 (16 USC 1531). This act provides for the conservation of endangered and threatened species of fish, wildlife, and plants. The act prohibits any action that would jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat.

The Migratory Bird Treaty Act (16 U.S.C. 703-712). This act makes it illegal to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid Federal permit. Migratory bird species protected by the Act are listed in 50 CFR 10.13.

The Coastal Zone Management Act of 1972 (16 USC 1451 et seq.). This act establishes national policy for the management, use, protection, and development of land and water resources of the nation's coastal zones. Section 307(c) of the act and implementing regulations prohibit the EPA from issuing a permit for activity affecting coastal zone land or water without the certification from the applicant that the activity is in compliance with the state's Coastal Zone Management Program.

The Fish and Wildlife Coordination Act of 1934, as amended (16 USC 661 et seq.). This act promotes the conservation of wildlife, fish, and game and integrates this conservation with water resource projects. Certain provisions of the act require that permits proposing or authorizing the impoundment, diversion, or other control or modification of any body of water be considered by the appropriate state agency for impacts to wildlife resources.

Because LANL has ongoing programs in support of the National Historic Preservation Act, the Endangered Species Act, and the Fish and Wildlife Coordination Act, consideration was given to all these federal laws.

The National Historic Preservation Act is administered by the Advisory Council on Historic Preservation, appointed by the President, along with the New Mexico State Historic Preservation Office. Section 106 of the Act requires DOE to consider the effects of its actions on historic properties and provide the Council with a reasonable opportunity to comment on those actions and the manner in which DOE takes historic properties into account in their decisions. DOE accomplishes this through consultation with the State Historic Preservation Office whenever a project may potentially impact a historic property. At LANL, historic properties include prehistoric and historic archaeological sites, historic Manhattan Project and Cold War-era buildings, and associated artifacts. LANL may prepare a Historic Building Survey Report assessing the eligibility of a historic building dating from the Manhattan Project and early Cold War periods (1943 to 1956) for the National Register of Historic Places and evaluating the impacts of the proposed actions. The consultation process was formalized in April 2000 through a Programmatic Agreement between DOE, the Council, and the State.

For any undertaking on DOE land that may directly or indirectly impact threatened and endangered species or their habitat, DOE must consult with the U.S. Fish and Wildlife Service, as provided under Section 7 of the Endangered Species Act. Similarly, DOE must consult with the U.S. Fish and Wildlife Service for projects that would impound, divert, or otherwise control or modify a body of water, as required by the Fish and Wildlife Coordination Act.

For Endangered Species Act compliance, LANL may prepare a Biological Assessment to document the presence of threatened and endangered species and to evaluate the impacts of a project on a listed species or its habitat. DOE will then request in writing that the U.S. Fish and Wildlife Service concurs with DOE's findings in the Biological Assessment. In 2000, DOE and LANL streamlined the consultation process by preparing a threatened and endangered Species Habitat Management Plan. This plan fulfills the provisions of the Endangered Species Act that require federal agencies to carry out programs for the conservation of threatened and endangered species and their habitat. The U.S. Fish and Wildlife Service approved this plan in February 1999.

For Migratory Bird Treaty Act compliance, LANL ensures that operations and activities do not cause the take (including killing, capturing, selling, trading, and transport) of any migratory bird, including eggs and nestlings in an active nest.

Provisions in the Wild and Scenic Rivers Act and the Coastal Zone Management Act are not applicable to LANL's activities.

Consideration will be given to Executive Orders, issued by the President, that are relevant to waste management activities at LANL. When any of these Orders is applicable, its provisions will be followed. Requirements for Executive Orders are reserved in 40 CFR §270.3(f).

2.16 Groundwater Monitoring

The general information requirements for 40 CFR §§270.14(c)(1) – 270.14(c)(8) stipulate that a part B Permit Renewal Application include additional information regarding groundwater protection for regulated units. The three regulated units at LANL are located at TA-54. They are Material Disposal Areas (MDAs) G, H, and L.

The requirements of 40 CFR §§270.14(c)(1 through 8) for regulated units are met by LANL Interim Facility-Wide Groundwater Monitoring Plan for the 2020 Monitoring Year, October 2019-September 2020 (IFGMP) (LANL 2020b), Section 5-*Technical Area 54 Monitoring Group*. As described in Section II.C of the Consent Order (New Mexico 2005), the monitoring conducted under this program meets the requirements of 40 CFR §§270.14(c)(1 through 8) for the Permittee's groundwater, detection and compliance monitoring programs, as well as the required corrective action program.

"(c) ***Additional information requirements.*** The following additional information regarding protection of groundwater is required from owners or operators of hazardous waste facilities containing a regulated unit, except as provided in § 264.90(b) of this chapter:

> **(1)** A summary of the groundwater monitoring data obtained during the interim status period under §§ 265.90 through 265.94, where applicable."

The Permittees have not collected groundwater data under interim status.

> **“(2)** Identification of the uppermost aquifer and aquifers hydraulically interconnected beneath the facility property, including groundwater flow direction and rate, and the basis for such identification (i.e., the information obtained from hydrogeologic investigations of the facility area).”

There has been no change in the identification of the uppermost aquifer or aquifers hydraulically connected beneath the LANL facility property, as detailed in the most recent version of the IFGMP.

> “**(3)** On the topographic map required under paragraph (b)(19) of this section, a delineation of the waste management area, the property boundary, the proposed “point of compliance” as defined under § 264.95, the proposed location of groundwater monitoring wells as required under § 264.97, and, to the extent possible, the information required in paragraph (c)(2) of this section.”

There is no change to the delineation of the waste management area, the property boundary, the point of compliance as defined under §264.95, or the location of groundwater monitoring wells as required under §264.97. The information required in paragraph (c)(2) of this section (i.e., identification of the uppermost aquifer and aquifers hydraulically interconnected beneath the facility property, including groundwater flow direction and rate) is provided in detail in the most recent version of the IFGMP, including Figure 5.1-1.

> **“(4)** A description of any plume of contamination that has entered the groundwater from a regulated unit at the time that the application was submitted that:
>
> > **(i)** Delineates the extent of the plume on the topographic map required under paragraph (b)(19) of this section;”

No plume of contamination has entered the groundwater from the regulated units at TA-54. Groundwater monitoring results for the regulated units are reported in the Annual Periodic Monitoring Report for the TA-54 Monitoring Group.

> > “**(ii)** Identifies the concentration of each Appendix IX, of part 264 of this chapter, constituent throughout the plume or identifies the maximum concentrations of each Appendix IX constituent in the plume.”

No plume of contamination has entered the groundwater from the regulated units at TA-54. Groundwater monitoring results for the regulated units are reported in the Annual Periodic Monitoring Report for the TA-54 Monitoring Group.

> “**(5)** Detailed plans and an engineering report describing the proposed groundwater monitoring program to be implemented to meet the requirements of § 264.97.”

The detailed plans and an engineering report describing the proposed groundwater monitoring program for the regulated units are included in the most recent version of the IFGMP.

> “**(6)** If the presence of hazardous constituents has ***not*** been detected in the groundwater at the time of permit application, the owner or operator must submit sufficient information, supporting data, and analyses to establish a detection monitoring program that meets the

requirements of § 264.98. This submission must address the following items specified under § 264.98:"

Hazardous constituents have been detected above applicable standards in groundwater in the vicinity of the regulated units (MDAs G, H, and L) at TA-54 in the most recent groundwater monitoring sampling event. Groundwater monitoring results for the regulated units are reported in the Annual Periodic Monitoring Report for the TA-54 Monitoring Group. The IFGMP includes the detection monitoring program that has been established to meet the requirements within Section II.C of the 2016 Consent Order (New Mexico 2016) and hence §264.98 for regulated units.

"**(i)** A proposed list of indicator parameters, waste constituents, or reaction products that can provide a reliable indication of the presence of hazardous constituents in the groundwater;"

The indicator parameters, waste constituents, and reaction products that provide a reliable indication of the presence of hazardous constituents in the groundwater are listed in the most recent version of the IFGMP, Section 5 - Technical Area 54 Monitoring Group.

"**(ii)** A proposed groundwater monitoring system;"

The Permittees' groundwater monitoring system is detailed in the most recent version of the IFGMP, Section 5 - Technical Area 54 Monitoring Group.

"**(iii)** Background values for each proposed monitoring parameter or constituent, or procedures to calculate such values; and"

There has been no change to the background values for each proposed monitoring parameter. The applicable background or screening levels used for each analyte are listed in Appendix B of the most recent version of the IFGMP.

"**(iv)** A description of proposed sampling, analysis, and statistical comparison procedures to be utilized in evaluating groundwater monitoring data."

The Permittees' sampling, analysis, and statistical comparison procedures to be utilized in evaluating groundwater monitoring data are detailed in the most recent version of the IFGMP, Table 1.7-2.

"**(7)** If the presence of hazardous constituents has been detected in the groundwater at the point of compliance at the time of the permit application, the owner or operator must submit sufficient information, supporting data, and analyses to establish a compliance monitoring program that meets the requirements of § 264.99. Except as provided in § 264.98(h)(5), the owner or operator must also submit an engineering feasibility plan for a corrective action program necessary to meet the requirements of § 264.100, unless the owner or operator obtains written authorization in advance from the Regional Administrator to submit a proposed permit schedule for submittal of such a plan. To demonstrate compliance with § 264.99, the owner or operator must address the following items:

(i) A description of wastes previously handled at the facility.

(ii) A characterization of the contaminated groundwater, including concentrations of hazardous constituents.

(iii) A list of hazardous constituents for which compliance monitoring will be undertaken in accordance with §§ 264.97 and 264.99.

(iv) Proposed concentration limits for each hazardous constituent, based on the criteria set forth in § 264.94(a), including a justification for establishing any alternate concentration limits.

(v) Detailed plans and an engineering report describing the proposed groundwater monitoring system, in accordance with the requirements of § 264.97.

(vi) A description of proposed sampling, analysis, and statistical comparison procedures to be utilized in evaluating groundwater monitoring data."

Hazardous constituents ([1,4-]dioxane and bis(2-ethylhexyl)phthalate) have been detected above applicable standards in groundwater in the vicinity of the regulated units (MDAs G, H, and L) at TA-54 in the most recent groundwater monitoring sampling event. Groundwater monitoring results for the regulated units are reported in the Annual Periodic Monitoring Report for the TA-54 Monitoring Group. The IFGMP establishes the requirements for the compliance monitoring program, as described in § 264.99 for the regulated units at TA-54. The informational requirements to items (i) through (vi) are provided in the most recent version of the IFGMP and the Annual Periodic Monitoring Report for the TA-54 Monitoring Group.

"**(8)** If hazardous constituents in the groundwater have been measured that exceed the concentration limits established under § 264.94 Table 1, or if groundwater monitoring conducted at the time of permit application under 265.90 through 265.94 at the waste boundary indicates the presence of hazardous constituents from the facility in groundwater over background concentrations, the owner or operator must submit sufficient information, supporting data, and analyses to establish a corrective action program that meets the requirements of § 264.100. However, an owner or operator is not required to submit information to establish a corrective action program if he or she demonstrates to the Regional Administrator that alternate concentration limits will protect human health and the environment after considering the criteria listed in § 264.94(b). An owner or operator who is not required to establish a corrective action program for this reason must instead submit sufficient information to establish a compliance monitoring program that meets the requirements of § 264.99 and paragraph (c)(6) of this section. To demonstrate compliance with § 264.100, the owner or operator must address, at a minimum, the following items:

(i) A characterization of the contaminated groundwater, including concentrations of hazardous constituents.

(ii) The concentration limit for each hazardous constituent found in the groundwater, as set forth in § 264.94.

(iii) Detailed plans and an engineering report describing the corrective action to be taken.

(iv) A description of how the groundwater monitoring program will demonstrate the adequacy of the corrective action.

> **(v)** The permit may contain a schedule for submittal of the information required in paragraphs (c)(8) (iii) and (iv), provided the owner or operator obtains written authorization from the Regional Administrator before submitting the complete permit application."

Hazardous constituents ([1,4-]dioxane and bis(2-ethylhexyl)phthalate) have been detected above applicable standards in groundwater in the vicinity of the regulated units (MDAs G, H, and L) at TA-54 in the most recent groundwater monitoring sampling event. Groundwater monitoring results for the regulated units are reported in the Annual Periodic Monitoring Report for the TA-54 Monitoring Group. The Consent Order and the IFGMP meet the corrective action program requirements of § 264.100. The informational requirements to items (i) through (v) are provided in the most recent version of the IFGMP and the Annual Periodic Monitoring Report for the TA-54 Monitoring Group.

2.17 Solid Waste Management Units

The general information requirements at 40 CFR §270.14(d) stipulate that a part B permit application contains information regarding each SWMU at the Facility. This information includes location, designation, descriptions, operation, and all wastes managed at the unit. Furthermore, information is required for releases of hazardous wastes or hazardous constituents from these units.

The Permittees conduct limited corrective actions for releases from SWMUs or Areas of Concern (AOCs) under the Permit rather than under the Consent Order, under the following circumstances:

1. New releases and newly discovered releases of hazardous waste or hazardous constituents from hazardous waste management units at the Facility.
2. The closure and post-closure care requirements of 40 CFR Part 264, Subpart G, as they apply to hazardous waste management units at the Facility.
3. Implementation of controls, including long-term monitoring, for any SWMUs or AOCs listed in Permit Attachment K (Listing of SWMUs and AOCs), Table K-2 (Corrective Action Complete with Controls).
4. Any corrective action conducted to address releases of hazardous waste or hazardous constituents that occur or are discovered after the date on which the Consent Order terminates.
5. Newly created SWMUs and AOCs from nonpermitted operations.

The Permittees coordinate all corrective action conducted under the current Permit with corrective action conducted under the Consent Order, in accordance with the requirements for 40 CFR §264.101. Corrective action for releases from hazardous waste management units that commingle with releases originating from other sources are conducted under the Consent Order and represent the bulk of the corrective actions undertaken. If corrective action for a SWMU or an AOC is not subject to corrective action under the Consent Order, the corrective action will be performed under the Permit.

2.17.1 Summary Tables of SWMUs and AOCs

Tables 2.1 through 2.8 herein provide summaries of all SWMUs and AOCs located within or in close proximity to the RCRA Permitted units. The Table provides

- the SWMU Number (current or former number),

- the location of the unit,
- the type of unit,
- the SWMU and AOC general dimensions and structural description,
- operational dates (if known),
- the type(s) of waste managed at the unit and release information, and
- the unit's current status (active or inactive and NMED status).

The documents used to prepare this Table are cited in the Reference List within Section 7, *References,* of this Permit Renewal Application.

Note that where applicable, references below to SWMU and AOC listings on the LANL Hazardous Waste Facility Permit Table K-1 may not be reflective of the investigative status of the SWMU/AOC, as the Permittees plan to propose adjustments to the LANL Hazardous Waste Facility Permit Tables K-1, K-2, and K-3 through permit modification requests apart from this reapplication.

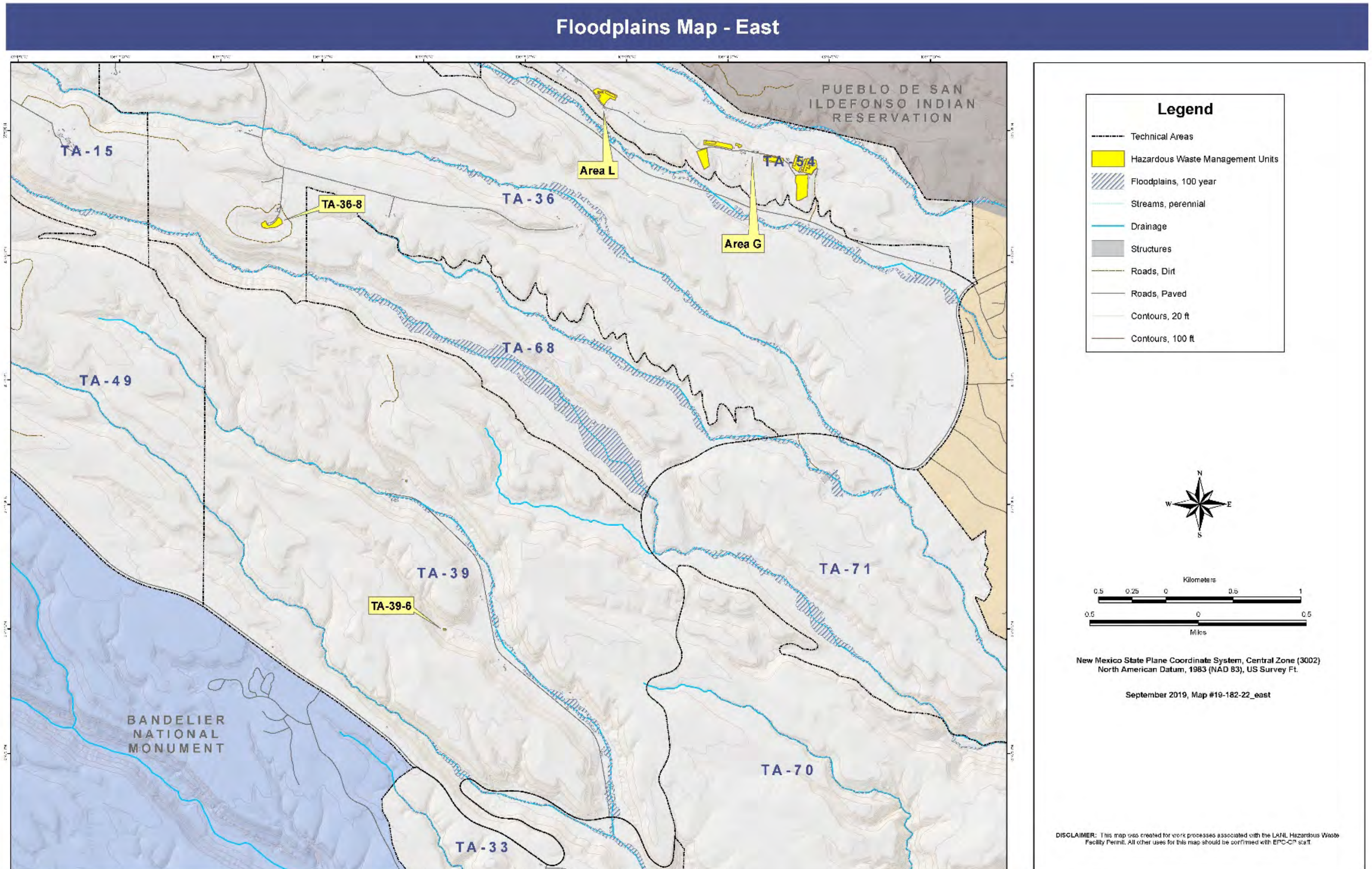

Figure 2-1. LANL floodplains (East)

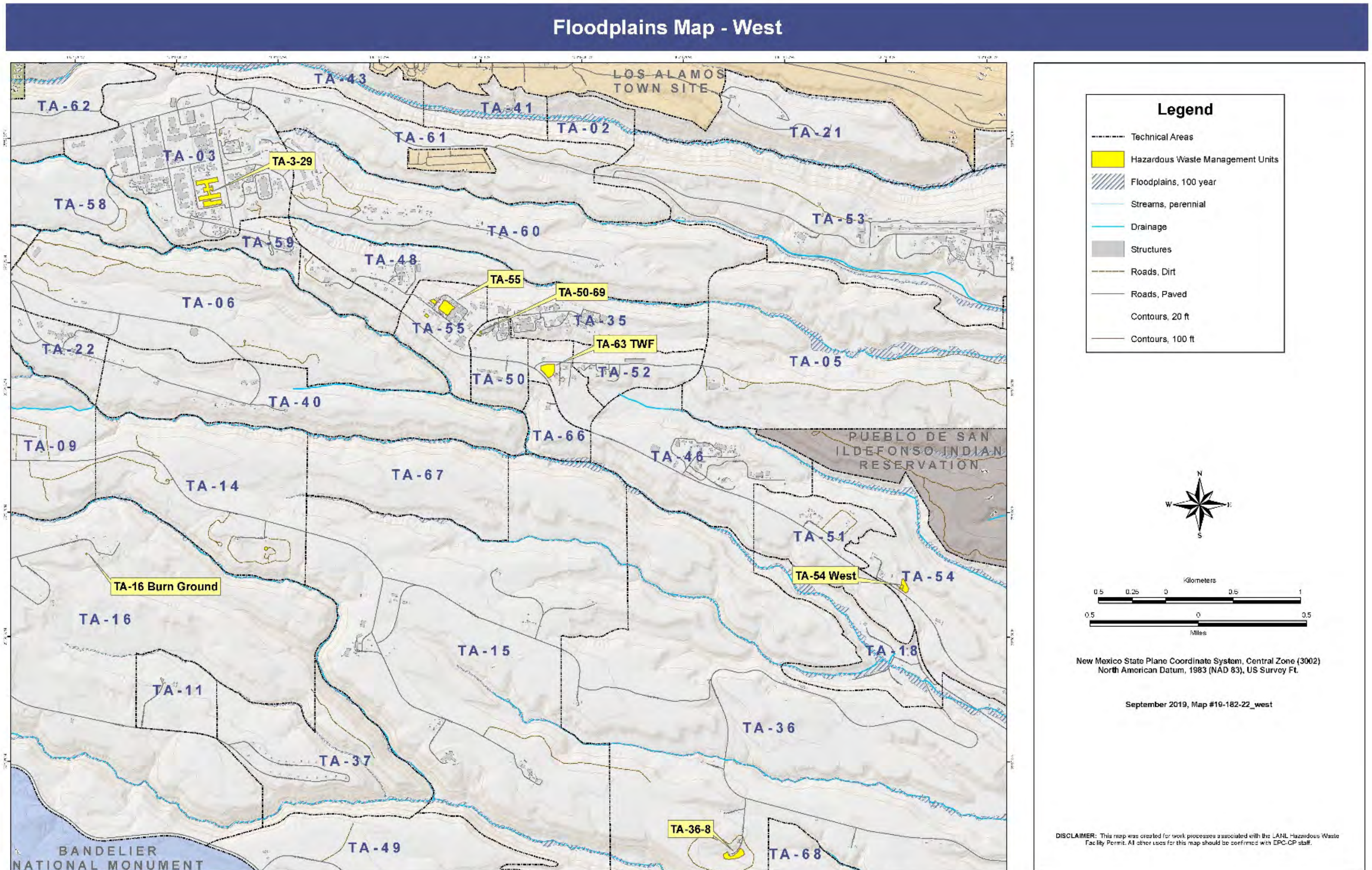

Figure 2-2. LANL floodplains (West)

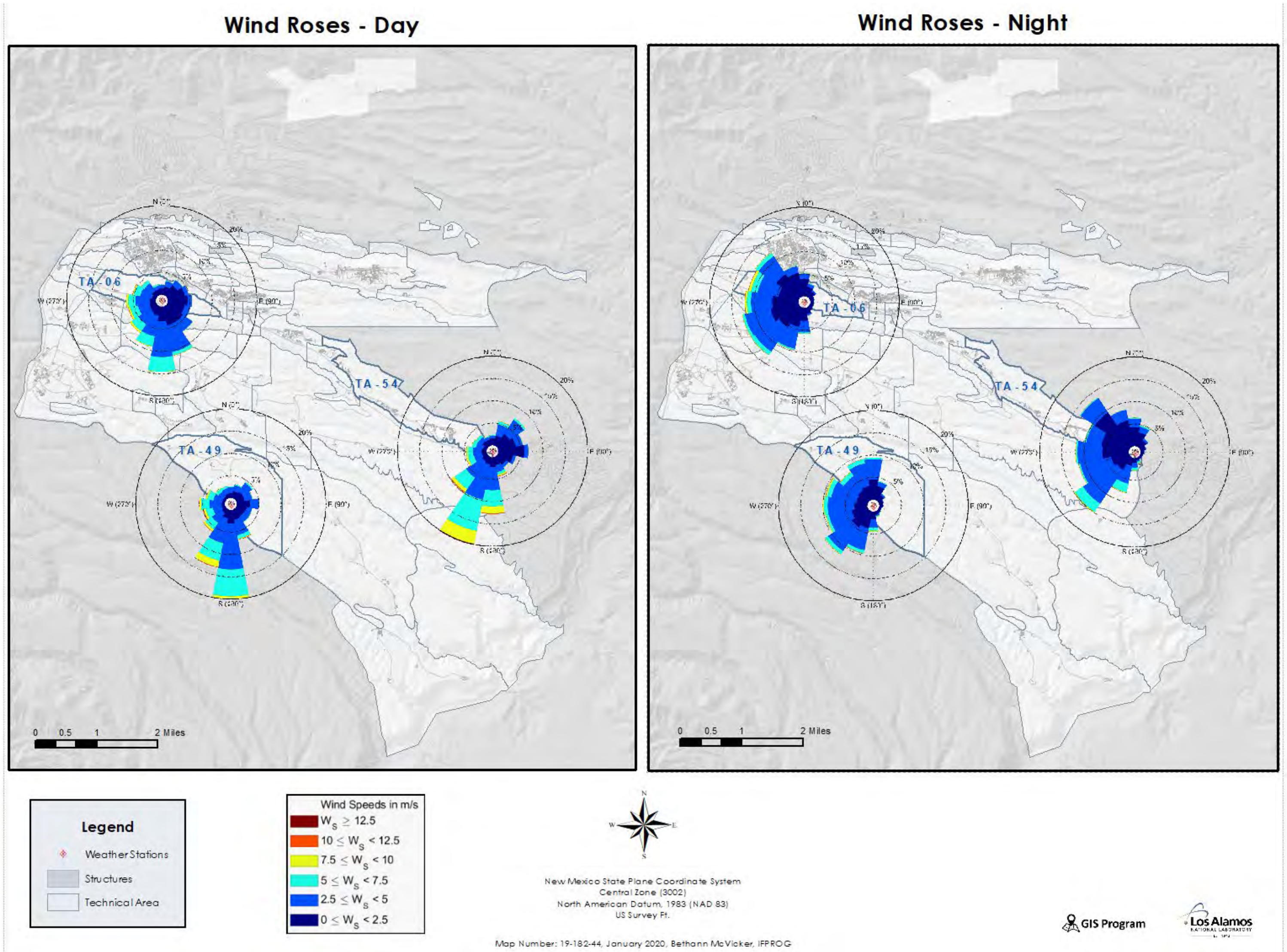

Figure 2-3. Wind Roses (day and night averaged for the 365 days of 2018)

Table 2-1. TA-3 SWMU Descriptions

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
03-025(b)	TA-03 (building 03-102)	Sumps	Active sump: 40 inches x 24 inches x 30 inches; this unit is positioned on the concrete basement floor within an 8-inch-high concrete berm. Inactive sump: 0.25-inch-thick welded steel box contained in a concrete sump in the sub-floor; wastewater flows from floor, show and sink drains in 03-102 through sumps to the radioactive liquid waste line to the radioactive liquid waste treatment facility at TA-50.	Unknown to present	Radiological wastewater, oil; no investigations have been conducted to date. However, available information indicates a very low likelihood of release of contaminants.	Active. Site is deferred per the Consent Order. This SWMU is included on the LANL Hazardous Waste Facility Permit Table K-1.
03-050(d)	TA-03 (south side of building 03-102)	Soil contamination	Approximately 20-ft. x 6-ft. area of potential soil contamination from deposition of contaminants from exhaust emissions from a baghouse air-pollution control device.	1957-1992	Radioactive air emissions; radiological field survey results showed no detectable activity on the concrete pad or surrounding soil.	Inactive. Investigation in progress; SWMU is on the LANL Hazardous Waste Facility Permit Table K-1
03-051(b)	TA-03 (southwest corner of building 03-102)	Soil contamination	Two areas of soil contamination associated with former location of two air compressors; each area measures approximately 12 ft. x 12 ft.	Unknown to 1992	Lightweight mineral oil, polychlorinated biphenyls (PCBs); wipe samples collected from two compressors previously located in this location showed PCB concentrations ranging from 9.4 ug/100 sq. cm to 17 ug/100 sq. cm; a concrete slab now extends from the former compressor locations to the fence line south of building 03-0102; there is no evidence of staining on the concrete.	Inactive. Investigation in progress; AOC is on the LANL Hazardous Waste Facility Permit Table K-1.

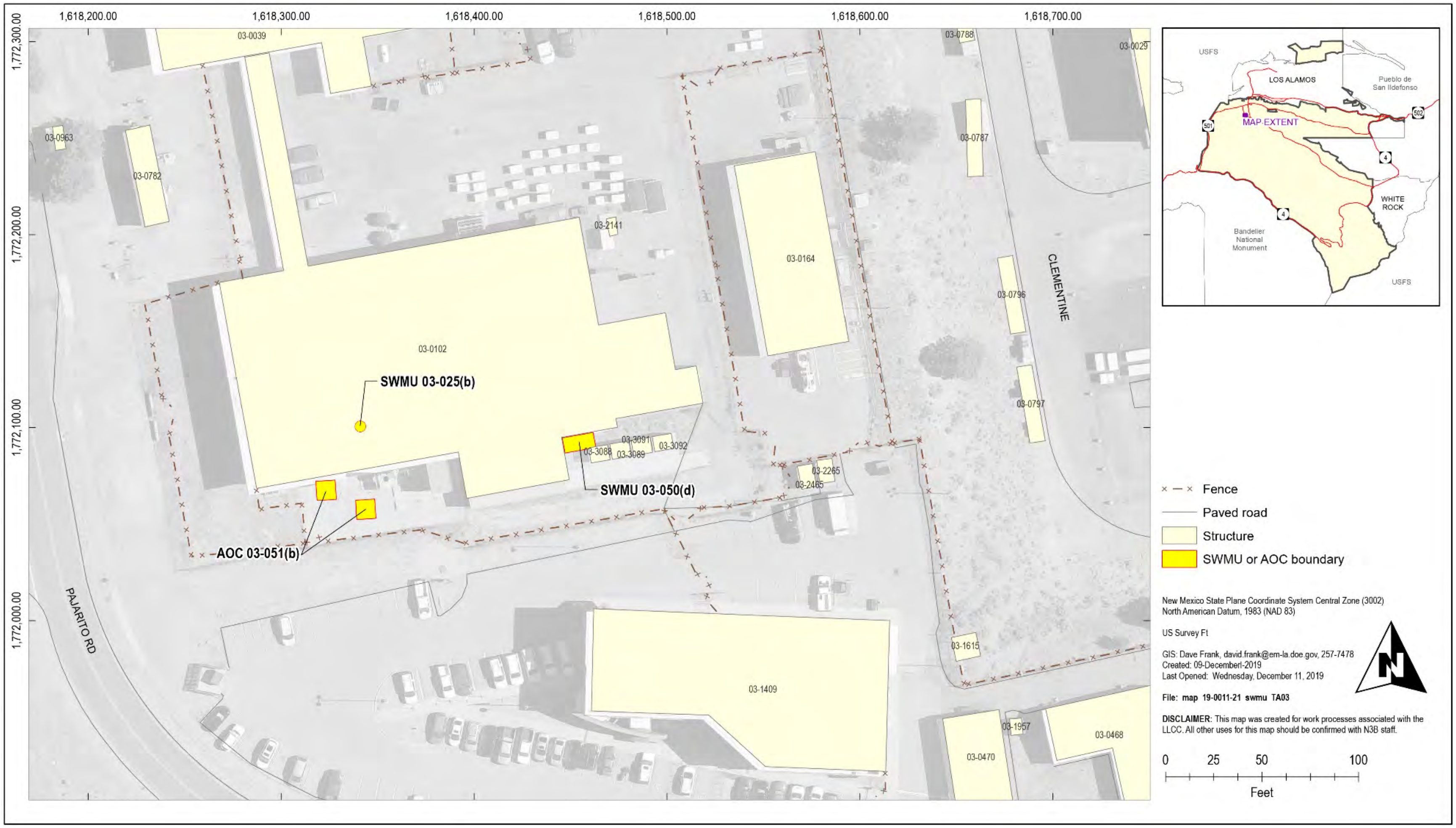

Figure 2-4. TA-03 SWMUs and AOCs

Table 2-2. TA-16 SWMU Descriptions

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
16-010(c)	TA-16-388	Flash Pad/Burn Tray	Former burn tray converted to an enclosed 100-ft x 100-ft. concrete pad and 16-ft. x 4-ft. metal tray situated 2 ft .above ground surface. The current unit consists of a 22-ft. x 22-ft. concrete pad set on secondary containment and surrounded on three sides by a concrete wall. The current burn tray consists of a stainless-steel kettle that is 30 inches in diameter and 24 inches in height. Propane burners are used to treat HE-contaminated liquid wastes at the burn tray. The entire assembly, which can be covered with a retractable cover, is provided with secondary containment.	1950s to present	HE, metals, and dioxins/furans were all known to have been used onsite; periodic soil monitoring is conducted as part of operational conditions.	Active RCRA unit; not subject to the Consent Order.
16-010(d)	TA-16-399 (Burning Ground)	Burn Tray	100 sq. ft. enclosed area consisting of a concrete pad and burn table situated 2 ft. above the ground surface and a 16 ft. x 4 ft. metal tray.	1950s to present	HE and metals were known to have been used onsite; no soil sampling has been performed under the Consent Order at SWMU 16-010(d).	Inactive; currently undergoing RCRA closure; anticipated for clean closure approval.
C-16-001	TA-16 (NE Corner) 16-384	Building – Former Aboveground Platform	This elevated platform was situated above three HE wastewater troughs that exited former building 16-390. Wash water originally flowed to HE filter beds and then to metal	1951-1970	HE; no documented releases or management of solid or hazardous wastes is associated with this AOC.	Inactive; will be recommended for corrective action complete; included on LANL Hazardous Waste Facility Permit Table K-1

Table 2-2. TA-16 SWMU Descriptions (continued)

			pressure filter vessels. The T-shaped platform was constructed of steel and measured 8.5 ft. x 3 ft. x 4 ft.			
16-010(h)/16-010(h)-99	TA-16 (NE Corner)	Former Basket Wash House (Building 16-390)	Former basket wash facility used to clean filters from site-wide HE sumps and directed filtered wash water to troughs. The former basket-wash house measured approximately 25 ft. x 25 ft.	1951-1966	HE and metals; suspected lead and HE releases.	Inactive; investigation in progress; included on LANL Hazardous Waste Facility Permit Table K-1
16-010(j)/16-010(h)-99	TA-16 (NE Corner)	Former Filter Bed/Burn Tray	Unknown	1951-1966	HE, oils, and solvents; soil sampling confirmed presence of contaminants, including HE, inorganic chemicals, organic chemicals, and in some cases uranium	Inactive; no longer subject to the Consent Order; no further action approved.
C-16-070	TA-16 Burning Ground 50 ft. NE of structure 16-390	Underground Tank (propane)	24. ft. x 5 ft., 3063 gallons. The tank contained a manhole cover to access tank valves and a 6-inch corrugated metal drain from the manhole tank. The tank stored propane that was used to heat and dry the filtering material (sand) in the Burning Ground's two filter tanks. Sand was burned to remove residual HE.	1951-1970	HE; tank was never used to manage RCRA solid or hazardous waste and survey results show no HE or rad contamination.	Inactive; investigation in progress; included on LANL Hazardous Waste Facility Permit Table K-1.
C-16-061	TA-16, 80 feet east of structure 16-390	Soil Contamination (former latrine)	Wood frame latrine 4 ft. x 4 ft. x 7.5 ft. with no plumbing	1951-1968	Never used to manage RCRA solid or hazardous waste. No hazardous materials are associated with this structure.	Inactive; investigation in progress; included on LANL Hazardous Waste Facility Permit Table K-1.
16-010(n)/16-010(h)-99	TA-16 (NE Corner), east of 16-399	Former Trough Structure 16-1136	Approximately 10 ft. wide by 275 ft. long	1951-1966	Uranium and HE; HE found above soil screening levels in shallow subsurface.	Inactive; investigation in progress; included on LANL Hazardous Waste Facility Permit Table K-1.

Table 2-2. TA-16 SWMU Descriptions (continued)

16-005(g)/16-010(h)-99	TA-16 (NE Corner)	Soil Contamination from Former Filter Bed Treatment Unit Structure 16-393	Approximately 150 ft. long, 10 ft. wide	1951-1966	HE; HE releases	Inactive; investigation in progress; included on LANL Hazardous Waste Facility Permit Table K-1.
16-010(m)/16-010(h)-99	TA-16 (NE Corner), east of 16-399	Former Trough Structure 16-1135	Approximately 10 ft. wide by 350 ft. long (based on drawing estimates). This trough carried wash water from the bucket wash facility to a filter bed (16-393) and later a filter vessel.	1951-1966	HE; HE found above soil screening levels in shallow subsurface.	Inactive; investigation in progress; included on LANL Hazardous Waste Facility Permit Table K-1.
16-010(i)/16-010(h)-99	TA-16 (NE Corner)	Burn Pad Structure 16-392	Approximately 400 ft. long by 10 ft. wide	1951-1966	Uranium contaminated objects; likely release.	Inactive; investigation in progress; included on LANL Hazardous Waste Facility Permit Table K-1.
16-010(k)/16-010(h)-99	TA-16 (NE Corner)	Former Trough Structure 16-1129	This former steel trough was open at the top and elevated 3 ft. off the ground surface; this structure measured approximately 370 feet long and extended south from structure 16-390.	1951-1966	HE; HE and lead found above soil screening levels in soil.	Inactive; investigation in progress; included on LANL Hazardous Waste Facility Permit Table K-1.
16-010(l)/16-010(h)-99	TA-16 (NE Corner)	Former Trough Structure 16-1134	This former steel trough was open at the top and elevated 3 ft. off the ground surface; this structure measured approximately 370 feet long and extended south from structure 16-390.	1951-1966	HE; HE found above soil screening levels in shallow subsurface.	Inactive; investigation in progress; included on LANL Hazardous Waste Facility Permit Table K-1.

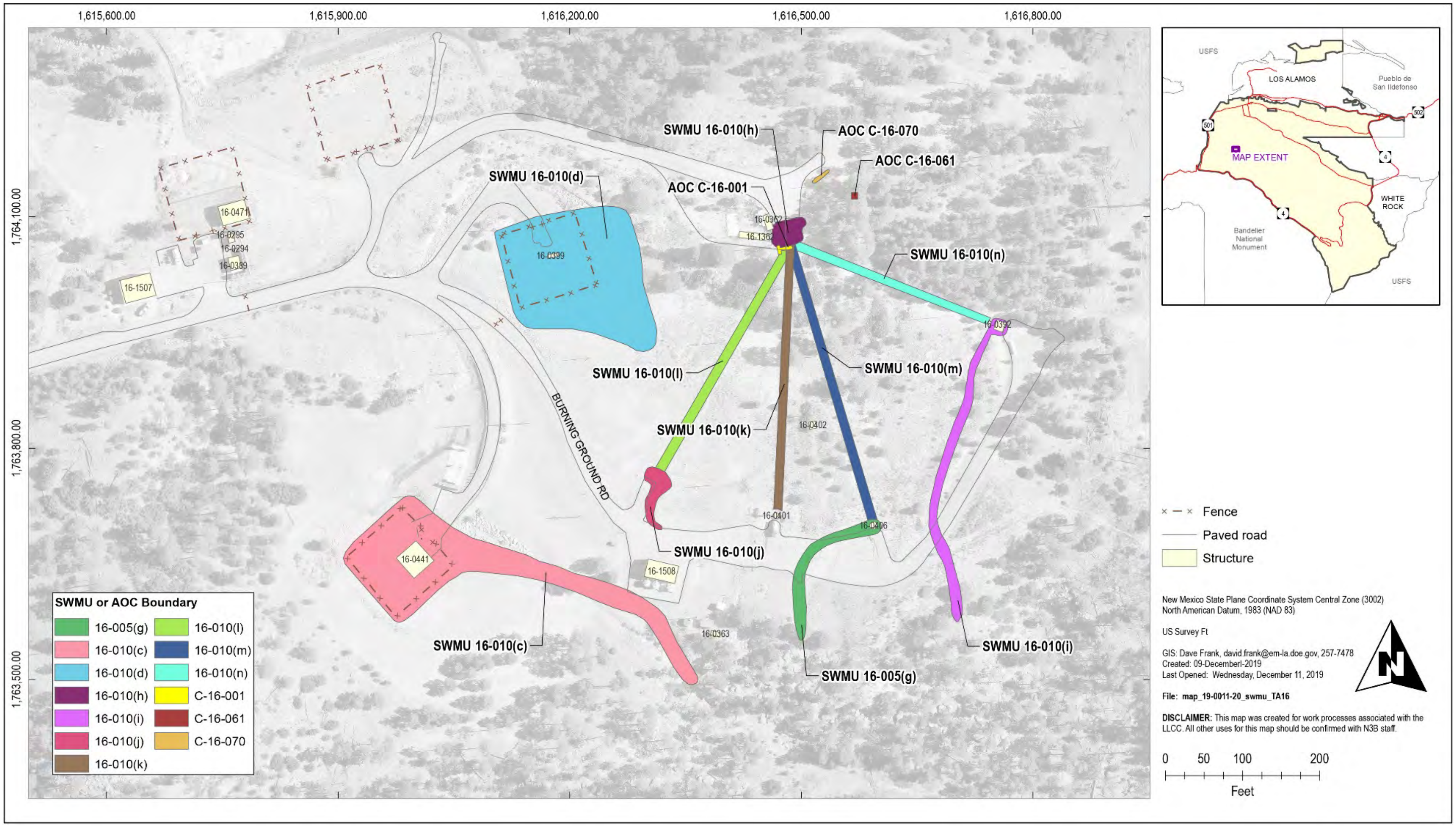

Figure 2-5. TA-16 SWMUs and AOCs

Table 2-3. TA-36 SWMU Descriptions

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
36-004(c)	TA-36 near the head of Fence Canyon, approximately 800 ft south of AOC 36-004(b)	Firing Site	This site consists of the firing point, a control bunker (building 36-8), a make-up building (36-7), a firing platform, and an x-ray house.	1950s to present	DU, beryllium, lead, copper, iron, barium, aluminum, steel, and various plastics; samples collected in the downgradient drainage show no migration of potential contaminants.	Active firing site; investigation deferred under the Consent Order; included on LANL Hazardous Waste Facility Permit Table K-1.
36-005	TA-36 near the head of Fence Canyon between AOCs 36-004(b) and 36-004(c)	Surface Storage Area	260 ft. x 300 ft. undeveloped storage area is largely covered with grass and ponderosa pine.	1950s to present	Radioactive constituents, metals, and VOCs; some release; nature and extent not defined at the area.	Inactive; investigation in progress; does not pose a potential unacceptable risk or dose under the industrial, construction worker, and residential scenarios; poses no unacceptable ecological risk; included on LANL Hazardous Waste Facility Permit Table K-1.

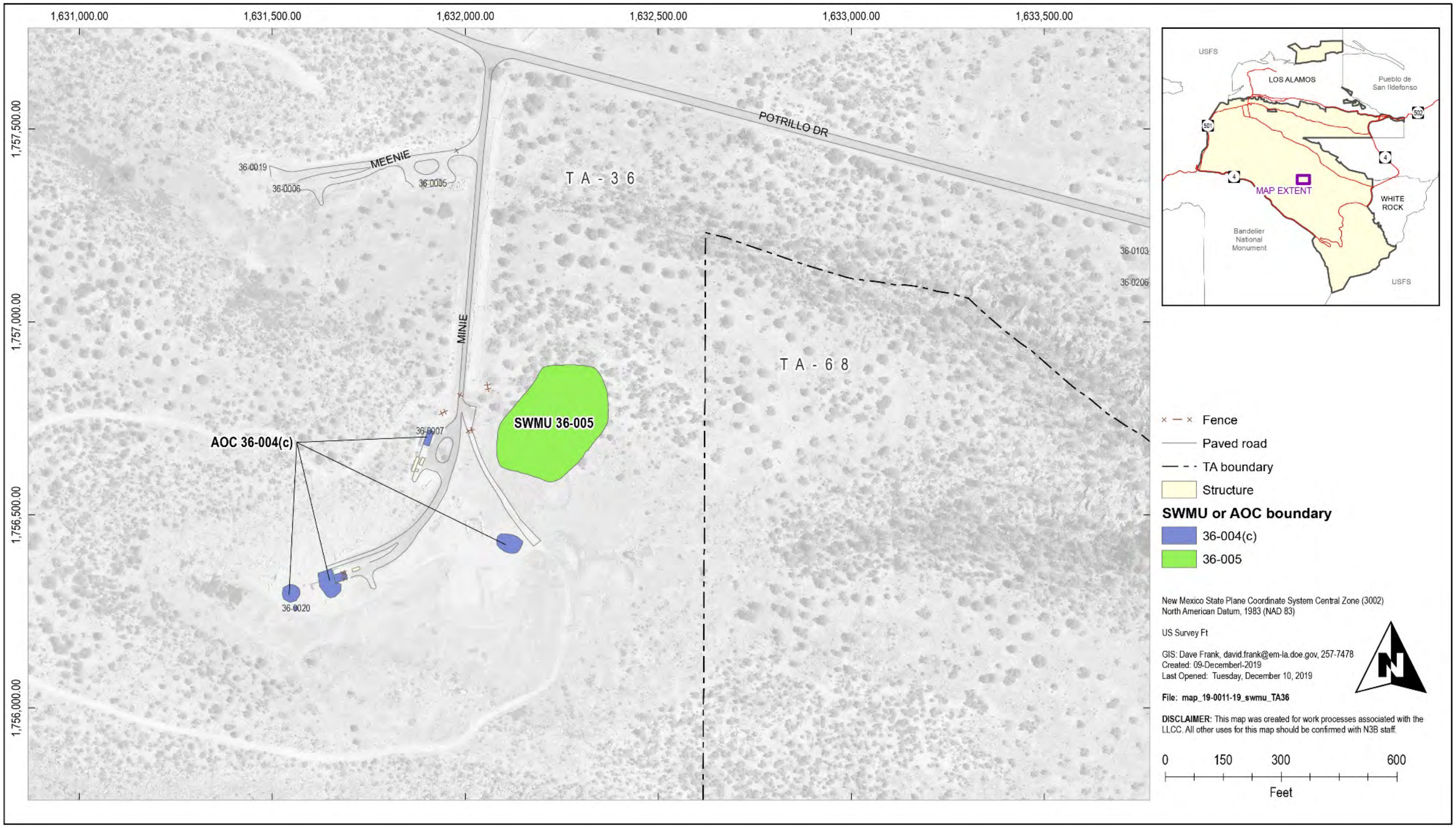

Figure 2-6. TA-36 SWMUs and AOCs

Table 2-4. TA-39 SWMU Descriptions

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
39-004(a)	TA-39	Firing Site Structure 39-7	Approximately 1000 sq. ft. (based on SWMU/AOC map)	1953-present	HE and metals; samples collected in the downgradient drainage show no migration of potential contaminants.	Active; investigation is deferred under the Consent Order; included on LANL Hazardous Waste Facility Permit Table K-1.
39-004(d)	TA-39	Firing Site Structure 39-57	Approximately 1000 sq. ft. (based on SWMU/AOC map)	1953-present	HE and metals; samples collected in the downgradient drainage show no migration of potential contaminants.	Active; investigation is deferred under the Consent Order; included on LANL Hazardous Waste Facility Permit Table K-1.
39-002(d)	TA-39	Container Storage Area	5 ft. x 5 ft. x 4 ft.	1980s to 1990s	Photographic wastes, cloth, and paper contaminated with various substances (acetone, ethanol, transformer oil, trichloroethane, vacuum grease, and copper sulfate); no known or documented releases.	Inactive; certificate of completion received without controls from NMED; listed on the LANL Hazardous Waste Facility Permit Table K-1.

Figure 2-7. TA-39 SWMUs and AOCs

Table 2-5. TA-50 SWMU Descriptions

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
50-001(a)	Building 50-1	Radioactive Liquid Waste Treatment Facility (RLWTF)	System of drain lines and tanks	1963 to present	RLW, sludge, and potentially hazardous constituents; no information on unintentional releases.	Active; included on LANL Hazardous Waste Facility Permit Table K-1; deferred investigation per Consent Order.
50-001(b)	TA-50	Waste Lines and Manholes	A manhole (structure 50-72) is the central collection area for most incoming liquid waste. Three lines feed into manhole 50-72; all manholes that transport wastewater to Building 50-1 are monitored continuously. Four other waste lines run from TA-55 to Building 50-1 through structure 50-106 to tanks in an underground vault (structure 50-66). Three of the lines are 1.5-inch stainless-steel lines, each encased in 3-inch PVC.	1963 to present	RLW and potentially hazardous constituents; potential releases west and north of the tank farm.	Active; included on LANL Hazardous Waste Facility Permit Table K-1; deferred investigation per Consent Order.
50-002(a)	Building 50-2	Tank Farm	A reinforced concrete vault that houses six flow-through process tanks, an equipment room, and associated waste transfer lines; floor 17 ft. below ground surface; incoming raw-waste tanks (25,000 gallons and 75,000 gallons) and two 25,000-gallon tanks used to store treated waste for reuse; fifth tank (capacity 25,000 gallons) flows into the 75,000-gallon tank and was previously used to	1963 to present	RLW, sludge, and potentially hazardous constituents; in July and September 1974, two separate, unintended operational releases occurred from the overflow of a sump in Building 50-2. Both releases caused untreated wastewater to be discharged to waste lines 55 and 67 (the waste lines for treated effluent) and into the outfall area at the head of Ten Site Canyon [see SWMU 50-	Active; included on LANL Hazardous Waste Facility Permit Table K-1; deferred investigation per Consent Order.

Table 2-5. TA-50 SWMU Descriptions (continued)

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
			store waste during D&D activities; currently, this tank receives waste from chemistry labs in the building; The sixth tank (capacity 30,000 gallons) originally functioned as a holding tank for low-level sludge.		006(a)]. In February 1975, waste line 67 was plugged at its outfall.	
50-002(b)	30 ft. west of the southwest corner of Building 50-1	Underground Storage Tank Structure 50-67	Concrete vault measures 18 ft. x 16 ft. x 14 ft. deep	Unknown to present	RLW and potentially hazardous waste; no documented releases.	Active; included on LANL Hazardous Waste Facility Permit Table K-1; deferred investigation per Consent Order.
50-002(c)	30 ft. west of the southwest corner of Building 50-1	Underground Storage Tank Structure 50-68	Concrete vault measures 18 ft. x 16 ft. x 14. ft. deep	Unknown to present	RLW and potentially hazardous waste; no documented releases.	Active; included on LANL Hazardous Waste Facility Permit Table K-1; deferred investigation per Consent Order.
50-002(d)	Building 50-1 adjacent to room 63D	Aboveground Storage Tank Structure 50-5	Decommissioned aboveground, 5000-gallon, stainless-steel tank used for nitric acid storage	1964 to 1996	Unused product storage only; no documented releases.	Active; included on LANL Hazardous Waste Facility Permit Table K-1; deferred investigation per Consent Order.
50-003(a)	Building 50-1, Room 59 along the northwest wall	Container Storage Unit	Approximately 2-ft. x 19-ft. area	Unknown	Mixed waste; no documented releases.	Inactive; in November 2004, NMED approved this RCRA interim status unit for clean closure.
50-004(a)	RLWTF	Historical Waste Lines	Decommissioned RLW and industrial waste lines routed to the RLWTF from LANL TAs located along Pajarito Road.	1963 to 1989	RLW and potentially hazardous constituents; release of radionuclides; area remediated to meet ALARA levels in 1975.	Inactive; site meets residential and ecological risk levels and is recommended for corrective action complete without controls; included on LANL Hazardous Waste Facility Permit Table K-1.
50-004(b)	RLWTF	Underground Vault Structure 50-3	Decommissioned underground concrete vault that housed three stainless-steel-lined concrete storage tanks (1,000–4,500 gallons) used to collect and store	1963 to 1989	RLW and potentially hazardous constituents; no elevated concentration were detected during decommissioning in 1989.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; site meets residential and ecological risk levels and is recommended for corrective action

Table 2-5. TA-50 SWMU Descriptions (continued)

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
			wastewater from the Omega Reactor.			complete without controls.
50-004(c)	RLWTF	Soil Contamination from Historical Waste Lines and Manholes	13 industrial waste lines and three manholes that discharged to the decommissioned underground vault	Most 1963 to 1989; line #56 still in service	RLW and potentially hazardous constituents; field screening for radionuclides confirmed ALARA levels met.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; site meets residential and ecological risk levels and is recommended for corrective action complete without controls.
50-006(a)	RLWTF pump house	Operational Release	Outfall area at the head of Ten Site Canyon	1963 to present	RLW and potentially hazardous constituents; approximately 0.72 cubic yards of radioactively-contaminated soil was excavated and removed from release area.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; site meets residential and ecological risk levels and is recommended for corrective action complete without controls.
50-006(c)	TA-50	Operational Release	Surface Soil contamination from historical stack emissions; unknown dimensions; seven stacks.	1963 to present	Soil contaminated with radioactive and potentially hazardous constituents; release of metals, PAHs, and radionuclides.	Active; included on LANL Hazardous Waste Facility Permit Table K-1; requesting certificate of completion.
50-006(d)	Mortandad Canyon	Effluent Discharge	Drain line and National Pollutant Discharge Elimination System-permitted Outfall 051 in Mortandad Canyon; 6-inch-diameter iron discharge pipe that was rerouted in 1983.	1963 to present	Soil contaminated with a variety of chemicals, radionuclides, and heavy metals.	Active Permitted outfall; no discharges since 2010; included on LANL Hazardous Waste Facility Permit Table K-1; investigation and remediation complete; plan to ask for a certificate of completion.
50-007	In Rooms 112 and 115 at TA-50-37	Former Incinerator Complex	An incinerator, various waste feed components, two waste feed tanks; maximum inventory of 600 gallons.	1975 to 1987	Hazardous and mixed waste; radioactively contaminated PCBs; slightly elevated plutonium detected in nearby soils.	Inactive; EPA issued a permit for the incineration of PCBs in 1984, and NMED included the incinerator in a 1989 HWFP; operation of the incinerator was discontinued in 1987 to

Table 2-5. TA-50 SWMU Descriptions (continued)

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
						allow for system upgrades; removed and underwent RCRA closure in 1998 included on LANL Hazardous Waste Facility Permit Table K-1.
50-008	Inside Rooms 102 and 103 at TA-50, Building 69	Reduction Site	Container storage unit inside Rooms 102 and 103	1982 to 1991	Mixed waste; radionuclide release in nearby soils.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; investigation in progress
50-009	North side of Pajarito Road at TA-50	MDA C	11.8 acres and consists of 7 pits and 108 shafts; depths of the 7 pits at MDA C range from 12 to 25 ft. below the original ground surface, and the depths of the 108 shafts range from 10 to 25 ft. below the original ground surface.	1948 to 1974	Radioactive, mixed, hazardous, and solid waste; release of VOCs and potentially tritium.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; corrective action path forward in progress; vapor monitoring ongoing.
50-010	Room 34 B of the RLWTF	Decontamination Facility	An inactive vehicle decontamination area.	1963 to 1999	Radioactive and potentially hazardous waste; no known releases.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; deferred investigation per Consent Order.
50-011(a)	South end of RLWTF	Soil Contamination associated with Septic System	Influent line from TA-50-1, septic tank, manhole, a sanitary distribution system, and a seepage pit; removed in 1983.	1964 to 1983	Sanitary waste; known releases of radionuclides remediated to meet ALARA levels.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; deferred investigation per Consent Order.
50-011(b)	RLWTF	Lift Stations	Two active sanitary wastewater lift stations (TA-50-91 and TA-50-92) and approximately 400 ft. of piping that transport sanitary wastewater.	1983 to present	Sanitary waste; Permitted outfall releases.	Active; included on LANL Hazardous Waste Facility Permit Table K-1; deferred investigation per Consent Order.
50-003(d)	Against the south wall of the east wing of Building 1	Container Storage Unit	Canvas building about 12-ft. wide and 14-ft. deep, whose floor had an inflatable berm; the second structure is a modular 9 ft. x 24 ft.	Unknown	Hazardous and mixed waste; no documented releases.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-3; no further action approved.

Table 2-5. TA-50 SWMU Descriptions (continued)

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
			steel shed set on a concrete pad			
50-005	Inside building 50-1	Waste Treatment Facility	Closed 500-gallon pressure vessel and associated processing components.	Unknown	Hazardous waste; no known release.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-3; no further action approved.
C-50-001	East of building 50-0001	Former Transformer	PCB transformer was situated on a 20 ft. x 10 ft. concrete pad.	1963-1994	PCB oil; one release described as a minor seep of PCB oil is documented from this AOC in 1989.	Inactive; Consent Order investigation in progress; listed in the LANL Hazardous Waste Facility Permit Table K-1.

Figure 2-8. TA-50 SWMUs and AOCs

Table 2-6. TA-54 SWMU Descriptions

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
54-001(a)	Structure 54-215, Area L	Storage Area	150-ft. x 40-ft. bermed paved storage area	Unknown to present	Mixed waste and hazardous waste; VOC release.	Active; VOC monitoring; no longer subject to the Consent Order.
54-002	TA-54, Area L (eastern portion)	Container Storage Area	1950-gallon-capacity area	Unknown to present	Mixed, solid, and hazardous waste.	Active; no further action approved; no longer subject to the Consent Order.
54-004	TA-54, Area H	Material Disposal Area MDA H	0.3-acre site, containing 9 shafts	1960 to 1986	Classified waste; nonhazardous and hazardous wastes, depleted uranium, fuel elements, plutonium, HE; VOC release.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; to undergo corrective action.
54-005	TA-54, Area J	Material Disposal Area MDA J, Pits 1-5, Shafts 1-4	5.5-acre site containing 6 pits and 4 shafts	1961 to 2001	Barium sand and administratively controlled waste; no known release.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; post-closure monitoring complete.
54-006	TA-54, Area L	Material Disposal Area MDA L, all subsurface units such as Pit A; Impoundments B, C, D; Shafts 1-28 and 29-34	2.5-acre fenced area that includes MDA L, which consists of 1 inactive subsurface disposal pit (pit A); 3 inactive subsurface treatment and disposal impoundments (impoundments B, C, and D); and 34 inactive disposal shafts (shafts 1 through 34).	1959 to1985	Uncontainerized chemical wastes and liquids; VOC release.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; VOC monitoring.
54-007(a)	Structure 54-16, Area G	Former Septic System	1000-gallon concrete septic tank (54-16), concrete distribution box, and VCP drain lines.	Unknown to 1998	Sanitary wastes and potentially radioactive constituents; septic tank releases determined not to be of concern.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; certificate of completion without controls received from NMED.
54-007(c)/54-007(c)-99	TA-54 West	Former Septic System	Consisted of a fiberglass tank 4 ft. in diameter and 12 ft. in length, a drain line, and a drain field formed by three parallel-buried lines of slotted PVC pipe,	1960s to 1992	Sanitary wastewater; Septic tank releases detected in soil not of human health or ecological concern.	Inactive; VCA completed; included on LANL Hazardous Waste Facility Permit Table K-3; no further action approved.

Table 2-6. TA-54 SWMU Descriptions (continued)

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
			approximately 4 ft. below ground surface.			
54-007(e)/54-007(c)-99	TA-54 West	Former Septic System	1500-gal. concrete septic tank and a 4-inch PVC drain line connected to a drain field formed by two parallel lines of 4-inch slotted PVC pipe	1960s to 1992	Sanitary wastewater; septic tank releases detected in soil not of human health or ecological concern.	Inactive; VCA completed; included on LANL Hazardous Waste Facility Permit Table K-3; no further action approved.
54-012(b)	TA-54-82, Area L	Drum Crusher	Drum compactor in the central portion of Area L	Unknown to present	Radionuclides, organics, and metals; suspected release.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; to undergo corrective action.
54-013(b)/54-013(b)-99	TA-54, Area G	MDA G, Vehicle Monitoring/Decontamination Area	Exact dimensions unknown	Unknown	Radiological wash water; releases of radiological constituents and metals.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; to undergo corrective action.
54-014(a)	TA-54, Area L (northwest corner)	MDA L, Storage Shafts	Shaft 36 is 30 inches x 27.5 feet, shaft 37 is 48 inches by 35.75 feet, each has a storage capacity of 300 gallons; each shaft is constructed of CMP and equipped with a 1-ft. thick concrete plug at the bottom and a steel cap and concrete shielding block	Mid-1980s to 2004	Steel rods filled with irradiated lead and concrete; no known releases.	Active; included on LANL Hazardous Waste Facility Permit Table K-1; currently operated under RCRA interim status requirements for storage of mixed waste.
54-014(b)/54-013(b)-99	TA-54, Area G	MDA G, Pit 9	30 ft. wide by 400 ft. long by 20 ft. deep	1974 to1978	Retrievable TRU and mixed TRU waste; releases of radiological constituents and metals.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; to undergo corrective action.
54-001(b)	TA-54, building 54-31 (inside)	Storage Area	13.5 ft. x 14.5 ft. (440 gallons) with a paved, sealed and bermed floor	Unknown to present	Mixed wastes; no releases have been identified.	Active; no further action approved; no longer subject to the Consent Order.
54-001(d)	TA-54, Area L	Storage Area	17 ft. x 59 ft. constructed of a bermed concrete floor	Unknown to present	PCBs; no releases have been identified.	Active; no further action approved; no longer subject to the Consent Order.

Table 2-6. TA-54 SWMU Descriptions (continued)

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
54-001(e)	TA-54, Area L	Container Storage Area	15.5 ft. x 116.5 ft. (17,220 gallons) constructed of a bermed, sealed concrete pad divided into six cells, each equipped with secondary containment sump	1987 to present	Mixed waste; no releases have been identified.	Active permitted container storage area; no further action approved; no longer subject to the Consent Order.
54-007(d)	TA-54, north of Pajarito Road	Former Septic System	972-gallon concrete septic tank, distribution box, 4-inch drain line and two 60-ft. x 4-inch diameter drain lines.	1962 to 1970	Radiological constituents, VOC, SVOCs, PCBs, pesticides, inorganic chemicals; VCA conducted in 2000 showed no elevated gross radiation screening levels and no VOCs or SVOCs above screening levels.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; certificate of completion without controls received from NMED.
54-009	TA-54, Area L	Former Aboveground Tanks	Four carbon steel tanks each with a capacity of 1660 gallons measuring 9 ft. (diameter) x 3.5 ft.	1988 to1993	Ammonium bifluoride, barium; o releases have been identified.	Inactive; closure certification report for these tanks was submitted to NMED in October 2006; no further action approved; not subject to the Consent Order.
54-014(c)/54-013(b)-99	TA-54, Area G	MDA G, Shafts 200-233	1 ft. in diameter, 18 ft. deep; they are lined with concrete and contain TRU waste	1978 to 1987	TRU waste and tritium; releases of radiological constituents and metals.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; to undergo corrective action.
54-014(d)/54-013(b)-99	TA-54, Area G	MDA G, Trenches A-D	Trenches A, B, and C vary in size from 219 ft. to 262.5 ft. long by 13 ft. wide by 6 ft. to 8 ft. deep; Trench D is 60 ft. long x 13 ft. wide x 6 ft. deep	1974 to unknown	TRU and mixed LLW; releases of radiological constituents and metals.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; to undergo corrective action.
54-015(a)	TA-54, Area G	Storage Area	15 ft. x 40 ft. x 12 ft. metal shed	Unknown to present	Mixed waste, TRU waste.	Active; no further action approved; not subject to Consent Order.

Table 2-6. TA-54 SWMU Descriptions (continued)

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
54-015(b)	TA-54, Area G	Storage Area	Approximately 30 ft. in diameter	Unknown to 1992	TRU and LLW retrievable waste; investigations not conducted to date.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; to be closed under MDA G closure.
54-015(c)	TA-54, Area G	Low-Level Waste (LLW) Storage Area	Three levels of subsurface storage totaling 960,000 gallons	Unknown to present	LLW and TRU retrievable waste; investigations not conducted to date.	Active permitted container storage unit; no further action approved; not subject to the Consent Order.
54-015(d)	TA-54, Area G	Storage Area	Six levels of subsurface, retrievable waste storage totaling 430,000 gallons	1974 to present	Retrievable TRU waste; investigations not conducted to date.	Inactive; no further action approved; not subject to the Consent Order.
54-015(e)	TA-54, Area G	Storage Area	Three levels of subsurface retrievable waste storage totaling 300,000 gallons	1974 to present	TRU retrievable waste; investigations not conducted to date.	Active permitted storage unit; no further action approved; not subject to the Consent Order.
54-015(f)	TA-54, Area G	Storage Area	Approximately 40 ft. x 290 ft.; six levels of retrievable waste storage totaling 970,000 gallons	1974 to present	TRU retrievable waste; investigations not conducted to date.	Active permitted storage unit; no further action approved; not subject to the Consent Order.
54-015(j)	TA-54, Area G	Storage Area	Bermed storage area approximately 60 ft. x 450 ft.	Unknown to present	Mixed waste; investigations not conducted to date.	Active permitted storage unit; no further action approved; not subject to the Consent Order.
54-015(k)/54-013(b)-99	TA-54, Area G	MDA G, Layer of Retrievable TRU Waste	Layer of retrievable TRU waste in cement-filled sections of corrugated pipe located inside a mound of fill material within the top of pit 29	Unknown	TRU and mixed TRU; releases of radiological constituents and metals.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; to undergo corrective action.
54-016(b)	TA-54, Area G	Sump	Dimensions unknown	Unknown to present	TRU waste drum (corrosion inhibitor); investigations not conducted to date.	Active; included on LANL Hazardous Waste Facility Permit Table K-1; investigation will be performed when the structure 54-33 is removed.
54-017/54-013(b)-99	TA-54, Area G	MDA G, Disposal Pits 1-8, 10, 12, 13, 16-22, and 24	19 pits ranging in area from approximately 20	1959 to 1980	Radioactive mixed and TRU waste; releases of	Inactive; included on LANL Hazardous Waste

Table 2-6. TA-54 SWMU Descriptions (continued)

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
			ft. x 450 ft. to 100 ft. x 600 ft.		radiological constituents and metals.	Facility Permit Table K-1; to undergo corrective action.
54-018/54-013(b)-99	TA-54, Area G	MDA G, Disposal Pits 25-33 and 35-37	12 pits ranging in area from approximately 100 ft. x 300 ft. to 100 ft. x 600 ft.	1979 to 1980	Radioactive mixed and TRU waste; releases of radiological constituents and metals.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; Pit 29 has been proposed to undergo closure/post-closure in accordance with alternative requirements, as allowed by 20.4.1 NMAC §264.110(c) [6-14-00], to meet post-closure care requirements.
54-019/54-013(b)-99	TA-54, Area G	MDA G, Disposal Shafts 1-20, 24-34, 38-92, 96, 109-112, and 150	Range in size from 1 ft. to 6 ft. in diameter and 25 ft. to 60 ft. deep and are located primarily in the northeast quadrant of Area G	1966 to 1980	LLW and hazardous and mixed waste; releases of radiological constituents and metals.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; to undergo corrective action.
54-020/54-013(b)-99	TA-54, Area G	MDA G, Disposal Shafts C1-C10, C12, C13, 22, 35-37, 93-95, 99-108, 114, 115, 118-136, 138-140, 151-160, 189-192, and 196	Range in size from 1 ft to 8 ft. in diameter and 0.25 ft. to 65 f.t deep, and are located throughout the eastern portion of Area G	1970 to early 1990s	PCB residues, LLW, hazardous and mixed waste; releases of radiological constituents and metals.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; Shaft 124 has been proposed to undergo closure/post-closure in accordance with alternative requirements, as allowed by 20.4.1 NMAC §264.110(c) [6-14-00], to meet post-closure care requirements.
54-021	TA-54, MDA L	Six Aboveground Oil Storage Tanks (former location)	Six former aboveground fiberglass storage tanks; four had capacities of 771 gallons, one had a capacity of 5650 gallons and one had a capacity of 5086 gallons	1987 to 1989	PCB and solvent-contaminated waste oil; no known releases.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-3; no further action approved.

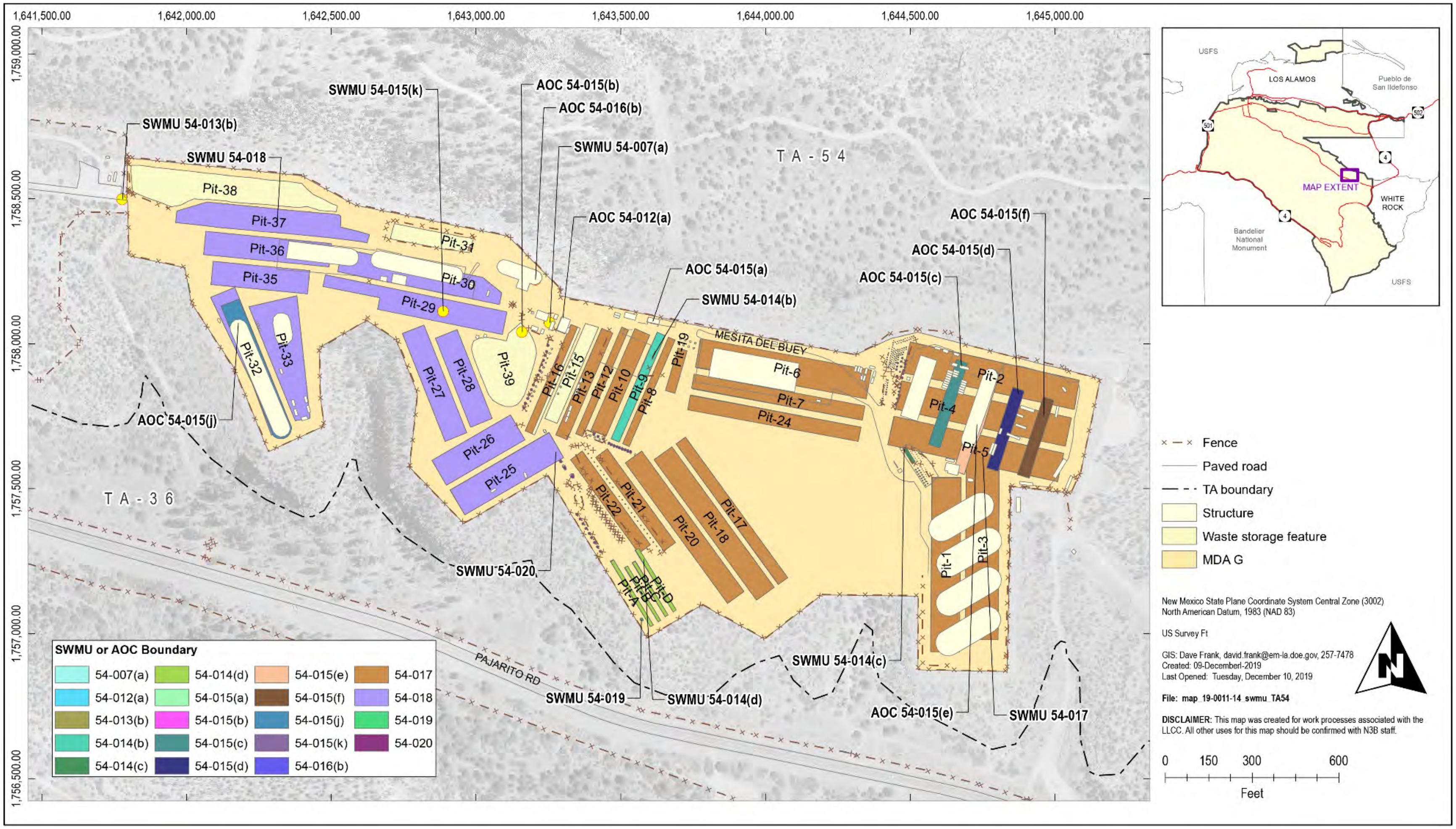

Figure 2-9. TA-54 Area G SWMUs and AOCs

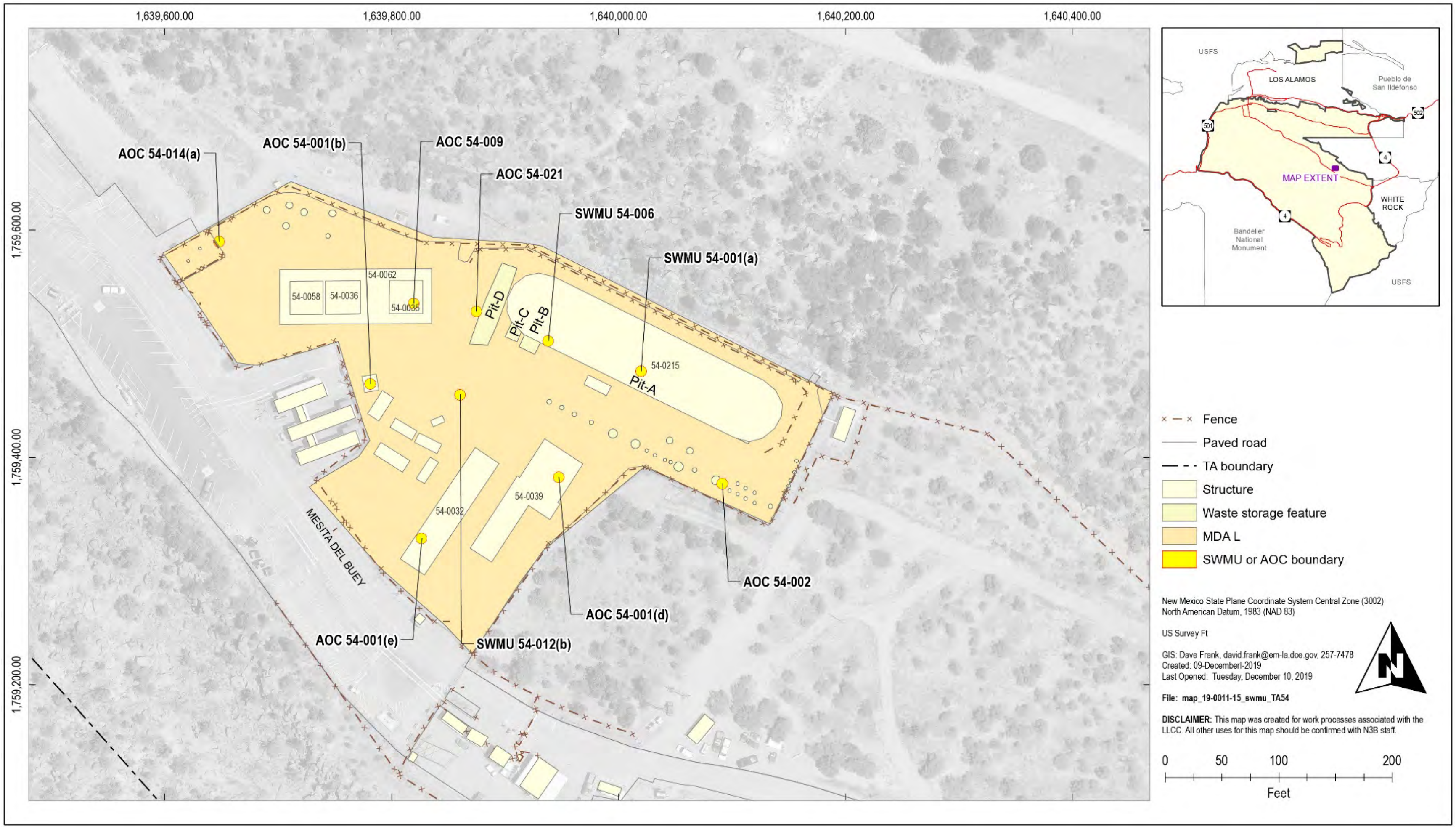

Figure 2-10. TA-54 Area L SWMUs and AOCs

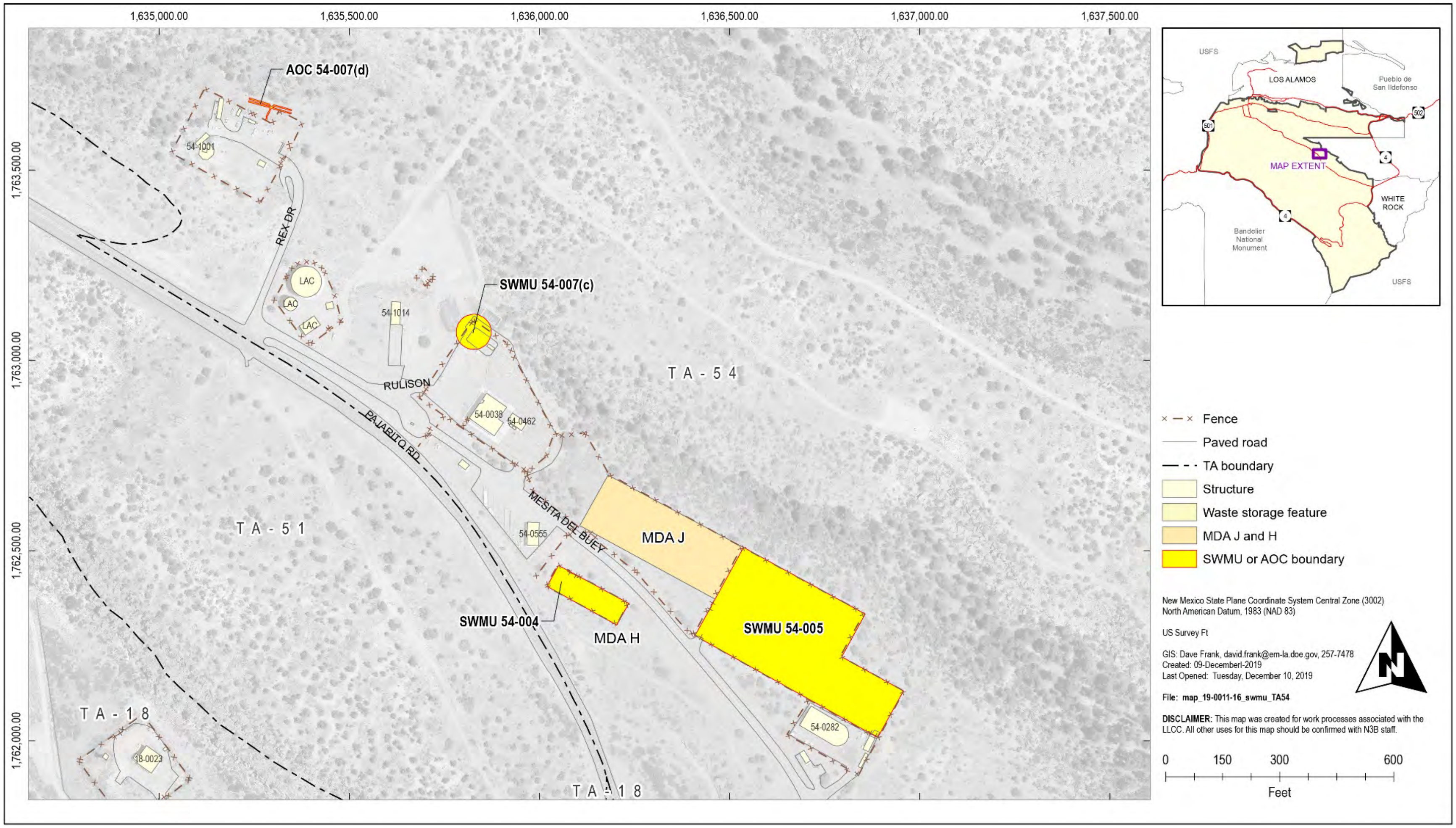

Figure 2-11. TA-54 West SWMUs and AOCs

Table 2-7. TA-55 SWMU Descriptions

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
42-001(a)/42-001(a)-99	North of former building 42-1 (removed by 1978) within TA-55	Soil Contamination from Former Incinerator Building 42-1	Designed to burn radioactive-contaminated waste in a cylindrical chamber with a throughput between 45.5 and 90.8 kilograms per hour; combustion products passed through an off-gas treatment system before being released through an exhaust stack, the off-gas system consisted of a Venturi scrubber, filter bank, and an ash separator	1951 to 1952	Radioactive-contaminated waste; releases from the incinerator are currently below residential and ecological risk levels.	Inactive; listed on the LANL Hazardous Waste Facility Permit Table K-1; site meets residential and ecological risk levels and is recommended for corrective action complete without controls.
42-001(b)/42-001(a)-99	Structure 42-2 located at former building 42-1 within TA-55	Soil Contamination from Former Ash Storage Tank	Tank was 22 ft. in diameter and approximately 13 ft. high, with a volume of 37,000 gallons	1951 to unknown	Radioactive-contaminated waste; no known releases at this tank.	Inactive; listed on the LANL Hazardous Waste Facility Permit Table K-1; site meets residential and ecological risk levels and is recommended for corrective action complete without controls.
42-001(c)/42-001(a)-99	Structure 42-3 located at former building 42-1 within TA-55	Soil Contamination from Former Ash Storage Tank	Tank was 22 ft. in diameter and approximately 13 ft. high, with a volume of 37,000 gallons	1951 to unknown	Radioactive-contaminated waste; no known releases at this tank.	Inactive; listed on the LANL Hazardous Waste Facility Permit Table K-1; site meets residential and ecological risk levels and is recommended for corrective action complete without controls.

Table 2-7. TA-55 SWMU Descriptions (continued)

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
42-002(b)/42-001(a)-99	West of former building 42-1 within TA-55	Soil Contamination from Former Decontamination Area	Unknown	1956 to 1969	Radioactive-contaminated waste; releases in this area are currently below residential and ecological risk levels.	Inactive; listed on the LANL Hazardous Waste Facility Permit Table K-1; site meets residential and ecological risk levels and is recommended for corrective action complete without controls.
42-003/42-001(a)-99	Site of former building 42-1 within TA-55	Soil Contamination from Former Septic System	565-gallon tank structure 42-4, drain line, filter trench, tile leach field, and outfall to Mortandad canyon removed in 1978	1951 to 1978	Sanitary sewage; septic tank may have overflowed in 1973; radiological contamination found and removed in 1978.	Inactive; listed on the LANL Hazardous Waste Facility Permit Table K-1; site meets residential and ecological risk levels and is recommended for corrective action complete without controls.
42-004	TA-42/TA-55	Canyon Disposal	Approximately 200 ft. x 100 ft.	1950s	Unknown constituents; no apparent releases based onsite soil sampling.	Inactive; listed on LANL Hazardous Waste Facility Permit Table K-3; no further action approved.
55-008	Building 55-4 basement	Sumps and Tanks	Six sumps/pumps, each with a capacity of 3 cubic ft., collect spills and mop-water generated in the building.; our 8-inch-diameter x 4-ft.-long condensate tank pumps and eight 8-inch-diameter x 4-ft.-long blowdown tanks receive condensate from cooling coils	1973 to present	Possibly small amounts of hazardous and/or radioactive constituents; no known releases to the environment.	Active; listed on LANL Hazardous Waste Facility Permit Table K-1; deferred site investigation per Consent Order.

Table 2-7. TA-55 SWMU Descriptions (continued)

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
55-009	Structure 55-263	Concrete Enclosure	9-ft. x 9-ft. x 6-ft.-deep concrete-lined pit; walls and floor of the monitoring station consist of 6-inch-thick reinforced concrete	1973 to unknown	Hazardous wastes were not generated, treated, stored, or disposed at the site, and radioactivity was never detected in the waste stream.	Inactive; listed on LANL Hazardous Waste Facility Permit Table K-3; no further action approved.

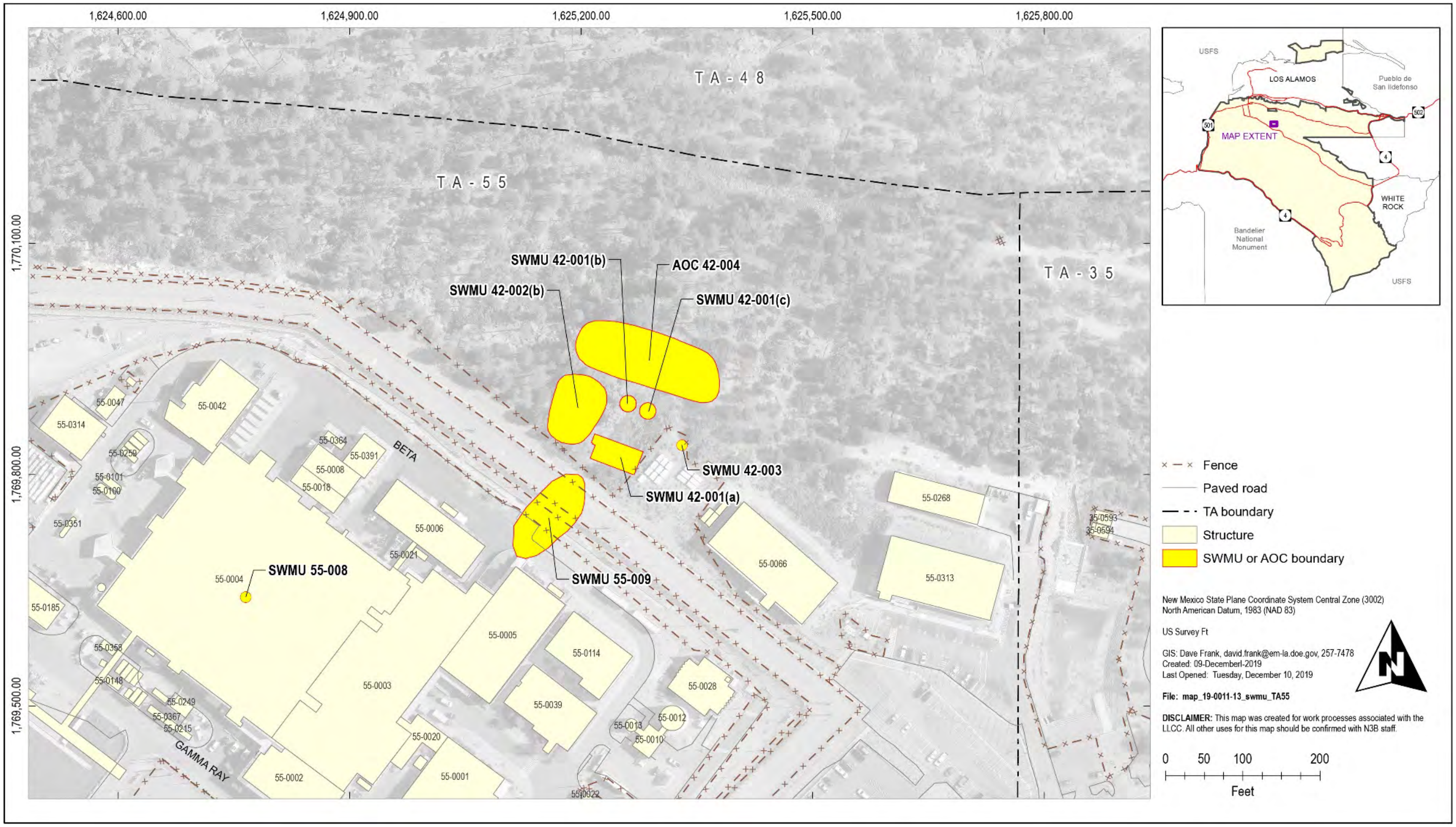

Figure 2-12. TA-55 SWMUs and AOCs

Table 2-8. TA-63 SWMU Descriptions

SWMU/AOC Number	Location	Type of Unit	General Dimensions and Structural Description	Operation Dates	Wastes Managed at the Unit and Release Info	Unit Status
63-001(a)	TA-6 structure 63-12	Septic System	1000-gallon tank with associated seepage pit and drain line	Unknown	Sanitary wastewater; no documentation of spills, releases, or incidents at TA-63 has been found.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; certificate of completion without controls received from NMED.
63-001(b)	TA-63 structure 63-14 at Building 1	Septic System	920-gallon tank with associated seepage pit and drain lines; seepage pit 4 ft. by 50 ft. dep	Unknown	Sanitary wastewater; no documentation of spills, releases, or incidents at TA-63 has been found.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-1; certificate of completion without controls received from NMED.
63-002	Fenced yard east of the north parking area at TA-63	Container Storage Area	Unknown	Unknown	Solvents; no identified releases.	Inactive; included on LANL Hazardous Waste Facility Permit Table K-3; NFA approved.

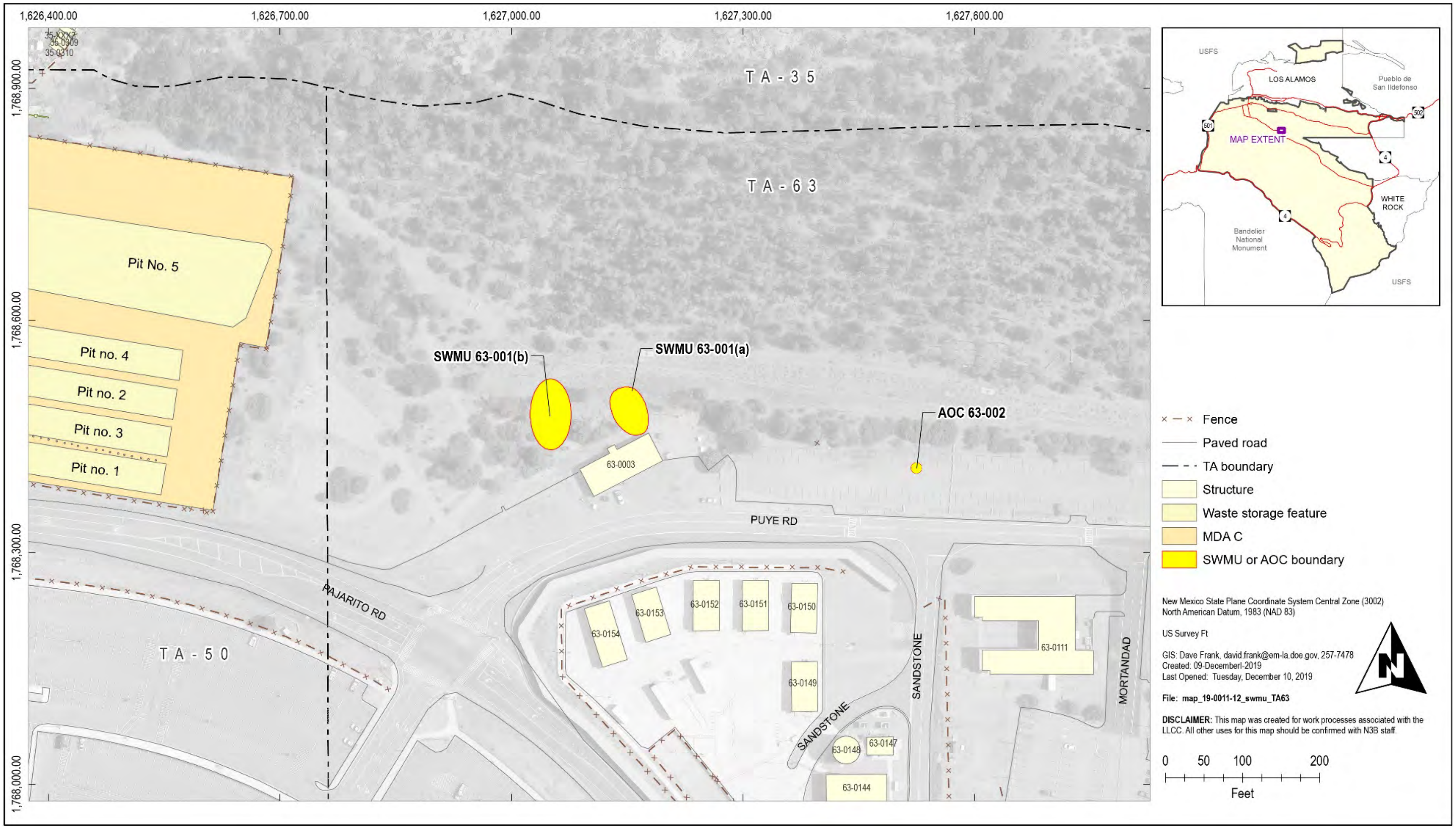

Figure 2-13. TA-63 SWMUs and AOCs

3.0 SPECIFIC UNIT INFORMATION REQUIREMENTS

This section of the Permit Renewal Application addresses the stipulated specific part B information requirements for permitted units, including 25 container storage units, one storage tank, and one treatment (stabilization) unit under 40 CFR §§270.15, 270.16 and 270.23. The Permittees are also authorized to treat hazardous waste (via microencapsulation or stabilization within containers) at 16 units primarily utilized for storage as described below.

The Permittees do not propose any changes to these permitted units. However, as described below, DOE-Triad has proposed one minor change to delete permit text at Permit Section 3.10.2. Information associated with the addition of three treatment units conducting open detonation and open burning under 40 CFR Subpart X are included in Sections 4.0 and 5.0 of this Permit Renewal Application.

3.1 Storage in Containers

Permit Part 3, *Storage in Containers,* includes requirements for active hazardous waste management units used for container storage. The Permittees propose no substantive changes to the hazardous waste management units used for storage of waste in containers. All the requirements within 40 CFR Part 264, Subpart I, are included within Permit Part 3 of the current LANL Hazardous 2010 Permit.

Under the Permit, DOE-Triad manages and operates container storage units at the following locations:

- Technical Area 3, Building 29, Container Storage Unit
- Technical Area 50, Building 69, Indoor Container Storage Unit
- Technical Area 50, Building 69, Outdoor Pad
- Technical Area 54 West, Building 38, Container Storage Unit (TA-54-38)
- Technical Area 54, West, Outdoor Container Storage Unit
- Technical Area 55, Building 4, Container Storage Unit, B40
- Technical Area 55, Building 4, Container Storage Unit, B05
- Technical Area 55, Building 4, Container Storage Unit, K13
- Technical Area 55, Building 4, Container Storage Unit, B45
- Technical Area 55, Building 4, Container Storage Unit, B13
- Technical Area 55, Building 4, Container Storage Unit, G12
- Technical Area 55, Building 4, Container Storage Unit, Vault
- Technical Area 55, 0355 Pad
- Technical Area 55, Outdoor Storage Pad
- Technical Area 63, TWF

Under the Permit, DOE-N3B manage and operate container storage units at the following locations:

- Technical Area 54, Area G, Pad 1, Container Storage Unit
- Technical Area 54, Area G, Pad 3, Container Storage Unit
- Technical Area 54, Area G, Pad 5, Container Storage Unit
- Technical Area 54, Area G, Pad 6, Container Storage Unit
- Technical Area 54, Area G, Pad 9, Container Storage Unit
- Technical Area 54, Area G, Pad 10, Container Storage Unit

- Technical Area 54, Area G, Pad 11, Container Storage Unit
- Technical Area 54, Area G, Storage Shed 8, Container Storage Unit
- Technical Area 54, Area G, Building 33, Container Storage Unit
- Technical Area 54, Area L, Container Storage Unit

The Permittees propose minor change to remove Permit Section 3.10.2, *Secondary Containment,* regarding the storage of hazardous waste in Technical Area 3, Building 29. Containers with free liquids stored within the hazardous waste management unit at TA-3-29 are managed on secondary containment pallets, as required by Permit Section 3.7.2, *Containers with Free Liquids*. Permit Section 3.10.2 indicates that the epoxy that coats the floor within the unit is utilized as part of the unit's containment system. Although the epoxy is chemical-resistant, it is not designed to operate as containment per the requirements of 40 CFR §264.175. The Permittees maintain the epoxy flooring as part of general facility management; however, secondary containment requirements are met by using secondary containment pallets. A summary table of changes summarized Appendix 1, *Summary Table of Changes to the Los Alamos National Laboratory Hazardous Waste Facility Permit,* and is included in Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11*.

3.2 Storage in Tanks and Mixed Waste Stabilization

Permit Part 4, *TA-55 Storage in Tanks and Treatment by Stabilization,* includes the requirements for active hazardous waste management units used for storage in tanks and stabilization by cementation at Technical Area 55. The Permittees propose no changes to these hazardous waste management units. All applicable requirements within 40 CFR Part 264, Subpart J and Subpart X, are included within Permit Part 4 of the most recent Permit. It should be noted that while the application requirements utilized to permit the mixed waste stabilization units are located in Subpart X of 40 CFR Part 264, the unit process code is T04, for "Other Treatment" in the LANL General Part A Permit Application, Revision 10.0 (LANL 2020a).

3.3 ~~Stabilization~~ Treatment in Containers

Permit Part 7, *~~Stabilization~~Treatment in Containers,* includes the Permit conditions associated with the treatment of hazardous waste in ~~a~~ contained environments at Technical Area 50, Building 69; TA-54, Area G, Pad 9, Dome 231 Perma-Con; and TA-54, Area G, Pad 1, Building 412. The Permittees propose no changes to the operations at these~~this~~ hazardous waste management units.

3.4 Treatment by Macroencapsulation

Macroencapsulation is an EPA-approved immobilization technology that includes the application of surface coating materials such as polymeric organics (e.g., resins and plastics) or use of a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media. Permit Part 8, *Treatment by Macroencapsulation,* includes the Permit conditions associated with the treatment of hazardous waste debris and radioactive lead solids by macroencapsulation. The Permittees propose no changes to this treatment process and may conduct this treatment at the following hazardous waste management units:

- TA-3-29, up to 3,441 gallons/day
- TA-50-69 Outdoor Pad, up to 275 gallons/day

- TA-54 Area G Pad 1, up to 23,160 gallons/day
- TA-54 Area G Pad 3, up to 23,160 gallons/day
- TA-54 Area G Pad 5, up to 23,160 gallons/day
- TA-54 Area G Pad 6, up to 23,160 gallons/day
- TA-54 Area G Pad 9, up to 23,160 gallons/day
- TA-54 Area G Pad 10, up to 23,160 gallons/day
- TA-54 Area G Pad 11, up to 23,160 gallons/day
- TA-54 Area G TA-54-33, up to 23,160 gallons/day
- TA-54 Area L Outdoor Pad, up to 23,160 gallons/day
- TA-54-38 West Outdoor Pad, up to 3,441 gallons/day
- TA-55-4, B40, up to 3,441 gallons/day
- TA-55-4, B45, up to 3,441 gallons/day
- TA-55-4 Outdoor Storage Pad, up to 3,441 gallons/day
- TA-55-355 Pad, up to 3,441 gallons/day
- TA-63 Transuranic Waste Facility, up to 23,160 gallons/day

4.0 OPEN DETONATION TREATMENT

This section outlines the application requirements in 40 CFR §270.14 (Part B General Requirements) and 40 CFR §270.23 (Specific Requirements for Miscellaneous Units) for treatment processes conducted in the two open detonation units at TA-36 and TA-39. The open detonation units are currently interim status units, and the Permittees propose for these units to be permitted. As required, this section describes the operating steps and requirements in place to ensure safe and effective waste treatment events of explosives waste and explosives-contaminated waste at the open detonation units. Proposed changes to the current 2010 Permit to facilitate the addition of these units are summarized and included Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit,* and Supplements 1-1 through 1-8, within the following Permit parts and attachments:

- Permit Part 1, *General Permit Conditions*
- Permit Part 5, *(Reserved)*
- Attachment A, *Technical Area Unit Descriptions*
- Attachment C, *Waste Analysis Plan*
- Attachment D, *Contingency Plan*
- Attachment E, *Inspection Plan*
- Attachment G, addition of closure plans, *Attachment G.2 Technical Area 36-8 Open Detonation Unit Closure Plan, and Attachment G.3 Technical Area 39-6 Open Detonation Unit Closure Plan*
- Attachment J, *Hazardous Waste Management Units*
- Attachment N, *Figures*.

4.1 Open Detonation Facility Background and Descriptions

Since the 1950s, the LANL has conducted treatment of solid and liquid explosive waste and explosive-contaminated waste by open detonation operations at TA-36-8, known as the Minie Site, and TA-39-6, known as Point 6. These sites are interim status units proposed by the DOE and Triad's predecessor (Los Alamos National Security, LLC) to be permitted through a Class 3 permit modification request submitted to NMED in July 2011. This Permit Renewal Application incorporates by reference this Class 3 modification request (LANL 2011).

Construction of the TA-36 Minie Firing Site was completed in 1950. The site has been used extensively to conduct armor-piercing experiments, in which penetrator jets are directed at targets at the canyon wall to the west of the site. Metal plates are placed behind the targets to stop the penetrators. The Minie Firing Site has also been used for open detonation of excess high explosives determined to be reactive RCRA waste. In addition, emergency detonation of leaking gas cylinders has also been performed, but on a very infrequent basis.

The TA-39 Point 6 site was established and began use as a test firing site in 1953. The site is located in the southernmost western tributary of Ancho Canyon at the canyon bottom between an ephemeral stream and steep hill slopes to both the north and the south. The site is used for explosives experiments and for treating reactive hazardous waste by open detonation. The experiments conducted at this firing site are designed to expend all high explosives in the device. The open detonation units are used to treat only solid and liquid hazardous explosive waste. The open detonation units are used to open air detonate waste-excess explosives and explosive-contaminated combustible waste to remove the characteristic of reactivity. The wastes treated by open detonation cannot be safely disposed through other modes of treatment, and open detonation treatment leaves any treatment residuals of the reactive hazardous waste safe to handle and dispose.

The types of hazardous listed waste treated at the open detonation units include the following EPA Hazardous Waste Numbers: D001, D003, D005, D008, D030, and F003. The waste categories treated at the open detonation units fall under several general categories: 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; and black powder or gunpowder. The treated waste streams consist of many different components, but they generally consist of waste contaminated with high explosives, such as off-specification high explosive powders, filters, filter cartridges, fiber drums, gun test debris, gun targets, prep room debris, shrapnel, plastic bags, vials, plastics, cellulosic material (e.g., wipes, swabs, paper), wood, tape, gloves, brass casings, magazines, steel canisters, and excess experimental energetics. Data from 2006 through 2014 demonstrate that the Facility's waste minimization program reduced the amount of waste treated by open detonation from more than 2,553.66 pounds over 20 events in 2006 to 6.49 pounds in one event in 2014. The largest treatment shot over those years was approximately 685 pounds. Through careful planning, the Facility established other uses for explosives that used to be considered waste and required treatment at the open detonation units. Now, there are efforts that use the explosives as fuel for training, sanitization, or experimental purposes, which is why in the short term there is not a regular need for these units. However, as buildings are decommissioned, areas are closed, and demolition activities are conducted to reduce the LANL facility footprint, explosives and explosives-containing materials will be found that cannot be used for their intended purposes and the open detonation units will need to be used to safely treat the material.

4.1.1 Open Detonation Permitting History

Since 1980, LANL has operated TA-36-8 and TA-39-6 open detonation units under the "interim status" requirements of the New Mexico Hazardous Waste Act and 40 CFR Part 265, Subpart P. Interim status is a designation given to facilities in existence before 1980 and contain requirements that apply until issuance of a final permit. The TA-36-8 and TA-39-6 units are classified as "thermal treatment hazardous waste management units" because they are used to treat explosive hazardous wastes; the units must meet requirements applicable to "miscellaneous units" under 40 CFR 264, Subpart X.

The permitting process for the TA-36-8 and TA-39-6 open detonation units has taken several decades. In November 1988, DOE and the University of California (the predecessor to the current contractor, Triad) submitted a permit application for hazardous waste treatment, including these two open detonation units. In January 1991, a Part A application for mixed waste units at LANL was submitted to NMED and included the units. The units were also included in Revision 1.0 and Revision 2.0 of the Part A permit application for mixed waste submitted to NMED in September 1993 and September 1994, respectively. In accordance with direction from NMED, a unit-specific Part A permit application (LANL, 1996b) for the units was submitted in 1996 (referred to as the OB/OD Part A), along with a unit-specific Part B as separate document. Prior to the issuance of the 2010 Permit, the most recent permit application for TA-36-8 was September 1999 and for TA-39-6 the most recent permit application was February 2000.

A Class 3 Permit Modification request was submitted July 19, 2011, as required by the 2010 Permit. The application was determined to be administratively complete on February 14, 2012. NMED issued a Notice of Deficiency on March 27, 2012, regarding two of the technical documents (the air-modeling report and the human-health risk assessment) included within the Permittees' 2011 application. The technical documents for which comments were provided have been updated and replaced herein as the following supplemental documents within Appendix 4, *Open Detonation and Open Burning Information*:

- Supplement 4-3, *Screening Level Air-Modeling Analysis and Risk Evaluation for Open Detonation Operations*
- Supplement 4-7, *Open Detonation Unit at Technical Area 36 Human Health and Ecological Risk Screening Assessments*
- Supplement 4-8, *Open Detonation Unit at Technical Area 39 Human Health and Ecological Risk Screening Assessments*

The units treat only explosives waste streams. The open detonation units are used to open air detonate waste-excess explosives and explosive-contaminated combustible waste.

4.1.2 Open Detonation Facility Descriptions

The two open detonation units at LANL are located at TA-36 and TA-39. The descriptions provided below meet the application requirements for 40 CFR §§270.14(b)(1) and 270.23(a).

4.1.2.1 Technical Area 36 Open Detonation Unit

Located in the east central portion of LANL, TA-36 is spread over several mesa tops between a branch of Pajarito Canyon to the north and Water Canyon to the south. Mesa-top elevations at TA-36 range from approximately 6,380 to 7,120 ft. above mean sea level. TA-36 contains an open detonation unit, several other firing sites, and supporting offices where research is conducted with various types of explosives. The location of the unit is depicted on revised Figure 2 included within Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*.

The TA-36-8 open detonation unit is located in the southern portion of TA-36. The unit consists of an irregularly shaped area near Building TA-36-8 (the control building), as shown on newly included Figure 6 within Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*, and on the TA-36 topographic map included with the updated *Los Alamos National Laboratory General Part A Permit Application, Revision 10* (LANL 2020a). The TA-36-8 open detonation unit is a sand- and grass-covered area that measures approximately 500 ft. east to west and 300 ft. north to south. The western portion is relatively flat; the eastern portion is concave to minimize fragment dispersion. Because the unit consists simply of an area on soil-covered tuff, an engineering drawing for structures cannot be developed for the unit. The topography and extent of the TA-36-8 open detonation unit are shown on the aerial figure included in the *Los Alamos National Laboratory General Part A Permit Application, Revision 10* (LANL 2020a). The TA-36-8 open detonation unit has a maximum treatment capacity of 2,000 pounds of explosive waste per detonation and an annual treatment limit of 15,000 pounds. The unit is used primarily for non-treatment-related experimental test detonations and is occasionally used to treat explosive hazardous waste. Operations at the unit require post-detonation visual surveys as soon as practical for materials not consumed by the detonation. This practice minimizes the potential for precipitation contacting untreated hazardous waste, if any is generated.

4.1.2.2 Technical Area 39 Open Detonation Unit

TA-39 is located in the southern portion of LANL (revised Figure 2 within Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*) and includes much of the mesa between Water Canyon to the north and Ancho Canyon to the south. Mesa-top elevations at TA-39 range from approximately 6,500 to 7,000 ft. above mean sea level. The area was established in 1959 to test explosive materials and has been used continuously for that purpose. TA-39 contains a number of structures located in the north fork of Ancho Canyon; however, these structures are not routinely occupied and are only used during firing site operations or maintenance activities.

The TA-39-6 open detonation unit is associated with Building TA-39-6 (the control building). The location of the unit is shown on newly included Figure 7 of Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures,* and on the TA-39 topographic map in the updated LANL General Part A Application, Revision 10 (LANL 2020a). The TA-39-6 open detonation unit is a relatively flat, sand-covered area and measures approximately 40 ft. by 40 ft., and is located near the canyon bottom. Steep canyon walls that rise to heights of 100 ft. or more in the immediate vicinity of the TA-39-6 open detonation unit serve to attenuate the force of the detonations. Additionally, the area recently has been reconfigured to have a retaining wall in front of the canyon wall roughly forming a semicircle around the unit, which also provides attenuation of the detonation force. Building TA-39-6 (the control building) is a reinforced concrete structure that partially extends beneath the detonation area. An engineering drawing cannot be developed for the unit because it consists simply of an open area on sand-covered tuff. The topography and aerial extent of the unit are shown on the figure included in the LANL General Part A Application, Revision 10 (LANL 2020a). The TA-39-6 open detonation unit has a maximum waste treatment capacity of 1,000 pounds of explosive waste per detonation and an annual treatment limit of 15,000 pounds. The unit is used primarily for non-treatment-related experimental test detonations and is also occasionally used to treat hazardous explosive waste. Operations require post-detonation visual surveys as soon as practical for materials not consumed by the detonation. This practice minimizes the potential for precipitation contacting untreated hazardous waste, if any is generated.

4.2 Waste Characterization and Acceptance

The explosives waste and explosives-contaminated waste treated by open detonation typically consists of off-specification explosives wastes, excess explosives waste, and other explosives-contaminated solid wastes (e.g., rags, glass, and wood). These wastes exhibit the characteristic of reactivity, as defined in 40 CFR §261.23. Open detonation treatment of these wastes involves a detonation that chemically transforms the high explosives component of the waste faster than the speed of sound and renders the waste nonreactive.

Waste characterization and analysis requirements for explosives and explosives-contaminated waste treated by open detonation at LANL must be included within Permit Attachment C, *Waste Analysis Plan*. These waste streams include homogeneous and heterogeneous wastes. Open detonation operations are necessary for hazardous waste treatment to remove the characteristic of reactivity. Treatment by open detonation renders hazardous waste nonreactive and any potential remaining residue amenable to handling and dispositioning. Solid and liquid hazardous explosives waste may be treated (i.e., open detonated) at the units. Proposed changes to the Permit necessary to include these treatment operations are incorporated within the revised Permit Attachment C, *Waste Analysis Plan,* within

Appendix 1, Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan,* of this Permit Renewal Application.

Waste characterization, acceptance, authorized wastes, and plans for waste analysis prior to treatment and after treatment (if needed) are outlined in Appendix 1, Supplement 1-3, in accordance with the requirements under 40 CFR §§264.13(a-c), 265.375, 265.382, and 270.14(b)(2-3). The changes include information specific to waste analysis and acceptance at the open detonation units. The Waste Analysis Plan was developed to ensure that all hazardous waste streams treated at the hazardous waste management units are properly characterized and any hazardous constituents that might contain or that are released through treatment are sufficiently identified.

4.3 Security

At LANL, the Permittees prevent the unknowing entry and minimize the possibility for the unauthorized entry of persons or livestock onto the active hazardous waste management units, in accordance with the requirements from 40 CFR §§264.14 and 270.14(b)(4). Security is of paramount importance to safe and successful operations at LANL.

Access to the isolated and security-controlled locations of the open detonation units at TA-36 and TA-39 is maintained through both administrative controls and physical barriers. Entry into each of the firing sites or high explosives exclusion areas are controlled through an industrial fence with access granted through an access control station or a locked access gate. Access into the security area through the fence can only be gained by persons possessing an appropriate security clearance and site-specific training. Entry into the secured area is controlled via a combination of an entry station that is manned by LANL security personnel or by badge readers on gates 24 hours per day. Unescorted access to the appropriate firing site or high explosives exclusion area is granted only to persons possessing appropriate security clearance and meeting site-specific training requirements. Visitors must check in at the appropriate access control station to be added to the site-specific badge-reader system to gain access to the area. Proposed changes to the Permit to update descriptions of security measures at the open detonation units are included to Attachment A, *Technical Area Unit Descriptions*, within this Permit Renewal Application in Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.

4.4 Inspection Schedules and Procedures

Per the requirements at 40 CFR §§ 270.14(b)(5) and 264.602, inspections at the open detonation units are conducted and documented as outlined in Permit Section 2.6, *General Inspection Requirements*. Permit Attachment E, *Inspection Plan,* with a revised inspection plan that includes the requirements for inspections at the open detonation hazardous waste management units, can be found in Supplement 1-5, *Permittees' Proposed Changes to Permit Attachment E, Inspection Plan,* of this Permit Renewal Application. No changes to Permit Section 2.6 are associated with the addition of these hazardous waste management units.

4.5 Waivers for Preparedness and Prevention

The information requirements for 40 CFR §270.14(b)(6) stipulate that a part B permit application include "a justification for any request to waive the preparedness and prevention requirements of Part 264, subpart C." No waivers of the preparedness and prevention requirements under Part 264, subpart C, are being sought by the Permittees.

4.6 Contingency Plan

As required by 40 CFR §270.14(b)(7), the Contingency Plan meets the requirements for 40 CFR Part 264, Subpart D, *Contingency Plan and Emergency Procedures*. Information on emergency response resources and release prevention/mitigation are included in the current 2010 Permit Attachment D, *Contingency Plan*. A copy of the revised Contingency Plan that includes updates for the inclusion of the open detonation units is included in this Permit Renewal Application as Supplement 1-4, *Permittees' Proposed Changes to Permit Attachment D, Contingency Plan*. The revised plan incorporates the emergency equipment located at the open detonation units at TA-36-8 and TA-39-6.

4.7 Hazards Prevention

The following sections present how operations at the open detonation units comply with the preparedness and prevention requirements of 40 CFR Part 264, Subpart C, and the application requirements for 40 CFR §§270.14(8)(i-vi), where they differ from those presented in Section 2.7, *Hazards Prevention,* of this Permit Renewal Application. Health and safety procedures are followed by site personnel during routine operations.

4.7.1 Waste Handling at Open Detonation Units

All waste-handling operations at the open detonation treatment units are conducted as discussed in Section 2.7.1, *Waste Handling and Preventing Hazards in Unloading/Loading*, of this Permit Renewal Application, thus meeting the requirements of 40 CFR §270.14(8)(i).

4.7.2 Control of Runon/Runoff

Prevention of runoff from the hazardous-waste-handling areas per the requirements for 40 CFR §270.14(8)(ii) is described in Section 4.18.2, *Protection of Surface Water/Wetlands/Soil Surface,* of this Permit Renewal Application.

4.7.3 Preventing Water Supply Contamination

The water supply at LANL is as described in Section 2.7.3, *Preventing Water Supply Contamination,* of this Permit Renewal Application.

4.7.4 Mitigate the Effect of Equipment Failure and Power Outages

There are no special requirements at the open detonation units required to mitigate equipment failure and power outages, per the requirements of 40 CFR §270.14(b)(8)(iv). The description of required equipment and testing maintenance of that equipment follow the permit conditions referenced in Section 2.7.4, *Mitigate the Effect of Equipment Failure and Power Outages,* of this Permit Renewal Application with the proposed permit changes as described within the section.

4.7.5 Preventing Undue Exposure of Personnel

The requirements at the open detonation units to prevent undue exposure of personnel, per the requirements at 40 CFR §270.14(b)(8)(v), are as described in Section 2.7.5, *Preventing Undue Exposure of Personnel,* of this Permit Renewal Application.

4.7.6 Preventing Releases to the Atmosphere

Releases to the atmosphere resulting from treatment activities at the open burning and open detonation treatment units cannot be prevented as required by 40 CR §270.14(b)(8)(vi). However, assuming conservative scenarios for treatment activities at each of the units (as discussed in Section 4.18.3, *Protection of Atmosphere,* and included in Supplement 4-3, *Screening Level Air Modeling Analysis and Risk Evaluation for Open Detonation Operations*), the estimated resulting emissions will not exceed regulatory levels for health-based protection. Therefore, such emissions will not adversely affect human health or the environment.

Air-monitoring data collected in 2011 during treatment events at the open detonation units is included as Supplement 4-4, *Air Sampling at Open Detonation Units,* of this Permit Renewal Application. Each sample was collected as close to the treatment unit as possible and downwind of the shot. The data indicate that much of the measurable air contaminants can be attributed to air entrainment of soil, rather than emissions from the treatment processes.

4.8 Ignitable, Reactive, and Incompatible Waste Precautions

The application requirements for 40 CFR §270.14(b)(9) are included in Section 2.8, *Ignitable, Reactive, and Incompatible Waste Precautions,* of this Permit Renewal Application. There are no changes required to Permit Section 2.8, *Ignitable, Reactive, and Incompatible Waste*, for the inclusion of the open detonation units within 2010 Permit. The treatment of wastes by open detonation is an appropriate treatment method under RCRA. It is necessary to mitigate the ignitable and/or reactive hazards associated with explosives waste streams and is the preferred waste management practice for health and safety concerns.

4.9 Traffic

In accordance with the requirements of 40 CFR §270.14(b)(10), the primary traffic routes used to transport hazardous waste to the TA-36-8 open detonation unit include West Jemez Road (State Road 501), Anchor Ranch Road, R Site Road, and Potrillo Drive. The primary traffic routes used to transport hazardous waste to the TA-39-6 open detonation unit are within TA-39. Ancho Road is a nonpublic road within TA-39 (see Figures 1 and 2 in Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*). Additional discussion of traffic at LANL is included in Section 2.9, *Traffic Pattern, Estimated Volume, and Control*.

4.10 Location and Facility-Wide Information

Facility location information to meet the requirements for 40 CFR §270.14(b)(11) is included within this Permit Renewal Application within Section 2.10, *Facility Location Information*. Additionally, the information requirements for 40 CFR §§270.14(b)(12, 14, 15, 16, 17, 18, 19, 20, 21, and 22) and 270.14(c & d) are covered for the LANL facility within Sections 1 and 2 of this Permit Renewal Application. There are no additional information requirements necessary to add the open detonation units to the 2010 Permit.

4.11 Closure Plan

Copies of the closure plans for each of the open detonation units as required by 40 CFR §270.14(b)(13) are included within Supplement 3-1, *Permittees' Proposed Changes to Attachments G.1 through G.30, Closure Plans,* of this Permit Renewal Application.

4.12 Design, Construction, Materials, and Operation

Open detonation completely removes the characteristic of reactivity from explosives waste and explosives-contaminated waste. However, these wastes may also exhibit RCRA toxicity characteristics or contain listed wastes. In some cases, open detonation is effective in removing these other characteristics and destroying listed waste associated with organic hazardous constituents (e.g., 2,4-dinitrotoluene and solvents). This is not the case when it comes to high explosives contaminated with RCRA-regulated metals. However, untreated explosives waste and explosives-contaminated waste do not usually contain metals in high enough concentrations to be considered hazardous.

The open detonation units are used to treat solid and liquid explosive hazardous waste. Descriptions of waste streams that might be treated by open detonation at the unit are discussed in Section 2.2, *Waste Analysis Plan,* of this Permit Renewal Application.

The TA-36-8 open detonation unit has a maximum treatment capacity of 2,000 pounds of explosive waste per detonation and an annual treatment limit of 15,000 pounds. Following waste placement at the unit, detonation operations are conducted remotely from Building TA-36-8 (the control building). The TA-39-6 open detonation unit has a maximum waste treatment capacity of 1,000 pounds of explosive waste per detonation and an annual treatment limit of 15,000 pounds. Following waste placement at the TA-39-6 unit, detonation operations are conducted from Building TA-39-6 (the control building). Both units are used primarily for non-treatment-related experimental test detonations and are also occasionally used to treat hazardous explosive waste. Operations at each of the units require post-detonation visual surveys as soon as practical for materials not consumed by the detonation. This practice minimizes the potential for precipitation contacting untreated hazardous waste, if any. The Permittees have proposed treatment permit conditions for these units to update Permit Part 5. These proposed revisions are included within in newly proposed Permit Part 5, *Treatment by Open Detonation,* and within Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11,* of this Permit Renewal Application.

4.12.1 Containment Systems

In accordance with requirements from 40 CFR §264.601(b)(2), the effectiveness and reliability of containment, confinement, and collection systems and structures that prevent contaminant migration at the open detonation units are evaluated in Section 4.18, *Environmental Performance Standards.*

Engineering controls are in place at each open detonation unit to prevent runoff of waste constituents from the unit to other areas of the facility or to the environment. A site plan and an aerial photograph of the unit is included in the *LANL General Part A Application, Revision 10* (LANL 2020a). Drainage control features and storm water controls are included on figures in Supplement 4-2, *Open Detonation Unit Groundwater Monitoring and Surface Drainage Information.*

Existing storm water controls at the TA-36-8 open detonation unit include an earthen berm and swale that direct runon around and to the south of the unit. The lower reach of this swale is well vegetated, and a 12-inch culvert directs runoff under the access road, with the banks of the drainage adjacent to the outlet lined with riprap. The general unit area is surrounded with an earthen berm, and the outfall for the site is well vegetated and has a layer of wood chips that filter runoff from the site. The site is flat, so the vast majority of rainfall is absorbed into the soil. Native vegetation in the area surrounding the unit holds soil in place, increases infiltration, and slows and filters runoff.

Storm water controls at the TA-39-6 open detonation unit include a retaining wall to the north and west of the TA-39-6 firing pad. This wall diverts surface water runon north to a tributary of Ancho Canyon and prevents potentially contaminated runoff from entering the tributary to Ancho Canyon. The north slope of the retaining wall is covered with native vegetation to provide stabilization. Several rock check dams are located north of the firing point in a tributary to Ancho Canyon. Runoff from the TA-39-6 open detonation unit is directed into a rock-lined channel that leads to a culvert under the site access road. The discharge outlet of this culvert is protected with rock check dams. A drainage swale around the south edge of the dirt access road leading to the unit directs storm water away from the firing point and through the easternmost culvert present at the sire. Several rock check dams are located within the swale above this culvert. The discharge outlet of these culverts is protected with rock check dams. Thick native vegetation at the easternmost culvert's outlet serves as detention, filtration, and infiltration control, preventing sediment transport into the tributary to Ancho Canyon.

4.12.2 Operating Requirements

Open detonation operations are conducted in accordance with this section and as detailed in the most recent, approved versions of LANL facility plans and operating procedures. These procedures are described in the following sections to address the general and site-specific safety and health hazards associated with working with explosives.

Waste to be treated is collected from various areas at the Facility. Prior to treatment of any waste, the waste generator submits waste characterization documentation and a request for treatment. This information is reviewed for acceptance at the treatment unit by a trained professional familiar with the waste characterization requirements of the Waste Analysis Plan and the site-specific restrictions of the waste treatment unit at TA-36-8 or TA-39-6. Treatment event(s) is/are scheduled once waste characterization documentation has been approved by the firing site leader, waste acceptance personnel, high explosives official safety personnel, and responsible line management.

4.12.2.1 Waste Treatment Process

Scheduling a waste treatment event involves arranging for transportation of waste from one or more locations to the make-up building (or preparation building) or to the TA-36-8 or TA-39-6 open detonation units. When loading waste, the cargo compartment of the transport vehicle is checked to ensure that it is clean and contains no loose items such as tools or pieces of metal. For transport, the wastes are placed in an enclosed compartment or secured with tie-downs. The load limit for transporting explosives is determined by the capacity of the transport vehicle. Wastes are transported by appropriately trained personnel in a designated vehicle to a make-up building or to the open detonation unit. The waste is unloaded from the vehicle and placed within the make-up building by qualified technicians/specialists. A visual examination is conducted after unloading to ensure that no explosive material remains in the transport vehicle.

For efficiency and with the intent to minimize handling of explosives, waste may be staged overnight after transport to the make-up room. The make-up buildings are located near the TA-36-8 and TA-39-6 open detonation units within an area where access is controlled.

Specific treatment operations and explosives handling and assemblies are addressed in operating procedures described in this document and take into account all the potential hazards present during treatment preparation. The wastes treated at the open detonation units are prepared in the make-up room, where assemblies necessary for detonation of the waste are located. The required amount of explosive is moved into the open detonation unit for a treatment event. Final setup for waste treatment occurs at the open detonation unit, and this setup includes configuration of explosives and detonator. This includes connecting electronic components and wiring at the open detonation unit to ensure remote initiation of the waste treatment detonation functions correctly.

The firing site leader at each open detonation unit configures a waste treatment shot that ensures complete detonation of the waste. Multiple compatible waste streams may be consolidated to create efficiencies in the waste treatment. Wastes requiring the use of more fuel may be paired with wastes that require less fuel, so the least amount of fuel possible is used to treat waste effectively and efficiently. Also considered in the process are other safety and health considerations, including but not limited to minimizing the handling and transport of explosives, noise mitigation, meteorological conditions, and fire danger. Risk to human health is the greatest consideration. Should operational or meteorological conditions change rapidly and unexpectedly, the waste may remain at the open detonation unit under administrative control until open detonation treatment can be conducted safely.

Operations at firing sites at LANL are carefully coordinated and Access Control is notified prior to and after conducting of treatment operations via phone or radio. Fire department personnel may be notified, and these personnel may be present or on standby at certain treatment events, as determined by high explosives safety personnel. Initiation for all waste treatment operations is performed remotely by qualified personnel from inside the control buildings. Upon completion of shot setup, area clearances are completed and the shot is fired. After the shot is fired, the firing site leader (or designee) conducts a visual inspection to ensure that the high explosives were expended and safe conditions exist. If the inspection confirms that the shot fired completely, an “All Clear” is signaled via phone or radio. All personnel must remain in the bunker until given permission to leave the control building by the personnel inspecting the site.

If there are indications that the shot did not fire properly, clearance personnel will be notified of the condition. All personnel within the control building will remain in the control building, with misfire or partial fire procedures going into effect. LANL minimizes the impact to the environment by conducting treatment operations in strictly controlled, remote areas within LANL boundaries. Waste treatment shots are carefully assembled to ensure thorough detonation and minimize fragment dispersion. Residues (metallic shards, wood, plastic, cables, or foam pieces) are managed in accordance with appropriate LANL waste management procedures.

4.12.2.2 Waste Accumulation

Explosives waste is not routinely accumulated at the firing site. When possible, explosives waste and explosives-contaminated waste are removed from compliant storage at the generating location just prior to being treated.

4.12.2.3 Treatment Operations

The TA-36-8 open detonation unit and the TA-39-6 open detonation unit are used for thermal treatment of explosive-contaminated hazardous waste that exhibits the characteristic of reactivity, in accordance with 40 CFR Part 265, Subpart P. The purpose of waste treatment at the units is to remove the characteristic of reactivity by open detonation. Treatment of the waste is accomplished by using a predetermined amount of explosive (fuel or donor charge) to initiate and increase the effectiveness of treatment. All treatment detonations are conducted above the ground surface, with a clearance area established based on the size of the treatment shot. Detonations are configured at each unit to minimize fragmentation dispersal. The detonation may create temperatures ranging from 4,500 to 9,000 degrees Fahrenheit (2,500 to 5,600 degrees Celsius) (NAVAMI 2005).

Generally, explosives-contaminated waste includes make-up room (located in the make-up building) wastes and, to a very limited degree, firing site debris. Make-up room waste consists of explosives-contaminated debris such as paper towels, gloves, swabs, and similar materials that contain no tangible pieces of explosives but are used in the preparation of detonations (i.e., shots) in the make-up building. Firing site debris that is potentially contaminated with explosives would only be generated in the rare instance that a waste treatment or experimental shot is incomplete. This debris waste stream consists of wood scraps, cardboard, burlap, Plexiglas®/Lexan®, plastic, glass, Styrofoam, electrical cables, and metallic foils used for pin switches or metals such as target plates. When generated, firing site debris is characterized using LANL waste management procedures and determined to not meet the criteria for a reactive waste. Therefore, firing site debris is almost always sent offsite for dispositioning.

Explosives waste includes identifiable excess explosives that are safe to handle. These materials include excess explosives assemblies and explosives, identifiable booster charge scrap, and any other process or cleanup wastes that have been determined to be potentially reactive.

Waste containers for explosives-contaminated waste and explosives waste generally consist of plastic bags, paper-lined cardboard boxes, or plywood boxes. Explosives-contaminated waste and explosives waste are packaged for intrusive transport typically in compliance with U. S. Department of Transportation requirements. Explosives-contaminated waste is placed within a container, sealed, and labeled appropriately. These waste containers are stored in a central accumulation area or a satellite accumulation area. Excess explosive waste may be stored in compliant explosives storage. Firing site debris that includes pieces of damaged explosives resulting from a misfire, sensitivity experiment, incomplete detonation, or exposure to severe testing is packaged separately from explosives waste. Exceptions to handling are done on special items, which are handled safely and appropriately.

4.12.2.3.1 Pretreatment Activities

Open detonation operations are conducted in accordance with this section and as detailed in the most recent, approved versions of LANL facility plans within the Permit and operating procedures (as described here), which are designed to help trained personnel assess and address the general and site-specific safety and health hazards associated with working with explosives.

Waste to be treated is collected from various areas at the Facility. Prior to treatment of any waste, the waste generator must submit waste characterization documentation and a request for treatment. This information is reviewed for acceptance at the treatment unit by a trained professional familiar with the waste characterization requirements of the Permit Attachment C, *Waste Analysis Plan* (the revised Waste Analysis Plan with the proposed changes to include open detonation is in this Permit Renewal Application's Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*) and the site-specific restrictions of the waste treatment unit at TA-36-8 or TA-39-6. A treatment event(s) is/are scheduled once the waste characterization documentation has been approved by the firing site leader, waste acceptance personnel, high explosives official safety personnel, and responsible line management.

4.12.2.3.2 Waste Staging

For efficiency and with the intent of minimizing handling of explosives, waste may be staged overnight after transport to the make-up room in the make-up building. The make-up buildings are located near the TA-36-8 and TA-39-6 open detonation units, and within an area where access is controlled. Waste is not staged outside on the firing point.

4.12.2.3.3 Restrictions on Operations

Operating conditions for the open detonation units include not conducting detonation operations during adverse weather conditions and accepting only a maximum of up to 2,000 pounds of waste explosives per treatment at the TA-36-8 open detonation unit and 1,000 pounds of waste per treatment at the TA-39-6 open detonation unit. Annually, the Facility is limited to 15,000 pounds per year for both the open detonation units combined.

Transportation of or routine operations with explosives waste at the open detonation units may not occur during the following severe conditions:

- Lightning within a six mile radius
- ~~Bounding conditions as detailed in the LANL Fire Danger Matrix maintained by emergency operations personnel at the Facility~~
- Icy roads (for transport)
- During precipitation events
- Winds greater than 20 miles per hour

Specific bounding conditions for treatment operations are detailed in the LANL Fire Danger Matrix (https://www.lanl.gov/resources/emergency/fire-danger-matrix.php) maintained by emergency operations personnel at the Facility. Wind data is standardized using the facility-wide LANL Weather Machine, meteorological tower 6 postings. Routine open detonation operations occur only during daylight hours (i.e., one hour after sunrise or one hour before sunset).

4.13 Demonstration of Treatment Effectiveness

To address the applicable miscellaneous unit requirements specified in 40 CFR §270.23(d), a demonstration of treatment effectiveness must be included for the open detonation units. As indicated in the U.S. Army Environmental Hygiene Agency (AEHA) guidance document, "RCRA Part B Permit Writers Guidance Manual for Department of Defense Open Burning/Open Detonation Units" (AEHA 1987), a demonstration of treatment effectiveness can be based on laboratory or field data. For wastes treated by open detonation, information demonstrating that any residues or fragments remaining are not reactive after the detonation (i.e., as defined by RCRA) should be provided. At the open detonation units, the goal of waste treatment is to have no residue after each waste treatment event. The area is visually inspected for complete detonation directly after each treatment event. If any explosives waste remains after the initial treatment, it is treated again to ensure that any residues or fragments remaining are not reactive. Remaining residues that could be reactive would be considered an off-normal situation and would be documented as such. Any remaining explosive remnants would be treated in accordance with safety practices and approved LANL waste management procedures. Residues that are not reactive are managed as such, and must be in compliance with applicable state, federal, and local requirements.

4.14 Assessment of Alternatives

An assessment of alternatives to onsite open burning and open detonation treatment activities is included in Supplement 4-1, *Assessment of Alternatives for Open Detonation and Open Burning Activities for Open Detonation and Open Burning Activities* of Appendix 4, *Open Detonation and Open Burning Information,* of this Permit Renewal Application. The assessment discusses waste minimization efforts, operational practice changes, and process efficiencies that have occurred to decrease the amount and types of waste that require treatment through open detonation and open burning activities. Waste-minimization and process-efficiency efforts have decreased the volume of waste generated during routine operations. These efforts are continual at LANL and prove effective at reducing explosives waste for treatment by open detonation, resulting in no waste treatment detonations at either unit since 2014 at LANL. This reduction has been accomplished mainly by identifying other uses for excess and out-of-specification explosives. However, these activities do not eliminate all potential waste streams requiring thermal treatment (i.e., open detonation or open burning).

In addition, the assessment outlines alternative treatment technologies to open detonation and open burning and the restrictions for offsite transport of explosive hazardous waste. Overall, the assessment concludes that no single treatment technology exists that could treat all wastes currently treated by open burning and open detonation at LANL; therefore, multiple treatment technologies would have to be employed onsite to replace open detonation and open burning treatment activities. These technologies would also require RCRA permits prior to construction.

Additionally, the assessment in Supplement 4-1 outlines the safety considerations that are important for both onsite treatment activities and offsite shipment of explosives waste streams. It concludes that onsite open detonation and open burning treatment are the only options for treatment of certain waste streams. Open detonation or open burning is the safest and most reliable method for all explosives waste streams treated onsite and thus cannot be eliminated.

4.15 Noise Considerations

Noise resulting from open detonation treatment activities is minimized by conducting such treatment in a remote area within LANL boundaries and under optimal meteorological conditions. This section describes the potential impacts to human health and the environment resulting from noise and ground vibrations.

Impulse noise is a discrete noise event that typically lasts less than two seconds (often less than one second) and produces a rapid increase in the sound pressure level. Impulse noise measurements were collected at the intersection of Piera Loop and New Mexico State Road 4 in White Rock, New Mexico, located approximate 2.5 miles east of the TA-36-8 open detonation during the detonation of explosives. Measurements were taken on approximately 110 separate occasions between 2008 and early 2011. On seven of those occasions, impulse noise measurements were also taken at a location approximately 13 miles east of the open detonation unit, in El Rancho, New Mexico. The El Rancho location has a "direct line of sight" to LANL boundaries. The practice for evaluating noise concerns associated with all routine detonation activities is specifically described in Supplement 4-10, *Predicting and Controlling Noise from Detonation Activities*. Historic measurements collected that support the information in Supplement 4-10 are described below.

On December 21, 2010, the noise levels of a 35-pound detonation were recorded at the two locations. The measurement at Piedra Loop and State Road 4 intersection was 118 decibels (dB), and the measurement at El Rancho was 100 dB. There was a weather inversion during this event. Impulse noise measurements were also made at Piedra Loop and New Mexico State Road 4 intersection during a 400-pound detonation on August 20, 2009. The reading at this location was 106 dB.

On December 15, 2010, a noise measurement was made at the entrance to Bandelier National Monument during an open detonation at the TA-39-6 open detonation unit. The observed reading was 110 dB. Additional noise monitoring was conducted at the intersection of Monte Ray South and State Road 4 in White Rock, New Mexico, on seven additional occasions, with the highest reading being 106 dB on January 20, 2011, taken during a 100-pound open detonation.

Workers involved in actual open detonation operations are stationed in the control building at the unit during detonation and, based on the levels measured at the TA-36-8 unit, exposure is expected to be between approximately 126 and 132 dB. Exposure received at the TA-39-6 unit would be approximately 134 dB. Both of these potential exposures are below the occupational exposure limit of 140 dB set by the American Conference of Governmental Industrial Hygienists. As a precautionary measure, various types of hearing protection are made available to workers and visitors during open detonation operations.

4.16 Minimum Distance Requirements

Treatment of waste at the open detonation units is conducted using a noncontinuous (batch) thermal process, in which a discrete quantity of waste is treated through a complete thermal cycle, in accordance with requirements specified in 40 CFR §§265.370 and 265.373. Open detonation of wastes at the open detonation units will be conducted in a manner that does not threaten human health or the environment. Based on the unit's maximum 2,000-pound treatment capacity at the TA-36-8 open detonation unit, a minimum required distance of 1,730 ft. will be maintained between the point of detonation and the property of others. For the TA-39-6 open detonation unit's maximum 1,000-pound treatment capacity, a minimum required distance of 1,250 ft. will be maintained between the point of detonation and the property of others, as required by 40 CFR §265.382.

4.17 Ground Vibration Concerns

LANL measured ground vibration during a series of 400-pound open detonation events at the TA-36 open detonation in August 2009. The largest seismic ground motion at 0.6 miles (1 kilometer) from the TA-36-8 open detonation unit was approximately 10 times less than the U.S. Bureau of Mines Safe Level Standards for the 400-pound shots. At a distance of 1.2 miles, the acoustic signals were below U.S. Bureau of Mines Safe Level Standards for the 400-pound shots. In the nearest community of White Rock, New Mexico, located approximately 2.5 miles away from the TA-36-8 open detonation unit, all measurements were at least 15 dB below safe level standards. LANL has been taking detailed acoustic and seismic measurements for all shots at three locations since December 2010. Additionally, based on the fact that measurements are well below established safe level standards and due to the remote location of the open detonation units, potential impacts to human health and the environment resulting from ground vibration are assessed to be minimal.

4.18 Environmental Performance Standards

The TA-36-8 and TA-39-6 open detonation units are located in remote areas of LANL. The units are operated, maintained, and will be closed in a manner that will ensure protection of human health and the environment, in accordance with 40 CFR §264.601. General geologic and hydrologic characteristics of the LANL Facility and land-use patterns in the Los Alamos area are discussed in Section 2.1, *General Facility Description,* and Section 2.10, *Facility Location Information,* of this Permit Renewal Application.

The open detonation units have been designed to facilitate safe handling and treatment of wastes to prevent adverse human health and environmental impacts. Design information and waste management practices for the TA-36-8 open detonation unit and the TA-39-6 open detonation unit are detailed above.

4.18.1 Protection of Groundwater/Vadose Zone

As required by 40 CFR §264.601(a), the open detonation treatment units are operated in a manner that prevents releases that might have adverse effects to human health or the environment as a result of migration of waste constituents through the vadose zone to groundwater. The following sections provide information on the hydrogeology beneath the TA-36-8 open detonation unit and at the TA-39-6 open detonation unit, as well as describe monitoring and reporting conducted to assess the impact of open detonation operations on groundwater.

4.18.1.1 Hydrogeology

The TA-36-8 open detonation unit and the TA-39-6 open detonation unit are located in a mixed semiarid, temperate, and mountain climatic zone. From 1981 to 2010, the average annual precipitation in Los Alamos was 18.97 inches and the average annual snowfall was 57.5 inches (LANL, 2009a). Published precipitation data for TA-36 and TA-39-6 units do not exist; however, TA-49, located southwest of TA-36, has an annual precipitation of 22.27 inches per year (LANL, 1998). The evaporation rate of freestanding water exceeds the average annual precipitation. A discussion of the hydrology beneath each of the open detonation units is included in the sections below. Pertinent locations for monitoring are included within figures in Supplement 4-2, *Open Detonation Unit Groundwater Monitoring and Surface Drainage Information*, which lists the possible contaminants of concern and shows their monitoring frequency. Tables included within Supplement 4-2 are modified from the 2020

Interim Facility-Wide Groundwater Monitoring Plan and include the analyte suite and the frequency of analysis (C = continuous, Q = quarterly, S = semi-annual, and A = annual) conducted in 2019 for the constituents listed in the columns (LANL 2020b). Map 3 within the concurrent submittal of the LANL General Part A Permit Application, Revision 10.0 (LANL 2020a), shows the locations of all regional and alluvial wells used for data gathering at LANL, whereas the TA-36 and TA-39 topographic maps within the LANL General Part A Permit Application depict more detailed information about wells, surface water stations, springs, and groundwater movement at and around each of the open detonation units. Supplement 4-2, *Open Detonation Unit Groundwater Monitoring and Surface Drainage Information,* of this Permit Renewal Application contains monitoring data for alluvial, perched-intermediate, and regional groundwater zones near the open detonation units.

4.18.1.1.1 Hydrogeology near and beneath the TA-36-8 Open Detonation Unit

A detailed description of the hydrogeologic characteristics immediately below the TA-36-8 open detonation unit is not currently documented in published or internal reports. However, a discussion of surface water, the vadose zone, and groundwater specific to Operable Unit 1130, which includes TA-36, and a conceptual hydrogeologic model of the area are presented in Sections 3.5 and 3.6 of the RFI Work Plan for Operable Unit 1130 (LANL, 1993a). Additional hydrologic information for the area north of the TA-36-8 open detonation unit is presented in the Pajarito Canyon Investigation Report, Revision 1 (LANL, 2009b).

The hydrologic conditions on the surface and within the dry-mesa setting such as that found at the TA-36-8 open detonation unit lead to slow unsaturated flow and transport (Birdsell et al., 2005). Dry mesas shed precipitation as surface runoff to the surrounding canyons, and most mesa-top infiltration occurs episodically following snowmelt. Much of the water that enters the soil zone is lost through evapotranspiration. Potential evapotranspiration was estimated to exceed precipitation at a climate station on the eastern portion of the plateau by a ratio of 6:1 (LANL, 2003b). As a result, annual net infiltration rates for dry mesas are less than ten 10 millimeters per year (mm/yr.) and are more often estimated to be on the order of 1 mm/yr. or less (Kwicklis et al., 2006). Because the dry mesas generally consist of nonwelded to moderately welded tuffs with low water content, flow is matrix dominated. Travel times for contaminants migrating through mesas to the regional aquifer are expected to be several hundred to thousands of years (Newman, 1996; Newman et al., 1997; Birdsell et al., 2000; Nylander et al., 2003).

The regional water table is approximately 1,000 ft. below the TA-36-8 open detonation unit. The only aquifer in the Los Alamos area capable of municipal and industrial water supply is the regional aquifer. The nearest supply well to the TA-36-8 open detonation unit, PM-2 is located 6,500 ft. to the northeast. PM-4 is 9,300 ft. north-northeast of the TA-36-8 open detonation unit. Upper levels of the regional aquifer on the Pajarito Plateau are predominantly under phreatic (unconfined) conditions (LANL, 2009b). The deep portion of the regional aquifer is predominantly under confined conditions, and it is the portion of the regional aquifer influenced by Pajarito Plateau municipal supply pumping. The intensive pumping causes very small water-level fluctuations in the upper (phreatic) portions of the aquifer. Seasonal water-table fluctuations of approximately 0.5 ft. are observed at monitoring well R-27 (Koch and Schmeer, 2010), located 2,400 ft. west of the TA-36-8 open detonation unit (Supplement 4-2, *Open Detonation Unit Groundwater Monitoring and Surface Drainage Information*). These low-magnitude responses in the phreatic zone from municipal well pumping are in contrast to the larger responses at monitoring wells completed in deeper parts of the aquifer, indicating that the hydraulic communication is poor between the phreatic zone and deeper parts of the aquifer. The small-scale fluctuations in the phreatic zone may be from drawdowns and/or strata compaction. The small water-level fluctuations do not seem to affect the magnitudes and directions of groundwater flow. Capture of contaminants by municipal supply wells, such as well PM-4, which is screened approximately 180 to 1,775 ft. below the regional water table (Koch and Schmeer, 2010), is unlikely because of this poor vertical hydraulic communication. As a result, contaminant migration follows the ambient water-table gradients rather than diverting towards the pumping water supply wells, based on hydraulic data. Based on water-table maps, the regional groundwater flow direction in the vicinity of the TA-36-8 open detonation unit is expected to range from east-northeast to east-southeast.

4.18.1.1.2 Hydrogeology near and beneath the TA-39-6 Open Detonation Unit

The TA-39-6 open detonation unit is located in a semiarid, temperate, mountain climate. From 1981 to 2010, the average annual precipitation in Los Alamos was 18.97 inches and the average annual snowfall was 57.5 inches (LANL, 2009a). Published precipitation data for TA-39 do not exist; however, TA-49, located west of TA-36, has an annual precipitation of 22.27 inches per year (LANL, 1998). The evaporation rate of freestanding water exceeds the average annual precipitation.

A detailed description of the hydrogeologic characteristics immediately below the TA-39-6 open detonation unit is not currently documented in published or internal reports. However, a discussion of surface water, the vadose zone, and groundwater specific to Operable Unit 1132, which includes TA-39, and a conceptual hydrogeologic model of the area is presented in Section 3.7 of the RFI Work Plan for Operable Unit 1132 (LANL, 1993b). Additional hydrologic information for the areas surrounding the TA-39-6 open detonation unit is presented in the Investigation Report for North Ancho Canyon Aggregate Area, Revision 1 (LANL, 2010a).

Ancho Canyon is classified as a dry canyon, as described by Birdsell et al. (2005). Generally, on the Pajarito Plateau, dry canyons have relatively small catchment areas (less than 13 square kilometers), experience infrequent surface flows, and have limited or no saturated alluvial systems. The hydrologic conditions yield little down canyon, near-surface contaminant migration and are characterized by very slow unsaturated water flow from the surface to the regional aquifer. Because surface-water flow is infrequent and shallow alluvial groundwater is not common, contaminants largely remain near their original sources, predominantly in soil and sediment. Net infiltration beneath dry canyons is low, with rates generally believed to be less than tens of mm/yr. and commonly on the order of 1 mm/yr. or less. Finally, transport times to the regional aquifer beneath dry canyons are expected to exceed hundreds of years.

The only aquifer in the Los Alamos area capable of municipal and industrial water supply is the regional aquifer. There are no municipal supply wells downgradient of the TA-39-6 open detonation unit. The regional water table is approximately 560 ft. below the TA-39-6 open detonation unit. Upper levels of the regional aquifer on the Pajarito Plateau are predominantly under phreatic (unconfined) conditions (LANL, 2009b). The deep portion of the regional aquifer is predominantly under confined conditions, and it is the portion of the regional aquifer influenced by Pajarito Plateau municipal supply pumping. The intensive pumping causes very small water-level fluctuations in the upper (phreatic) portions of the aquifer. Seasonal water-table fluctuations of less than 0.5 ft. have been observed at monitoring well R-31 (Koch and Schmeer, 2010), located 1,550 ft. southeast of the TA-39-6 open detonation unit. These low-magnitude responses in the phreatic zone from municipal well pumping are in sharp contrast to the much larger (10 to 20 ft.) responses at monitoring wells completed in deeper parts of the aquifer (e.g., well R-20 screen 3 in Pajarito Canyon near PM-2), indicating that the hydraulic communication is poor between the phreatic zone and deeper parts of the aquifer. The small-scale fluctuations in the phreatic zone may be from drawdowns and/or strata compaction. The small water-level fluctuations do not seem to affect the magnitudes and directions of groundwater flow. Capture of contaminants by municipal supply wells is unlikely because of this poor vertical hydraulic communication. Additionally, the small hydraulic response observed at well R-31 is attributable to pumping at the nearest municipal supply well PM-2, which is located 14,775 ft. north of the TA-39-6 open detonation unit. As a result, contaminant migration follows the ambient water-table gradients rather than diverting towards the pumping water supply wells, based on hydraulic data. Based on water table maps, regional groundwater flow in the vicinity of the TA-39-6 open detonation unit is expected to be towards the southeast.

4.18.1.2 Groundwater Monitoring and Reporting

LANL has an established groundwater monitoring network to assess the quality of groundwater in the Los Alamos area. The monitoring network includes monitoring wells, water-supply wells, surface-water sampling stations, and springs located both inside and outside the LANL boundary. Three groundwater zones—alluvial, perched-intermediate, and regional groundwater—are monitored as part of the monitoring network. Sample locations, analytical suites, and sampling schedules for the monitoring network are identified in the most recent version of the IFGMP (LANL 2020b), a document updated annually with approval by NMED-HWB in accordance with the June 2016 Compliance Order on Consent (New Mexico 2016). These water-quality data are used for characterization purposes, to support corrective-measures work conducted at sites around the Facility, and to support general surveillance. Map 3 within the concurrent submittal of the LANL General Part A Permit Application, Revision 10.0 (LANL 2020a), shows the locations of all wells sampled as part of the IFGMP. The TA-36 topographic map within the LANL General Part A Permit Application shows the locations of IFGMP wells pertinent for monitoring groundwater downgradient of the TA-36-8 open detonation unit. The TA-39 topographic map within the LANL General Part A Permit Application shows the locations of the IFGMP wells pertinent for monitoring the TA-39-6 open detonation unit. These topographic maps also include wells upgradient of the TA-36-8 and the TA-39-6 open detonation units that provide baseline information about groundwater quality entering the site.

The locations of routinely monitored wells that are downgradient of the TA-36-8 and the TA-39-6 open detonation units are shown on figures within Supplement 4-2, *Open Detonation Unit Groundwater Monitoring and Surface Drainage Information*. The monitoring schedule for these wells are also included within Supplement 4-2. Details can be found in the most current version of the IFGMP. Surface and groundwater samples collected under the IFGMP are routinely analyzed for potential contaminants and other water-quality parameters. Figures and summary of the data from 2000 to present for the monitoring locations are provided in Supplement 4-2 of this Permit Renewal Application. The data indicate that no constituents related to the operations at these units have impacted groundwater at levels exceeding applicable standards. The sampling results are also published in periodic groundwater-monitoring reports submitted to the NMED-HWB and in the Facility's annual environmental reports. Tables and figures are located in Supplement 4-2, *Open Detonation Unit Groundwater Monitoring and Surface Drainage Information*.

4.18.2 Protection of Surface Water/Wetlands/Soil Surface

As required by 40 CFR §264.601(b), the open detonation units are located in a remote area and are operated in a manner that prevents any releases that might have adverse effects on human health or the environment as a result of migration of waste constituents in surface waters, wetlands, or on the soil surface. General operation of these units includes incorporating best management practices, such as the following: spill prevention and response; control of storm water runon and runoff; installation of erosion and sediment controls; personnel training; and good housekeeping practices.

4.18.2.1 Surface Water

Storm water discharges from both of these units are regulated under the Clean Water Act by the National Pollutant Discharge Elimination System permit program. Prior to the issuance of the current LANL Storm Water Individual Permit in 2010, these open detonation units were regulated under the Multi-Sector General Permit (MSGP) for Storm Water Discharges Associated with Industrial Activity. The LANL Storm Water Individual Permit (NM0030759) issued by the EPA, Region 6, became effective on November 1, 2010. The current LANL Storm Water Individual Permit expired on March 31, 2014, but it has been administratively continued, pending issuance of a new permit. The EPA issued LANL a draft Storm Water Individual Permit on November 30, 2019. A final Permit is expected following a public comment period, which ends on July 31, 2020. Additional historic surface-water compliance information and Permit applicability is included in Section 2.3.2, "Protection of Surface Water/Wetlands," of the Los Alamos National Laboratory Permit Modification Request for Open Detonation Units at Technical Areas 36 and 39 (TA-36-8 and TA-39-6), Revision 0 (LANL 2011).

The LANL Storm Water Individual Permit contains nonnumeric technology-based effluent limitations, coupled with a comprehensive, coordinated monitoring program and implementation of corrective actions where necessary, to minimize pollutants in LANL's storm water discharges from SWMUs and AOCs. LANL must implement site-specific control measures (including best management practices) to address the nonnumeric technology-based effluent limits contained in the LANL Storm Water Individual Permit, followed by confirmation monitoring against New Mexico water-quality criteria-equivalent target action levels to determine the effectiveness of the site-specific measures. If target action levels are exceeded, corrective actions detailed in the LANL Storm Water Individual Permit are initiated and additional confirmation monitoring is conducted following completion of corrective actions. Monitoring of storm water under the LANL Storm Water Individual Permit has been ongoing since 2011.

4.18.2.1.1 Hydrologic Assessment and Surface Water Flow

Net annual precipitation for the Los Alamos area, including the open detonation units, is low. Surface waters within LANL are limited to ephemeral or intermittent flows in the canyon bottoms that result from rainfall or snowmelt. The locations of these surface waters, including intermittent streams, at each of the open detonation units are located on figures within Supplement 4-2, *Open Detonation Unit Groundwater Monitoring and Surface Drainage Information*.

The TA-36-8 open detonation unit is located near the headwaters of Fence Canyon, which connects geographically to Potrillo Canyon but does not discharge into it. Drainage from this unit flows east to Fence Canyon (receiving water). The stream flow in Fence Canyon and Potrillo Canyon is ephemeral and occurs only as the result of rainfall or snowmelt. Currently, LANL Storm Water Individual Permit monitoring is conducted below the point of discharge from the TA-36-8 open detonation unit, prior to entering Fence Canyon. Surface waters from the upstream portion of the Potrillo Canyon watershed do not contribute to flows that reach the Rio Grande through Water Canyon (LANL, 1993a). Canyon bottom surface waters from Potrillo Canyon downstream of the TA-36-8 open detonation unit eventually flow into Water Canyon. A gaging station (E267) in Portillo Canyon, located 3 miles upstream of the Rio Grande, recorded no flow for water year 2019.

The TA-39-6 open detonation unit is located in a tributary of the north branch of Ancho Canyon. All runoff from the TA-39-6 open detonation unit eventually flows to the main Ancho Canyon watercourse. Impervious surfaces comprise 99% of the 197-acre watershed that comprises the site monitoring area (SMA). The stream flow in Ancho Canyon is ephemeral and occurs only as the result of rainfall or snowmelt. Canyon bottom surface waters from the north branch of Ancho Canyon eventually flow into the main channel of Ancho Canyon. A gaging station (E275) in Ancho Canyon, located approximately 2 miles upstream of the Rio Grande, recorded two days of flow for E275 in water year 2019, with a recorded maximum daily flow for water year of 8.9 cubic feet per second.

4.18.2.1.2 Monitoring and Reporting

The open detonation units were historically permitted under the National Pollutant Discharge Elimination System MSGP for Storm Water Discharges Associated with Industrial Activity. This permit coverage was replaced by the LANL Storm Water Individual Permit when it first became effective in 2010. Baseline storm water controls and other measures, including collection of storm water samples, have been implemented at both open detonation units, in accordance with applicable LANL Storm Water Individual Permit requirements.

LANL Storm Water Individual Permit controls incorporated into the TA-36-8 open detonation unit [identified as AOC 36-004(c)] include earthen and rock berms, swales, riprap, an infiltration basin, and rock check dams to control runon and runoff of storm water and erosion and movement of sediment from the site.

LANL Storm Water Individual Permit controls incorporated into the TA-39-6 open detonation unit [identified as SWMU 39-004-(c)] include berms, swales, and rock check dams, the combination of which control storm water runon and runoff, erosion, and movement of sediment from the site, as discussed in Section 4.12.1, *Containment Systems*.

For both units, these controls are designed to prevent pollutant migration that could affect surface water quality. Stormwater runoff monitoring at both open detonation units has been underway since the implementation of the LANL Storm Water Individual Permit in 2011.

Stormwater discharge from TA-36-8 open detonation unit is monitored from LANL Storm Water Individual Permit Site Monitoring Area F-SMA-2. Following the installation of baseline control measures, a baseline storm water sample was collected on August 15, 2011. Analytical results from this sample yielded the following target action level exceedances:

- Aluminum concentration of 866 micrograms per liter (µg/L) (maximum target action level is 750 µg/L)
- Copper concentration of 72.5 µg/L (maximum target action level is 4.3 µg/L)
- Gross-alpha activity of 140 picocuries per liter (pCi/L) (average target action level is 15 pCi/L).

Following the installation of enhanced control measures at F-SMA-2, corrective-action storm water samples were collected on July 15, 2014, and July 31, 2014. Analytical results from these corrective-action monitoring samples yielded the following target action level exceedances:

- Copper concentrations of 10.8 µg/L (maximum target action level is 4.3 µg/L)
- Gross-alpha activities of 112 pCi/L and 58.9 pCi/L (average target action level is 15 pCi/L).

Site history and shallow (i.e., less than 3 ft. below ground surface) soil-sampling data (where available) are used to determine whether the target action level exceedance constituent(s) may be related to historical industrial activities.

Copper was likely associated with industrial materials historically managed at this site. Copper was detected in 5 of 14 samples at maximum concentration 2.9 times the sediment's background value.

Alpha-emitting radionuclides are known to be associated with industrial materials historically managed at AOC 36-004(c)/TA-36-8. Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed using gamma spectroscopy, which can detect americium-241 and uranium-235, and for uranium isotopes, all of which are alpha-emitting radionuclides. Alpha-emitting radionuclides managed by the Permittees are exempt from regulation under the Clean Water Act and are excluded from the definition of adjusted gross-alpha radioactivity. Target action level exceedances were also evaluated against the appropriate storm water background value, that is, "Bandelier Tuff background" for undisturbed SMAs or "developed background" for urban settings. Background values are expressed as upper-tolerance limits using the approved EPA method to calculate background values. Upper-tolerance limits for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff. Upper-tolerance limits developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features. Monitoring location F-SMA-2 receives storm water runon from developed environments, including paved parking lots, roads, and buildings, as well as locations with sediment derived from Bandelier Tuff. Metals including copper are associated with building materials, parking lots, and automobiles. Gross alpha in Bandelier Tuff is associated with naturally occurring radioactive uranium- and thorium-bearing minerals.

- Copper—copper's upper-tolerance limit from developed landscape storm water runon is 32.3 µg/L; copper background storm water upper-tolerance limit from locations with sediment derived from Bandelier Tuff is 3.43 µg/L. The copper result from 2011 is greater than both values, whereas the 2014 results are between these two values.
- Gross alpha—the gross-alpha background upper-tolerance limit for locations with sediment derived from Bandelier Tuff is 1490 pCi/L, and the gross-alpha background storm water upper-tolerance limit for storm water runon from a developed landscape is 32.5 pCi/L. The 2011 and 2014 gross-alpha results are between these two values.

Stormwater discharge from TA-39-6 open detonation [identified by the LANL Storm Water Individual Permit as SWMU 39-004(c] is monitored from LANL Storm Water Individual Permit Site Monitoring Area A-SMA-3 along with another site [AOC 39-002(b)]. Following the installation of baseline control measures, a baseline storm water sample was collected on July 25, 2013. Silver is reported as a nondetectable result equal to or greater than the target action level. This value is reported at the practical quantitation level; however, the maximum target action level for this analyte is below the target action level. Analytical results from this sample yielded the following target action level exceedances:

- Aluminum concentration of 997 µg/L (maximum target action level is 750 µg/L)
- Copper concentration of 245 µg/L (maximum target action level is 4.3 µg/L)
- Mercury concentration of 9.04 µg/L (average target action level is 0.77 µg/L)
- Selenium concentration of 12.1 µg/L (average target action level is 5 µg/L)
- Gross-alpha activity of 136 pCi/L (average target action level is 15 pCi/L)
- Polychlorinated biphenyl concentration of 3060 ng/L (average target action level is 0.6 ng/L)

Following the installation of enhanced control measures at A-SMA-3, a corrective action storm water sample was collected on August 10, 2018. Analytical results from this corrective action monitoring sample yielded the following target action level exceedances:

- Copper concentration of 50.2 µg/L (maximum target action level is 4.3 µg/L)
- Gross-alpha activity of 90.8 pCi/L (average target action level is 15 pCi/L)
- PCB concentration of 3400 ng/L (average target action level is 0.6 ng/L)

Site history and shallow (i.e., less than 3 ft. below ground surface) soil-sampling data (where available) are used to determine whether the target action level exceedance constituent(s) may be related to historical industrial activities. Regarding SWMU 39-004(c)/TA-39-6:

- Aluminum is known to be associated with industrial materials historically managed at the site. Aluminum, however, was not detected above background value in 45 shallow (i.e., less than 3 ft. below ground surface) soil samples collected during the 2009 Consent Order investigation and 1995 RFI.
- Copper is known to be associated with industrial materials historically managed at the site. Copper was detected above background value in shallow Consent Order and RFI soil samples. Copper was detected above the soil background value in 15 of 45 shallow samples, with a maximum concentration 180 times the soil background value.
- Mercury is known to be associated with industrial materials historically managed at the site. Mercury was only detected above the soil background value in 2 of 45 shallow samples, with a maximum concentration 85 times the soil background value.
- Selenium is not known to be associated with industrial materials historically managed at the site. Selenium was not detected above background value in 45 shallow Consent Order and RFI soil samples.
- PCBs are known to have been associated with industrial materials historically managed at this site. Three PCB mixtures (Aroclor-1248, Aroclor-1254, and Aroclor-1260) were detected in shallow Consent Order samples. Aroclor-1248 was detected in 3 of 4 shallow samples, with a maximum concentration 30 times the residential soil screening level. Aroclor-1254 was detected in 1 of 4 shallow samples, with a maximum concentration 52% of the residential soil screening level. Aroclor-1260 was detected in 2 of 4 shallow samples, with a maximum concentration 3.1 times the residential soil screening level.
- Thorium and uranium are known to have been associated with industrial materials historically managed at this site. RFI and Consent Order samples were not analyzed for gross-alpha radioactivity but were analyzed for plutonium, thorium, and uranium isotopes, all of which are alpha-emitting, as well as total uranium, which has alpha-emitting isotopes. Alpha-emitting

radionuclides managed by the Permittees are exempt from regulation under the Clean Water Act and are excluded from the definition of adjusted gross-alpha radioactivity.

Target action level exceedances were also evaluated against the appropriate storm water background value, that is, “Bandelier Tuff background” for undisturbed SMAs or “developed background” for urban settings. Background values are expressed as upper-tolerance limits using the approved EPA method for calculating background values. Upper-tolerance limits for undisturbed SMAs were derived from storm water runoff containing entrained sediments derived from Bandelier Tuff. Upper tolerance limits developed for urban settings were derived from runoff from developed landscapes on the Pajarito Plateau, including buildings, parking lots, roads, and associated features. Most of the A-SMA-3 drainage area is located on Bandelier Tuff, and there is no runon from developed facilities (e.g., buildings, parking lots, and pavement). Therefore, the Bandelier Tuff background upper-tolerance limit was compared with aluminum, copper, PCBs, and gross-alpha storm water exceedances. Mercury and selenium do not have a sufficient number of detected results to determine the upper-tolerance limit background value.

- Aluminum—aluminum is a major component of Bandelier Tuff. Aluminum’s upper-tolerance limit for storm water containing sediments derived from Bandelier Tuff is 2210 µg/L; the result from 2013 is less than this value.
- Copper—copper is associated with trace minerals in Bandelier Tuff. Copper’s upper-tolerance limit for storm water containing sediments derived from Bandelier Tuff is 3.43 µg/L. The copper results from the storm water confirmation samples in 2013 and 2018 are above this value.
- PCBs—the PCB upper-tolerance limit for storm water containing sediments derived from Bandelier Tuff is 11.7 ng/L. The average target action level exceedances in the storm water confirmation samples in 2013 and 2018 are greater than the storm water baseline upper-tolerance limit.
- Gross alpha—gross-alpha activity is associated with naturally occurring radioactive uranium- and thorium-bearing minerals in Bandelier Tuff. The gross-alpha upper-tolerance limit for storm water containing sediments derived from Bandelier Tuff is 1490 pCi/L; the results from 2013 and 2018 confirmation samples are below this value.

Tables and figures are located in Supplement 4-2, *Open Detonation Unit Groundwater Monitoring and Surface Drainage Information*.

4.18.2.2 Soil Surface Monitoring

The texture of the soils in Los Alamos County range from very fine clay and sandy loams to gravelly, sandy loams and stony, clay loams. Soil erosion by storm water or winds could potentially transport contaminants from the open detonation units to surrounding areas. Natural sediment storage features created by surface water runoff, such as stream bank and bar deposits or drainage channels, could contain heavy metals or explosives residues redistributed from the units.

Operational procedures for the open detonation units have been developed (described in previous sections) and are followed using careful assessment to limit the amount of contamination that may enter or remain in the soil. Preventative measures include implementing good housekeeping procedures, using a sufficient charge to ensure complete destruction, and performing effective treatment of the waste.

To meet the requirements of 40 CFR §264.601(b), the firing sites are operated in a manner that minimizes or prevents releases that might have adverse effects to human health or the environment as a result of migration of waste constituents on the soil surface. The following information assesses the potential for adverse effects to human health or the environment as a result of operations at the open detonation units and describes monitoring and reporting efforts that have been or will be undertaken to assess the impact of operations at the units. Surface soil samples were collected at both open detonation treatment units and analyzed for potential constituents to assess any impact from the units to the soil surface and mark any changes from previous monitoring activities.

The following paragraphs detail soil-monitoring efforts that have been performed at the open detonation units, in accordance with the requirements in 40 CFR §264.602. Description of modeling associated with the potential for soil deposition is included in Section 4.18.3, *Protection of Atmosphere,* and is included in Supplement 4-3, *Screening Level Air Modeling Analysis and Risk Evaluation for Open Detonation Operations* of Appendix 4, *Open Detonation and Open Burning Information,* of this Permit Renewal Application.

In 2010 and early 2011, soil samples were collected at the TA-36-8 open detonation unit and the TA-39-6 open detonation unit. A summary of the analytical results of these sample collection events is included in Attachment D of *Los Alamos National Laboratory Permit Modification Request for Open Detonation Units at Technical Areas 36 and 39 (TA-36-8 & TA-39-6), Revision 0* (LANL 2011). Samples were analyzed for high explosives, metals, dioxins/furans, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), perchlorates, and radiological constituents (gross alpha, gross beta, and isotopic uranium). Both composite and grab samples were collected at each of the sites. Concentrations for the constituents of concern were measured within the soil in and around the units to determine the soil concentration baseline at the units after more than 50 years of use. Analytical results indicate that the average soil constituent concentration in and around the TA-36-8 open detonation unit and the TA-39-6 open detonation unit are less than the selected soil screening levels (in 2011) and operations at the units do not pose an unnecessary risk to human health. Potential contamination is believed to be primarily limited to the surface (i.e., the first few inches in depth) of the sites.

In 2018, the Permittees collected additional surface soil samples to assess any changes that might have occurred to the units. However, it should be noted that the last time the TA-36-8 unit was utilized for treatment operations was in February 2014 and the last waste-treatment operation at the TA-39-6 unit was September 2013. 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,* of Appendix 4 of this Permit Renewal Application, both include the most current soil analytical summaries for the open detonation units. Soil sampling and laboratory analysis for constituents of concern, as detailed in the soil monitoring reports, were conducted at the open detonation units to determine if treatment activities affected the area. Soil samples were collected from the ground surface to 2 inches below the ground surface from locations in and around the open detonation areas based on predominant wind direction and drainage features. The laboratory analytical results were compared to established background values and to New Mexico residential soil screening levels. The soil-sampling and analysis results indicate most constituents for which the samples were analyzed were not detected in the soil samples. The soil constituent concentrations that were detected at both of the units are less than the selected soil screening levels, with a single exception. Organics detected at both units were all below available soil screening levels. Several inorganic constituents at both units were detected above established background values but below soil screening levels. All metals detected at TA-39-6 were less than residential soil screening levels. At TA-36-8, a single concentration of thallium was measured to be above residential soil screening levels. Details of the constituents detected are in Supplements 4-5 and 4-6.

Utilizing the 2018 soil-sampling analytical results, risk assessment analyses were conducted for each of the open detonation treatment units. These assessments conclude that there are no unacceptable risks associated with hazardous waste constituents measured within the soil that could pose increased risk to human and ecological receptors. These risk assessments are included as Supplement 4-7, *Open Detonation Unit at Technical Area 36 Human Health and Ecological Risk Screening Assessments*, and Supplement 4-8, *Open Detonation Unit at Technical Area 39 Human Health and Ecological Risk Screening Assessments,* of Appendix 4 of this Permit Renewal Application. Additionally, for completeness, a revision of the 2011 risk assessment (LANL 2011) is included as Supplement 4-9, *Revision of 2011 Open Detonation Risk Assessment.* This assessment includes an ecological risk assessment, as requested by the NMED in a March 2012 letter of disapproval for the 2011 open detonation permit modification request (NMED 2012).

Supplement 4-7, *Technical Area 36 - Open Burn/Open Detonation (OB/OD) Area - Technical Area 36-8 Open Detonation Unit Human Health and Ecological Risk Screening Assessments,* details the human health and ecological risk assessments conducted using the 2018 soil data collected from the TA-36-8 open detonation unit. The screening evaluation concluded that residents and workers at the site are not at risk as a result of exposure to soils at the hazardous waste management unit. Although the calculated risk for three ecological receptors was above the minimum no-effect ecological screening levels (American robin, plants and earthworms), there is likely no unacceptable risk to ecological receptors at the hazardous waste management units. Because of the nature of the operations at the unit, the entire unit footprint is kept cleared as disturbed, bare ground. Therefore, plants and earthworms are not expected to be present at the unit. Furthermore, surface water (as well as sediment) migration from the site is minimized and monitored, as described in 4.18.2.1, *Surface Water*. Lastly, robins are not expected to feed within the area of the unit that is kept bare, and regular monitoring of avian receptors within the area do not indicate that birds are adversely affected.

Supplement 4-8, *Technical Area 39 - Open Burn/Open Detonation (OB/OD) Area - Technical Area 39-6 Open Detonation Unit Human Health and Ecological Risk Screening Assessments*, details the human health and ecological risk assessments conducted using the 2018 soil data collected at the TA-39-6 open detonation unit. The screening evaluation concluded that residents and workers at the site are not at risk caused by exposure to soils at the hazardous waste management unit. Additionally, calculated risk for plants and earthworms at the site were above the minimum no-effect ecological screening levels. However, for the reasons described above (the area is kept bare and migration is controlled and monitored), plants and earthworms are not expected to be present at the unit.

4.18.3 Protection of Atmosphere

To meet the requirements of 40 CFR §264.601(c), the TA-36-8 and the TA-39-6 open detonation units are operated in a manner that prevents any releases that could have adverse effects to human health or the environment as a result of migration of waste constituents to the atmosphere. The following information addresses the potential for operations at the open detonation units to adversely affect human health or the environment, describes the air modeling, and provides monitoring efforts to assess the impact of operations at the units on air quality.

Air-dispersion modeling was used to predict maximum ground-level concentrations of contaminants that could be predicted to occur downwind from the treatment operations; this type of modeling is a standard technique accepted by the U.S. EPA and the NMED. Conservative model input parameters were used for the treated waste streams, including maximum treatment volumes, independently obtained emission products and constituents, and unattenuated air-dispersion routes to receptor locations. These potential receptor locations were used in the modeling to estimate contaminant concentrations close to the detonation sites and to nearby public receptors. Model results indicate that the maximum ground-level contaminant concentrations for each detonation site occur on LANL property adjacent to the sites and predicted concentrations at public receptors were far less.

Maximum contaminant concentrations derived from the model were applied to emission factors for each predicted contaminant, with the results compared to air-quality standards. This analysis was conducted using the highest maximum model result, which occurred at any public receptor outside the LANL boundary, as is the protocol under NMED modeling guidelines when demonstrating compliance with ambient air-quality standards for permit purposes.

Computed results were also used to show the predicted impacts for acute and annual air concentrations to be below additional recommended human health screening levels. This evaluation was conservatively obtained by using the maximum contaminant concentrations within the LANL property boundary. Additionally, predicted soil deposition over a 10-year period shows impacts from the treatment operations to soil contaminant concentrations from the treatment operations to be less than residential screening levels and the minimum identified ecological screening levels. Supplement 4-3, *Screening Level Air Modeling Analysis and Risk Evaluation for Open Detonation Operations,* of this Permit Renewal Application, includes the full air-modeling evaluation conducted for open detonation treatment operations at LANL.

In 2010 and 2011, 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. These sampling efforts and the analytical results are detailed in Supplement 4-4, *Air Sampling at Open Detonation Units*, of Appendix 4 of this Permit Renewal Application. There were no dioxins or furan compounds detected within any of the samples collected. Comparisons of metals detected within the samples were below acute inhalation-exposure screening levels.

The radiological sampling network at LANL, AIRNET measures environmental levels of airborne radionuclides, such as plutonium, americium, uranium, and tritium. Three AIRNET stations were installed in 1994 near LANL firing sites to evaluate any relationship between firing site activities and airborne concentrations of radioactive material. After ten years of sampling, AIRNET stations along the LANL perimeter measured no detectable levels of airborne radiological emissions that could be linked to firing site operations. Moreover, no correlation between firing site activities and the AIRNET stations could be made (Fuehne et. al., 2007). Therefore, the stations were shut down in 2003 and 2004, and there are no further plans for ambient air-quality monitoring at the open detonation units. There are approximately 60 air stations within and around the LANL boundary that continue to gather information on radionuclides by collecting water vapor and particulate matter.

5.0 OPEN BURNING TREATMENT

This section outlines treatment processes conducted at the open burning treatment unit and describes the operating steps and requirements in place to ensure safe and effective waste treatment events of explosives waste and explosives-contaminated waste to meet the requirements in 40 CFR § 270.23 and 265, Subpart P. To permit the unit, summarized proposed changes to the 2010 Permit are included in this Permit Renewal Application in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit*. The Permittees propose language for the operations requirements for the unit, as outlined in newly proposed Permit Part 6 included within Permit Renewal Application in Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11*. Additionally, the Permittees propose a soil monitoring program as the preferred approach to continue to meet the monitoring and analysis requirements of 40 CFR §264.602. All changes are included within Supplements 1-1 through 1-8, and occur within the following permit parts and attachments:

- Permit Part 1, *General Permit Conditions*
- Permit Part 6 *(Reserved)*
- Attachment A, *Technical Area Unit Descriptions*
- Attachment C, *Waste Analysis Plan*
- Attachment D, *Contingency Plan*
- Attachment E, *Inspection Plan*
- Attachment G, addition of Closure Plan, *Attachment G.28 Closure Plan Open Burning Treatment Unit Technical Area 16-388 Flash Pad*
- Attachment J, *Hazardous Waste Management Units*
- Attachment N, *Figures*

5.1 Open Burning Facility Background and Description

Since the 1950s, LANL has treated hazardous wastes by open burning operations at several units at an area known as the "TA-16 Burn Ground." As discussed below, open burning operations have changed dramatically over time. With the exception of the TA-16-388 Flash Pad, the subject of this Permit Renewal Application, all open burning treatment operations conducted at LANL have ceased and the remaining units have closed (or are undergoing closure). The TA-16-388 Flash Pad, in turn, is currently considered an interim status unit proposed by the DOE and Triad's predecessor (Los Alamos National Security, LLC) to be permitted through a Class 3 permit modification request submitted to NMED on September 30, 2013 (LANL 2013). This Permit Renewal Application incorporates by reference this Class 3 modification request. The Class 3 permit modification request, in Appendix B, discusses the (1) historical and regulatory history of the open burning treatment operations at the TA-16 Burn Ground, (2) required permits for open burning operations, and (3) the history of the open burning Permit Renewal Application (see reference LANL 2013).

5.1.1 Open Burning Permitting History

Since 1980, LANL has operated the TA 16-388 Flash Pad as an open burn treatment unit under the "interim status" requirements of the New Mexico Hazardous Waste Act and 40 CFR Part 265, Subpart P. Interim status is a designation given to facilities that were in existence prior to 1980 and contain requirements that apply until issuance of a final permit. The TA-16-388 Flash Pad is classified as a "thermal treatment hazardous waste management unit" because it is used for treating explosives hazardous wastes; the Flash Unit must meet requirements applicable to "miscellaneous units" under 40 CFR Part 264, Subpart X.

The permitting process for the TA-16-388 Flash Pad has taken several decades. In June 1995, DOE and the University of California (the predecessor to the current contractor, Triad) submitted a revised permit application for two open burning units, the TA-16-388 Flash Pad and the TA-16-399 Burn Tray. In July 2009, NMED-HWB issued a revised Draft Permit authorizing use of these units. On February 2, 2010, NMED issued a Notice of Intent to Deny (NOID) the application for the TA-16-388 Flash Pad and the TA-16-399 Burn Tray. The Fact Sheet accompanying the NOID identified the following deficiencies supporting denial: (1) the need to fully characterize the low to moderate risk associated with the ecological risk assessment conducted by the Permittees, (2) public opposition to open burning, and (3) the need to evaluate alternatives to open burning.

Following a public hearing, the Secretary of NMED issued a final decision to deny the open burn units on November 30, 2010. In December 2010, DOE and Los Alamos National Security, LLC (LANS), petitioned the Secretary of the NMED to reconsider the decision to deny the open burn units and allow the Permittees to resubmit an application that addressed the deficiencies identified in the application. On December 21, 2010, the Secretary granted the Permittees the request in an *Order Granting Applicants' Motion for Partial Reconsideration*. This Order required the Applicants to file a "full and complete permit application that adequately addresses all deficiencies previously identified in writing and at the hearing by the HWB at a date determined by the HWB."

Pursuant to the Secretary's Order, on September 30, 2013, DOE and Triad's predecessor (LANS) submitted a Class 3 permit modification request to permit the addition of the interim status unit TA-16-388 Flash Pad to the Permit. The Permittees decided to close TA-16-399 because it was no longer necessary from an operational standpoint. As required by the Secretary's Order, the Class 3 modification request specifically addressed all the deficiencies identified by the NMED. After the Class 3 permit modification was submitted, NMED-HWB issued an administrative completeness determination on April 24, 2014.
No further action was taken on this Class 3 permit modification request, and it was determined to pursue approval of this request in this Permit Renewal Application.

5.1.2 Open Burning Facility Description

At LANL there is one open burning treatment unit located at TA-16. The description provided below meets the application requirements for 40 CFR §§270.14(b)(1) and 270.23(a) and 265, Subpart P.

TA-16 is located in the southwestern portion of LANL (revised Figure 2 within Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*). TA-16 is situated on a broad mesa bounded on the north by Cañon de Valle, on the south by State Road 4 and Bandelier National Monument, and on the west by West Jemez Road (State Road 501) and the Santa Fe National Forest. Elevation ranges from approximately 7,700 ft. at the west end of the Technical Area to approximately 6,800 ft. at the lower east end. Topography is varied, ranging from steep precipitous canyon walls to sloping mesa tops. The open burning unit at LANL is located at the "TA-16 Burn Ground" in the northeast corner of TA-16. It is located on a mesa that drains to the east and south and is bordered on the northern side by Cañon de

Valle and on the southern side by Water Canyon. The location coordinates of the TA-16-388 Flash Pad in Universal Trans Mercator Zone 13, North American Datum 1983 (NAD83) coordinates are X-Coordinate-379670.0 and Y-Coordinate- 3967821.0.

The open burning unit, known as the TA-16-388 Flash Pad (newly included Figure 15 within Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*), consists of a 22-ft. by 22-ft. concrete pad set on a secondary containment area. The base of the pad is 12 inches thick. The entire concrete pad is on a 45-mil Hypalon liner, which is 6 inches below the bottom of the pad and curved up to ground level on all 4 sides, extending out 2 ft. from the pad perimeter. Inset 1 ft. from the edge of the concrete pad along the two sides and back is a 3-ft.-high, 8-inch-thick, integrally poured concrete wall. The pad is slanted down toward the back concrete wall. The TA-16-388 Flash Pad is also equipped with a retractable steel roof that covers the entire unit when not in use. A chain-link fence and brick retaining wall surround the TA-16-388 Flash Pad. Updated topographic map and aerial photography are included in the *LANL General Part A Application, Revision 10* (LANL 2020a).

Three 5-ft.-long forced-air propane burners with adjustable mounts are mounted on the concrete wall. These propane burners provide the heat source for treatment activities at the unit. A burner is mounted outside the wall on each side and on the back of the pad. One, two, or three burners can be used, depending on the amount and configuration of the material to be treated. Most treatment events utilize the two side burners. The total capacity of the propane supply system is approximately 7 million British thermal units per hour (BTU/hr.). Therefore, the output of each burner is dependent on how many are used for a burn. Usually, the burners are operated at approximately 2.5 million BTU/hr. This provides adequate heat to bring the material being flashed to a temperature sufficient to destroy explosives, as well as to maintain it at a level sufficient to avoid formation of incomplete combustion products for the duration of the treatment event. The burners and other components are maintained, modified, and/or replaced as needed to ensure proper operation and treatment effectiveness.

The TA-16-388 Flash Pad is used exclusively for open burning treatment of explosives waste streams that are generated at LANL—it is not used for any other activities. Following waste placement at the unit, open burning operations are controlled and monitored remotely from Building 16-389 (the control building). Operations at the unit require visual surveys and post-burn covering of the unit. This practice minimizes the potential for precipitation contacting untreated hazardous or residual waste, if any exists.

5.2 Waste Characterization and Acceptance

The explosives waste and explosives-contaminated waste treated by open burning typically consists of off-specification explosives wastes, excess explosives waste, and other explosives-contaminated solid wastes (e.g., rags, glass, and wood). These wastes exhibit the characteristic of reactivity, as defined in 40 CFR §261.23. The open burning treatment unit will only treat those wastes with the EPA Hazardous Waste Numbers listed in association with the open burning unit in the *LANL General Part A Permit Application, Revision 10.0* (LANL 2020a). Changes necessary to permit the treatment operations at the unit are proposed in the revised Permit Attachment C, *Waste Analysis Plan,* included within Supplement 1-3, *Permittees' Proposed Changes to Permit Attachment C, Waste Analysis Plan*.

The Permittees' proposed changes include waste characterization and analysis requirements for explosives and explosives-contaminated waste treated by open burning at LANL. The waste streams include homogeneous and heterogeneous wastes. Open burning operations are necessary for hazardous waste treatment to remove the characteristic of reactivity. Treatment by open burning renders hazardous waste nonreactive and any infrequent residue amenable to handling and dispositioning. Solid and liquid hazardous explosives waste may be treated (i.e., open burned) at the unit.

Waste characterization, acceptance, authorized wastes, and plans for waste analysis prior to treatment and after treatment (if needed) are outlined in Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*, in accordance with the requirements at 40 CFR §§264.13(a-c), 265.375, 265.382, and 270.14(b)(2-3). The changes include information specific to waste analysis and acceptance at the open burning unit. The plan was developed to ensure that all hazardous waste streams treated at the hazardous waste management units are properly characterized and any hazardous constituents that the treated waste could contain or that are released through treatment are identified.

The types of hazardous listed waste treated at the open burning unit include the following: D001, D003, D030, F003, and F005. The waste categories treated at the open burning unit fall under several categories, such as explosives-contaminated combustible debris, explosives-contaminated solvents, explosives-contaminated noncombustible debris, excess explosives, and explosives from machining waste. Waste streams include combustibles contaminated with high explosives, sludge, sand, wipes, rags, tile, filters and filter socks, paper, spent carbon, scrap metal, and pipes. The average amount of waste treated at the unit from 2005 through 2019 was approximately 2,200 pounds of waste. The largest amount of waste treated in a year was approximately 4,000 pounds, and the least amount of waste was less than 1,000 pounds.

5.3 Security

The Permittees prevent the unknowing entry, and minimize the possibility for unauthorized entry, of persons or livestock onto the unit, in accordance with the requirements at 40 CFR §§264.14 and 270.14(b)(4). Security is of paramount importance to safe and successful operations at LANL.

Access to the isolated and security-controlled location of the open burning unit at TA-16 is maintained through both administrative controls and physical barriers. Access into the security area can be gained only through controlled entry stations by persons possessing an appropriate security clearance and site-specific training. Entry into the secured area is controlled via an entry station manned by LANL security personnel or by badge readers 24 hours per day. In addition, entry into the high explosives exclusion area is controlled through an industrial fence, with access granted through an access control station or a locked access gate. To gain access to the area, visitors must check in at the appropriate access control station to be added to the site-specific badge reader system. Unescorted access to the high explosives exclusion area is granted only to persons possessing appropriate security clearance and meeting site-specific training requirements. Proposed changes required to add the unit to the 2010 Permit include adding the unit description to Permit Attachment A, *Technical Area Unit Descriptions*, and also including a figure to Permit Attachment N, *Figures.* These proposed changes are included within this Permit Renewal Application within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions,* and Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*.

5.4 Inspection Schedules and Procedures

Per the requirements for 40 CFR §§270.14(b)(5) and 264.602, inspections at the TA-16-388 Flash Pad are conducted and documented, as outlined in Permit Section 2.6, *General Inspection Requirements*, and Permit Attachment E, *Inspection Plan*. A revised inspection plan, including the requirements for the open burning hazardous waste management unit, can be found in Supplement 1-5, *Permittees' Proposed Changes to Permit Attachment E, Inspection Plan,* of this Permit Renewal Application. No changes to Permit Section 2.6 are associated with the addition of these hazardous waste management units.

5.5 Waivers for Preparedness and Prevention

The information requirements stipulated in 40 CFR §270.14(b)(6) require that a part B permit application include "a justification for any request to waive the preparedness and prevention requirements of Part 264, subpart C." No waivers of the preparedness and prevention requirements under Part 264, subpart C, are being sought by the Permittees.

5.6 Contingency Plan

The information requirements for 40 CFR §270.14(b)(7) stipulate inclusion of a Contingency Plan to meet the requirements of 40 CFR Part 264, Subpart D.

A copy of the revised Contingency Plan is included in this Permit Renewal Application in Supplement 1-4, *Permittees' Proposed Changes to Permit Attachment D, Contingency Plan,* as required by 40 CFR §270.14(b)(7), which has been drafted to meet the requirements in 40 CFR Part 264, Subpart D, *Contingency Plan and Emergency Procedures*. Information on emergency response resources and release prevention/mitigation are included in the 2010 Permit Attachment D, *Contingency Plan*. The proposed revised plan is included in this Permit Renewal Application Supplement 1-4, and incorporates the emergency equipment located at the TA-16-388 Flash Pad.

5.7 Hazards Prevention

The following sections present how operations at the TA-16-388 Flash Pad comply with the preparedness and prevention requirements of 40 CFR Part 264, Subpart C, and the application requirements for 40 CFR §§270.14(8)(i-vi), where they differ from those presented in Section 2.7, *Hazards Prevention,* of this Permit Renewal Application. Health and safety procedures are followed by site personnel during routine operations.

5.7.1 Waste Handling at the Open Burning Unit

All waste handling operations at the TA-16-388 Flash Pad are conducted, as discussed in Section 2.7.1, *Waste Handling and Preventing Hazards in Unloading/Loading*, of this Permit Renewal Application, meeting the requirements of 40 CFR §270.14(8)(i).

5.7.2 Control of Runon/Runoff

Prevention of runoff from the hazardous waste handling areas, per the requirements at 40 CFR §270.14(8)(ii), is described in Section 5.16.2, *Protection of Surface Water/Wetlands/Soil Surface,* of this Permit Renewal Application.

5.7.3 Preventing Water Supply Contamination

The water supply at LANL is as described in Section 2.7.3, *Preventing Water Supply Contamination,* of this Permit Renewal Application.

5.7.4 Mitigate the Effect of Equipment Failure and Power Outages

There are no special requirements at the TA-16-388 Flash Pad required to mitigate equipment failure and power outages, per the requirements of 40 CFR §270.14(b)(8)(iv). The description of required equipment and testing maintenance of that equipment follow the permit conditions referenced in Section 2.7.4, *Mitigate the Effect of Equipment Failure and Power Outages,* of this Permit Renewal Application, with the permit changes as described within the section.

5.7.5 Preventing Undue Exposure of Personnel

There are no special requirements at the TA-16-388 Flash Pad to prevent undue exposure of personnel, per the requirements in 40 CFR §270.14(b)(8)(v) and described in Section 2.7.5, *Preventing Undue Exposure of Personnel,* of this Permit Renewal Application.

5.7.6 Preventing Releases to the Atmosphere

Releases to the atmosphere resulting from treatment activities at the open burning treatment unit cannot be prevented, as required by 40 CFR §270.14(b)(8)(vi). However, assuming conservative scenarios for treatment activities at the TA-16-388 Flash Pad, as discussed in Section 5.16.3, *Protection of Atmosphere*, and included in Supplement 4-12, *Screening Level Air Modeling Analysis and Risk Evaluation for Open Burning Operations at Los Alamos National Laboratory*, the estimated resulting emissions will not exceed regulatory levels for health-based protection. Therefore, these emissions will not adversely affect human health or the environment.

Air-monitoring data collected in 2011 during treatment events at the open burning unit is included as Supplement 4-13, *Air Sampling at Open Burning Treatment Unit,* of this Permit Renewal Application. Each sample was collected downwind of the TA-16-388 Flash Pad at a distance of 25 ft. and 75 ft. Samples collected from five treatment events were analyzed for metals and dioxins/furans. The analysis results were then compared to acute air-inhalation exposure concentration screening levels, where screening levels could be identified. The data comparisons indicate the operations monitored did not exceed any appropriate state or federal levels specified for the analytes monitored.

5.8 Ignitable, Reactive, and Incompatible Waste Precautions

The application requirements for 40 CFR §270.14(b)(9) are included in Section 2.8, *Ignitable, Reactive, and Incompatible Waste Precautions,* of this Permit Renewal Application. There are no changes required within the 2010 Permit to Permit Section 2.8, *Ignitable, Reactive, and Incompatible Waste,* for the inclusion of the open burning unit. The treatment of wastes by open burning is an appropriate treatment method under RCRA. It is necessary to mitigate the ignitable and/or reactive hazards associated with explosives waste streams—it is the preferred waste management practice for health and safety concerns.

5.9 Traffic

In accordance with requirements for 40 CFR §270.14(b)(10), the primary traffic routes that might be used to transport hazardous waste to or from the TA-16-388 Flash Pad at TA-16 include Pajarito Road, State Road 502, Diamond Drive, State Road 501, Anchor Ranch Road, K-Site Road, State Road 4, and East Jemez Road (see Figures 1 and 2 in Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*). Additional discussion of traffic at LANL is included in Section 2.9, *Traffic Pattern, Estimated Volume, and Control*.

5.10 Location and Facility-Wide Information

Facility location information to meet the requirements for 40 CFR §270.14(b)(11) is included within this Permit Renewal Application within Section 2.10, *Facility Location Information*. Additionally, the information requirements under 40 CFR §§270.14(b)(12, 14, 15, 16, 17, 18, 19, 20, 21, and 22) and 270.14(c & d) are covered for the LANL Facility within Sections 1 and 2 of this Permit Renewal Application. There are no additional information requirements necessary to add to the open burning unit to the 2010 Permit.

5.11 Closure Plan

A Closure Plan for the open burning unit, as required by 40 CFR §270.14(b)(13), is included as a portion of Supplement 3-1, *Permittees' Proposed Changes to Attachments G.1 through G.30, Closure Plans,* of this Permit Renewal Application.

5.12 Design, Construction, Materials, and Operation

Open burning treatment is a recognized, well-characterized, and dependable method used to treat hazardous wastes that exhibit the explosive characteristic of reactivity (a subset of EPA hazardous waste number D003), which occurs by self-sustained combustion ignited by an external source. Reactive hazardous wastes are treated by open burning when it has been determined to be the safest method for treatment compared to other modes of treatment. It renders the treatment residuals safe to handle and dispose. After treatment, the characteristic of reactivity is removed, with remaining residues tested and generally disposed as nonhazardous wastes. The TA-16-388 Flash Pad is used to treat certain types of explosives hazardous waste streams by open burning. A description of the unit is included in Section 5.1, *Open Burning Facility Description*. The Permittees propose treatment permit conditions for these units to update Permit Part 5. These proposed revisions are included in Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11,* of this Permit Renewal Application.

5.12.1 Containment Systems

In accordance with requirements stipulated in 40 CFR §264.601(b)(2), the effectiveness and reliability of containment, confinement, and collection systems and structures that prevent contaminant migration at the open burning unit are evaluated in Section 5.16, *Environmental Performance Standards.*

The TA-16-388 Flash Pad open burning unit (newly included Figure 15 within Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*) consists of a 22-f.t by 22-ft. concrete pad set on a secondary containment area. The base of the pad is 12 inches thick. The entire concrete pad is on a 45-mil Hypalon liner, which is 6 inches below the bottom of the pad and curved up to ground level on all

4 sides, extending out 2 ft. from the pad perimeter. Inset 1 ft. from the edge of the concrete pad along the two sides and back is a 3-ft.-high, 8-inch-thick, integrally poured concrete wall. The pad is slanted down toward the back concrete wall. The TA-16-388 Flash Pad is also equipped with a retractable steel roof that covers the entire unit when not in use.

5.12.2 Operating Requirements

The TA-16-388 Flash Pad is used for thermal treatment (via open burning) of hazardous waste that exhibits the characteristic of reactivity, in accordance with 40 CFR Part 265, Subpart P. Treatment of waste at the TA-16-388 Flash Pad is conducted using a noncontinuous (batch) thermal process, where a discrete quantity of waste is treated through a complete thermal cycle, in accordance with the requirements specified in 40 CFR §§265.370 and 265.373. Treatment is accomplished using propane burners to supply heat and fuel to dry the explosives, if necessary, and destroy the explosives contamination to make the waste residuals more amenable to disposal. All treatment operations are conducted on the pad either using a steel tray that may be lined with firebrick or on a steel platform. Prior to waste treatment operations, the area is cleared of all personnel, except for authorized Burn Ground personnel. The gate in front of the TA-16-388 Flash Pad is closed to prevent entry until after the treatment is complete.

Open burning waste treatment operations occur only during the daylight hours (i.e., from one hour after sunrise to one hour before sunset) to ensure that the entire burn can be observed by a TA-16 Burn Ground Operator. Treatment events are monitored in accordance with 40 CFR §265.377, as applicable, to ensure that waste treatment is progressing as expected and that propane burners are operating correctly. Monitoring is performed through a closed-feed camera system or a periscope located at the TA-16-389 control building.

Based on the TA-16-388 Flash Pad's maximum 200-pound treatment capacity, a minimum required distance of 1,250 ft. will be maintained between the perimeter of the burn and the nearest non-LANL property, as required in 40 CFR §265.382. The closest property not owned by the Permittees is at a distance greater than one mile (5,280 feet) from the TA-16 Burn Ground. Additionally, the TA-16-388 Flash Pad is limited to an annual treatment capacity of 6,000 pounds per year.

5.12.3 Waste Treatment Process

Open burning operations are conducted in accordance with this section. The description below discusses how to assess and manage general and site-specific safety and health hazards associated with working with explosives. This section describes normal treatment operations at the TA-16-388 Flash Pad.

5.12.4 Waste Accumulation

Waste treated at the TA-16-388 Flash Pad is initially accumulated in less-than-90-day accumulation areas or satellite accumulation areas until the day of treatment. Explosives may also be collected directly from explosives storage locations at the Facility on the day of treatment. Safety concerns dictate that waste be burned promptly (within a couple of hours) after arriving at the TA-16 Burn Ground. Therefore, almost all wastes are treated on the same day that they are moved to the TA-16-388 Flash Pad.

5.12.5 Waste Transport

Waste to be treated is collected from various areas at the Facility. Prior to treatment of any waste, the waste generator must provide waste characterization documentation and a request for treatment. This information is reviewed for acceptance at the treatment unit by a trained professional familiar with waste characterization requirements of the Waste Analysis Plan and the site-specific restrictions of the waste treatment unit at the TA-16-388 Flash Pad. A treatment event(s) is/are scheduled once the waste characterization documentation has been approved by a TA-16 Burn Ground Operator, waste acceptance personnel, official explosives safety personnel, and responsible line management.

Scheduling of a waste treatment event involves arranging for the transportation of waste from one or more locations to the TA-16-388 Flash Pad. When loading waste, the cargo compartment of the transport vehicle is checked to ensure that it is clean and contains no loose items such as tools or sharp objects. For transport, the containers of waste are inspected for damage or leaking material and are then secured with tie-downs. The load limit for transporting explosives is determined by the capacity of the transport vehicle(s). Wastes are transported to the Burn Ground by appropriately trained and authorized personnel in vehicles designed to transport explosives. Qualified explosives handlers unload the waste from the vehicle and place it within the unloading area. A visual examination is conducted after unloading to ensure that containers are not damaged or leaking and that no explosive material remains in the transport vehicle.

Explosives-contaminated waste and explosives waste that must be transported on public roads between sites is packaged in compliance with requirements stipulated by the U.S. Department of Transportation. Onsite transportation requires that explosives waste be packaged in approved containers, sealed, and labeled appropriately. Waste containers (generally plastic bags, paper-lined cardboard boxes, plywood boxes, or plastic buckets) are then transported from the generator accumulation areas. Exceptions to packaging are made for special items to ensure the waste materials are handled and transported safely.

5.12.6 Waste Staging

Most waste streams treated at the TA-16-388 Flash Pad do not require staging prior to treatment. Waste streams that do not require staging include explosives machining waste, excess explosives, explosives-contaminated combustible debris, and explosives-contaminated solvent waste. The waste stream that may require staging prior to or during the burning treatment process is the explosives-contaminated noncombustible debris waste stream.

The explosives-contaminated noncombustible debris waste stream can consist of large pieces of equipment, debris from firing sites, material from decommissioning and demolition activities, and material from explosives processing areas that must be “flashed” prior to shipment offsite for recycle or disposal. Depending on the size and amount of waste to be flashed, it may take several days to stage the waste on the flash pad. The waste material to be treated may include relatively large metal pieces that involve extensive scheduling of collection and transport resources. They may require equipment such as forklifts or additional procedures for lifting of large pieces, as well as complicated stacking arrangements on removable steel supports.

Factors that influence waste staging are safety, the degree of difficulty in placing the waste on or removing it from the TA-16-388 Flash Pad, and the potential for influence from environmental factors (e.g., wind speed, fire conditions). Treatment operations can be delayed from a scheduled burn time caused by environmental factors, which are discussed below. If burning is delayed, a cover is placed over the waste.

5.12.7 Treatment Operations

The following sections describe open burning treatment operations on the day of treatment events.

5.12.7.1 Pretreatment Activities

Propane burners are tested for functionality on the day of or the day before treatment operations, before the waste is transported to the TA-16-388 Flash Pad. Prior to waste treatment, the area at the TA-16 Burn Ground is visually inspected for unauthorized personnel and large animals. When staging of the waste is not required, the waste is placed in a steel tray or on a steel pallet. Multiple compatible waste streams may be consolidated to create efficiencies in waste treatment. Wastes requiring the use of more fuel may be paired with wastes that require less fuel, so that the least amount of fuel possible is used to effectively and efficiently treat the waste. Wastes that contain combustible materials are placed within a screen cage inside the tray to reduce the potential for residue to escape.

5.12.7.2 Open Burning Treatment Operations

After the waste is placed within the burn tray at the TA-16-388 Flash Pad, the roof over the concrete pad is retracted and all access barricades and gates are confirmed to be in place. All personnel present at the TA-16 Burn Ground are moved to the control building. Additional personnel are not allowed to be present at the TA-16 Burn Ground during treatment operations. Access Control is notified via phone or radio that the burn is about to commence and that the propane burners have been started. All treatment operations are initiated remotely by qualified personnel from inside the control building and observed on the monitor located in the control building.

During the entire waste treatment operation, either a television camera mounted above the front of the TA-16-388 Flash Pad or a periscope located at the TA-16-389 control building is used to monitor the operation from inside the control building at TA-16-389. The lockout key for the power that operates the unit is also located in the control building. The lockout key is controlled by the Lead TA-16 Burn Ground Operator at all times.

Most commonly, treatment events last approximately 30 minutes. However, treatment is always continued until the TA-16 Burn Ground Operator determines visually that the waste is fully treated. After the propane burners have been shut off, the power to the unit is switched off and the lockout key is locked away. Access control is then notified that the treatment event is complete. The barricades in front of the TA-16-388 Flash Pad are left in place for up to an eight-hour period after the treatment event is complete to allow the tray to cool. Security access gates in front of building 16-389 and at the entryway to the TA-16 Burn Ground are lifted after treatment operations are completed.

5.12.7.3 Post-Treatment Operations

The burn trays must be left uncovered while they cool after each treatment event. The metal cover is placed back over the TA-16 Flash Pad eight hours after a treatment event, or earlier if a TA-16 Burn Ground Operator determines that it is safe to do so. Any residue (i.e., ash) that is left from a treatment event is left within the tray for a minimum of 24 hours after treatment. After 24 hours, the ash is removed using a shovel, broom, dustpan, or other tools, as necessary. The residue is then placed in a plastic bucket and accumulated until the container is approximately half full. Residues are characterized as described within Permit Attachment C, *Waste Analysis Plan.* The proposed changes to the Permit Attachment C are presented in this Permit Renewal Application as Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*, to account for the addition of the open burning unit.

5.12.7.4 Restrictions on Operations

As part of fire safety considerations, grasses and weeds located within a 200-ft. radius of the TA-16-388 Flash Pad are kept trimmed. This minimizes the potential for fire around the unit. Additionally, treatment operations are conducted within the bounding conditions detailed in the LANL Fire Danger Matrix (https://www.lanl.gov/resources/emergency/fire-danger-matrix.php), which is maintained by LANL emergency operations personnel. Wind data is standardized using the facility-wide LANL Weather Machine, meteorological tower 6 postings.

Other environmental factors restrict treatment operations at the TA-16-388 Flash Pad. Transportation or treatment of explosives waste at the TA-16-388 Flash Pad may not occur under the following conditions:

- When lightning is detected within a 6-mile radius of the unit
- During all precipitation events
- When roads are icy (applies to transport only)
- When wind speeds are determined to be greater than 20 miles per hour at the TA-16-389 control building

Risk to human health is the greatest consideration. Should any environmental factors change rapidly and unexpectedly, the waste may remain at the TA-16-388 Flash Pad, under administrative control, until treatment can be safely conducted. Applicable administrative controls include covering the waste if it is safe to do so and prohibiting nonessential personnel from entering the area.

5.13 Demonstration of Treatment Effectiveness

To address the applicable miscellaneous unit requirements specified in 40 CFR §270.23(d) and the thermal treatment unit requirements of 40 CFR Subpart 265, Subpart P, a demonstration of treatment effectiveness must be included for the TA-16-388 Flash Pad. As indicated in the AEHA guidance document, "RCRA Part B Permit Writers Guidance Manual for Department of Defense Open Burning/Open Detonation Units" (AEHA 1987), a demonstration of treatment effectiveness can be based on laboratory or field data. For wastes treated by open burning, information demonstrating that any residues remaining after burning are not reactive (i.e., as defined by RCRA) should be provided. At the TA-16-388 Flash Pad, this is accomplished by testing all residues for explosives. If explosives are present within the residue, it is treated again. Residues deemed not reactive are managed in accordance with LANL waste management procedures, characterized in accordance with Attachment C, *Waste Analysis Plan,* of the 2010 Permit (the proposed changes are presented in Supplement 1-3, *Permittees' Proposed Changes to Permit Attachment C, Waste Analysis Plan*), and managed in compliance with applicable state, federal, and local requirements.

Additionally, to provide an assessment of the temperatures of open burning treatment activities, measurements were collected from various types of burns at the TA-16-388 Flash Pad. Most open burning treatment events last approximately 30 minutes. The TA-16-388 Flash Pad internal operating procedures require that, for all burn events, the waste must continue to be treated until the operator determines visually that the waste is fully treated. The multidirectional propane burners ensure that high combustion turbulence is maintained throughout the treatment event.

Thermal studies, as described within Supplement 4-14, *Thermal Measurements at the TA-16-388 Flash Pad*, demonstrate that the propane burners on the TA-16-388 Flash Pad are capable of elevating the temperature within the burn cage well in excess of 2,000°F in most of the burn runs, to achieve complete combustion of complex and persistent toxins such as dioxins and furans and their building blocks. The thermal studies also demonstrate that open burning, as conducted on the TA-16-388 Flash Pad, meets all three major requirements of the American Chemistry Council's "3-T rule" for dioxin destruction: high combustion temperature to maximize waste destruction, adequate combustion time, and high combustion turbulence (American Chemistry Council 2003).

5.14 Inspection Schedules and Procedures

Per the requirements for 40 CFR §264.602, inspections at the open burning unit are conducted and documented, as outlined in Section 2.4, *Inspections.* Proposed changes to the plan are summarized in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit,* and a revised version of the plan is attached as Supplement 1-5, *Permittees' Proposed Changes to Permit Attachment E, Inspection Plan,* of this Permit Renewal Application.

5.15 Special Requirements for Ignitable, Reactive, and Incompatible Wastes

Waste management procedures for ignitable, reactive, and incompatible wastes to be treated will be followed, pursuant to 40 CFR §264.17 and as described in Section 2.8, *Ignitable, Reactive, and Incompatible Wastes,* of this Permit Renewal Application.

5.16 Environmental Performance Standards

This section addresses the ability of the TA-16-388 Flash Pad operations to meet environmental performance standards that protect groundwater, surface water, soil, and air quality. EPA identified these media as having the greatest chance of becoming exposure pathways for migration of hazardous waste and hazardous waste constituents to potential human and environmental receptors. As required by 40 CFR §264.601, the Flash Pad is located, designed, constructed, operated, and maintained in a manner that facilitates safe handling and treatment of explosives wastes to prevent adverse impacts to human health and the environment.

5.16.1 Protection of Groundwater/Vadose Zone

As required by 40 CFR §264.601(a), the TA-16-388 Flash Pad is operated in a manner that prevents releases that might have adverse effects to human health or the environment caused by migration of waste constituents through the vadose zone to groundwater. Specific items to be considered include the following:

- The volume and physical and chemical characteristics of the waste in the unit, including its potential for migration through soil, liners, or other containing structures.
- The hydrologic and geologic characteristics of the unit and the surrounding area.

- The existing quality of groundwater, including other sources of contamination and their cumulative impact on the groundwater.
- The quantity and direction of groundwater flow.
- The proximity to and withdrawal rates of current and potential groundwater users.
- The patterns of land use in the region.
- The potential for deposition or migration of waste constituents into subsurface physical structures and into the root zone of food-chain crops and other vegetation.
- The potential for health risks caused by human exposure to waste constituents.
- The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

The following sections provide information on the hydrogeology beneath the TA-16-388 Flash Pad and describe monitoring and reporting conducted in and around the area that can be used to assess the impact of open burning operations on groundwater. Tables and figures regarding groundwater flow and monitoring are located in Supplement 4-11, *Open Burning Unit Groundwater Monitoring and Surface Drainage Information,* of this Permit Renewal Application.

5.16.1.1 Hydrogeology in the Vicinity of the TA-16-388 Flash Pad

The TA-16-388 Flash Pad is located in the southwestern portion of LANL in a semiarid, temperate, mountain-climate setting. General geologic and hydrologic characteristics of LANL and land use patterns in the Los Alamos area are discussed in Appendix 1 of the Los Alamos National Laboratory General Part B Permit Application (LANL 2003b).

The TA-16 Burn Ground, where the TA-16-388 Flash Pad is located, is situated on a mesa top within TA-16. A hydrologic conceptual model for TA-16, including the area of the TA-16 Burn Ground, is presented in the TA-16 Well Network Evaluation and Recommendations (LANL 2012b). That document ranks different sources at TA-16 by their potential to impact groundwater. High- and moderate-ranking sources were characterized by significant hydrologic drivers, i.e., either large outfall volumes released to canyons or ponds located on mesa tops. Sources were also characterized in terms of the release of large inventories or high contaminant concentrations. Both of these conditions are necessary to consider an area to have a high or moderate impact to groundwater. The TA-16 Burn Ground area was ranked as a low-priority source for its potential to impact groundwater, because it lacks both a large contaminant inventory and a large volume of water to provide a hydrologic driving force for contaminant infiltration.

5.16.1.2 Existing Quality of Groundwater

From 1981 to 2010, the average annual precipitation in Los Alamos County was 18.97 inches and the average annual snowfall was 57.5 inches (LANL 2012a). The evaporation rate of freestanding water exceeds the average annual precipitation. Infiltration is limited and generally occurs in canyons or on mesas at sites that release large volumes of water (LANL 2011a; LANL 2012b). The topographic map for TA-16 within the concurrent submittal of the LANL General Part A Permit Application, Revision 10.0 (LANL 2020a), and the table within Supplement 4-11, *Open Burning Unit Groundwater Monitoring and Surface Drainage Information,* of this Permit Renewal Application, present the locations of all monitored springs and wells (regional, intermediate, and alluvial) that are pertinent to the TA-16 Burn Ground to evaluate potential impacts from the TA-16-388 Flash Pad. The table also contains monitoring data for groundwater contaminants in alluvial, perched-intermediate, and regional groundwater zones near the TA-16 Burn Ground that are equal to or exceed applicable regulatory screening levels.

Discharges from past explosives-manufacturing activities at TA-16 (high- and moderate-ranking sources, particularly at the nearby TA-16-260 outfall) are believed to be the dominant sources of the constituents found in deep groundwater (LANL 2011a; LANL 2012b). Contaminants are present in groundwater collected from springs and groundwater monitoring wells located at TA-16. It is believed that the spring contamination may be the result of ponded water on the mesas (e.g., historical and current ditches and ponds) and potentially the presence of fractures as infiltration pathways. The wells showing the highest contaminant concentrations are downgradient of higher priority TA-16 sources. However, those wells are located along infiltration pathways that are not downgradient of the TA-16-388 Flash Pad.

5.16.1.3 Quantity and Direction of Groundwater Flow

The only aquifer in the Los Alamos area capable of municipal and industrial water supply is the regional aquifer. The regional water table is approximately 1,200 ft. below the TA-16 Burn Ground. This aquifer occurs primarily within the poorly to semi-consolidated basin-fill sediments of the Santa Fe Group. The total thickness of the Santa Fe Group beneath the Pajarito Plateau is poorly defined. The deepest well on the plateau (PM-5), with a depth of 3,110 ft., does not fully penetrate the base of the basin-fill sediments. Estimates of the total thickness of these sediments range from 6,650 ft. in the central basin to as much as 9,000 to 10,000 ft. in the central and western parts of the basin (Broxton and Vaniman, 2005). Given the average long term water level declines on the order of 1.2–1.3 ft./yr., the aquifer should meet projected water demands for hundreds of years.

Water supply well PM-5, the nearest water-supply well to the TA-16-388 Flash Pad, is located approximately 16,000 ft. (3 miles) to the northeast. Water-supply well PM-4 is located approximately 19,000 ft. (3.6 miles) east of the TA-16-388 Flash Pad, and PM-2 is located approximately 21,000 ft. (4 miles) southeast of the unit. Upper levels of the regional aquifer on the Pajarito Plateau are predominantly under phreatic (unconfined) conditions (LANL 2011a).

5.16.1.4 Current and Potential Groundwater Users

The deep portion of the regional aquifer is predominantly under confined conditions, and it is the portion of the regional aquifer influenced by Pajarito Plateau municipal supply pumping (note: neither the alluvial or perched groundwater systems are influenced by municipal water supply pumping). At TA-16, water-supply pumping does not cause any obvious water-level responses in either shallow or deep aquifer screens for those regional aquifer wells near the TA-16-388 Flash Pad (LANL 2011a). As a result, potential contaminant migration follows the ambient water-table gradients rather than diverting towards the water supply wells. Based on hydraulic data, capture of potential contaminants near the water table by municipal supply wells is unlikely. Based on water table maps, the regional groundwater flow direction in the vicinity of the TA-16 Burn Ground is expected to range from east-northeast to east-southeast. Because the TA-16-388 Flash Pad has a low likelihood of impacting groundwater beneath TA-16, impact at the water-supply wells is even less likely. Supplement 4-11, *Open Burning Unit Groundwater Monitoring and Surface Drainage Information,* of this Permit Renewal Application, includes figures that show the locations of groundwater monitoring wells and springs that are pertinent for evaluating potential impacts of the TA-16-388 Flash Pad and data tables with groundwater monitoring information.

5.16.1.5 Groundwater Monitoring and Reporting

LANL has established a groundwater monitoring network to assess the quality of groundwater in the Los Alamos area. The monitoring network includes monitoring wells, water-supply wells, surface-water sampling stations, and springs located both inside and outside the LANL boundary. Three groundwater zones (alluvial, perched-intermediate, and regional groundwater) are monitored as part of the monitoring network. Sample locations, analytical suites, and sampling schedules for the monitoring network are identified in the IFGMP (LANL 2020b). The IFGMP is updated annually with approval by NMED-HWB, in accordance with the June 2016 Compliance Order on Consent, referred to as the Consent Order (New Mexico 2016). The groundwater monitoring points provide information regarding potential impacts to groundwater from contaminant sources upgradient of the TA-16-388 Flash Pad.

A summary of the data from 2000 to the present for locations both upgradient and downgradient of the TA-16 Burn Ground is provided in Supplement 4-11. The table shows the frequency of detections above the listed regulatory standards for constituents potentially related to operations at the TA-16-388 Flash Pad. A key confounding factor regarding the groundwater monitoring data is that constituents of concern are common across TA-16 and are predominantly attributable to sources other than those at TA-16-388 Flash Pad, many of which have substantially higher amounts of contamination associated with releases to the environment. Therefore, Supplement 4-11 includes data from groundwater monitoring locations that are upgradient of the TA-16 Burn Ground to provide local baseline groundwater conditions for comparison to groundwater data collected to monitor the TA-16-388 Flash Pad. The sampling results are also published in periodic groundwater monitoring reports submitted to the NMED-HWB and in the Facility's annual environmental reports.

5.16.2 Protection of Surface Water/Wetlands/Soil Surface

As required by 40 CFR §264.601(b), the TA-16-388 Flash Pad is operated in a manner that prevents any releases that might have adverse effects on human health or the environment caused by migration of hazardous waste constituents in surface waters or wetlands. There are no permanent surface-water bodies within the confines of the Flash Pad and the unit operations will not utilize water. However, as discussed within this section, surface-water runoff from the Flash Pad has the potential to flow and impact Fishladder Canyon, which in turn is a tributary to Cañon de Valle. As used in this section, "surface waters" includes storm water runoff and snowmelt runoff that can create sheet flow across the site. In addition, there is a wetland located approximately 1,500 ft. away from the TA-16-388 Flash Pad.

The following factors were considered in the surface-water analysis discussed below:

- The volume and physical and chemical characteristics of the waste in the unit.
- The effectiveness and reliability of containing, confining, and collecting systems and structures in preventing migration.
- The hydrologic characteristics of the unit and the surrounding area, including the topography of the land around the unit.
- The patterns of precipitation in the region.
- The quantity, quality, and direction of groundwater flow.
- The proximity of the unit to surface waters.
- The current and potential uses of nearby surface waters and any water quality standards established for those surface waters.

- The existing quality of surface waters and surface soils, including other sources of contamination and their cumulative impact on surface waters and surface soils.
- The patterns of land use in the region.
- The potential for health risks caused by human exposure to waste constituents.
- The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

5.16.2.1 Hydrologic Assessment and Surface Water Flow

Located in the southwestern portion of LANL, TA-16 occupies portions of the Water Canyon, Cañon de Valle, and S-Site Canyon watersheds. The TA-16-388 Flash Pad is located on the mesa top in TA-16's northeastern corner, which lies within the Cañon de Valle watershed. This watershed extends east-southeast across LANL from TA-16 to its confluence with Water Canyon at the boundary between TA-15 and TA-37. Surface water in TA-16 consists of storm water runoff, snowmelt runoff, and perennial spring flow that drains in small drainages or by sheet flow into Cañon de Valle. Surface water in Cañon de Valle to the north of the TA-16 Burn Ground is perennial from Burning Ground Spring to a stream gage (E256) below MDA P, which is an SWMU on the northern portion of the mesa top for which corrective actions are complete. From the southern portion of the TA-16 Burn Ground, where the TA-16-388 Flash Pad is located, intermittent surface water occurs from natural and anthropogenic sources from gage station (E257) to the Cañon de Valle confluence with Water Canyon.

Surface-water runoff from the TA-16-388 Flash Pad flows southwest to a small tributary to Fishladder Canyon, which in turn is a tributary to Cañon de Valle. Fishladder Canyon is located between the main channel of Cañon de Valle and S-Site Canyon, with a drainage length of approximately 3.5 kilometers (2.2 miles) and a drainage area of approximately 1.2 square kilometers (0.4 square miles). Surface water in the vicinity of the TA-16 Burn Grounds consists of storm water and snowmelt runoff that may flow by small drainages or sheet flow into Fishladder Canyon. Fishladder Seep is located in a hanging valley approximately 800 ft. southeast of the Burning Ground. Alluvial groundwater occasionally discharges at Fishladder Seep, although the prevalence of surface flow in Fishladder Seep has decreased significantly in recent years. Supplement 4-11, *Open Burning Unit Groundwater Monitoring and Surface Drainage Information,* of this Permit Renewal Application, contains a figure of drainage (Figure 4.11-1) near the open burning unit.

The US Army Corps of Engineers has identified and delineated a small wetland in this area (ACOE 2005). Wetland 16-1 is approximately 70 ft. long and 20 ft. wide, with an area of 0.03 acres. The wetland is more than 1500 ft. away from the TA-16-388 Flash Pad and is unlikely to be impacted by activities at the open burning unit.

Surface water within the Cañon de Valle watershed has been detrimentally impacted by two severe forest fires (LANL 2011a). In May 2000, the Cerro Grande fire burned the headwaters of Cañon de Valle and Water Canyon west of LANL, and also burned a large part of the Water Canyon watershed within LANL, including areas in TA-08, TA-09, TA-11, TA-14, TA-15, TA-16, TA-28, and TA-37. Various naturally occurring inorganic chemicals (e.g., barium, cobalt, and manganese) and anthropogenic fallout radionuclides (e.g., cesium-137, plutonium-239 and -240, and strontium-90) were concentrated in Cerro Grande ash at levels exceeding that of background sediment before the fire, and the transport of ash has resulted in elevated levels of these analytes in post-fire sediment deposits in some canyons.

In June 2011, the Las Conchas fire burned the headwaters of Cañon de Valle and Water Canyon west of LANL. The upper Cañon de Valle watershed was burned more severely than the upper Water Canyon watershed: 60% of the Cañon de Valle watershed within the burn perimeter was classified as high or moderate severity. Floods in July and August 2011 transported ash from the burn area onto LANL; it is expected that various inorganic chemicals and fallout radionuclides will be elevated in these media similar to the baseline samples collected from post-Cerro Grande fire runoff.

5.16.2.2 Surface Water Monitoring and Reporting

Protection of surface water is established by implementation of a Clean Water Act National Pollutant Discharge Elimination System storm water individual permit associated with industrial activities from certain SWMUs and AOCs (referred to as the "LANL Storm Water Individual Permit") (NPDES Permit No. NM0030759). The LANL Storm Water Individual Permit was initially effective on November 1, 2010. The LANL Storm Water Individual Permit expired on March 31, 2014, and has been administratively continued pending issuance of a new permit. A draft permit was issued by the EPA on November 30, 2019. A final permit is expected following a public comment period, which ended on July 31, 2020. The 2005 Consent Order (New Mexico 2005) designated the TA-16-388 Flash Pad as SMWU [16-010(c)], regulated under the LANL Storm Water Individual Permit. However, under the 2016 Consent Order (New Mexico 2016), the unit is identified as a permitted unit and is regulated by the 2010 Permit. A request to remove the TA-16-388 Flash Pad from the LANL Storm Water Individual Permit is currently pending with the EPA. Until the unit is removed from the LANL Storm Water Individual Permit, it will be monitored in compliance with that permit.

The LANL Storm Water Individual Permit contains non-numeric technology-based effluent limitations, coupled with a comprehensive, coordinated monitoring program and corrective action where necessary, to minimize pollutants in storm water discharges from sites. LANL is also required to implement site-specific control measures (including best management practices) to address the non-numeric technology-based effluent limits contained in the LANL Storm Water Individual Permit, followed by confirmation monitoring against New Mexico water-quality-criteria-equivalent target action levels to determine the effectiveness of the site-specific measures. If target action levels are exceeded, corrective actions detailed in the LANL Storm Water Individual Permit are initiated and additional confirmation monitoring is conducted, following completion of corrective actions. The LANL Storm Water Individual Permit designates SWMU 16-010(c) as a Moderate Priority Site with a corrective action deadline of October 31, 2015.

Installation of baseline control measures at CDV-SMA-2.5 (Cañon de Valle-Site Monitoring Area-2.5) were completed on December 15, 2010, and certified on January 12, 2011 (LANL 2011b). The active control measures are listed in the 2020 Individual Permit Annual Report (LANL 2020c) and the 2019 update to the Individual Permit Site Discharge Pollution Prevention Plan (LANL 2020d). The control measures include established vegetation, an earthen berm, straw wattles, riprap-lined channels/swales, and rock check dams that function as runon, runoff, erosion, and/or sediment controls.

The pollutants of concern to be monitored for each SMA are specified in Appendix B of the LANL Storm Water Individual Permit. At a minimum, all SMAs must be initially monitored for metals, gross-alpha radiation, Ra-226 + Ra-228, and cyanide (weak acid dissociable). The storm water monitoring requirement for CDV-SMA-2.5 also includes high explosives and SVOCs. Baseline confirmation monitoring at CDV-SMA-2.5 started in May 2011 at station SS090420, which is collocated with the E257 station (shown on Figure 4.11-1 within Supplement 4-11, *Open Burning Unit Groundwater Monitoring and Surface Drainage Information*). Baseline confirmation samples were collected on September 1, 2011, and October 12, 2012. No target action level exceedances were observed. However, the SVOC results were rejected as an outcome of data validation and are not usable for confirmation sampling assessment. A second sample was collected on July 26, 2013, and analyzed for SVOCs. No target action level exceedances were observed, thereby completing baseline confirmation monitoring.

Because this SWMU is an active hazardous waste management treatment unit, it is no longer subject to the Consent Order. A request to remove this site from the LANL Storm Water Individual Permit is currently pending with the EPA. Until this site is removed from the LANL Storm Water Individual Permit, it will be monitored in compliance with that permit. Supplement 4-11, *Open Burning Unit Groundwater Monitoring and Surface Drainage Information,* of this Permit Renewal Application, contains a figure of drainage near the open burning unit.

5.16.2.3 Soil Surface Monitoring

The following paragraphs detail soil monitoring efforts at the TA-16-388 Flash Pad, in accordance with the requirements in 40 CFR §264.602(b). Description of modeling associated with the potential for soil deposition as a result of modeled air impacts at the TA-16-388 Flash Pad is included in Supplement 4-12, *Screening Level Air Modeling Analysis and Risk Evaluation for Open Burning Operations at Los Alamos National Laboratory,* of this Permit Renewal Application. This modeling is discussed in the next section.

In 2009, 2012, and 2013, soil sampling occurred using grab sampling to collect soil samples to measure soil constituent levels at the TA-16-388 Flash Pad. A summary of the soil laboratory analytical results for the 2012 and 2013 sample collection events and a comparison of those results to the 2009 data are included in Attachment F of *Class 3 Permit Modification Request for Addition of an Open Burning Unit at Technical Area (TA) 16 to the Los Alamos National Laboratory (LANL) Hazardous Waste Facility Permit, EPA ID No. NM0890010515* (LANL 2013).

The most recent soil-sampling event occurred on September 2018, to continue to monitor and assess soil constituents at the TA-16-388 Flash Pad site. Sample locations were selected based on areas where deposition from air to soil is likely to occur and at locations of storm water runoff. Soil samples were collected from the ground surface to 2 inches below the ground surface and analyzed for constituents of concern. The laboratory soil analytical results were compared to established background values and New Mexico residential soil screening limits. The soil analytical results demonstrate that the majority of constituents analyzed for were nondetect. Soil sample concentrations were measured above their background values for eight inorganic constituents, but the concentrations did not exceed the soil screening levels. Supplement 4-15, *2018 Soil Sampling Results Summary Report for the Open Burning Unit at Technical Area (TA) 16-388 Flash Pad,* of Appendix 4 of this Permit Renewal Application, includes the most current soil analytical summary for the open burning unit and provides more detailed information regarding the soil sampling and analytical results.

5.16.2.4 Assessment of Potential Health Risks

Using the 2018 soil-sampling analytical results, risk assessment analyses were conducted to assess the potential for risk to human and ecological receptors from the open burning treatment unit. The assessments are included as Supplement 4-16, *Technical Area 16 - Open Burn/Open Detonation (OB/OD) Area - Technical Area 16-388 Flash Pad Human Health and Ecological Risk Screening Assessments,* of this

Permit Renewal Application. The human health risk assessment concluded that there are no unacceptable risks associated with the constituents measured within the soil. The ecological risk assessment concluded that there is a minimal risk to ecological receptors. The detected concentrations of barium above background levels presents a potential risk to plants. However, no effects on plants were noted during a site visit. The calculation of risk presented by the detected concentrations of dioxins/furans in the soils demonstrates that the low-effect ecological screening level for mammals and the no-effect ecological screening level for birds was exceeded at one sample location. Small mammal studies at TA-16 have found no uptake of dioxins/furans by small mammals.

5.16.3 Protection of Atmosphere

To meet the requirements of 40 CFR §264.601(c), the TA-16-388 Flash Pad is located in a remote area within LANL boundaries and is operated in a manner that prevents any releases of waste constituents to the atmosphere that may have adverse effects to human health or the environment.

Air modeling using the Open Burn and Open Detonation Model was conducted for the open burning unit. The air-dispersion model is used to estimate the ground-level concentrations that might occur downwind after an open burning event. The data inputs for the model use the most conservative values to provide the most protective modeling. For example, the data input regarding the maximum amount of explosive waste treated at the unit overestimates the quantity of waste to be 6,000 pounds per year compared to the actual amount of waste treated which is approximately 2,200 pounds per year on average. Additionally, the number of treatments conducted and the amount of time it takes to complete treatment operations were also overestimated. The waste stream emissions factors used for the analysis were also based on constituents that are more hazardous than what would ever be treated at the unit and estimate a higher air impact than what would be released from the unit under normal operations. After running the model through several iterations, the results demonstrate that all maximum ground-level concentrations occur close to the TA-16 Burn Ground. No ambient air-quality standards are projected to exceed the modeling results, since the model results are conservative. The calculated air-concentration results were compared to the air-quality standards and the appropriate human health screening levels, where available, and the predicted impacts are all below the appropriate screening levels. Predicted soil deposition (over a 10-year period) demonstrates that impacts to soil concentrations are also less than the human health and ecological screening levels. The air-analysis report which includes more detailed discussion of model inputs, emission factors, and results is included in Supplement 4-12, *Screening Level Air Modeling Analysis and Risk Evaluation for Open Burning Operations at Los Alamos National Laboratory,* of this Permit Renewal Application.

Atmospheric monitoring efforts that have been performed at the TA-16-388 Flash Pad, in accordance with the requirements of 40 CFR §264.602 and are included in Supplement 4-13, *Air Sampling at Open Burning Treatment Unit,* of this Permit Renewal Application. Each sample was collected downwind of the open burning treatment unit at a distance of 25 ft. and 75 ft. Samples collected from five treatment events were analyzed for metals and dioxins/furans. The analysis results were then compared to acute air-inhalation exposure concentration screening levels, where screening levels could be identified. The data comparisons indicate the operations monitored did not exceed any appropriate state or federal levels specified for the analytes monitored.

6.0 PERMIT CHANGES

This Permit Renewal Application contains a number of proposed Permit changes sought by the Permittees. These changes include proposed modifications to the text in both the Permit Parts and in Permit Attachments. All proposed Permit changes are specifically identified and summarized in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit*, which outlines changes proposed in Supplements 1-1 through 1-8; and Appendix 3, *Summary Table of Proposed Changes to Hazardous Waste Management Unit Closure Plans*, which outlines proposed changes in Supplement 3-1, *Permittees' Proposed Changes to Attachments G.1 through G.30, Closure Plans*. There are five categories of proposed permit changes summarized below.

1) Changes referred to within Section 2 of this Permit Renewal Application include changes to text and figures within the 2010 Permit Parts 1-11 and Permit Attachments A, C, D, E, and F. Section 2 of this Permit Renewal Application addresses several minor and nonsubstantive changes as needed to update terminology and/or organizational changes, facilitate implementation, clarify information where needed, update or add practices that are in place by the Permittees, and remove redundant information. These changes occur in the following:

   - Permit Section 2.8.1, *Ignitable and Reactive Waste Precautions*
   - Permit Section 2.10.2, *Testing and Maintenance of Equipment*
   - Attachment C, *Waste Analysis Plan*
   - Attachment D, *Contingency Plan*
   - Attachment E, *Inspection Plan*
   - Attachment F, *Personnel Training Plan*

2) Changes referred to within Section 3 of this Permit Renewal Application include removal of text regarding secondary containment that is not applicable, inclusion of practices that are already in place by the Permittees, corrections of typographical errors, and updates to referenced sections. These changes occur in the following:

   - Permit Section 3.5, *Management of Containers*
   - Permit Section 3.10.2, *Secondary Containment*
   - Permit Section 3.12.1, *General Operating Conditions*
   - 3.14.2(1), *Retention Basin*
   - 3.14.3, *Subsurface Vapor Monitoring*

3) Changes based on the Class 3 permit modification request pursuant to the 2017 Settlement Agreement in *U.S. v. Curry*, DC NM Case No. 10-0125. The changes associated with the request are described within Section 6.2 of this Permit Renewal Application. These proposed changes occur in the following:

   - Proposed new Permit Section 1.4.2, *Integration with Consent Order*
   - Permit Section 1.8, *Definitions*
   - Permit Section 1.9.1, *Duty to Comply*
   - Deleted Permit Section 4.6, *TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF)*
   - Permit Section 9.1, *Introduction*
   - Permit Section 9.1.1, *Regulated Units*
   - Permit Section 9.3, *Closure Requirements for Regulated Units*

- Deletion of applicable text within Attachment G, *Closure Plans*, applicable tables within Attachments G.1 through G.30: deletion of text “low-level radioactive solid waste” under column “Waste Type”

4) Changes required for the proposed addition of three treatment units. The application requirements for the addition of two open detonation units and one open burning unit are included in Sections 4 and 5 of this Permit Renewal Application. Specific Permit Parts and Permit Attachment changes necessary to include these units within the Permit are outlined in Sections 4.0 and 5.0. The other proposed changes occur in the following:

- Permit Section 1.2, *Permittees and Permitted Activity*, Table 1.2.1
- Permit Section 1.4.1, *Effect of this Permit on Interim Status Units*
- Permit Section 1.5, *Effects of Inaccuracies in Permit Application*
- Proposed new Permit Part 5, *Treatment by Open Detonation*
- Proposed new Permit Part 6, *Treatment by Open Burning*
- Attachment A, *Technical Area Unit Descriptions*
- Attachment C, *Waste Analysis Plan*
- Attachment D, *Contingency Plan*
- Attachment E, *Inspection Plan*
- Attachment G, addition of applicable closure plans
- Attachment J, *Hazardous Waste Management Units*
- Attachment N, *Figures*

5) Other proposed changes to the 2010 Permit text and figures that are not addressed in the four circumstances listed above are described in Section 6.2 of this Permit Renewal Application. These changes are minor in nature and have been proposed in most cases for clarity, consistency, or to remove redundant information within the 2010 Permit. These proposed changes are included in the following:

- Permit Table of Contents
- Permit Section 1.5, *Effects of Inaccuracies in Permit Application*
- Permit Section 1.8, *Definitions*
- Permit Section 1.9.8, *Inspection and Entry*
- Permit Section 1.9.14, *Other Noncompliance*
- Permit Section 1.10, *Information Repository*
- Permit Section 1.13, *Public Notification Via Electronic Mail (E-Mail)*
- Permit Section 1.16, Transfer of Land Ownership
- Permit Section 1.17.2, *Demolition Activities Update*
- Permit Section 2.4.7, *Waste Characterization Review*
- Permit Section 2.9, *Waste Minimization Program*
- Permit Section 2.12.2, *Facility Operating Record*
- Permit Section 3.5, *Management of Containers*
- Permit Section 3.12.1, *General Operating Conditions*
- Permit Section 3.14.2, *Retention Basin*
- Permit Section 3.14.3, *Subsurface Vapor Monitoring*
- Permit Section 11.1, *Corrective Action Requirements Under the Consent Order*
- Permit Section 11.2, *Corrective Action Requirements Under the Permit*
- Permit Section 11.3.1.1, *Notification of Detections*

- Permit Section 11.3.2, *Groundwater Monitoring Reporting*
- Permit Section 11.4.1.1, *Groundwater Cleanup Level for Perchlorate*
- Permit Section 11.10.2.7.i, *Groundwater Levels*
- Attachment A, *Technical Area Unit Descriptions*
- Attachment B, *Part A Application*
- Attachment C, *Waste Analysis Plan*
- Attachment D, *Contingency Plan*
- Attachment E, *Inspection Plan*
- Attachment F, *Personnel Training Plan*
- Attachment J, *Hazardous Waste Management Units*
- Attachment N, *Figures*

6.1 U.S. v. Curry

On July 20, 2017, the DOE and LANS (predecessor to Triad and N3B) submitted a Class 3 permit modification request to propose changes to the 2010 Permit that were agreed to under the terms of a Settlement Agreement dated April 17, 2017, resolving the Permittees' appeal of the 2010 Permit in *U.S. v. Curry*, DC NM Case No. 10-0125. This permit modification request is incorporated by reference into this renewal application and can be found at https://permalink.lanl.gov/object/tr?what=info:lanl-repo/eprr/ESHID-602518. As required by 40 CFR §270.42(c), the Permittees issued a public notice for a 60-day public comment period and conducted an informational public meeting on August 30, 2017. Permittees are requesting that the NMED approve these permit changes as part of this Permit Renewal Application. The Class 3 permit modification request, along with the administrative record (e.g., public notice, public comments, and public meeting) are incorporated by reference into this Permit Renewal Application, as referenced (LANL 2017).

Following is a summary of the proposed changes in the *U.S. v. Curry* Class 3 PMR sought for approval in this renewal application:

- Permit Section 1.4, *Effective of Permit*: revisions to provide information for the integration of corrective action in the 2016 Consent Order for regulated units at TA-54 MDAs G, H, and L.
- Permit Section 1.4.2.2, *Public Participation*: addition of language to this section related to public participation.
- Permit Section 1.8, *Definitions*: addition of definitions for the 2016 Consent Order and regulated units.
- Permit Section 1.9.1, *Duty to Comply*: addition of language related to delegation and assignment of the Permittees' responsibilities under the Permit.
- Permit Section 4.6, *TA-50 RLWTF:* deletion of permit text related to the regulation of RLWTF.
- Permit Section 9.1, *Introduction*: addition of language related to three categories of permitted units at the Facility.
- Permit Section 9.1.1, *Regulated Units*: addition of language related to the closure requirements for regulated units within MDAs G, H, and L.
- Permit Section 9.4, *Closure Requirements for Indoor and Outdoor Units*: addition of language related to closure requirements for indoor and outdoor permitted units.
- Attachment G, *Closure Plans*, Tables G.1 through G.30: deletion of text "low-level radioactive solid waste" under column "Waste Type."

- Attachment J, *Hazardous Waste Management Units*: deletion of text under Table J-1, *Active Portions of the Facility*, related to TA-54 MDA G, H, and L.

6.2 Other Permit Changes

This section includes a summary of the proposed changes to the 2010 Permit that are not otherwise discussed in the rest of the Permit Renewal Application. The Permittees' proposed changes are detailed within Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit*, and the appropriate supplements.

Most of the proposed changes within Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11*, fall under "other proposed permit changes" and include the following: minor changes to update the table of contents, removal of redundant information, updates to terminology, updates to current practices in place at the Facility, clarification of definitions and provisions for requirements such as the requirement to provide the NMED with copies of records during inspections, and the correction of typographical errors. Additional proposed changes to reporting requirement dates and waste minimization requirements are described herein and summarized in the table included as Appendix 1.

The Permittees propose to change the due dates for the annual reports required by Permit Section 1.9.14, *Other Noncompliance,* and Permit Section 2.9, *Waste Minimization Program*. The Permittees request that report due dates be moved to December 15 of each year due to several factors. The first is because data calls for information cannot be finalized until September 30 of each year due to the nature of the reports—that provides only 61 days for data gathering, drafting, finalizing, security review, and submittal. Additionally, there are now two contractors coordinating a single reporting deliverable, which typically requires more time for all parties to review the submittal. Lastly, the Thanksgiving holiday at the very end of the drafting and finalization window (e.g., the last weekend in November) results in complications for timely submittal to the NMED and subsequent placement in the Information Repository.

Proposed changes to Permit Section 1.10, *Information Repository*, include revision of the public notice requirements for the annual training to include the words "at least" before the 30-day requirement. The addition of the words "at least" provides flexibility for publishing the newspaper advertisements, because it is not possible for the five newspapers that are required to publish the advertisements to occur exactly 30 days before the scheduled training.

The Permittees propose a revision to the e-mail notification requirement included in Permit Section 1.13 *Public Notification Via Electronic Mail (E-Mail)*. The revision proposes a change to the deadline for completion of these e-mail notifications be increased to 15 days. This deadline better coincides with the deadline to place documents within the LANL Information Repository, as required by the 2010 Permit (10 days). Therefore, the e-notification deadline would fall after the deadline for placement in the Information Repository, rather than before, as it does now. The additional time will enable the Permittees to better coordinate placement of documents into the Information Repository, especially for submittals around holiday closures.

The Permittees propose a change to the frequency of reporting demolition activities at LANL. The proposed revisions reduce the reporting to twice yearly (biannually) to include a fiscal year notice (due September 30 every year) and an update to the annual notice (to be due March 30 every year).

Additional language is proposed to require a supplemental notice in the event that a demolition project is identified outside of the proposed reporting. Changes within this section are proposed based on reporting experience over the last several years that have identified few changes during current quarterly reporting. Occasional changes to the schedule that affect regular reporting would be more effectively managed through a supplemental notice.

Within Permit Section 2.4.7, *Waste Characterization Review,* Item (4) states that when re-characterization of a hazardous waste stream is needed because the Permittees are notified by a receiving offsite facility that characterization of a hazardous waste they obtained from the offsite facility does not match a pre-approved waste analysis certification or accompanying waste manifest or shipping paper, the Permittees must notify the NMED in writing within three days of their receipt of the notice of the discrepancy from a receiving facility. The Permittees propose this notification requirement be revised to be 15 days, as stipulated by the manifest discrepancy requirements at 40 CFR §264.72 to allow adequate time for the Permittees and the offsite facility to resolve the characterization issue, if necessary, and to draft a response and perform proper accuracy and security review for the notification. The regulation specifically states that manifest discrepancies be resolved within 15 days after the offsite facility receives the waste before requiring that a report be made to the regulatory agency. Per the regulation, differences in discrepancy type that can be resolved include the potential for inspection or analysis of the waste [40 CFR §264.72(b)]. Resolution of the discrepancy may entail repeated or additional waste analysis before determining that there is a characterization basis for the discrepancy or a final resolution. In addition, the 40 CFR §264.13(a)(3) waste analysis requirements include the need for repeat analysis of a waste stream following the offsite receiving facility's notification, but there is no minimum timeframe given at that regulatory citation. The current three-day notification provision prevents the Permittees from being allowed to resolve the discrepancy before notifying the NMED. Documentation of the actions resulting from such a notice will also be available, as required by the Facility Operating Record. Additionally, this Permit Section is particularly difficult to comply with at LANL because of the size and number of waste-generating organizations at the Facility. Often, notifications of characterization discrepancies of a waste stream are received from the offsite receiving facility via informal means (e-mail) to individuals, rather than facility liaison groups that can facilitate the notification to NMED.

The change proposed within Section 2.12.2, *Facility Operating Record:* correct a typographical error to a regulation citation.

Editorial updates are proposed to the text within Permit Section 3.14.3, *Subsurface Vapor Monitoring*, to aid in the clarification associated with the intent of the soil vapor monitoring conducted under the provisions of the Permit.

Several permit revisions are proposed to align the 2010 Permit with the 2016 Consent Order (New Mexico 2016). These proposed revisions occur in the following sections of the 2010 Permit:

- Permit Section 1.16, *Transfer of Land Ownership*
- Permit Section 3.14.3, *Subsurface Vapor Monitoring*
- Permit Section 11.1, *Corrective Action Requirements Under the Consent Order*
- Permit Section 11.2, *Corrective Action Requirements Under the Permit*
- Permit Section 11.3.1.1, *Notification of Detections*

- Permit Section 11.3.2, *Groundwater Monitoring Reporting*
- Permit Section 11.4.1.1, *Groundwater Cleanup Level for Perchlorate*

An update to Permit Section 11.10.2.7.i, *Groundwater Levels*, is proposed to change the length of the groundwater sampling period. This change was made related to the first Triennial Review (2018) findings; in accordance with the January 2016 Settlement Agreement and Stipulated Final Order, which found an inconsistency between the Permit which required a 14-day sampling period, whereas the IFGMP required a 21-day period. Groundwater corrective actions are being conducted in accordance with 2016 Consent Order Section XII, Groundwater Monitoring. Consistent with this, all monitoring wells within a watershed or area-specific monitoring group are sampled with 21 days of the start of the groundwater sampling event. This 21-day timeframe is necessary because of the number of monitoring locations in many of the monitoring groups.

Proposed revisions throughout Permit Attachment A, *Technical Area Unit Descriptions,* are included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*. The Permittees propose to update the section numbering and references to accommodate the proposed addition of open burning and open detonation sections. The Permittees propose correction of typographical errors within Permit Attachment A, including correction of the title of the attachment. Proposed changes also include formatting headings and section numbering consistency. Other proposed revisions to the attachment include removal of redundant information that may be inconsistent or that may not be complete when compared to the other instances within the 2010 Permit, where text regarding equipment, specific requirements, or information resides. Proposed updates to the description of security and access at Technical Area 50, Building 69, to remove information that is no longer relevant to the units that remain within the area. The information regarding TA-50 is based on outdated information originally included within a permit application that proposed permitting more units at Technical Area 50, which were subsequently closed. Additionally, the unit descriptions for units located at Technical Area 55 have been updated. Grammatical and formatting edits proposed within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions* are all reflected in the redline document, but may not be specifically highlighted in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit*, because formatting changes are difficult to highlight in table format. Additionally, grammatical and consistency changes may provide unnecessary clutter in the summary table.

Proposed changes to Permit Attachment B, *Part A Application*, have not been highlighted in this Permit Renewal Application because they are included in the concurrent submittal of the LANL General Part A Permit Application, Revision 10.0 (LANL 2020a). No substantive changes have been proposed to the form. Updates to the form include signatory name changes and environmental permit listing updates.

As described in Sections 2.2, 4.2, and 5.2 of this Permit Renewal Application proposed changes to Permit Attachment C, *Waste Analysis Plan*, are summarized in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit,* and included in Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*. Major updates to the plan include the addition of hazardous waste management units proposed for permitting. All other changes to the attachment are to improve consistency within the plan, remove outdated or redundant information, update terminology, remove acronyms and abbreviations, and organize tables in a consistent manner. Grammatical and formatting edits proposed within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan* are all reflected in the redline document, but may not be specifically highlighted in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit*, because formatting changes are difficult to highlight in table format. Additionally, grammatical and consistency changes may provide unnecessary clutter in the summary table.

Changes to Permit Attachment D, *Contingency Plan*, are described in Sections 2.6, 4.6, and 5.6 of this Permit Renewal Application and are included as Supplement 1-4, *Permittees' Proposed Changes to Permit Attachment D, Contingency Plan.* Changes are associated with hazardous waste management units that are proposed to be added to the 2010 Permit, general rearrangement of the plan, updating terminology associated with emergency preparedness activities, and organizational changes to facilitate implementation, provide clarity, and remove redundant information. Grammatical and formatting edits proposed within Supplement 1-4, *Permittees' Proposed Changes to Permit Attachment D, Contingency Plan*, are all reflected in the redline document, but may not be specifically highlighted in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit*, because formatting changes are difficult to highlight in table format. Additionally, grammatical and consistency changes may provide unnecessary clutter in the summary table.

Sections 2.4, 4.4, and 5.4 of this Permit Renewal Application discuss the changes summarized in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit,* and included as Supplement 1-5, *Permittees' Proposed Changes to Permit Attachment E, Inspection Plan*. Proposed changes include adding open burning and open detonation unit inspection requirements, as well as making updates to the arrangement of the inspection plan and the inspection forms.

Changes to Permit Attachment F, *Personnel Training*, are included as Supplement 1-6, *Permittees' Proposed Changes to Attachment F, Personnel Training Plan*. The Permittees propose updates to the plan to improve the quality of the document, correct inconsistencies, and update language to reflect multiple contractors and consolidate repetition within the plan.

Proposed changes within Attachment J, *Hazardous Waste Management Units,* are summarized in Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit,* and are detailed in Supplement 1-7, *Permittees' Proposed Changes to Attachment J, Hazardous Waste Management Units*. These changes propose to remove reference to interim status units, remove descriptions of units that are no longer valid, make changes as described in Section 6.1 above, and correct a typographical error.

The Permittees propose changes to Attachment N, *Figures,* including the consolidation of duplicative figures, updating outdated figures, and moving a figure to Permit Attachment D, *Contingency Plan,* where it is more appropriately placed. Proposed changes are summarized in the Attachment N portion of Appendix 1, *Summary Table of Proposed Changes to the 2010 Los Alamos National Laboratory Hazardous Waste Facility Permit,* and are included in Supplement 1-8, *Permittees' Proposed Changes to Attachment N, Figures*. Necessary proposed text changes to the 2010 Permit are included in Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1-11*; Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*; and Supplement 1-4, *Permittees' Proposed Changes to Permit Attachment D, Contingency Plan.* Text changes are necessary within the following sections:

- Permit Section 2.5, *Security*
- Permit Section 2.8, *Special Requirements for Ignitable, Reactive, or Incompatible Waste*
- Permit Section 3.14.1, *General Operating Conditions*
- Permit Section 3.14.3, *Subsurface Vapor Monitoring*
- Permit Attachment Section A.1.1, *TA-3 Building 29*
- Permit Attachment Section A.1.1.1, *TA-3-29 Room 9010*
- Permit Attachment Section A.1.1.3, *TA-3-29 Portion of Room 9030*
- Permit Attachment Section A.5, *TA-50*
- Permit Attachment Section A.5.1, *TA-50-69 Indoor Permitted Unit*
- Permit Attachment Section A.5.2, *TA-50-69 Outdoor Permitted Unit*
- Permit Attachment Section A.5.3, *Security and Access*
- Permit Attachment Section A.6, *TA-54*
- Permit Attachment Section A.6.1, *Area L*
- Permit Attachment Section A.6.1.1, *Storage Dome 215*
- Permit Attachment Section A.6.1.2, *Storage Sheds 68, 69, and 70*
- Permit Attachment Section A.6.1.3, *Storage Shed 31*
- Permit Attachment Section A.6.1.4, *TA-54-32*
- Permit Attachment Section A.6.1.5, *TA-54-35*
- Permit Attachment Section A.6.1.6, *TA-54-36*
- Permit Attachment Section A.6.1.7, *TA-54-58*
- Permit Attachment Section A.6.1.8, *TA-54-39 and Containment Pad*
- Permit Attachment Section A.6.2, *Area G*
- Permit Attachment Section A.6.2.1, *Pad 9*
- Permit Attachment Section A.6.2.2, *Pad 1*
- Permit Attachment Section A.6.2.3, *Pad 3*
- Permit Attachment Section A.6.3, *TA-54 West*
- Permit Attachment Section A.6.3.1, *TA-54 West Building (RANT, Radioactive Assay Nondestructive Testing)*
- Permit Attachment Section A.6.3.2, *TA-54 West Outdoor Pad*
- Permit Attachment Section A.6.4, *Security and Access Control*
- Permit Attachment Section A.7, *TA-55*
- Permit Attachment Section A.7.8, *Outdoor Storage Pad*
- Permit Attachment Section A.7.9, *TA-55-0355 Pad*
- Permit Attachment Section A.7.12, *Security and Access Control*
- Permit Attachment Section A.8, *TA-63*
- Permit Attachment Section A.8.1, *Concrete Pad*
- Permit Attachment Section A.8.10, *Subsurface Vapor Monitoring*
- Permit Attachment Section D.1.6.2, *Emergency Facilities at Los Alamos National Laboratory*

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8.0 CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

WILLIAM MAIRSON (Affiliate) Digitally signed by WILLIAM MAIRSON (Affiliate) Date: 2021.07.19 10:12:57 -06'00' FOR

7/19/21

Michael W. Hazen
Associate Laboratory Director
Environment, Safety, Health, Quality, Safeguards, and Security
Triad National Security, LLC
Operator

Date Signed

Kimberly D. Lebak Digitally signed by Kimberly D. Lebak Date: 2021.07.14 15:21:28 -06'00'

7/14/21

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National Nuclear Security Administration
U.S. Department of Energy
Owner/Operator

Date Signed

Stephen G. Hoffman Digitally signed by Stephen G. Hoffman Date: 2021.07.14 17:55:58 -06'00'

7/14/21

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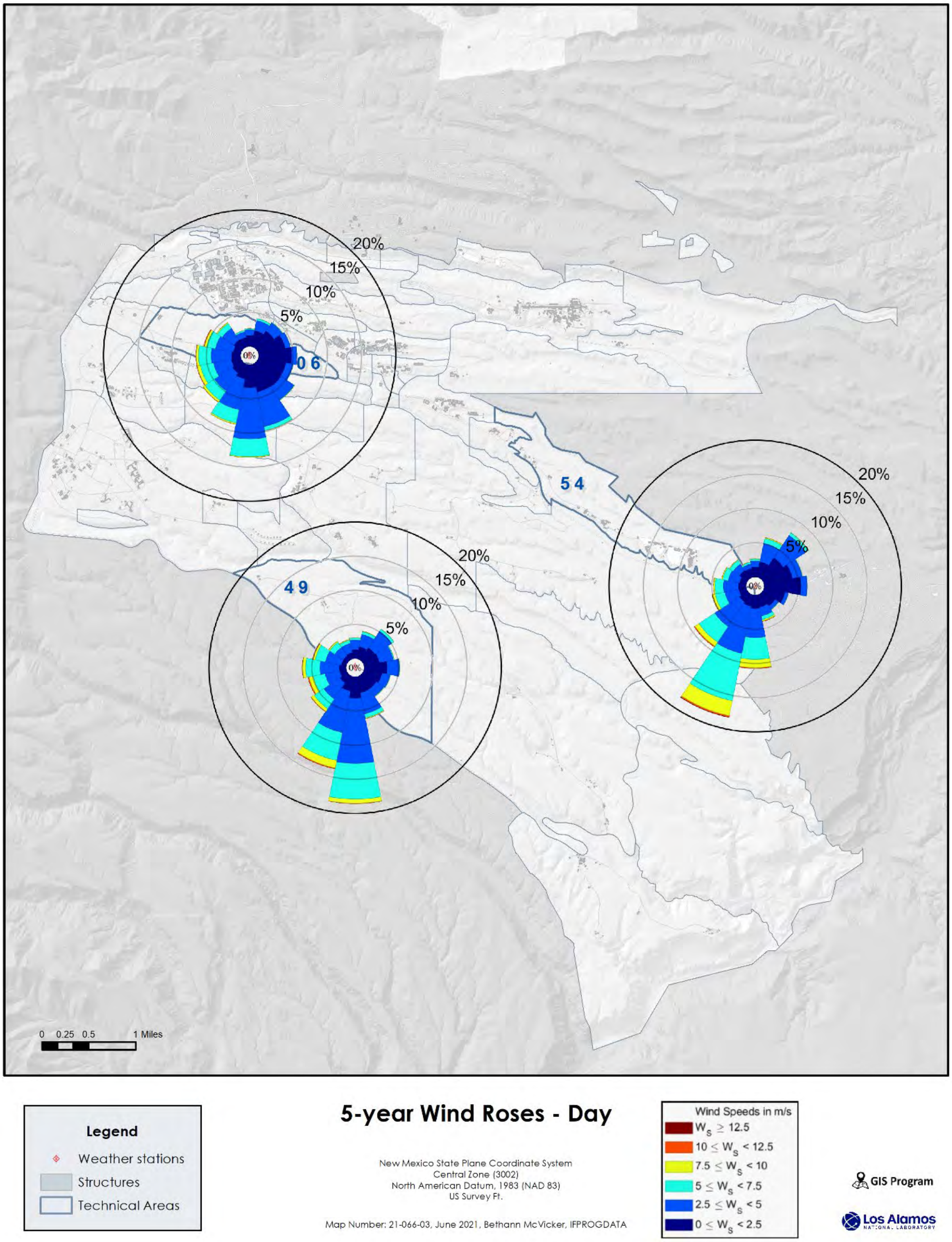
U.S. Department of Energy
Owner/Operator

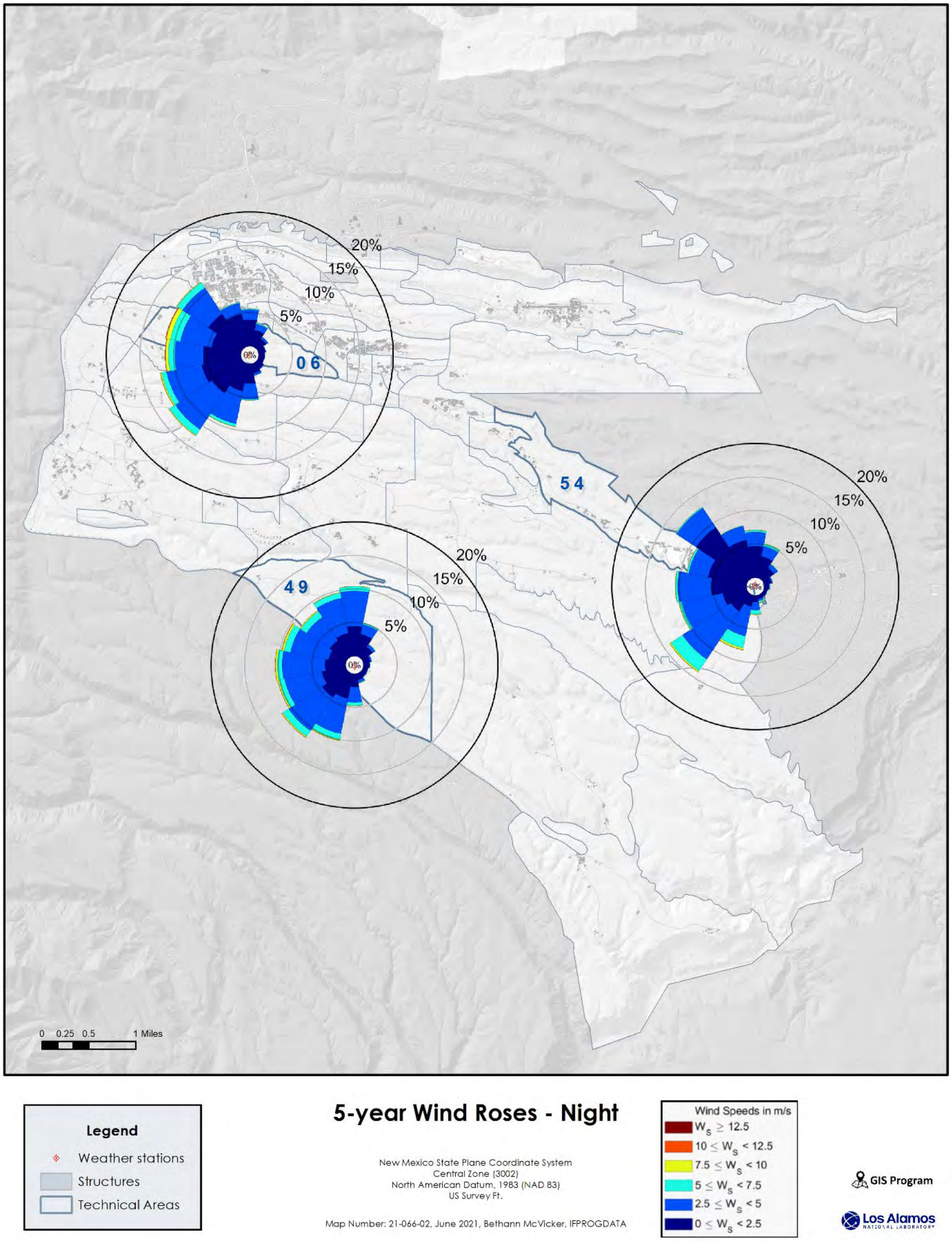
Date Signed

Attachment 5

5-Year Averaged Wind Roses for Day and Night at LANL (2016-2020)



5-Year Averaged Wind Roses – Day (2016 – 2020)



5-Year Averaged Wind Roses – Night (2016 – 2020)

Attachment 6

Revised Supplement 1-1, Permittees' Proposed Changes to Permit Parts 1-11

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Table 1.2.1. List of Hazardous Waste Management Units and Co-Operators

Location	**Type of Permitted Unit**	**Owner/Co-operator**
TA-3	Storage and Treatment	DOE/Triad
TA-14	Interim Status Open Burning/Open Detonation	DOE/Triad
TA-16	~~Interim Status~~ Open Burning	DOE/Triad
TA-36	~~Interim Status~~ Open Det~~n~~ona~~ati~~ion	DOE/Triad
TA-39	~~Interim Status~~ Open Deton~~ot~~ation	DOE/Triad
TA-50	Storage and Treatment	DOE/Triad
TA-55	Storage and Treatment	DOE/Triad
TA-63	Storage and Treatment	DOE/Triad
TA-54-38 West	Storage and Treatment	DOE/Triad
TA-54 Areas G, H and L	Storage, Treatment and Disposal (Including Units Undergoing Closure)	DOE/N3B

1.3 CITATIONS

Whenever this Permit incorporates by reference a provision of the 20.4.1 NMAC or Title 40 CFR, the Permit shall be deemed to incorporate the citation by reference, including all subordinate provisions of the cited provision, and make binding the full text of the cited provision.

Hazardous waste management regulations are cited throughout this Permit. The federal Hazardous Waste Management Regulations, 40 CFR Parts 260 through 273, are generally cited rather than the New Mexico Hazardous Waste Management Regulations, 20.4.1 NMAC. The federal regulations are cited because only the federal regulations set forth the detailed regulatory requirements; the State regulations incorporate by reference, with certain exceptions, the federal regulations in their entirety. Citing only the federal regulations also serves to avoid encumbering each citation with references to two sets of regulations. However, it is the State regulations that are legally applicable and enforceable. Therefore, for the purpose of this Permit, and enforcement of its terms and conditions, all references to provisions of federal regulations that have been incorporated into the State regulations shall be deemed to include the State incorporation of those provisions.

1.4 EFFECT OF PERMIT

As to those activities specifically authorized or otherwise specifically addressed under this Permit, compliance with this Permit during its term shall constitute compliance, for purposes of enforcement, with Subtitle C of RCRA and the HWA, and the implementing regulations at 40 CFR Parts 264, 266, and 268 except for those requirements that become effective by statute after the Permit has been issued (*see* 40 CFR § 270.4).

Compliance with this Permit shall not constitute a defense to any order issued or any action brought under: §§ 74-4-10, 74-4-10.1, or 74-4-13 of the HWA; §§ 3008(a), 3008(h), 3013, 7002(a)(1)(B), or 7003 of RCRA; §§ 104, 106(a), or 107, of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §§ 9601 to 9675; or any other federal, state or local law providing for protection of public health or the environment.

This Permit does not convey any property rights of any sort or any exclusive privilege, nor authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local laws or regulations. Compliance with this Permit does not relieve Permittees from the responsibility of complying with all applicable state or federal laws and regulations (*see* 40 CFR §§ 270.4, 270.30(g) and 270.32(b)(1)).

1.4.1 Effect of this Permit on Interim Status Units

~~For~~ The Permittees have submitted a revised closure plan for the interim status units listed in Table J-1 that the Permittees have determined to close ~~do not choose to operate, the Permittees shall submit to the Department within 180 days of the effective date of this Permit either a notice of intent to close in accordance with a current closure plan, or a revised closure plan~~. These documents ~~shall~~ indicate that the closure of these interim status units shall be initiated in accordance with 40 CFR § 265.113(a) no later than 270 days after the approval of the individual plan.

1.4.2 Integration with Consent Order

1.4.2.1 MDAs G, H, and L

The Consent Order requires the Permittees to conduct corrective action for releases of hazardous waste, hazardous waste constituents, and contaminants as defined in Section III of the Consent Order, at all solid waste management units (SWMUs) and Areas of Concern (AOCs) to fulfill, among other requirements, the requirements of 40 CFR § 264.101. TA-54 Material Disposal Areas (MDAs) G, H, and L, in their entirety, are undergoing corrective action under the Consent Order. The Department has determined that all corrective action for releases of hazardous waste and hazardous constituents from the "regulated units" at MDAs G, H, and L will be conducted solely under the Consent Order and not under this or any future Permit, with the exception of long-term monitoring and maintenance which will be conducted under a future modified permit. MDAs G, H, and L include land disposal units that meet the definition of regulated units as defined in 40 CFR § 264.90(a)(2). These regulated units are situated among SWMUs or AOCs. Investigations performed under the Consent Order have found that releases have occurred at MDAs G, H, and L and that both SWMUs and regulated units have likely contributed to these releases. These regulated units meet the conditions in 40 CFR §§ 264.90(f) and

264.110(c) for the use of alternative requirements under the Consent Order in place of the closure, groundwater monitoring, and post-closure requirements in 40 CFR Part 264, Subparts F and G.

The Permittees shall propose remedies in the Corrective Measures Evaluation Report under the Consent Order that achieve compliance with the closure performance standards at 40 CFR § 264.111. Fulfilling the requirements of the approved Corrective Measures Implementation Plan under the Consent Order shall also satisfy the requirements of 40 CFR Part 264, Subpart G.

1.4.2.2 Public Participation

Pursuant to Consent Order section XVII.B, statements of basis and remedies selected by the Department under Consent Order Section XVII associated with MDAs G, H, and L will follow the public participation requirements applicable to remedy selection under sections 20.4.1.900 NMAC incorporating 40 C.F.R § 270.41, 20.4.1.901 NMAC, 20.4.1.902 NMAC, and 20.1.4 NMAC. This will include a public comment period that extends for at least 60 days, and an opportunity for a public hearing on the remedy.

~~of the effective date of this Permit.~~

~~For the interim status units listed in Table J-1 that the Permittees propose to permit, the Permittees shall submit to the Department 180 days of the effective date of this Permit a permit modification request in accordance with 40 CFR § 270.42 that includes all applicable information required at 40 CFR §§ 270.10, 270.11, 270.14, and 270.23 for each unit.~~

1.5 EFFECT OF INACCURACIES IN PERMIT APPLICATION

This Permit is based on information submitted in the Permittees' Application. The Application has numerous iterations; however, this Permit is based on:

(1) the Part A Application dated ~~August 2018~~June 2020;

(2) the General Part B Permit Application dated August 2003;

(3) the TA-3-29 CMR Part B Application dated September 1999;

(4) the TA-50 Part B Permit Application dated August 2002;

(5) the TA-54 Part B Permit Application dated June 2003;

(6) the TA-55 Part B Permit Application dated September 2003; ~~and~~

(7) the TA-63 Permit Modification Request dated August 2011;~~.~~

(8) the Permit Modification Request for Open Detonation Units at TAs 36 and 39 (TA-36-8 & TA-39-6) dated July 2011;

(9) the Permit Modification Request for an Open Burning Unit at TA-16 dated September 2013;

(10) Request for Class 3 Permit Modification, Settlement Agreement Case No. 10-01251, Los Alamos National Laboratory Hazardous Waste Facility Permit, EPA I.D. #NM0890010515 (NA/LA, EM/LA) dated July 2017; and

(11) the Los Alamos National Laboratory Part B Permit Application for Renewal of the LANL Hazardous Waste Facility Permit dated June 2020.

Any inaccuracies found in the Application may be grounds for the termination, revocation and re-issuance, or modification of the Permit in accordance with 40 CFR §§ 270.41 through 270.43, which are incorporated herein by reference, and for enforcement action.

The Permittees shall inform the Department of any deviation from, or changes in, the information contained in the Application that would affect the Permittees' ability to comply with this Permit. Upon knowledge of such deviations, the Permittees shall, within 30 days, provide this information in writing to the Department in accordance with Permit Sections 1.9.14 and 1.9.15 and 40 CFR §§ 270.30(l)(11) and 270.43(a)(2), which are incorporated herein by reference.

1.6 PERMIT ACTIONS

1.6.1 Duration of Permit

This Permit shall be effective for a fixed term of ten years from its effective date. The effective date of this Permit shall be 30 days after notice of the Department's decision has been served on the Permittees or such later time as the Department may specify (*see* 40 CFR § 270.50(a)).

1.6.2 Permit Modification

This Permit may be modified for both routine and significant changes as specified in 40 CFR §§ 270.41 through 270.43, and any modification shall conform to the requirements specified in these regulations. The filing of a permit modification request by the Permittees, or the notification by the Permittees of planned changes or anticipated noncompliance, does not stay the applicability or enforceability of any permit condition (*see* 40 CFR § 270.30(f)).

1.8 DEFINITIONS

Terms used in this Permit shall have the same meanings as those in the HWA, RCRA, and their implementing regulations unless this Permit specifically provides otherwise. Where a term is not defined in the HWA, RCRA, implementing regulations, or this Permit, the meaning of the term shall be determined by a standard dictionary reference, EPA guidelines or publications, or the generally accepted scientific or industrial meaning of the term.

Acceptable Knowledge is defined at Permit Attachment C (*Waste Analysis Plan*), Section C.3.1.1.

Active Portion means that portion of a facility where treatment, storage, or disposal operations are being or have been conducted after the effective date of 40 CFR Part 261 and which is not a closed portion as defined in 40 CFR § 260.10.

Aquifer means a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells or springs.

Area of Concern (AOC) means any area that may have had a release of hazardous waste or hazardous constituents, which is not from a solid waste management unit.

Consent Order means the June 2016 ~~March 1, 2005~~ Compliance Order on Consent (as modified) issued to the ~~Permittees~~ DOE pursuant to the HWA and the New Mexico Solid Waste Act requiring the ~~Permittees~~ DOE to conduct Facility-wide investigations and cleanups of contaminants released to the environment.

Day means a calendar day unless otherwise specified. Business day means Monday through Friday, other than a federal or State legal holiday.

Department means the New Mexico Environment Department and any successor and predecessor agencies.

Discharge means the accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous waste into or on any land or water.

Disposal means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwaters.

Disposal Unit means any unit at the Facility at which hazardous waste is intentionally placed into or on any land or water and at which waste will remain after closure. The term disposal unit does not include corrective action management units into which remediation wastes are placed.

mixing hazardous waste constituents in the same area. A container alone does not constitute a unit; the unit includes containers and the land or pad upon which they are placed. At the Facility, hazardous waste management units include both permitted units and interim status units.

Interim Status Unit means any hazardous waste management unit that was in operation before the effective date of the statutory or regulatory amendments that caused the unit to become subject to permitting requirements, that meets the requirements for interim status under § 3005(e) of RCRA, 42 U.S.C. § 6925(e), for which interim status has not been terminated pursuant to section 3005(e)(2) of RCRA, 42 U.S.C. § 6925(e)(2), and that has not been issued a permit by EPA or the Department.

Land Disposal means placement of waste in or on the land, except in a corrective action management unit or staging pile, and includes without limitation, placement in a landfill such as a pit or a trench, surface impoundment, waste pile, or land treatment facility, or placement in a concrete vault or a shaft intended for disposal purposes.

Macroencapsulation is an EPA-approved immobilization technology that includes the application of surface coating materials such as polymeric organics (e.g., resins and plastics) or use of a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media. The encapsulating material must completely encapsulate debris and be resistant to degradation by the debris and its contaminants and materials into which it may come into contact after placement (leachate, other waste, microbes).

Off-Site Waste means any hazardous waste transported to the Facility from off-site but does not include intra-Facility waste.

Partial Closure means the closure of a portion of a permitted hazardous waste management unit, in accordance with the applicable closure requirements of 40 CFR Part 264 at a facility that contains other active hazardous waste management units.

Permit means this document including all attachments hereto and all modifications to the Permit.

Permitted Unit means a hazardous waste management unit: 1) that is not an interim status unit; and 2) that is authorized by this Permit and listed in Attachment J (*Hazardous Waste Management Units*), Table J-1 (*Active Portion of the Facility*), or Table J-2 (*Permitted Units Undergoing Post-Closure Care*).

Regulated Unit means a surface impoundment, waste pile, land treatment unit, or landfill that accepted hazardous waste after July 26, 1982 (*see* 40 CFR 264.90(a)(2)).

Release means any accidental or intentional spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, or dumping of any hazardous waste or hazardous constituents inside a permitted unit or from a permitted unit to the environment, including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous waste or hazardous constituents.

Representative Sample means a sample of a universe or whole (*e.g.*, waste pile, lagoon, groundwater) which can be expected to exhibit the average properties of the universe or whole.

Secretary means the Secretary of the New Mexico Environment Department or his or her designee.

Solid Waste Management Unit (SWMU) means any discernable unit at which solid waste has been placed at any time and from which the Department determines there may be a risk of a release of hazardous waste or hazardous waste constituents, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at the Facility at which solid wastes have been routinely and systematically released; they do not include one-time spills (*see* 61 Fed. Reg. 19431, 19442-43 (May 1, 1996)).

Storage means the holding of hazardous waste for a temporary period, at the end of which the waste is treated, disposed of, or stored elsewhere.

Transuranic (TRU) Waste means waste of more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: 1) high-level radioactive waste; 2) waste that the DOE Secretary has determined, with the concurrence of the EPA Administrator, does not need the degree of isolation required by the disposal regulations; or 3) waste that the Nuclear Regulatory Commission (NRC) has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61 (*see* Pub. L. 102-579, § 2(18) (1992)).

Waste Stream means each waste material generated from a single process or from an activity that is similar in the materials from which it was generated, similar in its physical form and hazardous constituents, and distinguishable from other wastes by EPA Hazardous Waste Numbers ~~and~~ or Land Disposal Restriction (LDR) status.

1.9 DUTIES AND REQUIREMENTS

1.9.1 Duty to Comply

The Permittees shall comply with all applicable conditions in this Permit except to the extent and for the duration such noncompliance is authorized in a temporary emergency permit pursuant to 40 CFR § 270.61. Any Permit noncompliance, except under the terms of an emergency permit, constitutes a violation of the HWA and RCRA and is grounds for enforcement or other Department action and may subject the Permittees to an administrative or civil enforcement action, including civil penalties and injunctive relief, as provided in Permit Section 1.9.2, or permit modification, suspension, termination, or revocation, or denial of a permit application or modification request under § 74-4-4.2 of the HWA and 40 CFR §§ 270.41 and 270.43.

~~No delegation or assignment of the Permittees' responsibilities under this permit can be made to any person or entity, including a separately organized agency, without the expressed permission of the Department; this prohibition does not preclude the Permittees' use of contractors for remediation.~~

~~The Permittees shall not allow any person or entity which currently exists or may be created, including a separately organized agency, to interfere with the performance of their obligations or responsibilities under this Permit.~~

1.9.2 Enforcement

Any violation of a condition in this Permit may subject the Permittees or their officers, employees, successors, and assigns to:

1) a compliance order under § 74-4-10 of the HWA or § 3008(a) of RCRA (42 U.S.C. § 6928(a));
2) an injunction under § 74-4-10 of the HWA or § 3008(a) of RCRA (42 U.S.C. § 6928(a)), or § 7002(a) of RCRA (42 U.S.C. § 6972(a));
3) civil penalties under § 74-4-10 of the HWA or §§ 3008(a) and (g) of RCRA (42 U.S.C. §§ 6928(a) and (g)), or § 7002(a) of RCRA (42 U.S.C. § 6972(a));
4) criminal penalties under § 74-4-11 of the HWA or §§ 3008(d), (e), and (f) of RCRA (42 U.S.C. §§ 6928(d), (e), and (f)); or
5) some combination of the foregoing.

The list of authorities in this paragraph is not exhaustive and the Department reserves the right to take any action authorized by law to enforce the requirements of this Permit.

1.9.3 Transfer of Permit

The Permittees shall not transfer this Permit to any person except after prior written approval of the Department. The Department will require modification or revocation and re-issuance of the Permit, as specified in 40 CFR §§ 270.40(b) and 270.41(b)(2), to identify the new Permittees and incorporate other applicable requirements under the HWA, RCRA, and their implementing regulations. The prospective new Permittee shall file a disclosure statement with the Department, if applicable and as specified at § 74-4-4.7 of the HWA, prior to modification or revocation and re-issuance of the Permit.

Before transferring ownership or operation of the Facility (or portions thereof), the Permittees shall notify the new owner and operator in writing of all applicable requirements of this Permit and 40 CFR §§ 264.12(c) and 270.30(l)(3), which are incorporated herein by reference.

1.9.8 Inspection and Entry

The Permittees shall allow authorized representatives of the Department, upon the presentation of credentials and at reasonable times, and under the conditions of this Permit, to:

(1) enter upon the Permittees' premises where the permitted unit or activity is located or conducted or where records must be kept;

(2) have access to and photograph any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required;

(3) inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required;

(4) have access to, and copy, at reasonable times, any records that must be kept; and

(5) sample or monitor, for the purposes of ensuring Permit compliance or as otherwise authorized by the HWA or RCRA, any substances or parameters at any location.

(*see* 40 CFR § 270.30(i))

In the event that the Permittees are not able to immediately provide inspection and entry as identified above in Permit Section 1.9.8(1) through (5) ~~that entry, access, or the ability to photograph or sample is not immediately available~~ due to security or safety restrictions, the Permittees shall provide needed inspection and entry, ~~photographs, or samples~~ as soon as reasonably possible.

1.9.9 Sampling and Records

1.9.9.1 Representative Sampling

All samples and measurements taken by the Permittees under any condition in this Permit shall be representative of the medium, waste, or other material being sampled. To obtain a representative waste sample, the Permittees shall use an appropriate method from 40 CFR Part 261, Appendix I or an equivalent method approved by the Department. Laboratory methods must be those specified in the most current edition of *Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW-846)*, or an equivalent method, as specified in Attachment C (*Waste Analysis Plan*) and Permit Section 2.4.

1.9.10 Reporting Planned Changes

The Permittees shall give advance written notice to the Department as soon as possible, of any planned physical alterations or additions to any permitted unit at the Facility (*see* 40 CFR § 270.30(l)(1)).

1.9.14 Other Noncompliance

The Permittees shall report all instances of noncompliance not reported under Permit Section 1.9.11. This report shall be submitted to the Department annually by December 15 for the year ending the previous September 30. These reports shall contain the information listed in Permit Section 1.9.12.2 and 40 CFR § 270.30(1)(10), which is incorporated herein by reference. The Permittees shall notify the Department in writing if there were no instances of noncompliance during the reporting period. This notice shall be submitted to the Department by December 15 for the year ending the previous September 30.

1.9.15 Omissions or Misstatements in Applications or Other Reports

Whenever the Permittees become aware that they have failed to submit any relevant facts in a permit application, or have submitted incorrect information in a permit application or a report to the Department, the Permittees shall promptly report such facts or information in compliance with 40 CFR § 270.30(1)(11), which is incorporated herein by reference.

1.9.16 Signatory requirement

Solely for their respective permitted units, the Permittees shall sign and certify all applications, reports, or information submitted to the Department and required by this Permit in compliance with 40 CFR §§ 270.11 and 270.30(k), which are incorporated herein by reference.

1.9.17 Submissions to the New Mexico Environment Department

The Permittees shall submit all written reports, notifications, or other submissions required by this Permit to be submitted to the Department by certified mail or hand-delivery to:

Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6303

The Permittees shall ensure that any notice, deliverable, or other requirement that under the terms of this Permit would be due on a Saturday, Sunday, or a state or federal holiday shall be due the first business day following the Saturday, Sunday, or state or federal holiday.

1.9.18 Approval of Submittals

All documents that the Permittees prepare under the terms of this Permit and submit to the Department that are subject to the requirements of 20.4.2 NMAC shall be subject to the procedures set forth therein. Documents requiring Department approval that are not subject to the requirements of 20.4.2 NMAC may be reviewed and approved, approved with modifications or directions, disapproved, denied, or rejected by the Department.

Upon the Department's written approval, all submittals and associated schedules shall become enforceable as part of this Permit in accordance with the terms of the Department's written approval, and such documents, as approved, shall control over any contrary or conflicting requirements of this Permit. This provision does not affect any public process that is otherwise required by this Permit, the HWA, or its implementing regulations.

1.9.19 Extensions of Time

The Permittees may seek an extension of time in which to perform a requirement of this Permit, for good cause, by sending a written request for extension of time and proposed revised schedule to the Department. The request shall state the length of the requested extension and describe the basis for the request. The Department will respond in writing to any request for extension following receipt of the request. If the Department denies the request for extension, it will state the reasons for the denial.

The Permittees shall give notice by e-mail to persons on the e-mail notification list of all Department approved extensions of time in accordance with Permit Section 1.13.

1.9.20 Confidential Information

The Permittees may claim that any information required by this Permit or otherwise submitted to the Department is confidential pursuant to the provisions of §§ 74-4-4.3(D) and (F) of the HWA and 40 CFR §§ 260.2 and 270.12.

1.9.21 New or Modified Permitted Units

The Permittees may not treat or store hazardous waste at a new permitted unit or in a modified portion of an existing permitted unit except as provided in 40 CFR § 270.42 until the Permittees have complied with the requirements of 40 CFR §§ 270.30(l)(2)(i) and (ii).

1.10 INFORMATION REPOSITORY

The Permittees shall establish both an electronic Information Repository (IR) accessible through the internet on the Permittees' environmental web site and a physical IR containing paper documents. (S*ee* 40 CFR § 124.33(d))

The Permittees shall ensure that the electronic and physical IRs contain, unless specified otherwise, the following documents:

(1) The Permittees' Part A and Part B Permit Applications associated with the permit renewal;

(2) A link to this Permit as it appears on the Department's website (electronic IR only);

(3) Permit modification requests associated with this Permit submitted pursuant to 40 CFR § 270.42 and any associated Department responses;

(4) The Waste Minimization Report submitted pursuant to Permit Section 2.9;

(5) The Biennial Report submitted pursuant to Permit Section 2.12.5;

(6) Corrective action documents submitted pursuant to Permit Part 11;

(7) Notices of deficiency or disapproval (NODs), NOD responses, final approval letters, and Department directions associated with the documents identified in Paragraphs 1, 3 and 6, above; and

(8) Notices of violation (NOV), administrative compliance orders, responses required by the Department, and Department directions associated with this Permit.

(*See* 40 CFR § 124.33(c))

Within 180 days of the effective date of this Permit, the Permittees shall establish the electronic IR, and inform the Department of the location, nature, and normal business hours of the physical IR. (*See* 40 CFR §§124.33 and 270.30(m))

The Permittees shall add new documents to the IR within ten days after the documents are submitted to, or received from, the Department. (*See* 40 CFR § 124.33(f))

The Permittees shall inform the public of the existence of each IR by the following methods:

(9) written notice to all individuals on the facility mailing list 30 days after the IR becomes operational;

(10) public notice in area newspapers, including the *Santa Fe New Mexican*, the *Journal North- Albuquerque Journal*, the *Rio Grande Sun*, the *Taos News*, and the *Los Alamos Daily Post* when the IR becomes operational;

(11) continuous notice on the Permittees' environmental home page of the existence of the IRs; and

(12) in the public notice for any of the Permittees' requested permit modifications.

(*See* 40 CFR § 124.33(e))

The Permittees shall ensure that the electronic IR includes an electronic index of the documents contained in the IR that identifies each document by title, publication date, author, and any identification number, such as a Los Alamos Unrestricted Release

(LAUR) number. The Permittees shall ensure that all documents maintained in the electronic IR are searchable by title, date, author, identification number, and individual words and phrases, and that all such documents are printable.

The Permittees shall conduct annual training to inform inexperienced computer users of how they can access and utilize the electronic IR. The Permittees shall inform the public of this training at least 30 days prior to the training by methods specified in Permit Section 1.10(9) through (11). The Permittees shall document the training content and all efforts to inform the public in the Facility Operating Record.

1.10.1 PUBLIC ENVIRONMENTAL DATABASE

The Permittees shall provide data from environmental media (*i.e.*, soil, sediment, surface water, groundwater, air and biota) collected under this Permit and incorporated into LANL databases to the public database through updates on a no less than monthly basis.

1.11 GENERAL DOCUMENTS AND INFORMATION TO BE MAINTAINED AT THE FACILITY

The Permittees shall maintain at the Facility the following documents and all amendments, revisions, and modifications to these documents:

(1) this Permit, including all attachments;

(2) a topographic map as required by 40 CFR § 270.13(l) and this Permit;

(3) the Waste Analysis Plan as required by 40 CFR § 264.13(b) and this Permit;

(4) the Inspection Plan (*see* 40 CFR § 264.15(b)); and

(5) a copy of emergency response agreements including all Memorandums of Agreement, Memorandums of Understanding, and Mutual Aid Agreements.

The above-mentioned list is not intended to be exhaustive.

The Permittees shall maintain the documents referenced in this Permit Section in a paper or an electronic format acceptable to the Department.

1.12 COMMUNITY RELATIONS PLAN

The Permittees shall establish and implement a Community Relations Plan (CRP) to describe how the Permittees will keep communities and interested members of the public informed of Permit-related activities, including waste management, closure, post-closure, and corrective action (*see* 40 CFR § 270.32(b)(2)). The CRP shall explain how communities and interested members of the public can participate in Permit-related activities.

1.13 PUBLIC NOTIFICATION VIA ELECTRONIC MAIL (E-MAIL)

The Permittees shall notify individuals by e-mail of submittals as specified in this Permit. The Permittees shall maintain a list of individuals who have requested e-mail notification and send such notices to persons on that list. The notice shall be sent within ~~seven~~ fifteen days of the submittal date and shall include a direct link to the specific document to which it relates.

The Permittees shall provide a link on the internet on the Permittees' environmental home page (http://www.lanl.gov/environment) whereby members of the public may submit a request to be placed on the e-mail notification list. In the event that the environmental home page stops operation, the Permittees shall use their best efforts to fully restore the page and its operation as soon as possible.

1.14 DISPUTE RESOLUTION

In the event the Permittees disagree, in whole or in part, with a condition or disapproval of any submittal, the Permittees may seek dispute resolution.

1.14.1 Notice to the Department

To invoke dispute resolution, the Permittees shall notify the Department in writing within 30 days of receipt of the Department's approval with conditions or disapproval of a submittal. Such notice shall set forth the specific matters in dispute, the position the Permittees assert should be adopted, the basis for the Permittees' position, and any matters considered necessary for the Department's determination.

The Permittees shall give notice by e-mail to persons on the e-mail notification list of invocation of dispute resolution in accordance with Permit Section 1.13.

1.14.2 Agreement or Disagreement between Parties

The Department and the Permittees shall have 30 days from the Department's receipt of notification provided under Permit Section 1.14.1 to meet or confer to resolve any disagreement. In the event an agreement is reached, the Permittees shall comply with the terms of such agreement or, if appropriate, submit a revised submittal and implement the submittal in accordance with the agreement, including the schedule specified in the agreement.

1.14.3 Final Decision of the Department

If an agreement is not reached within the 30 day period, the Department will notify the Permittees in writing of its decision on the dispute, and the Permittees shall comply with the terms and conditions of the decision. Such a decision shall be the final decision of the Department Secretary resolving the dispute and shall be incorporated as an enforceable part of this Permit. The Permittees shall comply with the terms of such decision including any schedule specified in the decision.

1.14.4 Actions Not Affected by Dispute

With the exception of those conditions under dispute, the Permittees shall proceed to take any action required by those portions of the submission and of this Permit that the Department determines not to be affected by the dispute.

1.14.5 Available Remedies Reserved

If an agreement is not reached within the 30 day period, the Permittees may seek any available legal remedy, including judicial review of the matter. Whether a disputed decision is final for purposes of judicial review shall be determined according to established principles of administrative law.

1.15 COMPLIANCE SCHEDULE

The Permittees shall submit documents to the Department for its approval, or perform other actions required by this Permit, in accordance with the schedule provided in Attachment I (*Compliance Schedule*) (*see* 40 CFR § 270.33(a)). If the action is not itself the submittal of a written document, the Permittees shall submit to the Department a written notification of their compliance with the schedule no later than 14 days following the scheduled date.

The Permittees shall give notice by e-mail to persons on the e-mail notification list in accordance with Permit Section 1.13 of any such submittal or notification under this Permit Section (1.15) and Attachment I as established on the effective date of this Permit.

Schedules required to be submitted by the conditions of this Permit are, upon approval of the Department, incorporated into this Compliance Schedule by reference and become an enforceable condition of this Permit. Such schedules are not subject to e-mail notification requirements under Permit Section 1.13.

1.16 TRANSFER OF LAND OWNERSHIP

The provisions of this Permit Section shall apply to any transfer in fee of Facility property subject to the requirements of this Permit to another entity. ~~This Section does not apply to Facility property subject to requirements of Section III.Y of the Consent Order.~~

DOE shall not transfer any land without submitting a notice to the Department. DOE shall submit the notice at least 120 days prior to the proposed effective date of transfer. At a minimum, the notice shall include an update of the Facility boundaries, as indicated in Figures 1, 2, and 3 in Attachment N (*Figures)*, at an appropriate scale to fully illustrate the boundaries of the transferred property and the modified Facility boundary.

The list shall be accompanied by an attachment that shall describe the processes or conditions that may result in the presence of hazardous material in each building or fixed structure.

1.17.2 Demolition Activities Update

On or before ~~the last day of each quarter (December 31,~~ March 30 every year,~~, June 30, and September 30),~~ the Permittees shall update the list to include any additional buildings and fixed structures that may contain hazardous material scheduled for demolition, or shall notify the Department in writing that no such additional demolitions have been scheduled. In the event a demolition project is identified after the previous notice due date, but will occur prior to the next notice due date, Permittees shall submit a supplemental notice conforming to Section 1.17.1 not less than 30 days prior to demolition.~~.~~

1.17.3 Actions

Based on the list, the Department may identify in writing those buildings or fixed structures for which it requires notice.

If a demolition completion report is prepared for any building or fixed structure identified by the Department, the Permittees shall provide to the Department a copy of the report within 30 days after such final report is written.

auditable form in the Facility Operating Record. The Permittees shall assign a traceable identifier to this documentation to facilitate both access to this information and its verification by the Permittees and the Department.

2.4.4 Waste Received from Off-Site

If a hazardous waste stream is received at the Facility from an off-site facility identified at Permit Section 2.2.1, the Permittees shall obtain from the facility a detailed characterization of a representative sample of the waste. If acceptable knowledge is used for the waste characterization, the Permittees shall require the facility to provide all acceptable knowledge documentation used to characterize the waste stream (*see* 40 CFR § 270.32(b)(2)). In addition, the Permittees shall ensure that all applicable waste characterization requirements specified in Permit Section 2.4 have been met and documented.

The Permittees shall ensure that the waste matches the identity of the waste designated on the accompanying manifest or shipping paper. If discrepancies between the waste received from an off-site treatment facility and the information on the manifest are found, the Permittees shall comply with the requirements of 40 CFR § 264.72, which is incorporated herein by reference, to resolve the discrepancies.

2.4.5 Treatment-Derived Waste

The Permittees shall characterize treatment-derived wastes generated both on-site and off-site by determining whether the treatment residues meet the applicable treatment standard in accordance with 40 CFR § 268.7(b), which is incorporated herein by reference, unless the Permittees have documented that the purpose of the treatment process is not to attain the applicable treatment standard. The Permittees shall ensure adherence to notification and recordkeeping requirements specified at 40 CFR § 268.7(b)(3)(ii). If the waste remains a hazardous waste, the Permittees shall further characterize it in compliance with the applicable requirements of Permit Section 2.4.1.

2.4.6 Reserved

2.4.7 Waste Characterization Review

The Permittees shall ensure that the initial characterization of any hazardous waste stream managed under this Permit is reviewed or repeated to verify that the characterization is accurate and up to date (*see* 40 CFR § 264.13(b)(4)). The Permittees shall document this review in the Facility Operating Record.

The Permittees shall perform the following:

(1) Annually reevaluate all hazardous waste streams generated to verify the accuracy of initial and subsequent characterization results. The annual reevaluation shall

be required no later than one year from the date of initial characterization of the hazardous waste stream or one year from the last annual revaluation;

(2) Recharacterize hazardous wastes whenever there is a change in the waste-generating processes which includes a change in the status of the waste for purposes of Land Disposal Restrictions or when analytical results indicate a change in the waste stream;

(3) Annually verify the waste characterization of one percent of hazardous waste streams characterized solely by acceptable knowledge (*see* 40 CFR §§ 264.13(b)(4) and 270.32(b)(2)). Such waste characterization verification shall be performed by quantitative chemical analyses appropriate for the waste as specified in Attachment C (*Waste Analysis Plan*). The one percent of wastes whose characterization is to be verified shall be determined in relation to the total number of unique waste streams characterized solely by acceptable knowledge and managed at TA-54 in the previous calendar year. The waste streams whose characterization is to be verified shall be chosen without further bias and the selection procedure shall be documented in the Facility Operating Record. Wastes not required to undergo this annual verification and not to be counted toward the total number of wastes managed in the previous year include mixed transuranic wastes, hazardous debris, and hazardous wastes that are hazardous only because they are listed at 40 CFR Part 261, Subpart D; and

(4) Recharacterize a hazardous waste stream whenever the Permittees are notified by a receiving off-site facility that the characterization of a hazardous waste they obtained from the Permittees' Facility does not match a pre-approved waste analysis certification or accompanying waste manifest or shipping paper. The Permittees shall notify the Department in writing within ~~three~~ fifteen days of their receipt of the notice of the discrepancy from a receiving facility.

2.4.8 Waste Characterization for Compliance with RCRA Air Emission Requirements

The Permittees shall characterize hazardous wastes managed in containers and tanks to determine the average volatile organic compound (VOC) concentration relative to 500 parts per million by weight (ppmw) at the point of waste origination in compliance with 40 CFR Part 264, Subpart CC. The Permittees shall determine the average VOC concentration either by utilizing acceptable knowledge or by using the procedures specified in 40 CFR § 264.1083(a), which is incorporated herein by reference. The Permittees shall review and update this determination at least once every 12 months following the date of the initial determination in compliance with 40 CFR § 264.1082(c)(1), which is incorporated herein by reference.

specified in 40 CFR § 268.7(b)(3)(ii), *Treatment Facility Paperwork Requirements Table*, which is incorporated herein by reference.

The Permittees shall characterize treatment-derived wastes, including those wastes that are formerly characteristic and no longer hazardous or mixed waste, to determine whether the waste meets the applicable treatment standard specified at 40 CFR §§ 268.40, 268.45, 268.48, and 268.49, in compliance with 40 CFR § 268.7(b), which is incorporated herein by reference. Pursuant to 40 CFR § 268.7(b)(3)(ii), the Permittees shall characterize treatment-derived wastes to determine the presence of any constituents of concern for hazardous waste codes F001 through F005, F039, and the presence of underlying hazardous constituents in characteristic wastes as defined at 40 CFR § 268.2(i), which is incorporated herein by reference.

2.5 SECURITY

The Permittees shall prevent the unknowing entry and minimize the possibility for the unauthorized entry of persons or livestock onto the permitted units at the Facility (*see* 40 CFR § 264.14).

The Permittees shall ensure the permitted units' security by implementing the following measures:

(1) 24-hour surveillance system continuously monitoring and controlling entry into the permitted units at the Facility; or

(2) controlled entry into the permitted units at all times via gates, stations, or other means (*e.g.,* attendants, locks, prohibited or controlled roadway access).

The Permittees shall maintain and ensure the effectiveness of all security fences, entry gates, and entry stations surrounding the permitted units as specified in Figures 4 through 13~~0 and 55~~ in Attachment N (*Figures)*.

2.5.1 Warning Signs

The Permittees shall post bilingual warning signs (in English and Spanish) at all gates and perimeter fences, where present, around the permitted units (*see* 40 CFR § 264.14(c)). Signs shall be posted in sufficient numbers to be visible at all angles of approach as well as from a distance of at least 25 feet. The Permittees shall include on the signs the following or an equivalent warning:

DANGER – UNAUTHORIZED PERSONNEL KEEP OUT (PELIGRO – SE PROHIBE LA ENTRADA A PERSONAS NO AUTORIZADAS)

The Permittees shall post warning signs in the appropriate dialect of Tewa in a manner equivalent to the bilingual warning signs in English and Spanish along shared boundaries with the Facility's permitted units and the Pueblo of San Ildefonso (PO WHO GEH).

incorporated herein by reference, as well as the training requirements in Attachment F (*Personnel Training Plan*).

2.8 SPECIAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

The Permittees shall manage ignitable, reactive, and incompatible hazardous wastes in containers and tanks in compliance with the requirements of 40 CFR §§ 264.17, 264.176, 264.177, 264.198, and 264.199, which are incorporated herein by reference, and Permit Parts 3 and 4. The Permittees shall ensure that containers holding ignitable or reactive wastes are located at least 15 meters from the facility boundary defined as the technical area (TA) specific ~~boundary~~ boundaries identified in Figure~~s 11, 22, 24, and 38~~ 2 in Permit Attachment N (*Figures*). At TA-63, the Permittees shall ensure that containers holding ignitable or reactive waste are located at least 15 meters from the TWF fence line, as shown in Figure ~~55~~ 13 in Permit A~~a~~ttachment N (*Figures*) (*see* 40 CFR §§ 264.176 and 270.32(b)(2)).

The Permittees shall take precautions during the treatment or storage of ignitable or reactive waste, the mixing of incompatible waste, or the mixing of incompatible wastes and other materials to prevent reactions that could lead to or cause the following:

(1) generation of extreme heat, pressure, fire, explosions, or violent reactions;

(2) production of uncontrolled toxic mist, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;

(3) production of uncontrolled inflammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;

(4) damage to the structural integrity of the container, tank, permitted unit, or other structure associated with the permitted unit; and

(5) a threat to human health or the environment.

(*see* 40 CFR § 264.17(b))

2.8.1 Ignitable and Reactive Waste Precautions

The Permittees shall prevent accidental ignition or reaction of ignitable or reactive wastes by taking the following precautions:

(1) ensure there are no sources of open flames in, on, or around the container or tank;

(2) segregate and separate ignitable or reactive wastes and protect them from sources of ignition or reaction such as cutting and welding, frictional heat, sparks (*e.g.*, static, electrical, mechanical), spontaneous ignition, and radiant heat;

(3) maintain adequate clearance around fire hydrants at permitted units;

(4) use only non-sparking tools or non-sparking processes when managing hazardous waste containers that contain ignitable or reactive wastes;

(5) ensure appropriate lightning protection is provided for all storage and treatment units;

(6) perform ongoing inspection, testing, and maintenance of fire protection equipment to determine appropriate test criteria and preventative maintenance activities;

(7) confine smoking and open flames to designated areas that are a minimum of 50 feet from areas where ignitable or reactive wastes are handled;

(8) stack containers of ignitable and reactive wastes no more than 2 drums high to comply with the National Fire Protection Association's (NFPA) *Flammable and Combustible Liquids Code*; ~~and~~

(9) ensure that each permitted unit's fire suppression system is compatible with the hazardous waste being stored or treated at the permitted unit or that any waste containers stored within a unit that may hold waste incompatible with a fire suppression system discharge are stored in a manner that will prevent contact with fire suppression system discharges; and

(10) ensure "No Smoking" signs are conspicuously placed prior to entry at a permitted unit.

~~.~~

The Permittees shall assume that all drums with volume capacities between 55 and 110 gallons that hold mixed transuranic wastes and that are not vented, and standard waste boxes that hold mixed transuranic waste and are not vented, contain hydrogen gas and the associated wastes are subject to the conditions of this Permit Section (2.8.1).

2.8.2 Incompatible Waste Precautions

The Permittees shall ensure that a storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers must be separated from the other materials (or waste) or is protected from them by means of a dike, berm, wall, or other device not to include the container, in order to, in the event of leakage from containers under conditions normally incident to storage, prevent the commingling of the incompatible wastes or materials (*see* 40 CFR § 264.177(c)).

The Permittees shall ensure that incompatible wastes or materials are not stored within or on the same secondary containment structure.

The Permittees shall ensure that incompatible wastes or materials are not stored so that a release or spill of these wastes might commingle in a fire suppression water holding area or tank.

The Permittees shall ensure that all waste and materials are segregated and stored in accordance with the Department of Transportation's (DOT) compatibility groupings or classes contained in 49 CFR § 177.848 (*see* 40 CFR § 270.32(b)(2)).

The Permittees shall not store cyanides and cyanide mixtures or solutions with acids if a mixture of the materials could generate hydrogen cyanide. The Permittees shall not store Class 8 (corrosive) liquids above or adjacent to Class 4 (flammable) or Class 5 (oxidizing) wastes except when it is known that the mixture of the wastes could not cause a fire or a dangerous evolution of heat or gas.

The Permittees shall ensure that hazardous wastes are not placed in an unwashed container (*see* 40 CFR § 264.177(b)) or tank (*see* 40 CFR § 264.199(b)) that previously held an incompatible waste or material.

2.9 WASTE MINIMIZATION PROGRAM

The Permittees shall implement and maintain a waste minimization program to reduce the volume and toxicity of hazardous wastes generated at the Facility (*see* 40 CFR § 264.73(b)(9)). The waste minimization program shall include proposed, practicable methods of treatment and storage currently available to the Permittees to minimize the present and future threat to human health and the environment. The Waste Minimization Program shall include the following items:

(1) written policies or statements that outline goals, objectives, and methods for source reduction and recycling of hazardous waste at the Facility;

(2) employee training or incentive programs designed to identify and implement source reduction and recycling opportunities for all hazardous wastes;

(3) source reduction or recycling measures implemented in the last five years or planned for the next federal fiscal year;

(4) estimated dollar amounts of capital expenditures and operating costs devoted to source reduction and recycling of hazardous waste;

(5) factors which have prevented implementation of source reduction or recycling;

(6) summary of additional waste minimization efforts that could be implemented at the Facility that analyzes the potential for reducing the quantity and toxicity of each waste stream through production process changes, production reformulations, recycling, and all other appropriate means including an

assessment of the technical feasibility, cost, and potential waste reduction for each option;

(7) flow charts and/or tables summarizing all hazardous waste streams produced by the Facility by quantity, type, building or area, and program; and

(8) demonstration of the need to use those processes which produce a particular hazardous waste due to a lack of alternative processes, available technology, or available alternative processes that would produce less volume or less toxic waste.

The Permittees shall submit to the Department a report regarding progress made in the waste minimization program in the previous year. The report shall address items (1)-(8) above, shall show changes from the previous report, and shall be submitted annually by December 15 for the year ending the previous September 30.

2.10 PREPAREDNESS AND PREVENTION

The Permittees shall maintain and operate each permitted unit in a manner that minimizes the possibility of fire, explosion or any unplanned sudden or non-sudden release of hazardous waste or hazardous constituent to the air, soil, or surface water that could threaten human health or the environment (*see* 40 CFR § 264.31). In addition to the general preparedness and prevention requirements identified here, the Permittees shall comply with the TA-specific preparedness and prevention requirements and shall maintain the equipment identified in Attachment A (*Technical Area Unit Descriptions*) and Attachment D (*Contingency Plan)*.

2.10.1 Required Equipment

At a minimum, the Permittees shall maintain at the Facility and at each permitted unit the internal communication and alarm system devices, fire control equipment, spill control equipment, and decontamination equipment listed in the tables in Attachment A (*Technical Area Unit Descriptions*) and Attachment D (*Contingency Plan*) (*see* 40 CFR § 264.32(b)(2)). The Permittees shall ensure that any changes to the emergency equipment lists adhere to the permit modification requirements at 40 CFR §§ 270.41 through 270.43.

The Permittees shall maintain spill kits at each permitted container storage and tank unit as specified in Attachment D (*Contingency Plan*). These spill kits shall be capable of mitigating small containable spills of acidic, caustic, inflammable, and otherwise hazardous waste present at the unit. For larger spills, the Permittees shall have plugging and diking equipment, siphon pumps, and loaders readily available at the Facility.

The Permittees shall ensure that there is adequate water pressure and volume available to each permitted unit to provide for fire suppression (*see* 40 CFR § 264.32(d)).

The Permittees shall operate and maintain the area-wide environmental monitoring network as specified in Section D.7.3 of Attachment D (*Contingency Plan*).

At permitted units where equipment is necessary to mitigate the effects of a power outage, the Permittees shall maintain batteries, generators, or some other form of backup power supply capable of operating equipment including evacuation alarms, emergency communication equipment, automatic fire suppression systems, and emergency lights. (*See* 40 CFR §§ 270.14(b)(8)(iv) and 270.32(b)(2))

The Permittees shall ensure that it is possible to provide fuel to backup generators under adverse conditions.

2.10.2 Testing and Maintenance of Equipment

The Permittees shall test the equipment listed in Section E.1.1 of Attachment E (*Inspection Plan*) in accordance with the schedule identified in Attachment E to ensure its functionality in the event of an emergency. The Permittees shall maintain the equipment specified in Permit Section 2.10.1 to ensure its proper operation in the event of an emergency (*see* 40 CFR § 264.33). This equipment shall undergo inspection in accordance with Attachment E (*Inspection Plan*). The Permittees shall document such inspections in the Facility Operating Record in accordance with this Permit Part.

If testing or inspections identify any missing or nonfunctioning communication equipment, alarm system, fire protection component, spill control, or decontamination equipment, the Permittees shall ensure it is promptly repaired or mitigated, or provide substitute equipment or provide other functionally equivalent measures and/or equipment (e.g., placement of fire watch and use of fire extinguishers, or limiting operations in the immediate area). If applicable, the~~or provide substitute equipment. The~~ Permittees shall ensure that employees and contractors working in the area are notified of the presence of substitute equipment and, if necessary, provide them with training in its use (*see* 40 CFR § 270.32(b)(2)). The Permittees shall document in the Facility Operating Record instances of such notifications and trainings. The Permittees shall ensure that malfunctioning equipment is clearly marked as out of use and that the location of the substitute or functionally equivalent equipment and/or measures are ~~is~~ clearly posted on or adjacent to the faulty equipment or that such equipment/measures are communicated to any personnel working within the area (*see* 40 CFR §§ 264.31 and 270.32(b)(2)).

2.10.3 Access to Communications or Alarm System

Whenever an employee is present at a permitted unit and the unit contains hazardous waste, the Permittees shall ensure that all personnel at the unit have immediate access to an internal alarm or emergency communication device either directly or through visual or voice contact with another employee (*see* 40 CFR § 264.34(a)). The Permittees shall ensure that communication devices are easily accessible without personnel having to enter another building (*see* 40 CFR § 270.32(b)(2)).

The Permittees shall ensure that any employee working alone at a permitted unit is capable of summoning external emergency assistance and shall have immediate access to

2.12.2 Facility Operating Record

The Permittees shall maintain a written Facility Operating Record for the operations of each permitted unit at the Facility until the Department has approved either the closure certification statement or, if the unit enters post-closure care, the post-closure certification statement with respect to such unit as specified in Permit Sections 9.5 and 10.2.3 respectively (*see* 20.4.1.500 and 501 NMAC). For documents that address the entire Facility (*e.g.*, certifications of a Facility program to reduce the volume and toxicity of hazardous waste), the Permittees shall maintain these documents throughout the active life of the Facility including the post-closure care period.

Unless specifically prohibited by this Permit, an electronic record in a format acceptable to the Department and capable of producing a paper copy shall be deemed to be a written record (*see* 40 CFR § 270.32(b)(2)). Any substantive alterations made to the electronic record shall be documented, dated, and made part of the Facility Operating Record.

The Permittees shall incorporate, as soon as it becomes available, into the Facility Operating Record the following information:

(1) a description of the hazardous waste received and the methods and dates of treatment and storage at each permitted unit in accordance with Appendix I of 40 CFR Part 264, which is incorporated herein by reference;

(2) the location of each type of hazardous waste within each permitted unit and the total quantity of all wastes and waste types at each unit (the location shall be identified as one of the permitted units listed in Attachment J (*Hazardous Waste Management Units*) and any associated structure (*e.g.,* room, dome));

(3) records and results of waste analyses and waste determinations that are performed pursuant to Permit Section 2.4, Attachment C (*Waste Analysis Plan*), and 40 CFR §§ 264.1083, 268.7, and 268.9, which are incorporated herein by reference;

(4) incident reports and details of all incidents that required the implementation of Attachment D (*Contingency Plan*), any instance of fire, explosion, spill, or release from, or at, a permitted unit regardless of whether the incident required implementation of the Contingency Plan or Permit Part 11 (*see* 40 CFR § 270.32(b)(2));

(5) records and results of inspections as required in Permit Section 2.6 and Attachment E (*Inspection Plan*);

(6) monitoring, testing, analytical data, and response actions when required by 40 CFR §§ 264.191, 264.193, 264.195, 264.602, 264.1063(d) through 264.1063(i), 264.1064, and 264.1082 through 264.1090, which are incorporated herein by reference;

(7) notices to off-site generators as specified in 40 CFR § 264.12(b), which is incorporated herein by reference;

(8) (reserved);

(9) an annual certification stating a Facility program is in place to reduce the volume and toxicity of hazardous waste generated;

(10) for treated wastes, the information contained in the notice and certification required under 40 CFR § 268.7(b), which is incorporated herein by reference;

(11) if applicable, for hazardous wastes left in the ground after closure (*i.e.,* disposal units), the information required of a treatment facility under 40 CFR § 268.7(c~~b~~), which is incorporated herein by reference;

(12) for stored wastes, the notice (or information contained in the notice for wastes generated on-site) and certification required at 40 CFR § 268.7, which is incorporated herein by reference;

(13) all monitoring reports and records required by this Permit, including but not limited to:

a. records of all monitoring data used to complete Permit Application(s);

b. all data gathered or generated during the closure or post-closure process; and

c. all laboratory reports, drilling logs, bench-scale or pilot scale data;

(14) documentation demonstrating distribution of the Contingency Plan in accordance with Permit Section 2.11.3;

(15) documentation demonstrating the installation and maintenance of secondary containment system coatings or sealants as required at Permit Section 3.7.1(4) and 4.4(4);

(16) personnel training records including both introductory and continuing training programs used to prepare employees to safely operate and maintain a permitted unit in compliance with 40 CFR § 264.16(d), which is incorporated herein by reference, and this Permit;

(17) documentation of notifications and trainings associated with alternate emergency equipment as required at Permit Section 2.10.2; and

(18) documentation of all instances where an indoor fire suppression system has been activated resulting in fire suppressants contacting a waste storage pad.

3.3 ACCEPTABLE STORAGE CONTAINERS

The Permittees shall only use containers that comply with 40 CFR Part 264 Subpart I *(Use and Management of Containers*) for storage of hazardous waste at permitted units. Prior to shipment of hazardous waste, containers must comply with Department of Transportation (DOT) shipping container regulations (*see* 49 CFR § 173 - *Shippers - General Requirements for Shipment and Packaging,* and 49 CFR § 178 - *Specifications for Packaging*).

Solid, oversize items (*e.g.*, glovebox, glovebox parts, vacuum pumps, tanks, duct work, piping, HEPA filters) contaminated with hazardous wastes that cannot be containerized in the waste containers referenced in the previous paragraph shall be subject to this Permit Part. These items shall be wrapped in plastic with a minimum of two layers of plastic to prevent dispersion of contaminating material.

3.4 COMPATIBILITY OF WASTE WITH CONTAINERS

The Permittees shall use containers made of, or lined with, materials that are compatible with and will not react with the hazardous waste to be stored, so that the ability of the container to contain the waste is not impaired (*see* 40 CFR § 264.172).

3.5 MANAGEMENT OF CONTAINERS

(1) The Permittees shall ensure that all containers are kept closed during storage except when waste is added to or removed from the container or when a container's contents need to be repackaged (*see* 40 CFR § 264.173(a)). The Permittees shall not open, handle, or store a container holding hazardous waste in a manner that may rupture the container or cause the container to leak (*see* 40 CFR § 264.173(b)).

(2) The Permittees shall establish and maintain lines of demarcation which identify the boundaries of all permitted CSUs. The line may be identified by paint, tape, signs, or other permanent, visible marking on the floor or base material (*see* 40 CFR § 270.32(b)(2)). Permanent fences marking the unit boundary, or rooms or buildings whose walls constitute the boundary of the permitted units, satisfy this requirement.

(3) The Permittees shall ensure that drums stored in movable buildings (*e.g.,* modular buildings, transportainers) with non-grated floors are stored on wheeled drum dollies, steel pallets, or are otherwise elevated.

(4) The Permittees shall ensure that when waste containers are moved during storage, the location of each hazardous waste and the quantity at each location is documented in accordance with Permit Section 2.12 (*see* 40 CFR § 264.73(b)(2)).

3.10 TA-3 CONTAINER STORAGE REQUIREMENTS

The Permittees (DOE and Triad) co-operate hazardous waste management units at TA-3 and have a duty to meet the additional permit requirements in this Section.

3.10.1 General Operating Conditions

The Permittees shall ensure that storage of hazardous or mixed waste in containers at TA-3-29 occurs only in the CSU in Rooms 9010, and portions of Rooms 9020, and 9030 identified in Attachment A (*Technical Area Unit Descriptions*) and Attachment J (*Hazardous Waste Management Units*), Table J-1 (*Active Portion of the Facility*).

~~3.10.2 Secondary Containment~~

~~The Permittees shall paint the floors in Rooms 9010, 9020, and 9030 within the TA-3-29 permitted unit with an epoxy sealant. The sealant must be maintained in accordance with Permit Section 3.7.1 of this Part and the manufacturer's specifications.~~

3.11 TA-50 CONTAINER STORAGE REQUIREMENTS

The Permittees (DOE and Triad) co-operate hazardous waste management units at TA-50 and have a duty to meet the additional permit requirements in this Section.

3.11.1 General Operating Conditions

(1) The Permittees shall ensure that storage of hazardous or mixed waste in containers at TA-50 occurs only in two areas: 1) an indoor storage area located in Building 69 (TA-50-69), Rooms 102 and 103; and 2) an outdoor storage area (TA-50-69, Outdoor) located south/southeast of Building 69, comprised of an asphalt pad and modular transportainer units, as identified in Attachment A (*Technical Area Unit Descriptions)* and Attachment J (*Hazardous Waste Management Units*).

(2) The Permittees shall ensure that ignitable wastes will not be stored inside the glovebox located within the indoor permitted unit.

(3) The Permittees shall at all times maintain a fire access lane between the TA-50-69 Outdoor and Indoor permitted units (*see* 40 CFR § 270.32(b)(2)).

3.11.2 Preventing Hazards in Loading/Unloading

The Permittees shall not load or unload waste at TA-50 during severe weather conditions.

3.11.3 Preventing Run-on

The Permittees shall prevent surface water run-on from contacting stored waste containers at the TA-50 permitted units.

The Permittees shall annually inspect and when necessary maintain the drainage swales located south of the permitted unit between the permitted unit and Material Disposal Area (MDA) C, and located on the west side of the permitted unit between Pecos Drive and the TA-50 fence line, to ensure that potential run-on is directed away from the permitted units (*see* 40 CFR § 264.175(c)(1)).

3.12 TA-54 CONTAINER STORAGE REQUIREMENTS

3.12.1 General Operating Conditions

The Permittees shall ensure that storage of hazardous waste in containers at TA-54 occurs only in the permitted unit at Area L, the nine permitted units at Area G, the two permitted units at TA-54 West, and as identified in Attachment A (*Technical Area Unit Descriptions)* and Attachment J (*Hazardous Waste Management Units*). Permittees Triad and N3B co-operate different permitted units at TA-54. Triad co-operates two permitted units at TA-54 West and N3B co-operates ten permitted units at Areas G and L. The Permittees have a duty to meet the additional Permit requirements of this Section solely for their respective permitted units, as specified below.

Area G (N3B, co-operator)

(1) The Permittees shall remove all fluids above the HDPE liner at Area G, Dome 224 within 24 hours of discovery (*see* 40 CFR§ 270.32(b)(2)). The Permittees shall include a record of the evacuation in the Facility's Operating Record including a complete chemical analysis of the fluid.

(2) The Permittees shall ensure that at Area G, all containers storing hazardous waste with free liquids are stored on secondary containment pallets, except inside the following structures: Domes 230, and Sheds 144, 145, 146, 177, 1027, 1028, 1030~~29~~, and 1041.

Area L (N3B, co-operator)

(1) The 10,000 gallon holding tank at Area L, Dome 215 shall be inspected monthly and any detected fluids shall be characterized and removed within 3 days. The Permittees shall include a record of all holding tank inspections and evacuations in the Facility's Operating Record, including a complete chemical analysis of the tank contents (*see* 40 CFR § 270.32(b)(2)).

(2) The Permittees shall ensure that at Area L, all containers storing hazardous waste with free liquids are stored on secondary containment pallets, except when inside the following structures: Sheds 31, 68, 69, 70; concrete pad with canopy TA-54-32; concrete pads TA-54-35, TA-54-36, TA-54-58; and building TA-54-39 (Room 101 and South Containment Pad).

in accordance with Permit Section 3.7.1 of this Permit Part and the manufacturer's specifications.

3.12.3.7 Dome 224

The Permittees shall not rely on the engineered high-density polyethylene (HDPE) liner in Dome 224 as a method of secondary containment and shall instead store all hazardous waste container holding free liquids on secondary containment pallets.

3.13 TA-55 CONTAINER STORAGE REQUIREMENTS

The Permittees (DOE and Triad) co-operate hazardous waste management units at TA-55 and have a duty to meet the additional permit requirements in this Section.

3.13.1 General Operating Conditions

The Permittees shall ensure that storage of hazardous or mixed waste in containers at TA-55 occurs only in the permitted units B13, B45, B40, B05, G12, K13, the vault located at TA-55-4, TA-55-0355 Pad and the outdoor container storage pad located northwest of TA-55-4, and as identified in Attachment A (*Technical Area Unit Descriptions*) and Attachment J (*Hazardous Waste Management Units*).

3.14 TA-63 CONTAINER STORAGE REQUIREMENTS

The Permittees (DOE and Triad) co-operate hazardous waste management units at TA-63 and have a duty to meet the additional permit requirements in this Section.

3.14.1 General Operating Conditions

The Permittees shall ensure that storage and characterization of hazardous waste in containers at the Transuranic Waste Facility (TWF) occurs only on the permitted unit pad at TA-63, and as identified in Attachment A (*Technical Area Unit Descriptions)* and Attachment J (*Hazardous Waste Management Units*). This includes five storage buildings, the storage and characterization building, the characterization trailers, and the outside areas of the concrete pad within the unit boundary subject to the provisions of Permit Section 3.5.1, *Storage Configuration and Minimum Aisle Space*.

(1) The Permittees shall store all hazardous waste containers known or suspected of holding free liquids on secondary containment pallets. If containers with free liquid are stored in the characterization trailers without secondary containment pallets for longer than 24 hours, the Permittees shall follow the reporting conditions of Permit Section 1.9.14, Other Noncompliance.

(2) The Permittees shall not store containers with ignitable or reactive waste (E.P.A. Hazardous Waste Numbers D001 or D003) within 15 meters of the permitted unit's security barrier system shown in Figure ~~55~~ 13 (*see* 40 CFR §264.176 and

3.14.2 Retention Basin

The Permittees shall inspect the retention basin as required by Permit Section 2.6, *General Inspection Requirements*, and in accordance with Permit Attachment E, *Inspection Plan*, for evidence of contamination and deterioration during each inspection. The Permittees shall record inspection results and any remediation in the Operating Record. Any decontamination of the retention basin will be subject to the provisions of Permit Attachment D, *Contingency Plan*.

(1) The Permittees shall control run-on and run-off as specified in Permit Attachment A, Section A.8.8~~6.9~~., *Control of Run-on/Run-off*. Run-off collected in the retention basin shall be evaluated before discharge. If the run-off is known to be or potentially contaminated with hazardous waste constituents from a spill, leak, or other release, it shall be sampled.

If sampling and analysis are required due to known or suspected contamination, the Permittees shall collect a water sample within 24 hours of discovery of the known or suspected contamination. The analytical testing shall include all appropriate methods based on the composition of waste stored at the unit. If the run-off present in the retention basin is determined to be hazardous waste, the Permittees shall implement Attachment D, Contingency Plan, and manage the waste spill as required by Permit Section D.4. The Permittees shall use the analytical results, together with information from the Operating Record, to characterize the water in accordance with Permit Attachment C, *Waste Analysis Plan*. The Permittees shall record the type and quantity of waste water present in the retention basin, the date of the incident, and the date of removal of the waste water in the Operating Record.

If the Permittees determine that the storm water is not hazardous waste, but that it is contaminated with hazardous waste constituents, the Permittees shall ensure the storm water meets the applicable clean-up requirements in Permit Section 11.4.3, *Surface Water Clean-up Levels,* prior to discharge.

If the Permittees determine that the storm water is not contaminated with hazardous waste constituents, the Permittees shall manage the storm water in accordance with *The Multi-Sector General Permit For Stormwater Discharges Associated with Industrial Activity* (MSGP) for the facility.

(2) Within 24 hours of a fire event, the Permittees shall collect a sample of fire suppression water collected in the retention basin and analyze it for any hazardous waste constituents managed at the facility. If the fire suppression water present in the retention basin is determined to be hazardous waste, the Permittees shall manage the waste water as required by Attachment D, *Contingency Plan*. The Permittees shall use the analytical results, together with information from the Operating Record, to characterize the water in accordance with Permit

3.14.3 Subsurface Vapor Monitoring

The Permittees shall monitor subsurface vapors to evaluate for releases at the TWF from Material Disposal Area (MDA) C. If soil vapors are determined to present a potential risk to site workers, then the Permittees shall initiate corrective action as necessary to protect human health.

The subsurface vapor monitoring network is described in Permit Attachment A, Section A.~~-~~8.9~~6-10~~, and Figure ~~56~~ 32 in Attachment N (Figures). Vapor monitoring well construction must be completed and at least one vapor sample collected from each well sampling port prior to the start of operations at the TWF. Vapor samples must then be collected quarterly during the first year of operation. After the first year of sampling, the Permittees may propose an alternate sampling frequency for subsequent years, in a permit modification request, based on the evaluation of data from the pre-operational and quarterly samples, as well as relevant vapor monitoring data collected from nearby vapor-monitoring locations. All vapor samples shall be analyzed for volatile organic compounds (VOCs), and samples shall be collected in appropriate sample canisters and submitted for analysis of VOCs using EPA Method TO-15. The Permittees must submit a vapor monitoring work plan to the Department for approval no less than 90 days after the effective date of this Permit. The Permittees are required to submit a letter report no later than 60 days following each sample collection event detailing the sampling procedure, analytical results, and any deviations from the Department approved work plan.

The Department utilized the methodology described below to determine appropriate soil gas screening levels (SGSLs) for all vapor-phase hazardous constituents detected in the subsurface ~~at MDA C~~. Required detection and action levels for analytical data are consistent with the lowest SGSLs.

The SGSL levels for constituents detected at MDA C are provided as action levels in Tables 3.14.3.1, 3.14.3.2 and 3.14.3.3 at the end of this Section (3.14.3). The SGSL values were calculated using a generalized equation derived from Equation 19 in the EPA's "User's Guide to Evaluating Subsurface Vapor Intrusion Into Buildings" (February 22, 2004, United States Environmental Protection Agency, Washington, DC), and the methodology outlined in "Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance)" (October 2011, Department of Toxic Substances Control, California Environmental Protection Agency). The equation is as follows:

$$SGSL = IARL/\propto$$

Where:

SGSL = Soil gas screening level
IARL = Risk-based screening level for industrial workers indoor air
α = Attenuation factor (ratio of indoor air concentration to soil gas concentration)

The industrial air screening level from the May 2013 EPA Regional Screening Level (RSL) Tables, adjusted to a 1e-05 cancer risk, was applied for the indoor air concentration (IARL) (http://www.epa.gov/region9/superfund/prg/rsl-table.html). The attenuation coefficients were derived via utilization of EPA advanced soil gas Johnson and Ettinger model for sampling depths of 5, 25, and 60 feet below ground surface. http://www.epa.gov/oswer/riskassessment/airmodel/johnson_ettinger.htm). If the IARLs change for any constituent in Tables 3.13.3.1, 3.14.3.2 and 3.14.3.3, the Permittees shall calculate a revised SGSL using the attenuation factors identified in the Table. The revised SGSLs will be included in the letter report required by this Section.

If sample results, reported in accordance with Permit Section 11.10.3, indicate that volatile organic constituents are present at concentrations above soil gas screening levels at any port in any of the vapor detection network wells, the Permittees must:

(1) Notify NMED in writing within 24 hours of detection;

(2) Resample the wells as soon as is practicable within ten business days to confirm results. Confirmatory samples must be processed on a rush basis at the analytical laboratory;

(3) If the confirmatory analytical sample results verify the accuracy of the initial sample results, the Permittees must notify NMED in writing within 24 hours of confirmation in order to discuss whether subsurface mitigation measures are required to protect human health.

The Respondents shall notify the Department in writing within fifteen days after review of the analytical data if the data indicate any of the following:

(1) Detection of a contaminant in a vapor monitoring well if that contaminant has not previously been detected in the well.

(2) Detection of a contaminant in a vapor monitoring well at a concentration that exceeds one-half the soil gas screening level, if that contaminant has not previously exceeded one-half such screening level in the well.

(3) Detection of a contaminant in a vapor monitoring well at a concentration that exceeds one-half the soil gas screening level and that has increased for the third consecutive sampling of that well.

The written notification shall be submitted to the Department in a letter report that includes, at a minimum, in table format, the date or dates of the sampling event, the well designation, the location of the well, a list of the analytical data that triggered the reporting requirement, any known issues with sample quality, and the specific category for which the data is reported under this Section (3.14.3). The Permittees may submit a proposal for further sampling or investigation or, alternately, the Department may require further investigation. Any ~~further~~ sampling, ~~or~~ investigation, or corrective action involving MDA C would be conducted solely ~~performed in accordance with the corrective action required~~ under the 2016~~05~~ Order on Consent or Permit Part 11.

release to the environment, the Permittees shall submit a written report to the Department containing the information at 40 CFR § 264.196(d)(3), which is incorporated herein by reference.

(9) The Permittees shall give notice by e-mail to persons on the e-mail notification list of the written report under 40 CFR § 264.196(d)(3) in accordance with Permit Section 1.13.

4.5 IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTES

The Permittees shall ensure that the mixed waste storage tank and stabilization units do not manage ignitable or reactive waste.

The Permittees shall ensure that incompatible wastes, or wastes and other materials that are incompatible, are not placed in the same tank system or stabilization unit (*see* 40 CFR § 264.199).

~~4.6 TA-50 RADIOACTIVE LIQUID WASTE TREATMENT FACILITY~~

~~The Permittees shall discharge all treated wastewater from the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) through the outfall permitted under Section 402 of the federal Clean Water Act, or as otherwise authorized by the terms of an applicable Clean Water Act permit that regulates the treatment and use of wastewater. If the Permittees intentionally discharge through a location other than the permitted outfall or as otherwise authorized, they will fail to comply with this requirement, and as a consequence the wastewater treatment unit exemption under 40 CFR § 264.1(g)(6) will no longer apply to the RLWTF. The Permittees shall not accept listed hazardous wastes as specified at 40 CFR Part 261 Subpart D at the RLWTF.~~

PART 5: TREATMENT BY OPEN DETONATION

5.1 MANAGEMENT OF OPEN DETONATION UNITS

The Permittees shall utilize only the two permitted open detonation units for the treatment of hazardous waste. The Permittees shall treat by open detonation to remove the characteristic of reactivity (D003). In addition to exhibiting explosive reactivity, hazardous wastes may also exhibit other hazardous waste characteristics or be listed in 40 CFR part 261, Subpart D. The Permittees shall limit open detonation treatment activities to the high explosive waste categories identified in Attachment C (*Waste Analysis Plan*). All treatment open detonations are conducted above ground surface and by means of an explosion in which a chemical transformation passes through the material faster than the speed of sound.

The Permittees shall conduct open detonation operations in accordance with this Permit Part, Attachment A (*Technical Area Unit Descriptions*), 40 CFR 265, Subpart P, 40 CFR 264, Subpart X, 40 CFR§§ 268.7(b) and 40 CFR Part 270, which are incorporated by reference. The Permittees shall ensure that open detonation waste treatment occurs only at the following two permitted units:

1) TA-36-8 (open detonation unit); and

2) TA-39-6 (open detonation unit)

(See Figures 2, 6 and 7 in Permit Attachment N (*Figures*)).

5.1.1 Maximum Quantity of Waste to be Treated

The Permittees shall not treat more than 2000 lbs of wastes per treatment event at the TA-36-8 open detonation unit or 1000 lbs of waste per treatment event at the TA-39-6 open detonation unit. The Permittees shall not treat more than 15,000 lbs per calendar year, cumulatively at the two permitted units or 150,000 lbs for the ten year term of the Permit.

5.2 WASTE STREAMS TO BE TREATED AT THE OPEN DETONATION UNITS

The Permittees shall limit open detonation treatment activities to the explosives waste streams for open detonation identified in Attachment C (*Waste Analysis Plan*). The Permittees shall treat only those wastes identified by EPA Hazardous Waste Numbers (waste codes) listed in Attachment B (*Part A Application*) associated with TA-36 and TA-39 and identified as utilizing waste process code X01.

The Permittees shall not treat by open detonation any of the following wastes or materials (see 40 CFR § 270.32(b)(2)):

(1) wastes that do not meet the definition of waste explosives per 40 CFR § 265.382, *Open burning; waste explosives;*
(2) materials containing beryllium;
(3) materials containing perchlorate-based propellants or explosives; or
(4) polychlorinated biphenyls (PCBs).

5.3 DESIGN CONSTRUCTION, OPERATION, AND MAINTENANCE

5.3.1 General Requirements

The Permittees shall design, construct, operate, and maintain the open detonation units in accordance with the requirements of this Permit to minimize the possibility of accidental fire, explosion, or any sudden or non-sudden release of hazardous waste or hazardous waste constituents into air, soil, sediment, surface water or groundwater which could threaten human health or the environment, as required by 40 CFR §§ 264.31 and 264.601.

The Permittees shall ensure that warning signs are posted at each of the open detonation units in accordance with Permit Part 2.5.1.

The Permittees shall document abnormal treatment events in the facility operating record and then report them in accordance with Permit Part 1.9.14.

5.2.2 General Requirements

The Permittees shall design, construct, operate, and maintain run-off control systems (protective berms) at the open detonation units to minimize precipitation run-off and prevent the migration of hazardous waste or hazardous waste constituents from the units (*see* 40 CFR § 264.601(b)).

5.2.3 Restrictions on Operations

5.2.3.1 Hours of Operation

The Permittees shall conduct routine treatment open detonation operations only during daylight hours (i.e., between one hour after sunrise and one hour before sunset), except in an emergency [see 40 CFR § 264.1(g)(8)(i)(D)]. If the Permittees conduct treatment operations in response to an emergency before sunrise or after sunset on a given day, the Permittee shall notify the Department of this fact in writing within five days of conducting such treatment.

5.2.3.2 Weather Conditions

Transportation of or routine operations with explosives waste at the open detonation units shall not be conducted during the following severe conditions:

(1) lightning is within a six mile radius (9.6 kilometers) of the open detonation units;

(2) icy roads (for transport);

(3) winds greater than 20 miles per hour; or

(4) during precipitation events.

Should environmental conditions change rapidly and unexpectedly, the waste will remain at the unit under administrative control until treatment can be safely conducted.

5.2.3.3 Operational Restrictions

The Permittees shall comply with the following general requirements concerning operations at the open detonation units:

(1) The access gate at the entry to the firing site shall be closed for the treatment event.
(2) A minimum of 24 hours shall elapse between open detonation treatment events.
(3) Only non-sparking tools shall be utilized at the permitted unit when waste is present.

5.2.3.4 Other Restrictions

During normal treatment activities the explosives wastes shall be treated promptly upon transport to and configuration of the shot at the unit; provided abnormal conditions do not arise.

The Permittees shall cease treatment operations immediately upon the discovery of an unsafe situation including but not limited to an aircraft in dangerous proximity to the hazardous waste management unit.

The firing site leader or explosives safety personnel shall remain on site at the control building for the duration of the treatment operation.

The maximum extent of hazardous waste treatment operations at the open detonation shall be confined to the hazardous waste management unit.

Treatment of waste shall be conducted using a non-continuous (batch) thermal process (40 CFR § 265.373).

5.2.4 Operation Safety

5.2.4.1 Safety Precautions

When escorted visitors are present to observe treatment operations, there shall be at least one firing site leader or qualified explosives personnel present.

In addition to the security requirements set forth in Permit Part 2.5, the qualified personnel shall ensure that the firing area at the open detonation unit has been cleared and all personnel have entered the control building, or have been accounted for outside the clearance area. The Permittees shall not conduct treatment operations if unauthorized personnel are within the clearance area.

The Permittees shall conduct all treatment operations in accordance with all safety precautions required by this Permit.

Initiation of all waste treatment operations shall be performed remotely from inside the control building. After detonation is complete personnel shall inspect the site to ensure that the high explosives are expended. If the inspection confirms the shot fired completely an "All Clear" is signaled. Personnel must remain in the bunker or outside the clearance area until "All Clear" is signaled.

5.2.5 Maintenance

The Permittees shall ensure that all industrial equipment is maintained and repaired to avoid situations that may result in leaks, spills, and other releases of pollutants in storm water discharges to receiving waters. The Permittees shall ensure that all control measures used to mitigate the flow of storm water are maintained in an effective operating condition. The Permittees shall ensure that all nonstructural control measures have also been maintained (e.g., spill response supplies are available and personnel were trained). If control measures require repair or replacement, the Permittees shall ensure that necessary repairs or modifications are made as expeditiously as practicable. The unit shall be inspected in accordance with the requirements of Part 2.6.

5.2.5.1 Untreated Waste and Treatment Residues

Within 24 hours after each treatment operation, the Permittees shall inspect the entire hazardous waste management unit area for untreated reactive waste. Non-reactive waste residues (such as wood or metal fragments) originating from treatment operations shall be removed from the unit as part of good housekeeping practices and will be managed in accordance with appropriate LANL waste management procedures.

5.3 MONITORING AND HUMAN RISK SCREENING

5.3.1 Soil Monitoring Requirements

The Permittees shall conduct a soil sampling and analysis program to monitor for hazardous constituents released to soils during treatment events, and to ensure that any releases do not have an adverse effect on human health or the environment as required in 40 CFR § 264.602. All sampling events shall commence no later than one year of the effective date of the inclusion of the open detonation hazardous waste management units within the Permit. The Permittees shall collect soil samples at a frequency of one, four and seven years after the inclusion of the unit within the Permit. The Permittees shall submit a sampling plan to the Department at least 30 days prior to commencing sampling. The plan shall include locations for surface soil sample collection and analysis. Samples shall be analyzed for total metals, explosives compounds, and semi volatile organic compounds utilizing the analytical methods identified within the Attachment C (Waste Analysis Plan).

The Permittees shall submit to the Department a sampling and analysis report for each sampling event summarizing all sampling activities and the results of the sample analyses by October 1 of each sampling year. The Permittees shall identify in the report any sample analytical results that exceed either the baseline sampling event or any soil cleanup levels established in Permit Section 11.4.2.1, as applicable. Upon review of the report, the Department will determine if further action is needed.

~~**(RESERVED)**~~

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PART 6: TREATMENT BY OPEN BURNING

6.1 MANAGEMENT OF OPEN BURNING UNIT

The Permittees shall utilize the permit open burning unit at TA-16 only for the treatment of explosives waste streams. The Permittees shall treat by open burning only those hazardous wastes that that would result in detonation or deflagration to remove the characteristics of reactivity (D003) and ignitability (D001). Waste shall be treated by open burning only at the permitted unit, known as the TA-16-388 Flash Pad, identified with process code X01 in Attachment J (*Hazardous Waste Management Units*), Table J-1(Active Portion of the Facility). The permitted unit at the TA-16-388 Flash Pad (see Figures 2 and 5 in Permit Attachment N (*Figures*)) shall not treat waste in quantities that exceed the operating capacities identified in Table J-1.

The Permittees shall conduct open burning operations in accordance with this Permit Part; 40 CFR part 265, subpart P; 40 CFR part 264, subpart X; 40 CFR § 268.7(b); and 40 CFR Part 270, which are incorporated by reference.

6.1.1 Maximum Quantity of Waste to be Treated

The Permittees shall treat no more than 6,000 pounds via open burning per year and no more than 200 pounds per individual treatment event at the TA-16-388 Flash Pad (see 40 CFR § 270.32(b)(2)). The weight of any metal equipment or piping that will be recycled after treatment shall not be included in the waste-treated quantity.

6.2 WASTE STREAMS TO BE TREATED AT THE OPEN BURNING UNIT

The Permittees shall limit open burning treatment activities to the explosives waste streams for open burning identified in Attachment C (*Waste Analysis Plan*). The Permittees shall treat only those wastes identified by EPA Hazardous Waste Numbers (waste codes) listed in Attachment B (*Part A Application*) associated with TA-16 and identified as utilizing waste process code X01.

For certain waste streams, the following general provisions should be considered prior to acceptance of waste for treatment at the permitted unit (see 40 CFR §§ 265.382 and 270.32(b)(2)):

(1) Only excess explosives, explosives machining waste, explosives-contaminated combustible debris, explosives-contaminated noncombustible debris, and explosives-contaminated solvent waste may be treated by open burning.
(2) Explosives-contaminated equipment containing asbestos shall not be treated, unless the asbestos concentrations are in de minimis quantities.
(3) Liquids (e.g., water or dimethyl sulfoxide [DMSO]) shall have a minimum of 25% by volume of explosives content to be considered detonable.

(4) Solvents, other than DMSO or water, shall be treated only in de minimis quantities and associated only with explosives-contaminated debris.

The Permittees shall not treat by open burning any of the following wastes or materials (see 40 CFR § 270.32(b)(2)):

(1) the hazardous component of mixed wastes;
(2) beryllium;
(3) ammonium perchlorate;
(4) polyvinyl chloride (PVC);
(5) small control boxes or electronic equipment; and
(6) blasting caps, electric detonators, explosives units containing electric detonators, or mild detonating fuse arrays.

6.3 DESIGN, CONSTRUCTION, OPERATION, AND ROUTINE MAINTENANCE REQUIREMENTS

The Permittees shall operate and maintain the TA-16-388 Flash Pad in accordance with the requirements of this Permit to minimize the possibility of accidental fire, explosion, or any sudden or non-sudden release of hazardous waste or hazardous waste constituents into air, soil, sediment, surface water or groundwater which could threaten human health or the environment, as required by 40 CFR §§ 264.31 and 264.601.

6.3.1 General Requirements

The Permittees shall comply with the following requirements for treatment at the TA-16-388 Flash Pad (see 40 CFR § 270.32(b)(2)).

(1) No fuel other than propane shall support open burning treatment operations.
(2) Wastes shall be placed on the Flash Pad only if treatment is planned within four hours of such placement. However, if oversized equipment requires complex staging, the Permittees may stage the equipment at the TA-16-388 Flash Pad for 48 hours; the Department will not consider this staging inappropriate storage. The equipment and the unit must be covered during staging.
(3) All explosives-contaminated combustible debris shall be covered with a screen prior to treatment.
(4) The Permittees shall place containers holding explosives-contaminated solvent (i.e. DMSO) in steel trays, or some other form of secondary containment (e.g., additional pan, tray) for the duration of the treatment.
(5) Explosives-contaminated equipment to be treated shall be disassembled to the extent practicable prior to treatment.

6.3.2 Operational Restrictions

The Permittees shall comply with the following general requirements concerning operations at the open burning unit:

(4) The access gate at the TA-16-389 control building shall be closed for the duration of treatment.
(5) The gate in front of the unloading area at the TA-16-388 Flash Pad shall be kept closed for the duration of treatment and for the cool-down period after treatment to prevent the entry of unauthorized personnel into the area.
(6) The Permittees shall observe from the control building each treatment event using a computer, video display, or periscope for the duration of treatment.
(7) A minimum of 24 hours shall elapse between open burning treatment events.
(8) Only non-sparking tools shall be utilized at the permitted unit when waste is present.
(9) Open burning treatments shall be conducted only during the time period beginning 1 hour after sunrise and ending 1 hour before sunset.

6.3.3 Environmental Factors

The Permittees shall comply with the following requirements and restrictions with respect to environmental factors. Transportation of or routine operations with explosives waste at the permitted unit shall not be conducted during the following severe conditions:

(1) when lightning is detected within a six mile radius (9.6 kilometers) of the unit;
(2) during precipitation, or if storms are forecasted to occur within 4 hours at the location of the unit;
(3) when roads are icy (for transport); or
(4) when wind speeds at the TA-16-389 control building exceed 20 miles per hour.

6.3.4 Run-On and Run Off Controls

The Permittees shall design, construct, operate, and maintain run-off control systems (protective berms and check dams,) at the permitted unit to minimize precipitation run-off and prevent the migration of hazardous waste or hazardous waste constituents from the unit (see 40 CFR § 264.601(b)). The permitted unit's containment devices (e.g., pans, trays, pads) shall be covered within 10 hours after use and will remain covered when not in use to prevent precipitation collection and runoff.

6.3.5 Routine Maintenance

The Permittees shall conduct the following maintenance and inspection activities prior to treatment events at the TA-16-388 Flash Pad:

(1) Notify TA-16 Access Control Center at the start and end of each treatment event;
(2) Inspect the permitted unit and its associated equipment, within 24 hours preceding a treatment event;
(3) Inspect the video display or periscope (which ever will be used to view the treatment operations) located in the TA-16-389 control building to ensure it is functional before waste is staged for treatment;

(4) Test the propane burners at the permitted unit prior to staging waste. The Permittees shall cancel the planned open burn treatment if the burners firing test fails; and

(5) Patrol the area in the immediate vicinity of the permitted unit to unloading the waste for a scheduled burn to ensure that no large wildlife or unauthorized personnel are present at or around the unit.

6.4 TREATMENT RESIDUES

The Permittees shall clean the waste containment devices of any treatment residues as close to 24 hours after a treatment event as possible. If the Permittees find any untreated explosives waste remaining in the residue during inspection of the unit after treatment, the Permittees shall re-treat the waste on that day subject to the restrictions of this Permit Part. If lightning occurs within 3 miles of the unit during residue collection, the Permittees shall cease collection, and resume no more than 4 hours after the storm passes. The residues shall be managed as waste and characterized in accordance with Attachment C (Waste Analysis Plan) Section C.3.1.2.5.

6.5 MONITORING REQUIREMENTS

6.5.1 Soil Monitoring Requirements

The Permittees shall implement a soil sampling and analysis program to monitor for hazardous constituents released to soils during open burning treatment events and to ensure that any releases do not have an adverse effect on human health or the environment (see 40 CFR § 264.602). All sampling events as described in this section shall commence no later than July 1 of the designated sampling year. Samples shall be collected and analyzed 2, 5, and 8 years after the effective date of this Permit. The Permittees shall provide oral and written notification to the Department of the scheduled sampling activities at least 15 days prior to commencing sampling activity.

The Permittees shall analyze the soil samples collected during each monitoring event for total metals, explosive compounds, semi-volatile organic compounds, perchlorate, and dioxins/furans. Sampling events shall include at a minimum the 0 to 2 inch depth interval at the locations that are determined by the Department and the Permittees to be representative of drainage locations and potential deposition areas around the unit. These locations will be sampled for all three monitoring events. If no treatment was conducted at the open burning unit between sampling events, the Permittees may propose an alternative sampling schedule. The Permittees shall certify in writing no later than July 31 of the scheduled sampling year that treatment was not conducted since the preceding sampling event.

The Permittees shall submit to the Department a sampling and analysis report for each sampling event summarizing all sampling activities and the results of sample analyses by December 15 of each sampling year. The Permittees shall identify in the report any sample analytical results that exceed concentrations detected in previous analyses of soil samples collected at the site.~~(RESERVED)~~

PART 9: CLOSURE

9.1 INTRODUCTION

This Permit Part addresses the three categories of permitted units at the Facility. They are identified as follows:

(1) regulated units ~~(*i.e.*, material disposal areas G, H, L);~~

(2) indoor units (structures and related equipment); and

(3) outdoor units (asphalt or concrete pads and related structures and equipment):

a. co-located with a regulated unit; and
b. not co-located with a regulated unit.

Attachment J (*Hazardous Waste Management Units*), Table J-1 (*Active Portion of the Facility*), identifies the category of each permitted unit in the column titled *Type of Unit*.

This Permit does not address the closure of interim status units.

The Permittees shall adhere to the closure performance standards in Permit Section 9.2 for all the permitted units addressed in this Permit Section.

The Permittees shall close the permitted storage and treatment units in accordance with the requirements in 40 CFR §§ 264.110 through 264.116, 264.178, and 264.197 (which are incorporated herein by reference), this Permit Part (9), and the procedures described in the permitted unit-specific closure plans in Attachment G (*Closure Plans*).

9.1.1 Regulated Units

The closure requirements for regulated units within MDAs G, H, and L shall be addressed under the Consent Order (*see* Permit Section 1.4.2.1).

~~The regulated units shall not accept hazardous or mixed waste and shall undergo closure. The Permittees shall adhere to the closure performance standards in Permit Section 9.2 and the closure requirements in Permit Sections 9.3 and 9.5 for the closure of these units.~~

9.1.2 Indoor Units

Indoor units are buildings (*e.g.*, TA-54-412 DVRS), structures (*e.g.,* storage sheds, domes, transportainers, canopies, trailers, and permacons), or rooms within a building (*e.g.,* TA-3 Room 9010). The Permittees shall comply with the specific closure requirements in Permit Sections 9.4 and 9.5 for these units and comply with the closure performance standards in Permit Section 9.2.

performance standards at Permit Sections 9.2.2(1) through (3), and a post-closure plan, if necessary, to maintain the measures. The Permittees shall conduct any post-closure care in accordance with Permit Part 10 (*Post-Closure Care*).

The Permittees shall give notice by e-mail to persons on the e-mail notification list, in accordance with Permit Section 1.13, of the notice to the Department under this Permit Section (9.2.2.3).

~~9.3 CLOSURE REQUIREMENTS FOR REGULATED UNITS~~

~~Closure of the regulated units must meet the corrective action requirements of the March 1, 2005 Compliance Order on Consent (Consent Order). The Consent Order is an enforceable document that sets forth alternative closure requirements in accordance with 40 CFR § 264.110(c). The Permittees shall propose remedies in the Corrective Measures Evaluation Report under the Consent Order that achieve compliance with the closure performance standards at 40 CFR § 264.111. Fulfilling the requirements of the approved Corrective Measures Implementation Plan under the Consent Order shall also satisfy the requirements of 40 CFR Part 264, Subpart G.~~

9.3 RESERVED~~C~~

9.4 CLOSURE REQUIREMENTS FOR INDOOR AND OUTDOOR UNITS

This section specifies the closure requirements for indoor and outdoor (asphalt and concrete pad) permitted units.

9.4.1 Closure Schedule

The Permittees shall notify the Department in writing at least 45 days prior to the date on which they expect to begin closure of a permitted unit in accordance with 40 CFR § 264.112(d)(1), which is incorporated herein by reference. The beginning of closure is marked by initiating removal of waste from a permitted unit for the purpose of closure. In accordance with 40 CFR § 264.112(d)(2), incorporated herein by reference, the date when the Permittees begin closure shall be no later than 30 days after the date on which a permitted unit receives the known final volume of hazardous wastes, or if there is a reasonable possibility that the permitted unit will receive additional hazardous wastes, no later than one year after the date on which the unit received the most recent volume of hazardous wastes. In accordance with 40 CFR § 264.113(a), within 90 days after receiving the permitted unit's final volume of hazardous waste, the Permittees shall remove or treat, as applicable, in accordance with the approved closure plan, all hazardous waste from a permitted unit.

The Permittees shall give notice by e-mail to persons on the e-mail notification list, in accordance with Permit Section 1.13, of the notice to the Department provided under this Permit Section (9.4.1).

PART 11: CORRECTIVE ACTION

11.1 CORRECTIVE ACTION REQUIREMENTS UNDER THE CONSENT ORDER

The Department and the Permittees have agreed to a Compliance Order on Consent (Consent Order) dated ~~March 1, 2005~~June 2016, which requires the Permittees to conduct corrective action at all solid waste management units (SWMUs) and Areas of Concern (AOCs), at the Facility to fulfill the requirements of 40 CFR § 264.101. The Consent Order is an enforceable document pursuant to 40 CFR §§ 264.90(f), 264.110(c), and as defined in 40 CFR § 270.1(c)(7). Nothing in this Permit Part shall be construed to constitute a change to the Consent Order.

11.2 CORRECTIVE ACTION REQUIREMENTS UNDER THE PERMIT

The Permittees shall conduct corrective action under this Permit (or other enforceable document) rather than under the Consent Order, in the following circumstances:

(1) new releases and newly discovered releases of hazardous waste or hazardous constituents from hazardous waste management units at the Facility;

(2) the closure and post-closure care requirements of 40 CFR Part 264, Subpart G, as they apply to hazardous waste management units at the Facility;

(3) implementation of the controls, including long-term monitoring, for any SWMUs or AOCs listed in the Permit ~~on~~ in Attachment K (*Listing of SWMUs and AOCs*), Table K-2 (*Corrective Action Complete with Controls*); ~~and~~

(4) any corrective action conducted under this Part (11) to address releases of hazardous waste or hazardous constituents that occur or are discovered after the date on which the Consent Order terminates; and

(5) newly created SWMUs and AOCs from non-permitted operations.

(*see* § VII.A of the Consent Order)

~~.~~

~~(*see* § III.W.1 of the Consent Order)~~

In circumstances where Corrective Action is required under the Permit, the Permittees shall conduct corrective action pursuant to this Permit in accordance with §§ 74-4-4(A)(5)(h) and (i) and 74-4-4.2(B) of the HWA. The Permittees shall coordinate all corrective action conducted under this Permit with corrective action conducted under the Consent Order. Corrective action for releases from hazardous waste management units that commingle with releases originating from other sources shall be conducted under the Consent Order. Any SWMU or AOC for which corrective action is required that is not subject to corrective action under the Consent Order shall be subject to corrective action report submitted to the Department, in accordance with Permit Section 11.3.2, summarizing the groundwater monitoring results for the appropriate monitoring period.

11.3.1.1 Notification of Detections

By the fifteenth day of each month, the Permittees shall review the analytical data from all groundwater monitoring conducted under this Permit that was received during the previous month, and shall record the date of such review in the Operating Record. If the fifteenth day of a month is a non-business day, then the review shall be conducted by the next business day.

The Permittees shall notify the Department orally within one business day after review of the analytical data if such data show detection of a contaminant in a well screen interval or spring at a concentration that exceeds the groundwater cleanup levels established in Permit Section 11.4.1 if that contaminant has not previously exceeded such water quality standard or cleanup level in such well screen interval or spring.

The Permittees shall notify the Department in writing within fifteen days after review of the analytical data if the data show any of the following:

(1) Detection of a hazardous constituent that is an organic compound in a spring or screened interval of a well if that hazardous constituent has not previously been detected in the spring or screened interval;

(2) Detection of a hazardous constituent that is a metal or other inorganic compound at a concentration above the background level in a spring or screened interval of a well if that hazardous constituent has not previously exceeded the background level in the spring or screened interval;

(3) Detection of a hazardous constituent in a spring or screened interval of a well at a concentration that exceeds one-half the cleanup level established in Permit Section 11.4.1, if that hazardous constituent has not previously exceeded one-half such standard or screening level in the spring or screened interval;

~~(4) Detection of perchlorate in a spring or screened interval of a well at a concentration of 2 µg/L or greater if perchlorate at such concentration has not previously been detected in the spring or screened interval;~~

(4~~5~~) Detection of a hazardous constituent that is a metal or other inorganic compound in a spring or screened interval of a well at a concentration that exceeds two times the background level for the third consecutive sampling of the spring or screened interval; and

(5~~6~~) Detection of a hazardous constituent in a spring or screened interval of a well at a concentration that exceeds one-half the cleanup level established in Permit Section 11.4.1 and that has increased for the third consecutive sampling of that spring or screened interval.

The written notification shall be submitted to the Department in a letter report in table format that includes, but is not limited to, the date or dates of the sampling event, an identification of the well or spring, the location of the well or spring, the depth of the screened interval of the well or zone sampled, a list of the analytical data that triggered the reporting requirement, any known issues with sample quality, and the specific category for which the data is reported under this Permit Section (11.3.1.1).

Previous data to be evaluated under this Permit Section (11.3.1.1) to determine whether specified levels have been exceeded, or to determine trends in data for three consecutive samples shall include only data acquired after September 30, 2009. For the purpose of the notice requirements of this Permit Section (11.3.1.1), the background level of a contaminant shall be the most recent Department-approved 95 percent upper tolerance limit for the background for that contaminant set forth in the *Groundwater Background Investigation Report* approved by the Department, including any approved revisions, as it may be revised or replaced with another document.

The Permittees shall give notice by e-mail to persons on the e-mail notification list of groundwater analytical data reported under this Permit Section (11.3.1.1) in accordance with Permit Section 1.13.

11.3.1.2 Source Identification and Corrective Action

The Permittees shall provide written notification to the Department if a detected concentration exceeds the cleanup levels established in Permit Section 11.4.1, within seven business days of discovery of the exceedance in accordance with 40 CFR § 264.99(h)(1). The Permittees shall include in the notification whether or not they intend to attempt to make a determination that the source of the detected hazardous constituent is not the regulated unit, in accordance with 40 CFR § 264.99(i)(1). The Permittees shall submit a report to the Department within 90 days of such determination that demonstrates that the source of the detected hazardous constituent is not the regulated unit, in accordance with 40 CFR § 264.99(i)(2).

If the source of the detection is the regulated unit, the Permittees shall determine the nature and extent of the release in accordance with Permit Section 11.8.5, and take all steps necessary to contain and otherwise mitigate the release. The Permittees shall conduct a corrective measures evaluation (CME) in accordance with the procedures included in Permit Section 11.8.6 (*Corrective Measures Evaluation*), if the Department determines that such evaluation is necessary in order to select a remedy to achieve the cleanup levels included in Permit Section 11.4.1.

11.3.2 Groundwater Monitoring Reporting

The Permittees shall submit to the Department periodic monitoring reports in accordance with the schedule in the Interim Facility Wide Groundwater Monitoring Plan (IFGMP) or the Department-approved Long-term Groundwater Monitoring Plans. The reports shall be prepared in accordance with Permit Section 11.12. The Permittees shall submit to the Department periodic groundwater monitoring reports for all groundwater monitoring data generated pursuant to this Permit. The Permittees shall propose a schedule for such reporting to the Department for approval. Such reporting shall be coordinated with, and may be combined with, the reporting conducted under § ~~IV.A.6~~XII of the Consent Order.

11.3.3 Corrective Action Beyond the Facility Boundary

The Permittees shall notify the Department, orally and in writing in accordance with Permit Section 1.9.12, upon discovering that a release of hazardous waste or hazardous constituents has migrated beyond the Facility boundary or has the potential to migrate beyond the Facility boundary.

In the event that hazardous waste or hazardous constituents migrate beyond the Facility boundary, the Permittees shall implement corrective action beyond the Facility boundary as necessary to protect human health and the environment, unless the Permittees demonstrate to the Department that, despite the Permittees' best efforts, the Permittees are unable to obtain the necessary permission to undertake such actions. The Permittees are not relieved of any responsibility to clean up a release that has migrated beyond the Facility boundary where off-site access has been denied. On-site measures to address such releases shall be taken, to be determined on a case-by-case basis (*see* 40 CFR § 264.101(c)).

11.3.4 Off-Site Access

To the extent that any corrective action requirement of this Permit requires access to property not owned or controlled by the Permittees, the Permittees shall use their best efforts to obtain access from the present owners of such property to conduct the required activities and to allow the Department access to such property to oversee such activities. In the event that the Permittees do not obtain such access, the Permittees shall notify the Department in writing regarding its best efforts and its failure to obtain such access.

11.3.5 Newly Discovered Releases

The Permittees shall notify the Department, orally and in writing in accordance with Permit Section 1.9.12, upon discovery of any previously unknown release of hazardous waste or hazardous constituents into soil, sediment, surface water, or groundwater. The Department may determine that further investigation of the release is needed. The Department may also determine that corrective action is needed to address the release. If the Department makes such a determination, it will notify the Permittees in writing.

11.3.6 Field Activities

The Permittees shall notify the Department in writing of any field sampling or other field activities undertaken pursuant to any corrective action requirement of this Permit, and shall allow the Department to collect split samples upon request of the Department. For such sampling or other field activities, the Permittees shall notify the Department no less than 15 days prior to the commencement of such sampling.

Superfund Sites (RSLs) for tap water shall be used. If no WQCC groundwater standard or MCL has been established for a contaminant for which toxicological information is published, the Permittees shall use a target excess cancer risk level of 10^{-5} for carcinogenic substances and a HI of 1.0 for non-carcinogenic substances as the basis for proposing a cleanup level for the contaminant. If the background concentration of an inorganic constituent, as established in accordance with Permit Section 11.10.6, exceeds the standard then the cleanup level is the background concentration for that specific substance. Any cleanup level based on a risk assessment must be submitted to the Department for its review and approval.

The Permittees shall give notice by e-mail to persons on the e-mail notification list in accordance with Permit Section 1.13 of a submittal to the Department under this Permit Section (11.4.1).

~~**11.4.1.1 Groundwater Cleanup Level for Perchlorate**~~

~~If, during the term of this Permit, the WQCC adopts a groundwater quality standard for perchlorate, or EPA or the EIB adopts an MCL for perchlorate, such standard or MCL shall be the cleanup level in accordance with Permit Section 11.4.1. If perchlorate is detected, the Permittees shall evaluate the nature and extent of the perchlorate contamination. In the absence of a groundwater quality standard or MCL, if perchlorate is detected at concentrations at or greater than 4 µg/L, then the cleanup level shall be established using a HI of 1.0 in accordance with Permit Section 11.4.1 above.~~

11.4.2 Soil and Sediment

The cleanup levels for soil and sediments shall be the cleanup levels for soil set forth in this Permit Section (11.4.2). Should the Permittees be unable to achieve the Soil Cleanup Levels established under Permit Section 11.4.2.1, they shall conduct risk assessments in accordance with Permit Sections 11.10.4 and 11.10.5. Any cleanup level based on a risk assessment must be submitted to the Department for its review and approval.

11.4.2.1 Soil Cleanup Levels

The Department has specified soil-screening levels that are based on a target total excess cancer risk of 10^{-5} for carcinogenic substances and, for non-carcinogenic substances, a target HI of 1.0 for residential, industrial land use, and the construction worker scenarios. If the potential for migration to groundwater is applicable for a site, the Department may determine that a dilution attenuation factor (DAF) of one or greater, as calculated using the Department-approved methods, for contaminated soils is appropriate to achieve clean closure. This approach may apply at sites where the migration of contaminants through the soil column to groundwater has occurred or when the Department determines that the potential exists for migration of contaminants through the soil column to groundwater. Soil cleanup levels shall be the target soil screening levels listed in the Department's *Technical Background Document for Development of Soil Screening Levels* (as updated). If a Department soil screening level has not been established for a substance for which toxicological information is published, the soil cleanup level shall be established using

(2) organic vapors (using a photo-ionization detector with an 11.7 eV (electron volt) lamp, a combustible vapor indicator or other method approved by the Department);

(3) percent carbon dioxide;

(4) static subsurface pressure; and

(5) other parameters (such as carbon monoxide and hydrogen sulfide) as required by the Department.

The Permittees also shall collect vapor samples for laboratory analysis of the following as required:

(6) percent moisture;

(7) VOCs; and

(8) other analytes required by the Department.

Vapor samples analyzed by the laboratory for percent moisture and VOCs shall be collected using SUMMA canisters or other sample collection method approved by the Department. The samples shall be analyzed for VOC concentrations by EPA Method TO-15, as it may be updated or equivalent VOC analytical method.

Field vapor measurements, the date and time of each measurement, and the instrument used shall be recorded on a vapor monitoring data sheet. The instruments used for field measurements shall be calibrated daily in accordance with the manufacturer's specifications and as described in Permit Section 11.10.2.12. The methods used to obtain vapor-phase field measurements and samples shall be approved by the Department in writing prior to the start of air monitoring at each Facility site where vapor-phase monitoring is conducted.

11.10.2.7 Groundwater Monitoring

11.10.2.7.i Groundwater Levels

Groundwater level measurements shall be obtained at intervals required by the Department. Groundwater levels also shall be obtained prior to purging in preparation for a sampling event. Measurement data and the date and time of each measurement shall be recorded on a site monitoring data sheet. The depth to groundwater shall be measured to the nearest 0.01 feet. The depth to groundwater shall be recorded relative to the surveyed well casing rim or other surveyed datum.

Groundwater levels shall be measured in all wells at the facility (or the number of wells otherwise specified in a Department approved groundwater monitoring work plan) within 21~~14~~ days of the commencement of the monitoring activities. The Permittees shall conduct periodic measuring events, the schedule for which shall be provided in the groundwater monitoring work plans.

Attachment 7

Revised Supplement 1-3, Permittees' Proposed Changes to Attachment C, Waste Analysis Plan

ATTACHMENT C

WASTE ANALYSIS PLAN

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ATTACHMENT C

WASTE ANALYSIS PLAN

This Waste Analysis Plan (WAP) presents the characterization procedures used to determine the chemical and physical nature of waste streams ~~non-mixed hazardous waste, the hazardous component of mixed low-level waste (MLLW), and the hazardous component of mixed transuranic waste (MTRUW)~~ stored and treated at hazardous waste management units at the Los Alamos National Laboratory (LANL or the Facility) in accordance with 40 CFR § 264.13. These waste streams hazardous constituents are non-mixed (non-radioactive) hazardous waste including explosives waste streams, the hazardous component of mixed low-level waste, and the hazardous component of mixed transuranic waste. The ~~waste characterization~~ requirements contained in this WAP are used for characterization of wastes stored in containers and tanks, and to support treatment processes covered by the ~~stabilization process~~LANL Hazardous Waste Facility Permit (Permit). Waste analysis regulatory requirements are specified in 40 CFR §§ 264.13, 270.14(b) and 268.7. The general overview of ~~Waste analysis~~ permit requirements for waste analysis is ~~are~~ specified in Permit Section 2.4. This WAP discusses how the waste characterization information is obtained, ~~data prepared by generators are~~ reviewed, supplemented, and used by the Permittees to comply with 40 CFR Part 264 and Part 268 regulatory requirements.

This WAP is organized as follows:

Section C.1 Facility Description: Includes a general description of the Facility; general descriptions of the wastes stored and treated and the activities that generate waste.

Section C.2 Waste Analysis Parameters: Includes a discussion of the ~~proposed~~ hazardous waste analytical parameters and methods used by the Permittees and the criteria/rationale for parameter selection.

Section C.3 Characterization Procedures: Includes the characterization approach (*e.g.*, acceptable knowledge, sampling and analysis) for each waste classification stored and treated at the Facility.

Section C.4 Off-Site Waste: Includes a discussion of procedures in place for acceptance of waste from off-site facilities.

Section C.5 Special Procedural Requirements: Includes a discussion of the characterization procedures in place ~~for ignitable, reactive, and incompatible wastes; procedures~~ to ensure compliance with 40 CFR 268 Land Disposal Restrictions ~~land disposal restrictions~~ (LDR); and procedures to ensure compliance with 40 CFR Part 264 Subpart CC requirements.

Section C.6 References.

C.1 FACILITY DESCRIPTION

LANL ~~(the *Facility*)~~ is located in Los Alamos County in north-central New Mexico. It is approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. The Facility and the associated residential and commercial areas of Los Alamos County are situated on the Pajarito Plateau. The Facility is owned by the U.S. Department of Energy (DOE) and is operated jointly by DOE; Triad National Security, LLC, (Triad); and Newport News Nuclear BWXT-Los Alamos, LLC (N3B) (collectively the *Permittees*). ~~A more complete Facility description is provided in Attachment A.~~ The permitted units used for storage and treatment of wastes addressed in this WAP are located within various Technical Areas (TAs) at the Facility. These units are listed in Attachment J (*Hazardous Waste Management Units).* Detailed information on the permitted units is provided in Attachment A (*Technical Area Unit Descriptions).*

C.1.1 Facility Waste-Generating Processes and Activities

Wastes are primarily generated at the Facility ~~primarily~~ from research and development (R&D) activities, processing and recovery operations, decontamination and decommissioning (D&D) projects, and environmental restoration ~~(ER)~~ activities. Wastes generated from these types of processes and activities may also be received from off-site facilities (*see* Section C.4~~Attachment L (*Listing of Off-Site Facilities*))~~ and Permit Section 2.2.1). Tables C-1~~2~~ through C-4~~5~~ present descriptive information on non-mixed hazardous wastes, mixed low-level waste~~MLLW,~~ and mixed transuranic waste~~MTRUW~~ potentially generated at the Facility. ~~Wastes generated at off-site facilities that may be received at the Facility are described in Table C-8.~~ These tables include brief waste descriptions, brief descriptions of the waste-generating process or activity, the characterization basis for waste designation, potential U.S. Environmental Protection Agency (EPA) Hazardous Waste Number(s), the hazardous constituent(s) listed in Appendix VIII of 40 CFR Part 261 and/or the characteristic(s) defined at 40 CFR Part 261, Subpart C that make the waste hazardous, and the regulatory limits, as appropriate.

C.1.2 Stored Waste

Non-mixed hazardous waste, ~~MLLW~~mixed low-level waste, and mixed transuranic waste~~MTRUW~~ are stored at various ~~container storage~~hazardous waste management units throughout the Facility. The following sections contain general descriptions of these wastes and the processes that generate them.

C.1.2.1 Non-Mixed Hazardous Waste

Non-mixed hazardous wastes are generated at the Facility primarily from R&D activities, general facility operations, D&D projects, ~~and~~ environmental restoration ~~ER~~ activities, and explosives materials programs. Non-mixed hazardous waste streams may be of uniform physical composition (*i.e.*, homogeneous) or of diverse composition (*i.e.*, heterogeneous). Homogeneous waste is defined as waste that contains only one material or substance or waste that has its components mixed so that representative samples can be drawn throughout. Homogeneous waste streams can be either solids or liquids.

Heterogeneous waste is defined as waste that contains multiple components that are separate because of density or specific gravity, are located in different places within the mixture, or are discrete and different articles. Heterogeneous wastes (*e.g.*, debris) do not lend themselves to representative sampling and analysis.

Descriptions of routinely ~~Routinely~~ managed non-mixed hazardous wastes and their waste-generating processes are provided below and summarized in Table C-1~~2~~.

Spent Solvents

Spent solvents and spent solvent mixtures may contain organic or inorganic compounds, heavy metals, oils, and other contaminants. Waste-generating activities include R&D, laser research, organic and inorganic chemistry research, cleaning, and degreasing.

Contaminated Solid Wastes

Contaminated solid wastes (*i.e.*, wastes of a solid physical form) include mixtures of rags, spill cleanup materials, ~~Kimwipes™,~~ cleaning paper, cleaning wipes, gloves, filters, plastic and other paper products, and personal protective equipment. These wastes may also consist of disposable equipment contaminated with organic or inorganic compounds, heavy metals, oils, and other contaminants. Waste-generating activities include machining operations, chemistry research, D&D projects, metal finishing operations, and general maintenance operations.

Paint and Related Wastes

Paint and paint-related wastes consist of excess paint, paint strippers and thinners, and sludges of paints and thinners. Possible contaminants include heavy metals used as paint pigments and solvents contained in thinners and lacquers. Waste-generating activities include painting and finishing operations and general facility maintenance.

Photographic and Photocopier Wastes

Photographic wastes include spent or excess film developers, fixer solutions, and bleach solutions that may be contaminated with heavy metals. Photocopier wastes include kerosene-based toners and dispersants. These wastes are generated from photographic processing and photocopier operations.

Corrosive Liquid Wastes

These wastes consist of acidic or alkaline solutions that may contain organics, inorganics, metals, oils, and other contaminants. Waste-generating activities include analytical chemistry research, electro-etching, and electro-polishing.

Solid Metals and Metallic Compounds

These wastes consist of metal chips and turnings from machining and cutting operations. They also consist of metal powders; metal salts; metal sheets; reactive metals used in synthesis reactions; solders from electronic manufacturing, repair, and brazing operations; and grinding operations. Other solid metals and metallic compounds include lead shot, bricks, plate, and shielding.

Contaminated Non-Corrosive Aqueous and Non-Aqueous Solutions and Sludges

These wastes are non-corrosive aqueous and non-aqueous solutions and sludges ~~that are~~ contaminated with non-mixed hazardous wastes or hazardous residues. Waste-generating activities include vacuum pump maintenance, analytical spectrometry, equipment cleaning and maintenance, vehicle maintenance, synthesis reactions, metal-polishing operations, and chemical research.

Mercury Wastes

Mercury wastes include free elemental mercury, mercuric compounds, articles and instruments containing mercury, fluorescent light fixtures, and gels containing mercuric compounds. Waste-generating activities include lamp replacement, chemical research, mercury spill cleanup, and equipment cleaning and maintenance.

Used Batteries and Battery Fluids

Used batteries and battery fluids contain heavy metals such as cadmium, lead, mercury, and silver. Waste-generating activities include routine equipment maintenance.

Unused and Off-Specification Commercial Chemical Products

These wastes consist of discarded solid and liquid chemical reagents that are off-specification, unused, or outdated or are spill residues.

Gas Cylinder Waste

These wastes include pressurized gas cylinders, including aerosol cans, which may contain regulated hazardous metals, or organic compounds, or exhibit the hazardous characteristics of ignitability, corrosivity, and reactivity.

Soils and Sludges

These wastes consist of environmental media and sludges generated through various activities, including site decommissioning, site characterization, ~~and~~ site remediation, and treatment. Waste-generating activities include septic tank and detention basin closure, removal actions, and other remedial actions and site closures.

Aqueous Liquids

These wastes consist of liquids generated during various activities, including decontamination of remedial action equipment, drilling fluids and well development fluids, septic tank liquids, and contaminated stormwater runoff.

Debris

These wastes consist of debris (such as concrete, vitrified clay pipe, steel baffles, and building materials) generated through various activities, including site decommissioning, site characterization, and site remediation. Waste-generating activities include septic tank and detention basin closure, removal actions, and other remedial actions and site closures.

Explosives Waste Streams

Explosives-contaminated waste and explosives waste are generated at the Facility from firing site operations, explosives processing operations, such as machining and pressing; R&D activities, including pilot--scale explosives production; D&D activities; and environmental restoration activities. The waste streams identified in Table C-5 are waste streams that may be treated by open burning and open detonation. The waste streams include homogenous and heterogeneous wastes and are described in the following paragraphs.

Explosive-contaminated waste and explosives waste may consist of off-specification explosive wastes, excess explosive waste, and other explosives-contaminated solid wastes (e.g., rags, glass, metals, and wood). These wastes are characteristic for reactivity, as defined in 40 CFR § 261.23. Explosives waste and explosives-contaminated waste meet the definition of reactive provided in 40 CFR § 261.23, because they are capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement.

Explosives machining waste
This waste stream consists of explosives machining chips or cuttings, water, filters, and filter solids that result primarily from the filtration of water used during the machining of explosives. Cloth filters, plastic bags, and wrapping are sometimes present in the waste.

Excess explosives
This waste stream includes large and small pieces of excess conventional explosives. Explosives may be in the form of flakes, granules, crystals, powders, pressings, plastic bonded, putties, rubberized solids, or extrudable solids. This waste stream can include waste generated from inventory reduction efforts, off-specification explosives, damaged explosives, and salvaged explosives. Other materials that may be present in this waste stream include plastic bags, wrapping, and casings; cardboard and paper; and fiberboard containers. A small fraction of the waste stream may contain metals such as aluminum, brass, barium, steel, stainless steel, and copper.

Explosives-contaminated combustible debris
This waste stream includes detonable explosives-contaminated debris generated in research laboratories, processing areas, and prep rooms. Debris may include filters removed from laboratory equipment or may contain trace amounts of solvents. Other materials that may be present in this waste stream include plastic pieces, bags, fiber cloth, wrapping, and tubing; weigh boats; latex or nitrile gloves; glass or plastic vials; cardboard and paper; fiberboard containers; paper cleaning wipes, rags, and swabs; as well as noncombustible materials such as glassware and metal as minor components. Metal constituents may include aluminum, stainless steel, steel, brass, and copper. Small quantities of solvents such as ethanol, acetone methanol, ethyl acetate, and toluene may also be present in this waste stream.

Explosives-contaminated solvent waste
This waste stream consists of dimethyl sulfoxide (DMSO) that contains dissolved explosives. It is generated primarily by dissolving of explosives and polymers in support of research and development activities.

Explosives-contaminated noncombustible debris
This waste stream consists of explosives-contaminated equipment that includes discarded, noncombustible equipment, debris from firing sites, noncombustible material from decommissioning and demolition activities, and material from explosives processing areas. Materials in this waste stream include glass, metals, and ceramics. This waste stream is typically recycled after treatment when treated by open burning. Most often this waste stream consists of metal equipment or sand/carbon from water filtration activities or maintenance and decommissioning and demolition activities.

Detonators, initiators, mild detonating fuses, and blasting caps
This waste stream includes detonators, initiators, mild detonating fuses, and blasting caps containing conventional explosives. Explosives may be in metal or plastic casings and may contain lead--based primaries or be in metal sheaths. This waste stream includes manufactured articles (detonators) removed from fire protection systems. Other materials that may be present in this waste stream include plastic bags and wrapping; cardboard and paper; and fiberboard containers. This waste stream will include metals such as aluminum, lead, brass, stainless steel, steel, nickel, and copper.

Shaped charges and test assemblies
This waste stream includes shaped charges consisting of cores of explosives with metal sheaths or metal liners, or high--explosives test assemblies consisting of explosives in plastic or metal holders. Assemblies may contain metal including lead, aluminum, copper, brass, steel, tantalum, and stainless steel. Other materials that may be present in this waste stream include plastic components, bags, or wrapping; cardboard or paper; and fiberboard containers.

Projectiles and munitions larger than 0.50 caliber
This waste stream includes military munitions such as projectiles and munitions larger than 0.50 caliber. A fraction of this waste stream includes materials bonded to depleted uranium. Other materials that may be present in this waste stream include plastic bags and wrapping; cardboard and paper; fiberboard drums; and metal such as lead, brass, steel, stainless steel, copper, and aluminum.

Pressing molds
This waste stream includes urethane rubber pressing molds contaminated with detonable quantities of explosives. Other materials that may be present in this waste stream include plastic bags, plastic wrapping, cardboard, and paper.

C.1.2.2 Mixed Low-Level Waste

Low-level waste is defined in DOE Manual~~Order~~ M435.1, “Radioactive Waste Management Manual” (DOE, 2011~~1999~~), as “radioactive waste that is not ~~classified as~~ high-level waste, spent nuclear fuel, transuranic waste, by-product material [as defined in § 11(e)(2) of the Atomic Energy Act, as amended], or naturally occurring radioactive material”. ~~MLLW~~Mixed low-level waste is any low-level waste that has a hazardous waste component.

~~MLLW~~Mixed low-level waste is generated at the Facility primarily from R&D activities, processing and recovery operations, D&D projects, and environmental restoration ~~ER~~ activities. ~~MLLW~~Mixed low-level waste streams may be homogeneous or heterogeneous, as defined in Attachment Section C.1.2.1. Descriptions of the ~~MLLW~~mixed low-level waste -and ~~their~~the waste-generating processes are provided below and summarized in Table C-2~~3~~. Mixed Waste Inventory Report (MWIR) Waste Identification numbers are included with each category as reference to Los Alamos Federal Facility Compliance Order (NMED, 1995) waste documentation where applicable.

Soils with Heavy Metals

Soil waste contaminated with heavy metals is generated during D&D and ~~ER~~environmental restoration activities. This waste consists of soils contaminated with varying concentrations of lead or other heavy metals.

Environmental Restoration Soils, LA-W905

This waste consists of soils contaminated with heavy metals and organic compounds. They are generated by activities such as the remediation of spill and release sites and D&D activities.

Inorganic Solid Oxidizers, LA-W923

These wastes are discarded reagent powders and crystalline materials. Most of these items are in the original manufacturer's containers, some of which may be hydrated. Many of these containers are unopened but are suspected to have radioactive surface contamination. Waste-generating activities include D&D of research laboratories and R&D.

Lead Waste, LA-W903, LA-W921, LA-W924, LA-W930, and LA-W931

Lead waste consists of contaminated and activated lead shielding used as radiation shielding, inseparable lead, lead blankets, and lead requiring sorting. It is generated primarily from radioisotope experiments and other reactor, accelerator, laser, and x-ray activities. The lead may be in the form of sheets, pigs, bricks, shot, shavings, slag, dross, and other shapes.

Noncombustible Debris, LA-W922

Noncombustible debris consists of discarded hazardous and contaminated scrap metals that are generated by maintenance, D&D of research laboratories or equipment, R&D, and ~~ER~~environmental restoration activities. Additionally, discarded bricks and glass are generated through dismantling of Facility buildings, including plating shops and machine sheds. The waste may be considered hazardous due to the metal content or by virtue of contamination during use.

Combustible Debris, LA-W912

Maintenance, D&D, R&D, and ~~ER~~ environmental restoration activities generate rags and combustible debris with heavy metals and possibly organics, some of which contain residual liquids. Examples include solvents and lubricants that are used in metal-cutting operations.

Much of this waste is generated during the processing of lead and barium resulting in heavy metal contamination.

Organic-Contaminated Noncombustible Solids, LA-W919

These wastes include absorbed oils, laboratory trash, and discarded equipment. Absorbed oil waste is compo~~ri~~sed of drums containing vermiculite or other inorganic sorbents used to absorb oil from spills and routine maintenance operations. Some of the oil originates from vacuum pumps and may be contaminated by mercury, lead, or cadmium. Laboratory trash consists of noncombustible solid materials with residual solvent contamination. The laboratory debris includes reagent bottles, broken glassware, and disposable lab ware. Large quantities of chemicals are not placed in this trash; however, residual liquids or powders may have remained on some of the discarded material. Discarded equipment may have contained residual solvents.

Organic-Contaminated Combustible Solids, LA-W911

These wastes are similar to combustible debris waste and include rags, cardboard, protective clothing, and paint-stripper trash. They are potentially contaminated with methyl ethyl ketone and other solvents. Waste-generating activities include maintenance, D&D, and ~~ER~~ environmental restoration activities.

Water-Reactive Wastes, LA-W916

Water-reactive wastes consist of reactive metal debris generated through the cleanup of high explosives ~~HE~~ firing-site debris and from machining and disassembly of test components. They include calcium, lithium hydride, lithium metal, and magnesium.

Mercury Wastes, LA-W920 and LA-W925

Mercury-contaminated instruments and equipment consist of discarded or broken equipment containing liquid mercury such as broken thermometers, vacuum tubes, vacuum pumps with residual mercury, activated or contaminated fluorescent light bulbs, and mercury absorbed into a paper or solid matrix. Most of this waste is generated by cleanup operations.

Unused Solid Reagent Chemical Wastes

Many different types of discardable off-specification or unused solid reagent chemical wastes are generated at the Facility by R&D programs. Most of these items are in their original containers.

Spent Solvents and Contaminated Solvent Mixtures

These are spent solvents and spent solvent mixtures that contain organic or inorganic compounds, heavy metals, oils, and other contaminants. Waste-generating activities include a wide variety of maintenance, cleaning and degreasing, R&D, and processing operations, such as extraction, bench-scale experimental inorganic chemistry, environmental analysis, and radiochemistry.

Corrosive Liquid Wastes, LA-W914

These wastes are acidic or alkaline solutions that contain organics, inorganics, metals, oils, and/or other contaminants. Waste-generating activities include radiochemistry research, plutonium processing, and analytical chemistry.

Aqueous and Non-aqueous Liquids Contaminated with Heavy Metals and/or Organics, LA-W902, LA-W906, LA-W908, and LA-W913

These wastes consist of aqueous and non-aqueous solutions that contain heavy metals and possibly organics. Waste-generating activities include metal-polishing operations, radiochemistry research, and ~~ER~~ environmental restoration activities.

Oil Wastes, LA-W909

Oil wastes at the Facility are generated during equipment maintenance operations. Possible contaminants include heavy metals and solvents.

Unused Liquid Reagent Chemical Wastes

Many different types of discarded off-specification unused liquid reagent chemical wastes are generated at the Facility by R&D programs. Most of these items are in their original containers.

Gas Cylinder Waste, LA-W917 and LA-W918

These wastes consist of pressurized gas cylinders, including aerosol cans, which contain regulated hazardous metals~~,~~ or organic compounds, or exhibit the hazardous characteristics of ignitability, corrosivity, and reactivity.

~~Radioactive Lead Solids~~

~~These lead solids include, but are not limited to, all forms of lead shielding and other elemental forms of lead. These lead solids do not include treatment residuals such as hydroxide sludges, other wastewater treatment residuals, or incinerator ashes that can undergo conventional pozzolanic stabilization, nor do they include organolead materials that can be incinerated and stabilized as ash.~~

C.1.2.3 Mixed Transuranic Waste

Transuranic waste is defined in DOE M435.1-1, Radioactive Waste Management Manual (DOE, 2011), as "radioactive waste containing more than 100 nanocuries (3700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the Environmental Protection Agency, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or (3) waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61."

Transuranic isotopes are those with atomic numbers greater than 92. ~~MTRUW~~Mixed transuranic waste contains both a hazardous waste component and a transuranic ~~TRU~~ waste component.

~~MTRUW~~Mixed transuranic waste is generated at the Facility primarily from R&D activities, processing and recovery operations, and D&D projects. ~~Limited quantities of MTRUW from off-site facilities will be accepted at LANL for additional characterization and management. (see Table C-8). MTRUW~~ Mixed transuranic waste at the Facility includes four broad categories that can be described by a Summary Category Group, which is further subdivided into Waste Matrix Codes.

Summary Category Groups are used to define waste characterization groupings for the Federal Facility Compliance Order (Los Alamos National Laboratory) (New Mexico Environment Department [NMED], 1995) requirements and are based on the physical and chemical forms of the waste. Complete descriptions of the Summary Category Groups are contained in DOE Waste Treatability Groups Guidance (DOE, 1995).

The Summary Category Groups applicable to the ~~MTRUW~~ mixed transuranic waste stored and treated at the Facility are listed as follows:

1. *Summary Category Group S3000 (Homogeneous Solids)*: defined as solid waste materials, excluding soil and gravel, that do not meet the ~~EPA~~ LDR criteria for classification as debris.~~;~~
2. *Summary Category Group S4000 (Soil/Gravel)*: defined as solid waste materials that are at least 50 percent by volume soil and gravel.~~;~~
3. *Summary Category Group S5000 (Debris)*: defined as heterogeneous waste materials that are at least 50 percent by volume solid materials exceeding a 2.36-inch particle size that are intended for disposal and include manufactured objects, plant or animal matter, or natural geologic material. Particle sizes smaller than 2.36 inches in size may be considered debris if the debris is a manufactured object and if it is not a particle of S3000 or S4000 material.~~; and~~
4. *Summary Category Group L1000 (Aqueous Liquids/Slurries)*: defined as aqueous liquids and slurries that meet the ~~EPA~~ LDR criteria for wastewaters (*i.e.*, <1 percent total suspended solids).

Summary Category Groups are applied to ~~MTRUW~~mixed transuranic waste streams to distinguish between waste types. More specific waste identification systems (*i.e.*, Waste Matrix Codes [WMC] and Facility transuranic waste stream identification ~~TRU Waste Stream ID~~ numbers) are used for supplementary purposes as part of waste management operations. The general WMC series~~WMCs that are~~ applicable to the solid ~~MTRUW~~mixed transuranic waste stored at the Facility are:

1. *WMC S3100 (Inorganic Homogeneous Solid Waste)*: includes mixed inorganic homogeneous waste (cemented inorganics, organics on vermiculite, non-cemented, salts, and cemented organics);
2. *WMC S4200~~S4100~~ (Soil)*: consists of radioactive contaminated solid waste materials that are at least 50 percent by volume soil/gravel;

3. *WMC S5100 (Inorganic Debris Waste)*: consists of mixed non-combustible debris waste (scrap metal, concrete, brick, and glass) and up to approximately 10% of incidental organic waste forms; and

~~4. *WMC S5300 (Organic Debris Waste)*: consists of mixed combustible debris waste (plastic, cellulosics, and rubber); and~~

~~5.~~4. *WMC S5400 (Heterogeneous Debris Waste)*: includes mixed heterogeneous debris waste (varying amounts of combustible and noncombustible debris, with a small amount of homogeneous waste present).

Solid ~~MTRUW~~mixed transuranic waste is assigned a WMC and is further identified with a Facility transuranic waste stream identification~~TRU Waste Stream ID~~ number. Using the WMC, waste streams are further delineated based on the following prioritized criteria: 1) waste-generating process (to the degree to which waste has been segregated by process); 2) Summary Category Group (*i.e.*, homogeneous or debris waste); 3) waste matrix; and 4) hazardous chemical content (*i.e.*, organics and/or inorganics).

The following are general descriptions of types of ~~MTRUW~~mixed transuranic waste streams:

Homogeneous Solids, Solidified Inorganics
This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, facility and equipment operations and maintenance, and liquid waste treatment operations. The waste includes cemented sludge, solidified aqueous waste, solidified inorganic process solids, leached process residues, evaporator bottoms/salts, and/or cement paste.

Homogeneous Solids Salt Waste
A portion of the waste stream that requires treatment for off-site disposition includes evaporator bottom solutions (i.e., nitrate salts concentrates) generated prior to 1992 from nitrate recovery operations at TA-55. Evaporator bottoms solution is the liquid residual that results when a volume of ion-exchange effluents, oxalate filtrates, vacuum-seal water, or negative chilled waters is processed and concentrated in evaporator processes. The procedure for stabilization of the evaporator bottoms solution in a cement matrix was in development until 1992 when the process was successfully standardized. Prior to 1992, several alternate cementation methods were used and some of the cemented matrices may have dewatered over time.

Heterogeneous Debris
This waste stream consists of mixed heterogeneous debris waste generated from facility processes and equipment D&D, including associated sectioning, size reduction, and packaging operations. The waste is composed of noncombustible and combustible debris waste contaminated with radioactive isotopes. The waste includes greater than 50% by volume noncombustible waste, metal scrap, glass, metal waste, metal crucibles and dies, precious metals, filter media and residue, beryllium-contaminated debris, ion-exchange resins, irradiation sources, firing point sources, leaded rubber, graphite waste, high-efficiency particulate air (HEPA) filter waste, skull and oxide, slag and porcelain, and/or other noncombustible waste. The combustible portion of the waste stream consists of waste materials such as paper, rags, plastic, rubber, wood-based high-efficiency particulate air filters, or other plastic-based and cellulose--based items (e.g., personal protective equipment). Some secondary waste generated during the

remediation/repackaging operations may have been added to the waste containers. Nitrate salts in the form of homogenous solids can be found in some of the containers holding this waste stream and will require further treatment for disposition.

Soils

These wastes consist of soils and environmental media generated through various activities, including site decommissioning, site characterization, and site remediation, that contains transuranic waste radioactive components and is potentially contaminated, particularly with heavy metals and organic compounds.

1. ~~*Homogeneous Inorganic, Cemented*: includes solidified aqueous or homogeneous inorganic solids, solidified inorganic process solids, leached process residues, evaporator bottoms/salts, and/or cement paste;~~
2. ~~*Homogeneous Inorganic, Cemented Organics*: major portion of the waste is cement (*i.e.*, inorganic) containing a minor portion of cemented solidified organic process solids;~~
3. ~~*Homogeneous Inorganic, Non-cemented*: includes solid (non-cemented) inorganic waste, ash, dewatered aqueous sludge, and/or chemical treatment sludge;~~
4. ~~*Homogeneous Inorganic, Salts*: includes pyrochemical, nitrate, and/or chloride salts; hydroxide cake; and/or other salt waste;~~
5. ~~*Homogeneous Inorganic, Vermiculite*: includes vermiculite-absorbed hydrocarbon oil, vermiculite-absorbed silicon-based liquid, inorganic particulates, and solidified (non-cemented) organic waste.~~
6. ~~*Soil*: includes all radioactive-contaminated soil;~~
7. ~~*Combustible debris*: includes greater than 50% by volume combustible decontamination waste, cellulosics, plastics, rubber, laboratory trash, building debris, hot cell waste, and/or other combustibles; and~~
8. ~~*Heterogeneous debris*: includes greater than 50% by volume noncombustible waste, metal scrap, glass, metal waste, metal crucibles and dies, precious metals, filter media and residue, beryllium-contaminated debris, ion-exchange resins, irradiation sources, firing point sources, leaded rubber, graphite waste, high-efficiency particulate air (HEPA) filter waste, skull and oxide, slag and porcelain, and/or other noncombustible waste.~~

The WMCs correspond to other historical and current waste identification systems used at the Facility. Table ~~-~~C-~~3~~4 lists the ~~MTRUW~~ mixed transuranic waste streams stored at the Facility by their Summary Category Group, WMC, and general matrix description and provides a cross-reference between past and present waste identification systems.

Facility TRU Waste Stream ID numbers are applied to the ~~MTRUW~~ mixed transuranic waste streams described above. Facility TRU Waste Stream ID numbers are assigned the prefix "LA", followed by a unique identifier that further specifies the waste stream. ~~MTRUW~~Mixed transuranic waste information is summarized in Table ~~-~~C-~~4~~5.

~~The following are some examples of MTRUW waste streams stored, and in some cases treated, at the Facility.~~

~~LA-TA-55-19: Mixed Combustible Debris Waste~~

~~This waste stream consists of mixed combustible debris waste generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance. The debris waste includes paper, rags, plastic, rubber, wood-based HEPA filters, and other plastic-based and cellulose-based items.~~

~~LA-TA-55-30: Mixed Heterogeneous Debris Waste~~

~~This waste stream consists of mixed heterogeneous debris waste generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance. The waste includes plutonium-contaminated noncombustible and combustible debris waste.~~

~~LA-MIN01-CIN: Mixed Inorganic Homogeneous Waste, Cemented Inorganics~~

~~This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, facility and equipment operations and maintenance, and liquid waste treatment operations. The waste includes cemented sludge, solidified aqueous waste, and solidified inorganic process solids.~~

~~A portion of the waste stream that requires treatment for off-site disposition includes evaporator bottom solutions (i.e., nitrate salts concentrates) generated prior to 1992 from nitrate recovery operations at TA-55. Evaporator bottoms solution is the liquid residual that results when a volume of ion-exchange effluents, oxalate filtrates, vacuum-seal water, or negative chilled waters is processed and concentrated in evaporator processes. The procedure for stabilization of the evaporator bottoms solution in a cement matrix was in development until 1992 when the process was successfully standardized. Prior to 1992, several alternate cementation methods were used and some of the cemented matrices have dewatered over time. Sampling of the liquids has shown elevated levels of nitrates and a range of corrosive pHs requiring the addition of EPA Hazardous Waste Number D001 and D002, along with other applicable EPA Hazardous Waste Numbers.~~

~~LA-MIN02-V: Mixed Inorganic Homogeneous Waste, Organics on Vermiculite~~

~~This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance. The waste is comprised of organic liquids (oils and solvents) adsorbed on vermiculite.~~

~~Portions of this waste stream that require treatment for off-site disposition are unremediated and remediated nitrate salts. As described for waste stream LA-MIN01-CIN, evaporator bottoms (i.e., nitrate salts) have been generated continuously from nitrate recovery operations at TA-55. In some cases, the evaporator bottoms solution was cooled, which causes a precipitation of solids (i.e., nitrate salts). The unremediated nitrate salt-bearing waste stream are nitrate salts that were double bagged and placed in containers. Reevaluation of the characterization of this waste required the addition of EPA Hazardous Waste Numbers D001, and D002, along with other applicable EPA Hazardous Waste Numbers.~~

~~The unremediated nitrate salts were mixed with various types of absorbents (e.g., WasteLok 770 [sodium polyacrylate] and Swheat Scoop [organic kitty litter]). Up to 50 percent by volume of debris including plastic packaging, lead (e.g. shielding), personal protective equipment (PPE), and metal fines may also be present in this waste stream. Some secondary waste generated during mixing/repackaging operations may also have been added to the waste containers, including but not limited to: tools, paper/plastic tags and labels, plastic/metal wire tires, leather gloves, lead-lined gloves, PPE, plastic sheeting used for contamination control, rags and wipes (e.g., Kimwipes, or Wypalls), and some packaging material (e.g., plastic bags, fiberboard liners, rigid liner lids cut into pieces).~~

~~LA-MHD01.001: Mixed Heterogeneous Debris~~

~~Waste stream LA-MHD01.001 consists of mixed heterogeneous debris waste generated in TA-55. The debris waste includes paper, rags, plastic, rubber, wood based high-efficiency particulate air (HEPA) filters, other plastic based and cellulose based items (e.g., PPE), noncombustible items (e.g., metal, glass), and lesser quantities of homogenous solids (less than 50 percent by volume) contaminated with radioactive materials. Some secondary waste generated during the remediation/repackaging operations may have been added to the waste containers. Nitrate salts in the form of homogenous solids can be found in some of the containers holding this waste stream and will require further treatment for disposition. Evaluation of the characterization of this waste required the addition of EPA Hazardous Waste Numbers D001 and D002, along with other applicable EPA Hazardous Waste Numbers.~~

~~LA-MIN03-NC: Mixed Inorganic Homogeneous Waste, Non-cemented~~

~~This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, and liquid waste treatment operations. It consists of vacuum filter cake solid waste.~~

~~LA-MIN04-S: Mixed Inorganic Homogeneous Waste, Salts~~

~~This waste stream consists of mixed inorganic homogeneous waste generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance. It is comprised of non-cemented inorganic process solids (salts).~~

~~LA-MIN05-COR: Mixed Inorganic Homogeneous Waste, Cemented Organics~~

~~This waste stream consists of mixed inorganic homogeneous solidified (cemented) organic process solids and emulsified solvents and oils generated by plutonium recovery, R&D processes, and facility and equipment operations and maintenance.~~

~~LA-MHD02-238: Mixed Heterogeneous Debris Waste, Pu-238~~

~~This waste stream consists of mixed heterogeneous debris waste generated by Pu-238 processing operations (primarily heat-source fabrication) and facility and equipment operations and maintenance. The waste includes Pu-238 contaminated noncombustible and combustible debris waste.~~

~~LA-MIN06-C238: Mixed Inorganic Homogeneous Waste, Cemented Inorganics, Pu-238~~

~~This waste stream consists of mixed inorganic homogeneous waste comprised of solidified (cemented) inorganic process solids. This waste stream is generated by Pu-238 processing operations (primarily heat-source fabrication) and facility and equipment operations and maintenance.~~

~~LA-MHD03-DD: Mixed Heterogeneous Debris Waste, D&D~~

~~This waste stream consists of mixed heterogeneous debris waste generated from facility and equipment D&D, including associated sectioning, size reduction, and packaging operations. The waste is comprised of plutonium-contaminated noncombustible and combustible debris waste.~~

~~LA-MHD05-ITRI: Mixed Heterogeneous Debris Waste, ITRI~~

~~This waste stream consists of mixed heterogeneous debris generated between 1975 and 1984 by the Inhalation Toxicology Research Institute, which is currently operated by Lovelace at the Kirtland Air Force Base, New Mexico. The waste is comprised of laboratory waste that may contain rags, tools, and biological waste contaminated with Pu-239.~~

~~LA-MHD04-RH: Mixed Heterogeneous Debris Waste, Remote-Handled~~

~~This waste stream consists of mixed remote-handled heterogeneous debris waste generated by hot cell operations. This waste is comprised of combustible and noncombustible waste.~~

~~LA-MIN06-NS.001: Mixed Inorganic Homogenous Waste, Solids Mixed with Zeolite~~

~~This waste stream consists primarily of inorganic homogenous solids generated from the evaporator process at TA-55 and treated at TA-50. This waste is comprised of transuranic waste solids (evaporator bottoms consisting primarily of nitrate salts, which may be mixed with organic-based kitty litter or Waste Lock 770 ®) mixed with zeolite (aluminosilicate mineral).~~

C.1.3 Treated Wastes

~~MTRUW~~Hazardous, mixed low-level, and mixed transuranic wastes are ~~is~~ treated at hazardous waste management units~~a permitted unit~~ at the Facility. These treatment processes include explosives waste treatment by open burning/open detonation processes for hazardous waste, macroencapsulation for hazardous and mixed low-level waste, and stabilization in containers and ~~MTRUW is treated by~~ cementation for mixed transuranic ~~to stabilize the~~ waste ~~for storage and~~ to meet the Waste Isolation Pilot Plant (WIPP) waste acceptance criteria.

C.1.3.1 Open Burning/Open Detonation

Hazardous wastes that require treatment are generated primarily from R&D and processing explosive operations. Treatment of explosive hazardous wastes at the Facility consists of open burning or open detonation to consume waste materials or form a non-reactive solid matrix. Additional specific information on the open burning/open detonation processes is provided in Section C.3.1.4 of this WAP.

C.1.3.2 Macroencapsulation Wastes

Hazardous or mixed low-level wastes that require treatment by macroencapsulation may be generated by many of the operations described in Sections C.1.2.1 and C.1.2.2 of this WAP. The wastes will be treated primarily to meet LDR requirements for final disposition and the determination of applicable waste types will be controlled by the conditions for treatment identified in Permit Section 8.0, *Treatment by Macroencapsulation*. Additional specific information on the macroencapsulation treatment process is provided in Section C.3.1.3 of this WAP.

C.1.3.3 Treatment in Containers

Mixed transuranic wastes that require treatment are generated primarily from R&D and processing and recovery operations. Treatment of mixed transuranic waste at the Facility may consist of stabilization and neutralization in containers to form a nonignitable, non-corrosive solid matrix. The determination of applicable waste types for this type of waste will be controlled by the conditions for treatment identified in Permit Part 7.0, Stabilization in Containers. Additional specific information on the stabilization in containers treatment process is provided in Section C.3.2.6 of this WAP.

C.1.3.4 Cementation~~Treated Mixed TRU~~ Wastes

~~MTRUW~~Mixed transuranic waste that require treatment are~~is~~ generated primarily from R&D and processing and recovery operations. Treatment of ~~MTRUW~~ mixed transuranic waste at the Facility may consist of stabilization by cementation to form a noncorrosive solid matrix. Additional specific information on the stabilization treatment process is provided in Section C.3.2.~~4~~5 of this WAP.

~~C.1.4 Description of Permitted Units~~

~~The permitted units used for storage and treatment of wastes addressed in this WAP are located within various TAs at the Facility. These units are listed in Attachment J (*Hazardous Waste Management Units*). Detailed information on the permitted units is provided in Attachment A (*Technical Area Unit Descriptions*).~~

C.2 WASTE ANALYSIS PARAMETERS

The Permittees shall conduct detailed chemical and physical characterization for ~~on~~ non-mixed hazardous wastes, the hazardous component of ~~MLLW~~mixed low-level waste, and the hazardous component of ~~MTRUW~~mixed transuranic waste as required by 40 CFR § 264.13 and Permit Section 2.4. The Permittees shall select waste analysis parameters to ensure that the waste characterization documentation will contain the information necessary to manage the waste in accordance with Resource Conservation and Recovery Act (RCRA) general facility standards in 40 CFR Part 264 and the LDR requirements in 40 CFR Part 268.

C.2.1 Analytical Parameters and Methods

The Permittees shall use the characterization methods for non-mixed hazardous wastes, ~~MLLW~~mixed low-level waste, and ~~MTRUW~~mixed transuranic waste summarized in Tables C-6~~9~~ through C-8~~11~~ to quantify the waste characterization parameters in those tables. The Permittees shall comply with the sampling and analysis requirements of Permit Sections 2.4.1 through 2.4.9. The Permittees shall use the methods listed below, as necessary, for the wastes listed in ~~Attachment~~ Section C.1.

1. Acceptable Knowledge (AK);
2. Sampling and laboratory analysis to determine the presence and concentrations of:
   - RCRA-regulated metals
   - RCRA-regulated volatile organic compounds (VOC), and
   - RCRA-regulated semivolatile organic compounds (SVOC);
3. Additional ~~MTRUW~~ mixed transuranic waste characterization sampling methods:~~;~~
   - Headspace gas sampling to determine the presence of VOCs in container headspace, and
   - Physical waste form characterization through real-time radiography (RTR) and/or visual examination
4. Flash point characterization;
5. pH characterization;
6. Reactivity characterization; and
7. Free liquid determination via the paint filter test.

C.2.2 Criteria and Rationale for Characterization Methodology Selection

The Permittees shall select methods for waste characterization based on the physical form of the waste (*e.g.*, debris) and on knowledge of the process generating the waste. To determine whether a solid waste is hazardous, the Permittees shall use AK as described in Section C.3.1.1. When deemed necessary, the Permittees shall use sampling and laboratory analysis as described in Section C.3.1.2 and other characterization methodologies to evaluate the analytical parameters to confirm knowledge-based waste characterization for non-mixed hazardous waste, ~~MLLW~~mixed low-level waste, and ~~MTRUW~~mixed transuranic waste based upon the rationales identified in Tables C-6~~9~~, C-7~~10~~, and C-8~~11~~, respectively.

Approved ~~40 CFR § 260.11 lists approved~~ analytical methods to determine the concentrations of hazardous constituents in the liquid and solid fractions and extracts of waste samples are listed in 40 CFR § 260.11. All the methods are described in the most recent version of the U.S. EPA's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846)*. The Permittees shall use these and other ~~approved~~ methods approved by the Department, as necessary, to determine whether a waste stream is hazardous and to identify underlying hazardous constituents. The Permittees shall analyze samples for all hazardous constituents likely to be present based on the source of the waste stream and AK. ~~The Permittees shall require the analytical laboratory to report all constituents the laboratory analytical method is capable of measuring as specified in the most recent version of the U.S. EPA's *Test Methods for Evaluating Solid Wastes* (*SW-846*). Any hazardous constituents identified during analysis shall be included on the waste profile form. Detailed instructions for conducting Toxicity Characteristic Leaching Procedure (TCLP) waste analysis are found in the most recent version of *SW-846* and are incorporated by reference in 40 CFR § 260.11.~~ Also listed in *SW-846* is the appropriate analytical method for each hazardous constituent required to determine whether or not the waste contains a contaminant in excess of the maximum contaminant concentration regulated under 40 CFR Part 261. The Facility requires the analytical laboratory to report all constituents the laboratory analytical method selected is capable of measuring as specified in *SW-846*. Any hazardous constituents identified during analysis at levels higher than the regulatory thresholds for hazardous waste will be included within the waste characterization documentation.

~~TCLP is a method for leaching hazardous constituents from the solid portion of the waste and is used only if the solids constitute more than 0.5% of the waste by weight. The laboratory can also forego analysis by extraction if: 1) total analysis of the waste shows the concentrations of the analytes are so low that an extract of the waste could not contain analytes at concentrations above the regulatory limits (*see* Section C.3.1.2.1); or 2) analysis of any liquid portion of the waste contains such high concentrations of hazardous constituents that, even accounting for dilution, the entire sample would be hazardous.~~

Many hazardous wastes are restricted from land disposal under the Hazardous and Solid Waste Amendments unless they are treated to diminish their toxicity and reduce the likelihood that hazardous constituents will migrate from the disposal site. As required by 40 CFR Part 268, each waste shipment must be accompanied by a notification stating whether the restricted waste meets specific LDR treatment standards promulgated for hazardous constituents or is otherwise exempt. In most cases, the notification can be completed after laboratory analysis of the waste.

If an LDR notification is based solely on knowledge of the waste, the Permittees shall keep the supporting documentation on record, in accordance with 40 CFR § 268.7.

C.3 CHARACTERIZATION METHODS

Non-mixed hazardous wastes, mixed low-level waste, and mixed transuranic waste will be characterized based on the chemical, physical, and radiological nature of the waste stream. Characterization will be performed by using AK or sampling and analysis or both, as described below. The Permittees' operating procedures consider characterization of wastes before a waste-generating process will begin. The preliminary characterization of waste begins prior to actual generation (at the point of concept and design of a process or system) so that the generator can determine whether AK, sampling and analysis, or a combination of the two will be required for waste characterization.

~~The Permittees shall characterize non-mixed hazardous wastes, MLLW, and MTRUW based on the chemical, physical, and radiological nature of the waste stream. The Permittees shall perform characterization by using AK or sampling and analysis or both, as described below.~~

Once generated, the~~The~~ Permittees shall record information for each waste stream on a waste characterization profile that includes~~ form accompanied by~~ sampling and analysis data~~-~~ and/or AK documentation. This information is~~These documents are~~ collectively referred to as the waste characterization documentation. Such documentation may include items referred to by a traceable identifier and separately located within the Facility. The Permittees shall ensure that waste characterization documentation is reviewed and approved prior to waste acceptance at a hazardous waste management~~permitted~~ unit for treatment or storage. If the documentation is incomplete or does not contain sufficient information to characterize the waste, the Permittees shall return the documentation to the generator and shall not accept the waste for storage or treatment.

Before accepting waste for storage or treatment, the Permittees shall determine that waste characterization documentation satisfies the information requirements of Permit Section 2.4, including but not limited to the assignment of all applicable EPA Hazardous Waste Numbers and the LDR status of the waste. Once the waste characterization documentation is reviewed and approved, the Permittees may notify the generator and authorize the transfer of the waste to a permitted unit. Before the waste is transferred, the Permittees' waste management personnel shall review any transfer documentation to ensure that it accurately pertains to the waste being transferred and that it corresponds with the waste characterization documentation. If the transfer documentation does not correspond with the characterization documentation, the Permittees shall not transfer the waste. The Permittees shall maintain the waste characterization documentation and the transfer documentation shall be part of the Facility Operating Record. After approval of waste characterization of a waste stream by waste management personnel, the Permittees shall approve subsequent transfer of waste from that waste stream based upon the generator's statement that the waste stream is accurately represented by the previously approved waste characterization information.

Training for use of waste characterization documentation is included in a facility waste documentation course. This training provides step-by-step instructions on how to complete and review documentation ~~forms~~ for characterizing wastes.

The Permittees shall perform reevaluation of initial characterization information and annual verification in accordance with Permit Section 2.4.7.

The Permittees shall deem a waste container to contain free liquids if any of the following characterization methods so demonstrate:

- ~~1.~~ generator waste-characterization knowledge;
- ~~2.~~ visual examination;
- ~~3.~~ radiography; or
- ~~4.~~ the Paint Filter Test (*SW-846*, Method 9095).

C.3.1 Hazardous and Mixed Low-Level Waste Characterization

The Permittees shall select characterization methods for non-mixed hazardous waste and ~~MLLW~~mixed low-level waste based on the physical nature of the waste stream (*i.e.*, homogeneous or heterogeneous). The Permittees shall characterize homogeneous solid and liquid waste for the presence of hazardous constituents (*e.g.*, VOCs, SVOCs, metals) on the basis of AK and, if necessary, sampling and analysis.

The Permittees shall characterize heterogeneous solid waste solely on the basis of AK for the following reasons:

- ~~1.~~ the physical, chemical, and/or radiological nature of the waste makes it difficult to obtain representative samples;
- ~~2.~~ the lack of appropriate sampling methodology; and
- ~~3.~~ for ~~MLLW~~mixed low-level waste, safety concerns associated with unnecessary exposure to the radioactive component of the waste.

In using AK to characterize waste, the Permittees shall review characterization documents with the help of subject matter experts, when necessary.

The Permittees shall characterize chemicals of an unknown nature by assembling all knowledge of the operations and activities that were performed at the site of generation relevant to waste generation and management. The Permittees shall test unknown wastes in volumes greater than one gallon for ignitability, corrosivity, reactivity, toxicity characteristics, and any other parameters indicated by the initial data gathered on the material. Based on that determination, the Permittees shall assign the waste the proper EPA Hazardous Waste Number(s) and LDR status. The Permittees shall use the characterization methods provided in Tables C-6~~9~~ and C-7~~10~~.

The Permittees shall analyze small volumes of unknown wastes for pH, flash point, and reactivity. For purposes of managing unknown wastes, a small volume is defined as one liquid gallon or less. The rationale for this basis is that one gallon is the minimum quantity of sample needed for these three tests to determine whether or not the waste is hazardous.~~ The Permittees shall analyze small volumes of unknown wastes for pH, flash point, and reactivity.~~

C.3.1.1. Acceptable Knowledge

Acceptable knowledge (AK) includes process knowledge, additional characterization data, and facility records of analysis~~ (EPA, 1994A)~~.

Process knowledge ~~(PK) ~~includes information about the process used to generate the waste, material inputs to the process, and the time period during which the waste was generated. ~~PK~~Process knowledge is described in 40 CFR § 264.13(a)(2) as data developed under 40 CFR Part 261 and existing published or documented data on a specific hazardous waste or hazardous waste generated from similar processes. ~~PK~~Process knowledge may include off-site facility waste characterization data pertaining to a specific waste and laboratory analysis data performed prior to the effective date of applicable RCRA regulations.

Additional characterization data includes data obtained after the advent of RCRA and from chemical or physical analysis that is not subject to the most recent version of *SW-846* and other approved methods, or through testing of similar or surrogate waste streams. This includes previous analytical data relevant to the waste stream including results from fingerprint analyses, spot checks, or routine waste verification sampling.

Facility records of analysis consist of waste analysis and physical characterization performed prior to the effective date of RCRA regulations.

The Permittees may use AK alone or in conjunction with sampling and analysis in the following instances (EPA, 2015~~1994A~~):

- hazardous constituents in wastes from specific processes are well documented, such as with K-listed wastes, presuming that the wastes are not highly variable, and accurate and precise concentrations are not necessary for documenting compliance;
- wastes are discarded unused commercial chemical products, reagents, or chemicals of known physical and chemical constituents, presuming that the wastes are not highly variable, and accurate and precise concentrations are not necessary for documenting compliance. See the P- and U-listed waste categories in 40 CFR §261.33;
- it has been determined that no acceptable test method exists to satisfy an analytical requirement (e.g., hazardous waste determinations under §261.23 for D003 reactivity);
- health and safety risks to personnel would not justify sampling and analysis (e.g., if opening a container exposes technician to radionuclides from radioactive mixed waste); or
- the physical nature of the waste makes it technically impracticable to obtain a laboratory sample.

~~1. hazardous wastes from specific processes that are well documented;~~

~~2. F and K-listed wastes;~~

~~3. wastes are discarded, unused, commercial chemical products, reagents, or chemicals of known physical and chemical properties (P and U-listed wastes);~~

~~4. health and safety risks to personnel would not justify sampling and analysis ; and~~

~~5. physical nature of the waste does not lend itself to taking a laboratory sample (*e.g.*, heterogeneous waste streams).~~

The Permittees shall document the basis for using AK on a waste profile form. The Permittees shall maintain AK information in accordance with Permit Section 2.12.2 in a format that allows waste management personnel and subject matter experts to either obtain copies or, in the case of classified or sensitive AK documentation that cannot be kept in the standard recordkeeping systems~~sent to TA-54~~ due to security requirements, review the documentation at the point of waste generation. The Permittees shall assign a traceable identifier (*i.e.*, process or AK document number or alphanumeric designation) in accordance with Permit Section 2.4.1 to the waste characterization documentation so that the Permittees can obtain the information for as long as required by RCRA regulation and this Permit.

C.3.1.1.1 Process Knowledge

The Permittees shall obtain, assemble, and prepare the process knowledge documentation for each waste stream. The Permittees may substantiate process knowledge for a specific waste stream using documentation such as:

- ~~1.~~ laboratory notebooks that detail the research processes and raw materials used in an experiment;
- ~~2.~~ process or experiment design documents;
- ~~3.~~ safety analysis reports;
- ~~4.~~ standard operating procedures and detailed operating procedures, which can include a list of the raw materials or reagents, a description of the process or experiment that uses the materials, and a description of the wastes generated and how the wastes are handled;
- ~~5.~~ waste packaging logs;
- ~~6.~~ test plans or research project reports that describe the reagents and other raw materials used in an experiment;
- ~~7.~~ chemical inventory database for particular processes or experiments;
- ~~8.~~ information from site personnel (*e.g.*, documented interviews);
- ~~9.~~ industry reports on a similar process when there is a clear connection between the Facility process/experiment and the industry's similar process or experiment;
- ~~10.~~ ~~Material~~ Safety Data Sheets, product labels, and other product package information; and
- ~~11.~~ ~~ER~~Environmental restoration site and waste characterization data.

C.3.1.2 Sampling and Analysis

For waste streams that can be representatively sampled (*i.e.*, homogeneous), the Permittees shall conduct sampling and analysis when there is insufficient AK. The Permittees shall collect a representative sample of the waste and handle it by a means that preserves its original physical form and composition and prevents contamination or changes in concentration of the constituents to be analyzed. The Permittees shall, when it is necessary to conduct sampling and analysis to fully characterize a waste, utilize the analytical methods specified in Tables C-11~~9~~ through C-13~~18~~ for the identification of any hazardous constituents likely to be present based on the source of the waste stream and AK. Personnel involved in sampling and analysis shall comply with the most recent version of *SW-846* and other Department approved methods. The Permittees shall obtain samples representative of the waste stream in accordance with Permit Section 2.4.2.

C.3.1.2.1 Toxicity Characteristic~~Solid Waste~~ Analysis

The Permittees shall, if necessary for waste characterization purposes, sample and analyze homogeneous waste streams for the toxicity characteristic (TC) contaminants listed in 40 CFR § 261.24.~~, which is~~ Detailed instructions for conducting Toxicity Characteristic Leaching Procedure (TCLP) waste~~ incorporated herein by reference. The Permittees may conduct~~ analysis are ~~for total concentration of TC contaminants on samples in a screening step, ~~as described in Section -1.2 of SW-846 Method 1311~~, the toxicity characteristic leaching procedure (TCLP)~~. TCLP is a method for leaching hazardous constituents from the solid portion of the waste and is used only if the solids constitute more than 0.5% of the waste by weight. The Permittees may forego analysis by extraction if: (1) total analysis of the waste shows the concentrations of the analytes are so low that an extract of the waste could not contain hazardous constituents at concentrations above the regulatory limits; or (2) analysis of any liquid portion of the waste contains such high concentrations of hazardous constituents that, even accounting for dilution, the entire sample would be hazardous. If total concentrations are used in the waste characterization process, the Permittees shall compare analytical data to the TC regulatory levels expressed as total values. These total values will be considered the regulatory threshold limit ~~(RTL)~~ values for the determination of whether a particular waste exhibits a TC. The Permittees shall obtain Regulatory threshold limit ~~RTL~~ values by calculating the weight/weight concentration (in the solid) of a TC contaminant that would give the regulatory weight/volume concentration in the TCLP extract. If the total concentrations are less than the regulatory threshold limit~~ RTL~~ value, then it may be assumed that the waste does not exhibit the toxicity characteristic and the TCLP does not need to be completed for the screened TC contaminants.

~~C.3.1.2.2 Liquid Waste Analysis~~

Liquid wastes generated at the Facility consist of aqueous solutions, slurries, and organic liquids. The Permittees shall sample and analyze these wastes, if necessary for waste characterization purposes, for total metal content, VOCs, and SVOCs. In accordance with SW-846 Method 1311 ~~(TCLP)~~, liquid wastes (~~*i.e.*, those wastes~~ that contain less than 0.5 percent dry solids) do not require extraction. The liquid waste, after filtration, is defined as the TCLP extract. Liquid waste, therefore, is characterized by filtering the waste, measuring total contaminant concentrations in the resulting filtrate, and comparing these concentrations to the TC regulatory levels in 40 CFR § 261.24.

The Permittees shall characterize wastes that contain both a liquid and a solid phase using total analytical data for the solid phase to determine toxicity characteristics. The Permittees shall compare with the TC regulatory levels for each phase in a manner consistent with the discussion in ~~Section C.3.1.2.1~~this section. The following formula (EPA, 1994~~b~~) will be used to calculate the maximum theoretical leachate concentrations for the combined phases:

$$\frac{[A \times B] + [C \times D]}{B + [20 \text{ liters/kilogram} \times D]} = M$$

Where:

A = concentration of the analyte in the liquid portion of the sample (milligrams/liter);

B = volume of the liquid portion of the sample (liter);

C = concentration of the analyte in the solid portion of the sample (milligrams/kilogram);

D = weight of the solid portion of the sample (kilogram); and

M = maximum theoretical leachate concentration (milligrams/liter).

C.3.1.2.2~~3~~ Sample Handling, Preservation, and Storage

Table C-10~~5~~ presents ~~requirements specified in~~ the most recent ~~version of~~ *SW-846* requirements for ~~regarding~~ sample containers, preservation techniques, and holding times associated with sample collection. The Permittees shall adhere to these requirements to ensure that sampling and analysis meet quality objectives for data. In the event the specified criteria are not met, the Permittees shall collect another sample and submit it for analysis.

C.3.1.2.3~~4~~ Analytical Laboratory Selection and Analytical Methods

The Permittees shall ensure that analytical laboratories at the Facility and approved contractor laboratories conduct the detailed qualitative and quantitative chemical analyses specified in Tables C-11~~6~~ and C-12~~7~~. These laboratories must have:

1. a documented and comprehensive QA/QC program;
2. technical analytical expertise;
3. a document control and records management plan; and
4. the capability to perform data reduction, validation, and reporting.

C.3.1.3~~2.5~~ Characterization of Waste to be ~~t~~Treated by Macroencapsulation

The treatment objective of macroencapsulation is to utilize an EPA--approved treatment technology to meet the LDR treatment standard for hazardous debris waste and radioactive lead solids as specified in 40 CFR § 268.42 and 40 CFR § 268.45. The macroencapsulation technology is at least a two-component system formulated to resist contaminants and leachate. The closure system ensures a permanent and impermeable barrier between the waste debris and the outside environment. Permittees shall conduct chemical and physical characterization of hazardous or mixed low-level waste prior to treatment by macroencapsulation as described in ~~. The Permittees shall use documented AK, as described in Attachment C,~~ Section C.3.1.1, which will be used to determine whether or not the waste stream is regulated as a hazardous waste. ~~The Permittees shall use process knowledge, prior to macroencapsulation.~~ After treatment, the waste will meet LDR treatment standards for toxicity characteristic hazardous waste debris. The EPA hazardous waste numbers D004-D011 and D018-D043 will no longer apply to the waste. The Permittees shall confirm this condition with process knowledge and conformance with the applicable treatment conditions.

C.3.1.4 Characterization of Waste to be Treated by Open Burning and Open Detonation

Explosives waste streams at the Facility are treated to remove the characteristic of reactivity as defined in 40 CFR § 261.23. Open burning treatment of these wastes involves a propane-fueled burn that removes the high-explosives component of the waste and renders the waste non-reactive and any residue amenable to handling and dispositioning. Regulations do not specify a particular test method for reactivity of explosives waste or explosives-contaminated waste, therefore, the determination of whether a waste is reactive is made based on the properties of the chemicals known or suspected to be in the waste. Wastes that contain concentrated explosives are characterized by process knowledge, as described in Section C.3.1.1.1. Explosives-contaminated waste streams are characterized by both process knowledge and/or other acceptable knowledge (Section C.3.1.1). Information to determine whether explosives content within the waste stream is detonable follows.

- If it is unknown whether explosives are present, a screening method or field test, such as the High Explosives Spot Test, may be used.
- If the waste contains visible explosives, it is considered reactive.
- If the waste came into direct contact with explosives, and all of the surfaces cannot be tested or visually examined (e.g., debris or equipment), it is assumed that there is a reactive amount of explosives associated with it.
- All open burning treatment residues will be sampled and analyzed in accordance with the requirements of Section C.3.1.2 to ensure that treatment residuals are not hazardous waste. This is usually conducted using the appropriate analytical method from the most recent version of Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) listed in Table C-9. All sampling of waste streams is conducted to be representative of the waste.

Additionally, analysis of the treatment residue will be used to verify the characterization of the treated explosives waste stream that generated the residue. If analysis of the residue identifies constituents not identified in the waste characterization documentation, those constituents will be included on the waste profile form for the waste stream prior to acceptance at the unit in the future. Most treatment residues generated by the open burning treatment process are characterized as nonhazardous wastes; however, all treatment residues (both nonhazardous and hazardous) are shipped off-site for disposal.

- Because the TA-16-388 Flash Pad may be used to treat hazardous debris that exhibits a reactive characteristic potentially mixed with "toxicity characteristic debris" or a "debris contaminated with listed waste" (see 40 CFR § 268.45(b)), the alternative treatment standards outlined in Table 1 at 40 CFR § 268.45 must be met prior to land disposal of the waste. Any hazardous debris treated at the TA-16-388 Flash Pad that will be land disposed will be separated from treatment residues using simple physical or mechanical means as necessary. If further treatment of the hazardous debris waste is required to meet the waste-specific treatment standards for organic compounds, the additional treatment will be conducted at an off-site treatment facility prior to land disposal.

Open detonation treatment of these wastes involves an explosion that chemically transforms the high--explosives component of the waste faster than the speed of sound. Regulations do not specify a particular test method for reactivity of explosives waste and explosives--contaminated waste; therefore, the determination of whether a waste is explosives waste is made based on the properties of the chemicals known or suspected to be in the waste and/or field screening or laboratory analysis. Wastes that contain concentrated explosives are characterized by process knowledge, as described in Section C.3.1.1.1. Wastes that may contain explosives in lower concentrations are characterized by both process knowledge and/or the following techniques to determine whether explosives in lower concentrations are detonable/explosive.~~:~~

- If it is unknown whether explosives are present, a screening method, such as the High Explosives Spot Test, may be used.
- If heterogeneous waste contains visible high explosives, it is considered reactive.
- If heterogeneous waste came into direct contact with high explosives and all of the surfaces cannot be tested or visually examined (e.g., debris or equipment), it is assumed that there is a reactive amount of explosives associated with it.
- High explosives concentrations may be directly measured in homogeneous materials (e.g., soil or water). This is usually completed using the appropriate analytical method from the most recent version of SW 846 Method 8300 series. Parameters such as the concentration of the high explosive, its sensitivity, and the media in which it occurs are used to determine whether the waste is likely to be reactive or not.

Characterization methods for explosives-contaminated waste and explosives waste are summarized in Table C-9. Treatment by open burning and open detonation completely removes the reactive characteristic from explosives waste streams.

C.3.1.5~~3~~ Verification Frequencies

The Permittees shall comply with the waste characterization verification procedures identified in Permit Section 2.4.7(3). The Permittees shall place a non-conformance report in the Facility Operating Record if the characterization for the waste stream is found to be inconsistent with the documentation. The Permittees shall decline to accept any waste from the waste stream in issue until the characterization deficiency is remedied.

C.3.2 Mixed Transuranic Waste Characterization

The Permittees characterize mixed transuranic waste ~~MTRUW~~ for the information specified in Tables C-8 and C-13 and described in Permit Section 2.4.1 ~~in accordance with the parameters and methods shown in Tables C-11 and C-18~~ for management, storage, and treatment at the Facility. Characterization of the hazardous component of ~~MTRUW~~mixed transuranic waste to be stored and treated at the Facility shall be conducted in accordance with the procedures discussed in the following sections.

Initial characterization of ~~MTRUW~~mixed transuranic waste for the purpose of storage at the Facility is based primarily on AK (*see* ~~Attachment~~ Section C.3.1.1) with additional procedures applied to confirm the AK. The Permittees shall begin the AK process by reviewing the available generator documentation for the waste stream. This includes process knowledge, any extant analytical data, and the information included with the waste documentation forms associated with the individual waste containers.

Most mixed transuranic waste managed at the Facility is destined for disposal at the WIPP in Carlsbad, New Mexico. WIPP certification procedures require additional characterization to meet the requirements of the WIPP permit and waste acceptance criteria prior to shipment there. Information regarding the waste derived from the WIPP certification procedures will be used as additional information for AK.

The Permittees shall categorize ~~MTRUW~~mixed transuranic waste streams by Summary Category Groups based on the physical and chemical form of the waste as established by AK. The Permittees shall assign individual waste containers to waste streams based upon AK.

The Permittees shall utilize AK to determine the EPA Hazardous Waste Numbers applicable to the waste stream or container under consideration. The Permittees shall utilize AK to determine whether the container requires additional waste management procedures such as secondary containment for liquid waste or segregation of incompatible, ignitable, or reactive wastes. If AK is insufficient to determine needed information (*e.g.*, ignitability), the Permittees shall use headspace gas sampling to provide the needed information.

~~Until it is determined that a container does not contain free liquids, t~~The Permittees shall manage ~~MTRUW~~mixed transuranic waste ~~container storage~~ in accordance with regulations and Permit requirements applicable to containers holding free liquids (*i.e.*, with secondary containment and appropriate labeling) if the hazardous waste determination made pursuant to Permit Section 2.4.1 indicates that the container holds any free liquids.

If AK is inadequate to characterize a homogeneous ~~MTRUW~~mixed transuranic waste stream or container (*e.g.*, homogeneous solids, soil and gravel, aqueous liquids and slurries) the Permittees shall collect a representative sample of the waste and submit the waste for on-site laboratory analysis. Mixed transuranic waste is not shipped off-site for analysis.

C.3.2.1~~.1~~ Real-Time Radiography

~~MTRUW~~Mixed transuranic waste containers generated after the effective date of the Permit and that are not wastes taken from retrievable storage after that date are not required to undergo RTR if associated AK documentation contains the information necessary to fully characterize the waste in accordance with Permit Section 2.4~~/~~.1 and the WIPP waste acceptance criteria. Otherwise, all ~~MTRUW~~mixed transuranic waste containers require RTR prior to storage at the Facility.

RTR is a nondestructive, qualitative, and semi-quantitative characterization technique that involves x-ray scanning of waste containers to identify and verify the physical form(s) of waste container contents using appropriate equipment and qualified operators. The Permittees shall use RTR to verify the absence of free liquids, to confirm the physical form of containerized waste, and to document the materials present.

The Permittees shall ensure that during RTR the waste container is scanned while the operator views and permanently records the image from the television screen on audio and videotape. The radiography image is examined for evidence of liquids by repetitively moving the container-handling system and searching for evidence of wave motion. The Permittees shall utilize a radiography data form to document the materials present and all other relevant characterization information about the containerized waste.

The Permittees shall allow only properly trained personnel to operate radiography equipment. Standardized training requirements for radiography operators are based upon existing industry standard training requirements. Operators must requalify ~~at least every two years~~periodically, as required.

The Permittees shall examine the radiography image produced for evidence of liquids by repetitively moving the container-handling system and searching for evidence of wave motion.

C.3.2.~~1~~.2 Visual Examination

~~The Permittees may use v~~Visual examination (VE) or visual inspection (VI) is used to verify the contents of ~~MTRUW~~mixed transuranic waste containers as a substitute to RTR or during packaging of the waste. VE/VI is performed by physically examining the contents of a waste container to verify that the container is properly included in the appropriate waste stream, to verify the absence of free liquids, to confirm the physical form of containerized waste, and to document the materials present. The Permittees shall ensure that waste characterization determined through VE/VI is recorded in the associated waste's AK documentation.

~~Standardized training for VE shall be developed.~~ Visual examination operators shall be trained in the specific waste generating processes, typical packaging configurations, and waste material parameters expected to be found in each waste stream at the generator site. The training shall be site specific to include the various waste configurations generated at the site. Operators must requalify ~~at least every two years~~periodically, as required.

C.3.2.3 Headspace Gas Analysis

Headspace gas analysis is used to confirm the presence and concentration of flammable gas/VOCs, hydrogen, and methane in a mixed transuranic waste container intended for shipment to WIPP. A sample of headspace gas is taken through the vent assembly of a waste container at controlled temperatures and analyzed by gas chromatography and thermal conductivity. Waste characterization information collected through headspace gas analysis is recorded in the associated waste's AK documentation.

C.3.2.4~~2~~ Characterization to Meet LDR Requirements

Mixed transuranic waste is characterized~~The Permittees shall characterize MTRUW~~ to determine its land disposal restriction status in accordance with Attachment Section C.5.2.

~~C.3.2.3 WIPP Characterization~~

~~Most MTRUW waste at the Facility is destined for disposal at the Waste Isolation Pilot Project (WIPP) in Carlsbad, New Mexico. Therefore, prior to shipment to WIPP, additional characterization to meet WIPP certification procedures will be implemented to meet requirements of the WIPP permit for these wastes. Waste information that is derived from the WIPP waste characterization will be used for Facility MTRUW characterization as additional information for AK.~~

C.3.2.5~~4~~ Characterization Procedures ~~Prior~~for ~~to and After~~ Treatment of Mixed ~~TRU~~ Transuranic Wastes by Stabilization (Cementation)

The Permittees shall adhere to the waste characterization procedures specific to waste treatment in the stabilization unit at TA-55, Building 4, Room 401~~; for the stabilization process of blending with zeolite at the TA-50, Building 69 (TA-50-0069) Indoor Permitted Unit; and the stabilization/neutralization treatment processes at TA-54, Area G, Pad 9, Dome 231 (TA-54-0231) and TA-54, Area G, Pad 1, Building 412 (TA-54-0412)~~. The stabilization unit at TA-55 is a miscellaneous unit pursuant to 40 CFR Part 264, Subpart X, and is used to treat liquid and solid mixed wastes by stabilization in cement to form a noncorrosive solid matrix~~. The stabilization treatment process at TA-50 occurs within a glovebox at a permitted storage unit and is used to treat liquid and solid mixed waste by blending with water and zeolite to form a noncorrosive and non-ignitable solid matrix. The stabilization treatment process at TA-54-0231 occurs within a glove bag at a permitted storage unit and is used to treat liquid and solid waste by neutralizing pourable liquids and adding zeolite or another Waste Isolation Pilot Plan (WIPP)-approved absorbent to form a noncorrosive and non-ignitable solid matrix. The stabilization treatment process at TA-54-0412 occurs within the pre-engineered containment tent within TA-54-0412 at permitted storage unit and is used two treat liquid and solid waste by neutralizing pourable liquids and adding zeolite or another Waste Isolation Pilot Plan (WIPP)-approved absorbent to form a noncorrosive and non-ignitable solid matrix. Treatment will occur under fume hoods for 55-gallon and 85-gallon drums. The fume hoods are attached to the ventilation system when in use~~.

The stabilization (cementation) unit at TA-55 treats homogeneous liquid and solid mixed waste generated primarily from R&D and processing and recovery operations at TA-55 and at the Chemistry and Metallurgy Research Building at TA-3. The liquid wastes (Summary Category Group L1000) generally consist of evaporator bottoms solutions and laboratory solutions that may exhibit the hazardous characteristics of corrosivity and toxicity for metals (e.g., ~~including~~ arsenic, barium, cadmium, chromium, lead, mercury, and silver) as defined in 40 CFR §§ 261.22 and 261.24, which are incorporated herein by reference. The homogeneous solid process wastes

(Summary Category Group S3000) consist of process residue from the evaporator, process leached solids, filter cake, and other miscellaneous solids. This waste stream typically exhibits the hazardous characteristic of toxicity (for metals) and corrosivity. These waste streams are mixed with cement in 55-gallon drums and allowed to cure into a noncorrosive solid matrix. Table C-14~~9~~ provides a description of the waste streams associated with the stabilization unit and identifies their potentially applicable EPA Hazardous Waste Numbers. The resulting cemented waste is identified by Summary Category Group S3000 and typically carries the Waste Matrix Code S3100. Based on documented AK, the wastes treated by stabilization at TA-50 do not contain VOCs or SVOCs.

~~The glovebox at the TA-50-0069 Indoor Permitted Unit is used to treat nitrate salt-bearing waste by stabilization in containers. Liquids and solid waste that exhibit the hazardous characteristics of ignitability, corrosivity (for liquids only), and toxicity for metals (including arsenic, barium, cadmium, chromium, lead, mercury, and silver) as defined in 40 CFR §§261.22 and 261.24, which are incorporated herein by reference, are treated at the unit to remove only the ignitability and corrosivity characteristics. Table C-20 provides a description of the waste streams associated with the stabilization within a bowl in a glovebox located within in TA-50-0069 and the stabilization (including absorption) and neutralization inside a Perma-Con in building TA-54-0231, and identifies their potentially applicable EPA Hazardous Waste Numbers prior to treatment. After treatment, only the EPA Hazardous Waste Numbers for ignitability and corrosivity (D001 and D002) will be removed from the treated waste. All other Hazardous Waste Numbers will still apply to the treated waste.~~

~~The Permitted Units at TA-54-0231 and TA-0412 are used to treat mixed transuranic waste from the S3000 waste matrix (homogenous solids) to remove the Resource Conservation and Recovery Act (RCRA) hazardous waste characteristics of ignitability (D001), corrosivity (D002) and reactivity (D003). Treatment of cemented sludge waste will occur within glove bags located inside the Permitted Unit, a Perma-Con in TA-54-0231. At TA-54-0412,treatment of waste will occur within the pre-engineered containment tent within Building 412. Treatment activities include neutralization of liquids, and stabilization of liquids using zeolite or another WIPP-approved absorbent. Table C-20 provides a description of the waste streams associated with the stabilization (including absorption) and neutralization inside a glove bag located within a PermaCon in TA-54-0231 and within the pre-engineered containment tent in TA-54-0412; and identifies their potentially applicable EPA Hazardous Waste Numbers (HWNs) prior to treatment. After treatment, only the EPA HWNs D001 and D002 will be removed from the treated waste. To remove the D003 HWN, aerosol cans will be removed/segregated from the waste stream and sent off-site for treatment and disposal. All other HWNs that have not been removed by treatment or segregation will still apply to the treated waste.~~

C.3.2.6~~4.1~~ Characterization Procedures for Treatment of Mixed Transuranic Waste ~~to Be Treated~~ by ~~Stabilization~~ Treatment in Containers

The Permittees shall adhere to the waste characterization procedures specific to waste treatment for the stabilization process of blending with zeolite at the TA-50, Building 69 (TA-50-0069) Indoor Permitted Unit; and the stabilization/neutralization treatment processes at TA-54, Area G, Pad 9, Dome 231 (TA-54-0231) and TA-54, Area G, Pad 1, Building 412 (TA-54-0412). The stabilization treatment process at TA-50 occurs within a glovebox at a permitted storage unit and is used to treat liquid and solid mixed waste by blending with water and zeolite to form a noncorrosive and non-ignitable solid matrix. The stabilization treatment process at TA-54-0231 occurs within a glove bag at a permitted storage unit and is used to treat liquid and solid waste by neutralizing pourable liquids and adding zeolite or another Waste Isolation Pilot Plan (WIPP)-approved absorbent to form a noncorrosive and non-ignitable solid matrix. The stabilization treatment process at TA-54-0412 occurs within the pre-engineered containment tent within TA-54-0412 at permitted storage unit and is used two treat liquid and solid waste by neutralizing pourable liquids and adding zeolite or another Waste Isolation Pilot Plan (WIPP)-approved absorbent to form a noncorrosive and non-ignitable solid matrix. Treatment will occur under fume hoods for 55-gallon and 85-gallon drums. The fume hoods are attached to the ventilation system when in use.

The glovebox at the TA-50-0069 Indoor Permitted Unit is used to treat nitrate salt-bearing waste by stabilization in containers. Liquids and solid waste that exhibit the hazardous characteristics of ignitability, corrosivity (for liquids only), and toxicity for metals (including arsenic, barium, cadmium, chromium, lead, mercury, and silver) as defined in 40 CFR §§261.22 and 261.24, which are incorporated herein by reference, are treated at the unit to remove only the ignitability and corrosivity characteristics. Table C-15~~20~~ provides a description of the waste streams associated with the stabilization within a bowl in a glovebox located within in TA-50-0069 and the stabilization (including absorption) and neutralization inside a Perma-Con in building TA-54-0231, and identifies their potentially applicable EPA Hazardous Waste Numbers prior to treatment. After treatment, only the EPA Hazardous Waste Numbers for ignitability and corrosivity (D001 and D002) will be removed from the treated waste. All other Hazardous Waste Numbers will still apply to the treated waste.

The Permitted Units at TA-54-0231 and TA-0412 are used to treat mixed transuranic waste from the S3000 waste matrix (homogenous solids) to remove the Resource Conservation and Recovery Act (RCRA) hazardous waste characteristics of ignitability (D001), corrosivity (D002) and reactivity (D003). Treatment of cemented sludge waste will occur within glove bags located inside the Permitted Unit, a Perma-Con in TA-54-0231. At TA-54-0412,treatment of waste will occur within the pre-engineered containment tent within Building 412. Treatment activities include neutralization of liquids, and stabilization of liquids using zeolite or another WIPP-approved absorbent. Table C-15~~20~~ provides a description of the waste streams associated with the stabilization (including absorption) and neutralization inside a glove bag located within a Perma-Con in TA-54-0231 and within the pre-engineered containment tent in TA-54-0412; and identifies their potentially applicable EPA Hazardous Waste Numbers (HWNs) prior to treatment. After treatment, only the EPA HWNs D001 and D002 will be removed from the treated waste. To remove the D003 HWN, aerosol cans will be removed/segregated from the waste stream and sent off-site for treatment and disposal. All other HWNs that have not been removed by treatment or segregation will still apply to the treated waste.

The Permittees shall conduct chemical and physical characterization prior to treatment of ~~MTRUW~~mixed transuranic waste by stabilization. The Permittees shall use documented AK, as described in ~~Attachment~~ Section C.3.1.1, to determine whether or not the waste stream is regulated as a hazardous waste. The Permittees shall use process knowledge, chemical analytical data, or both to adequately characterize the ~~MTRUW~~mixed transuranic waste prior to stabilization and neutralization, if necessary (at TA-54-0231 and TA-54-0412 only). If process information is not sufficient, the Permittees shall periodically sample and analyze the wastes to be treated by stabilization for pH and for TC metals listed in 40 CFR § 261.24 to establish a baseline, as appropriate. ~~Based on documented AK, the wastes treated by stabilization at TA-55 do not contain VOCs or SVOCs.~~ Parameters and analytical methods for specific hazardous constituents are presented in Table C-13~~8~~.

The neutralization process will consist of verifying the pH and adding hydrochloric acid (HCl) or sodium hydroxide (NaOH) incrementally and iteratively to aqueous waste to bring the pH within a 3 -10 range. Pourable liquids in the waste drums will have their pH measured with a calibrated pH meter prior to the neutralization process and will generally follow EPA Method 9040C (as updated), pH Electrometric Measurement for pH testing. However, because of the need for "real-time" pH screening results at the time of waste processing, strict adherence to all aspects of EPA method 9040C may not be possible. The Permittees may use an equivalent method, if approved in advance by NMED. The liquids will be neutralized, if necessary, and stabilized with zeolite in a minimum ratio of 3:1 (three parts zeolite to one part liquid waste). The treated waste will be repackaged into a new certified 55-gal. daughter drum and characterized and certified by Central Characterization Program (CCP) personnel in accordance with the WIPP WAC. All measuring tools used in the stabilization process (*i.e.*, glass/plastic pipettes, graduated cylinders, beakers, etc.) must be resistant to a wide variety of reagents.

~~C.3.2.4.2 Characterization Procedures for Waste Treated by Stabilization~~

~~The Permittees shall characterize waste treated by stabilization (*i.e.*, MTRUW) in accordance with Attachment Section C.3.2. For treatment at the TA-50-0069 Indoor Permitted Unit, samples will be collected from a minimum of 1% of treated waste containers from each waste stream and analyzed at an onsite laboratory to confirm chemical composition when compared to that of the surrogates tested.~~

NMED may require additional sampling of waste from the TA-54-0231 and TA-54-0412 treatment processes.

C.3.2.7~~5~~ Sample Handling, Preservation, and Storage

Table C-15 presents the most recent *SW-846* requirements regarding sample containers, preservation techniques, and holding times associated with sample collection. The Permittees shall adhere to these requirements to ensure that sampling and analysis meet quality objectives for data.

C.4 OFF-SITE WASTE ACCEPTANCE PROCEDURES

For off-site waste, the Permittees shall require the generator to provide waste characterization documentation equivalent to that prepared by the Permittees for waste generated on site. The Permittees shall review such documentation for completeness and accuracy prior to approving the waste for shipment to the Facility.

The Permittees shall verify that off-site waste documentation, including Uniform Hazardous Waste Manifests and LDR Notification Forms, corresponds to the waste received and its associated characterization documentation.

The Permittees shall physically examine waste shipments upon receipt for correct documentation, correctness and completeness of waste container identification and labeling, and conformance with permitted container types and waste compatibility for storage and segregation, as appropriate. If the Permittees find discrepancies between the wastes received and the manifest or during further characterization find such discrepancies, the Permittees shall notify the Department in accordance with Permit Section 2.4.4. If the Permittees cannot resolve the discrepancies, the waste shall be returned to the generator in accordance with Permit Section 2.4.4.

C.5 SPECIAL PROCEDURAL REQUIREMENTS

Waste management requirements specific to ignitable, reactive, and incompatible waste as well as requirements for compliance with LDR and 40 CFR Part 264 Subparts BB and CC are described below.

C.5.1 Procedures for Ignitable, Reactive, and Incompatible Wastes to be Stored or Treated

The Permittees shall characterize all waste to be stored or treated under this Permit to identify applicable and appropriate classes and divisions contained in 49 CFR § 177.848, which is incorporated herein by reference, and shall label the container or tank to reflect that classification.

C.5.2 Procedures to Ensure Compliance with LDR Requirements

The Permittees shall evaluate all waste streams to identify all applicable underlying hazardous constituents (UHCs) exceeding treatment standards in accordance with 40 CFR § 268.7(a)(1), which is incorporated herein by reference. Waste designated to be disposed of at the ~~Waste Isolation Pilot Plant (~~WIPP~~)~~ must undergo characterization to determine whether it is subject to the land disposal prohibitions, but it is not required to be characterized to determine all applicable underlying hazardous constituents listed in 40 CFR § 268.48.

If waste is to be treated on site to meet the LDR requirements, the Permittees shall comply with the testing and reporting requirements of 40 CFR § 268.7(b), which is incorporated herein by reference. The Permittees shall identify and document before treatment all waste whose treatment goal is to meet the LDR requirements. After treating such waste, the Permittees shall characterize the treated waste or residue to determine whether all treatment standards have been met. The Permittees shall analyze residues from wastes with concentration-based treatment standards by the appropriate methods described in Attachment Section C.3.1.2 to assure that the waste meets applicable treatment standards.

The Permittees shall prepare certifications required by the 40 CFR § 268.7(b), which is incorporated herein by reference, appropriate to formerly characteristic wastes for which all characteristics have been deactivated and all Universal Treatment Standards have been met, formerly characteristic wastes for which all characteristics have been deactivated but not all treatment standards are achieved, and other special certifications as required. The Permittees shall prepare new waste characterization documentation for the treated waste or residue, as appropriate, incorporating the treatment facility paperwork requirements of 40 CFR § 268.7(b) or the generator paperwork requirements of 40 CFR § 268.7(a), which is incorporated herein by reference, if the residue is considered a newly-generated waste.

C.5.3 Procedures to Ensure Compliance with Subpart BB Requirements

The Permittees shall comply with 40 CFR Part 264, Subpart BB, as described below, as to equipment at the facility that is subject to specific requirements for test methods and procedures at 40 CFR Part 264 Subpart BB, which is incorporated herein by reference.

C.5.3.1 Requirements for Leak Detection and Monitoring

The Permittees shall ensure that monitoring complies with Reference Method 21 at 40 CFR Part 60.

The detection instrument shall meet the performance criteria of Reference Method 21. The Permittees shall use Reference Method 21 procedures to calibrate the detection instrument prior to each day it is used. The calibration gases shall be:

1. less than 10 parts per million (ppm) of hydrocarbon in air; and
2. methane or n-hexane mixed with air at approximately, but less than, 10,000 ppm methane or n-hexane.

The Permittees shall measure all potential leak interfaces as close to the interface as possible. For determining compliance with "no detectable emissions" requirements (40 CFR § 264.1054, which is incorporated herein by reference), the Permittees shall meet all of the above requirements as well as the following:

1. background shall be determined pursuant to Reference Method 21; and
2. the arithmetic difference between background and the maximum concentration detected shall be compared with 500 ppm.

C.5.3.2 Determination of Hazardous Waste Concentration

The Permittees shall determine whether hazardous waste contained in, or in contact with, the equipment is greater than or equal to 10% by weight organics using one of the following (*see* 40 CFR § 264.1063(d)):

1. ASTM Methods D 2267-88, E 169-87, E 168-88, E 260-85 (*see* 40 CFR § 260.11);
2. *SW-846* Method 9060 or 8260 (*see* 40 CFR § 260.11); or
3. acceptable knowledge with documentation (*e.g.*, production process information, measurements from an identical process at another facility).

If concentration of the hazardous waste changes such that it is believed to be greater than 10% by weight organics, the Permittees shall revise the determination only after chemical analyses is performed in accordance with the methods listed above (*see* 40 CFR § 264.1063(e)). If the Department does not agree with the determination, chemical analyses using the methods listed above can be used to resolve the dispute (*see* 40 CFR § 264.1063(f)). Samples used to make this determination shall be representative of the highest total organic concentration expected (*see* 40 CFR § 264.1063(g)).

C.5.4 Procedures to Ensure Compliance with Subpart CC Requirements

The Permittees' waste streams described in this document may be subject to 40 CFR Part 264, Subpart CC~~,~~ "Air Emission Standards for Tanks, Surface Impoundments, and Containers~~,~~" based on applicability criteria specified in 40 CFR § 264.1080, incorporated herein by reference. For waste units that are not exempt from this Subpart under 40 CFR §264.1080(b), the Permittees shall address the applicable Subpart CC requirements. In addition, exemption from the standards specified in 40 CFR §§ 264.1084 through 264.1087, incorporated herein by reference, can be demonstrated if the average VOC concentration is less than 500 parts per million by weight (ppmw) at the point of waste origination, as described at 40 CFR § 264.1082(c)(1), incorporated herein by reference. The Permittees shall make this determination in accordance with 40 CFR § 264.1083(a) and shall review and update it as necessary at least every twelve months.

If the Permittees claim a 40 CFR § 264.1082(c) exemption for any hazardous waste management units, the Permittees shall document the determination for each waste stream. Permittees may use AK or process knowledge to make the determination. However, if sampling and analysis is needed, the Permittees shall conduct it in accordance with the approved methods identified at 40 CFR §§ 265.1084(a)(3)(iii)(A) through 265.1084(a)(3)(iii)(I), and listed in Tables ~~-~~C-11~~6~~, C-12~~7~~, and C-13~~8~~. The Permittees shall review the characterization documentation before acceptance of the waste at ~~TA-54~~any permitted storage unit as required in Permit Section 2.4.7.

Characterization requirements for waste that has been treated to meet the exemptions allowed at 40 CFR §§ 264.1082(c)(2) and (4) are summarized below:

1. ~~i~~In accordance with 40 CFR § 264.1082(c)(2)(i), waste is treated to reduce the volatile organic (VO) concentration to less than 500 ppmw that is measured in either a waste from a single point of origination or individual wastes from multiple points of origination commingled before treatment. The Permittees shall analyze the waste prior to and after treatment pursuant to provisions at 40 CFR § 264.1083(a) and (b).~~;~~
2. ~~i~~In accordance with 40 CFR § 264.1082(c)(2)(ii), waste is treated to reduce the VO concentrations by at least 95% and the treated waste VO concentration is ensured to be less than 100 ppmw. The Permittees shall analyze the waste prior to and after treatment pursuant to provisions at 40 CFR § 264.1083(a) and (b).~~;~~
3. ~~i~~In accordance with 40 CFR § 264.1082(c)(2)(iii), waste is treated to remove VO mass greater than or equal to the VO mass that exceeded the 500 ppmw. The Permittees shall analyze the waste prior to and after treatment pursuant to provisions at 40 CFR § 264.1083(a) and (b).~~;~~
4. ~~i~~In accordance with 40 CFR § 264.1082(c)(2)(v), waste is treated to reduce the VO concentration to less than the lowest VO concentration for all individual waste streams mixed together at the point of origin and less than 500 ppmw. The Permittees shall

analyze the waste prior to and after treatment pursuant to provisions at 40 CFR § 264.1083(a) and (b).~~;~~

5. ~~i~~In accordance with 40 CFR § 264.1082(c)(2)(vi), waste is treated to reduce the VO concentration by 95% and each individual waste stream entering the treatment process is certified to be less than 10,000 ppmw. The Permittees shall analyze the waste prior to and after treatment pursuant to provisions at 40 CFR § 264.1083(a) and (b).~~; and~~
6. ~~i~~In accordance with 40 CFR § 264.1082(c)(4), waste is treated to meet LDR standards, either concentration-based or technology-based. LDR compliance is determined for concentration-based using either analysis or AK.

Details for specific treatment criteria and analytical requirements associated with each exemption can be found at the regulations cited.

C.6 REFERENCES

ASTM, 1991, "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds," ASTM D4547-91, *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials.

DOE, 2011~~1999~~, "Radioactive Waste Management Manual," *DOE Manual~~Order~~ 435.1*, U.S. Department of Energy, Washington, D.C.

DOE, 1995, "DOE Waste Treatability Groups Guidance," Revision 0.0, U.S. Department of Energy, Idaho Operations Office.

~~EPA, 1994a, "Waste Analysis at Facilities that Generate Treat, Store, and Dispose of Hazardous Wastes, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.~~

EPA, 2015, "Waste Analysis at Facilities that Generate Treat, Store, and Dispose of Hazardous Wastes, A Guidance Manual," EPA 530-R-12-001, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

EPA, 1994~~b~~, "Use of Total Waste Analysis in Toxicity Characteristic Determinations," FAXBACK 13647, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.

EPA, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C.

NMED, 1995, "Federal Facility Compliance Order (Los Alamos National Laboratory)," New ~~-~~Mexico Environment Department, Santa Fe, New Mexico.

~~Table C-1~~

~~(This table is reserved)~~

Table C-1~~2~~
Descriptions of Non-Mixed Hazardous Waste Stored at the Facility

~~(This table is for informational purposes only)~~

Waste Description[a]	Waste-Generating Process[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Spent Solvents	Research and development (R&D) activities; laser research; organic and inorganic chemistry research (*e.g.*, solvent extractions, liquid chromatography solvents, polymer synthesis, and distillations); cleaning; and degreasing operations	Acceptable Knowledge Sampling and Analysis	D001	Ignitability	NA[c]	Antimony, Arsenic, Barium, Cadmium, Cyanides (Total), Chromium (Total), Lead, Mercury-all others, Selenium, Silver, Acetone, Acetonitrile, Benzene, Carbon tetrachloride, Chlorobenzene, Chloroform, 1,4-Dichlorobenzene, 1,2-Dichloroethane, 1,1-Dichloroethylene, 2,4-Dinitrotoluene, 1,4-Dioxane, Ethyl ether, Hexachlorobenzene, Hexachloroethane, Methanol, Methylene chloride, Methyl ethyl ketone, Nitrobenzene, Pentachlorophenol, Pyridine, Toluene, Triethylamine, Trichloroethylene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, Vinyl chloride, and all applicable constituents identified above the UHC regulatory limit.
			D002	Corrosivity	NA[c]	
			D003	Reactivity	NA[c]	
			D004	Arsenic	5.0	
			D005	Barium	100.0	
			D006	Cadmium	1.0	
			D007	Chromium	5.0	
			D008	Lead	5.0	
			D009	Mercury	0.2	
			D010	Selenium	1.0	
			D011	Silver	5.0	
			D018	Benzene	0.5	
			D019	Carbon tetrachloride	0.5	
			D021	Chlorobenzene	100.0	
			D022	Chloroform	6.0	
			D027	1,4-Dichlorobenzene	7.5	
			D028	1,2-Dichloroethane	0.5	
			D029	1,1-Dichloroethylene	0.7	
			D030	2,4-Dinitrotoluene	0.13	
			D032	Hexachlorobenzene	0.13	
			D034	Hexachloroethane	3.0	
			D035	Methyl ethyl ketone	200.0	
			D036	Nitrobenzene	2.0	
			D037	Pentachlorophenol	100.0	
			D038	Pyridine	5.0	
			D040	Trichloroethylene	0.5	
			D041	2,4,5-Trichlorophenol	400.0	
			D042	2,4,6-Trichlorophenol	2.0	
			D043	Vinyl chloride	0.2	
			F001	Spent halogenated solvents	NA[c]	
			F002	Spent halogenated solvents	NA[c]	
			F003	Spent non-halogenated solvents	NA[c]	
			F004	Spent non-halogenated solvents	NA[c]	
			F005	Spent non-halogenated solvents	NA[c]	
			U213	Tetrahydrofuran	NA[c]	

Table C-1~~2~~ (continued)
Description of Non-Mixed Hazardous Waste Stored at the Facility

Waste Description[a]	Waste-Generating Process[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Contaminated Solid Wastes	Machining operations, chemistry research, decontamination and decommissioning projects, metal finishing operations, HE wastewater filtration, and general maintenance operations	Acceptable Knowledge Sampling and Analysis	D001	Ignitability	NA[c]	Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Mercury-all others, Selenium, Silver, Thallium, Benzene, Carbon Disulfide, Carbon t~~T~~etrachloride, Chlorobenzene, Chloroform, o-Cresol, m-Cresol, p-Cresol Cresol,1,4-Dichlorobenzene 1,1-Dichloroethylene,2,4-Dinitrotoluene, Ethyl Ether, Heptachlor (and its epoxide), Hexachlorobenzene Hexachlorobutadiene, Hexachloroethane,~~-~~ Methanol, Methyl ethyl ketone, Methylene Chloride, Nitrobenzene, Pentachlorophenol, Phenol, p,p'-DDT, Pyridine, Tetrachloroethylene, Trichloroethylene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, Vinyl chloride, and all applicable constituents identified above the UHC regulatory limit
			D003	Reactivity	NA[c]	
			D004	Arsenic	5.0	
			D005	Barium	100.0	
			D006	Cadmium	1.0	
			D007	Chromium	5.0	
			D008	Lead	5.0	
			D009	Mercury	0.2	
			D010	Selenium	1.0	
			D011	Silver	5.0	
			D018	Benzene	0.5	
			D019	Carbon tetrachloride	0.5	
			D021	Chlorobenzene	100.0	
			D022	Chloroform	6.0	
			D023	o-Cresol	200.0[d]	
			D024	m-Cresol	200.0[d]	
			D025	p-Cresol	200.0[d]	
			D027	1,4-Dichlorobenzene	7.5	
			D028	1,2-Dichloroethane	0.5	
			D029	1,1-Dichloroethylene	0.7	
			D030	2,4-Dinitrotoluene	0.13	
			D031	Heptachlor (and its epoxide)	0.008	
			D032	Hexachlorobenzene	0.13	
			D033	Hexachlorobutadiene	0.5	
			D034	Hexachloroethane	3.0	
			D035	Methyl ethyl ketone	200.0	
			D036	Nitrobenzene	2.0	
			D037	Pentachlorophenol	100.0	
			D038	Pyridine	5.0[e]	
			D039	Tetrachloroethylene	0.7	
			D040	Trichloroethylene	0.5	
			D041	2,4,5-Trichlorophenol	400.0	
			D042	2,4,6-Trichlorophenol	2.0	
			D043	Vinyl chloride	0.2	
			F001	Spent halogenated solvents	NA[c]	
			F002	Spent halogenated solvents	NA[c]	
			F003	Spent non-halogenated solvents	NA[c]	
			F004	Spent non-halogenated solvents	NA[c]	
			F005	Spent non-halogenated solvents	NA[c]	
			K045	Spent carbon	NA[c]	

Table C-1~~2~~ (continued)

Descriptions of Non-Mixed Hazardous Waste Stored at the Facility

Waste Description[a]	Waste-Generating Process[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Paint and Related Wastes	Painting and finishing operations, and general facility maintenance	Acceptable Knowledge Sampling and Analysis	D001 D005 D006 D007 D008 D009 D011 D036 F003 F005	Ignitability Barium Cadmium Chromium Lead Mercury Silver Nitrobenzene Spent non-halogenated solvents Spent non-halogenated solvents	NA[c] 100.0 1.0 5.0 5.0 0.2 5.0 2.0 NA[c] NA[c]	Barium, Cadmium, Chromium (Total), Lead, Mercury—all others, Silver, Methyl ethyl ketone, Nitrobenzene, and all applicable constituents above the UHC regulatory limit
Photographic and Photocopier Wastes	Photographic film processing and photocopier operations	Acceptable Knowledge Sampling and Analysis	D001 D002 D006 D007 D008 D011	Ignitability Corrosivity Cadmium Chromium Lead Silver	NA[c] NA[c] 1.0 5.0 5.0 5.0	Cadmium, Chromium, Lead, Silver, and all applicable constituents above the UHC regulatory limit
Corrosive Liquid Wastes	Analytical chemistry research, electro-etching, and electro-polishing	Acceptable Knowledge Sampling and Analysis	D001 D002 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D022 D038 F002 F003 F005 P023	Ignitability Corrosivity Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Chloroform Pyridine Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents Chloroacetaldehyde	NA[c] NA[c] NA[c] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 6.0 5.0 NA[c] NA[c] NA[c] NA[c]	Acetone, Arsenic, Barium, Benzene, Cadmium, Chromium (Total), Chloroform, Cyanides (Total), 2,4-Dinitrophenol, Fluoride, Isobutyl alcohol, Lead, Mercury-all others, Methanol, Nickel, o-Nitrophenol, Pyridine Selenium, Silver, Sulfide, Thallium, Triethylamine, Zinc, and all applicable constituents above the UHC regulatory limit

Table C-1~~2~~ (continued)
Descriptions of Non-Mixed Hazardous Waste Stored at the Facility

Waste Description[a]	Waste-Generating Process[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Solid Metals and Metallic Compounds	Machining and cutting operations; synthesis reactions; solder from electronic manufacturing, repair, and brazing operations; and grinding operations	Acceptable Knowledge Sampling and Analysis	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	NA[c] NA[c] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0	Arsenic, Barium, Cadmium, Chromium, Lead, Mercury-all others, Nickel, Silver, and all applicable constituents above the UHC regulatory limit
Mercury Wastes	Lamp replacement, chemical research, mercury spill cleanup, and equipment cleaning and maintenance	Acceptable Knowledge Sampling and Analysis	D003 D008 D009 D011 U151	Reactivity Lead Mercury Silver Mercury	NA[c] 5.0 0.2 5.0 NA[c]	Barium, Chromium (Total), ~~-~~ Lead, Mercury-all others, Silver, Thallium, Zinc, and all applicable constituents above the UHC regulatory limit
Unused/Off-specification Commercial Chemical Products	R&D, spill residues, and general facility operations	Acceptable Knowledge Sampling and Analysis	D001 D002 D003 D004 through D043 All P- and U-listed EPA Hazardous Waste Numbers[g]	Ignitability Corrosivity Reactivity Toxicity characteristic wastes Discarded commercial chemical products and off-specification species	NA[c] NA[c] NA[c] -[b] NA[c]	Arsenic, Barium, Cadmium, Chromium (Total), Lead, Mercury-all others, Nickel, Selenium, Silver, Acetonitrile, ~~-~~Benzene, Carbon tetrachloride, Chlorobenzene, Chloroform, o-Cresol, m-Cresol, p- Cresol, 2, 4-D, 1,4 Dichlorobenzene, 1,1-Dichloroethylene, 1,2-Dichloroethane 2,4 Dinitrotoluene, Endrin, Heptachlor (and its epoxide), Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Lindane, Methoxychlor, Methyl ethyl ketone, Nitrobenzene, Pentachlorophenol,~~;~~ Pyridine, Tetrachloroethylene, Toluene, Toxaphene, Trichloroethylene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4,5-TP (Silvex), Vinyl chloride, and all applicable constituents identified above the UHC regulatory ~~-~~limit

Table C-1~~2~~ (continued)
Descriptions of Non-Mixed Hazardous Waste Stored at the Facility

Waste Description[a]	Waste-Generating Process[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Contaminated Non-corrosive Aqueous and Non-aqueous Solutions and Sludges	Vacuum pump maintenance, analytical spectrometry, equipment cleaning and maintenance, vehicle maintenance, synthesis reactions, metal-polishing operations, and chemical research	Acceptable Knowledge Sampling and Analysis	D001	Ignitability	NA[c]	Acetone, Acetonitrile, Antimony, Arsenic, Barium, Benzene, Cadmium, Carbon tetrachloride, Chlorobenzene, Chloroform Chromium (Total), Chrysene, o-Cresol, m-Cresol p-Cresol m-Dichlorobenzene, 1,4-Dichlorobenzene 1,2-Dichloroethane, 1,1-Dichloroethylene, 2,4-Dinitrotoluene, 4,6-Dinitro-o-cresol, 1,4-Dioxane, Fluorine, Indeno(1,2,3-c,d) pyrene, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Lead,- Mercury-all others, Methanol, Methyl ethyl ketone, Methylene chloride, Naphthalene, Nitrobenzene, p-Nitrophenol, Pentachlorophenol, Pyridine, Selenium, Silver, Tetrachloroethylene, Toluene, Trichloroethylene, 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol, Zinc Vinyl chloride and all applicable constituents above the UHC regulatory limit
			D002	Corrosivity	NA[c]	
			D003	Reactivity	NA[c]	
			D004	Arsenic	5.0	
			D005	Barium	100.0	
			D006	Cadmium	1.0	
			D007	Chromium	5.0	
			D008	Lead	5.0	
			D009	Mercury	0.2	
			D010	Selenium	1.0	
			D011	Silver	5.0	
			D018	Benzene	0.5	
			D019	Carbon tetrachloride	0.5	
			D021	Chlorobenzene	100.0	
			D022	Chloroform	6.0	
			D023	o-Cresol	200.0[d]	
			D024	m-Cresol	200.0[d]	
			D025	p-Cresol	200.0[d]	
			D027	1,4-Dichlorobenzene	7.5	
			D028	1,2-Dichloroethane	0.5	
			D029	1,1-Dichloroethylene	0.7	
			D030	2,4-Dinitrotoluene	0.13[e]	
			D032	Hexachlorobenzene	0.13[e]	
			D033	Hexachlorobutadiene	0.5	
			D034	Hexachloroethane	3.0	
			D035	Methyl ethyl ketone	200.0	
			D036	Nitrobenzene	2.0	
			D037	Pentachlorophenol	100.0	
			D038	Pyridine	5.0	
			D039	Tetrachloroethylene	0.7	
			D040	Trichloroethylene	0.5	
			D041	2,4,5-Trichlorophenol	400.0	
			D042	2,4,6-Trichlorophenol	2.0	
			D043	Vinyl chloride	0.2	
			F001	Spent halogenated solvents	NA[c]	
			F002	Spent halogenated solvents	NA[c]	
			F003	Spent non-halogenated solvents	NA[c]	
			F004	Spent non-halogenated solvents	NA[c]	
			F005	Spent non-halogenated solvents	NA[c]	

Table C-1~~2~~ (continued)
Descriptions of Non-Mixed Hazardous Waste Stored at the Facility

Waste Description[a]	Waste-Generating Process[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Gas Cylinder Waste	R&D and general facility operations	Acceptable Knowledge	D001 D002 D003 Potential D-coded EPA Hazardous Waste Numbers Potential P- and U-listed EPA Hazardous Waste Numbers	Ignitability Corrosivity Reactivity Toxicity characteristic wastes Discarded commercial chemical products and off-specification species	NA[c] NA[c] NA[c] -[b] NA[c]	Arsenic, Barium, Cadmium, Chromium (Total), Lead, Mercury-all others, Selenium, Silver, Benzene, Carbon tetrachloride Chlorobenzene, Chloroform o-Cresol, m-Cresol, p-Cresol, 2,4-D, 1,4-Dichlorobenzene 1,1-Dichloroethylene,2,4-Dinitrotoluene, Endrin, Heptachlor (and its epoxide), Hexachlorobenzene Hexachlorobutadiene, Hexachloroethane, Lindane, Methoxychlor, Methyl ethyl ketone, Nitrobenzene, Pentachlorophenol Pyridine, Tetrachloroethylene, Toxaphene, Trichloroethylene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4,5-TP (Silvex) Vinyl chloride, and all applicable constituents identified above the UHC regulatory limit
Used Batteries and Battery Fluids	Equipment maintenance	Acceptable Knowledge	D002 D003 D006 D007 D008 D009 D011 D038	Corrosivity Reactivity Cadmium Chromium Lead Mercury Silver Pyridine	NA[c] NA[c] 1.0 5.0 5.0 0.2 5.0 5.0[e]	Cadmium, Chromium, Lead, Mercury-all others, Pyridine, Silver, and all applicable constituents above the UHC regulatory limit

Table C-1~~2~~ (continued)
Descriptions of Non-Mixed Hazardous Waste Stored at the Facility

Waste Description[a]	Waste-Generating Process[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Environmental Restoration ~~(ER)~~ Soils and Sludges	Site decommissioning, site characterization, and site remediation; includes septic tank and detention basin closure, removal actions, and other remedial actions and site closures	Acceptable Knowledge Sampling and Analysis	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D022 D030 D032 D033 D034 D036 D039 D040 D042 F001 F002 F003 F005	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Chloroform 2,4-Dinitrotoluene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane Nitrobenzene Tetrachloroethylene Trichloroethylene 2,4,6-Trichlorophenol Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[c] NA[c] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 6.0 0.13[c] 0.13[c] 0.5 3.0 2.0 0.7 0.5 2.0 NA[c] NA[c] NA[c] NA[c]	Arsenic, Barium, Cadmium, Chromium, Lead, Mercury-all others, Selenium, Silver, Benzene, Chloroform, 2,4-Dinitrotoluene, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Nitrobenzene, Tetrachloroethylene, Trichloroethylene, 2,4,6-Trichlorophenol, and all applicable constituents identified above the UHC regulatory limit

[a] Denotes information from the Los Alamos National Laboratory waste characterization documentation database

[b] A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA, 1986), the extract from a representative sample of the waste contains any of the contaminants listed (D004-D043) at a concentration equal to or greater than the respective value given in ~~the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart II,~~ 40 CFR Part 261, Subpart C ~~[6-14-00]~~

[c] Not applicable: Refers to the absence of regulatory limits for ignitable, corrosive, and reactive characteristic wastes and F-, P-, and U-listed wastes

[d] If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 milligrams per liter

[e] The quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level ~~(20.4.1 NMAC, Subpart II,~~ 40 CFR § 261.24, Table 1 ~~[6-14-00]).~~

Table C-2~~3~~
Descriptions of Mixed Low-Level Waste Stored at the Facility

~~(This table is for informational purposes only)~~

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Solid Wastes						
Soils with Heavy Metals	Decontamination and decommissioning (D&D) and Environmental ~~R~~restoration ~~(ER)~~ activities	Acceptable Knowledge and Preliminary Analysis	D004 D005 D006 D007 D008 D009 D010 D011	Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0	Arsenic, Barium, Cadmium, Chromium (Total), Mercury-all others, Lead, Selenium, Silver, Vanadium, Zinc and those constituents identified above the UHC regulatory limit
Environmental Restoration Soils	Remediation of release sites and D&D activities	Acceptable Knowledge Sampling and Analysis	D005 D006 D007 D008 D009 D028 D029 F001 F002 F004 F005	Barium Cadmium Chromium Lead Mercury 1,2-Dichloroethane 1,1-Dichloroethylene Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	100.0 1.0 5.0 5.0 0.2 0.5 0.7 NA[c] NA[c] NA[c] NA[c]	Barium, Cadmium, Chromium (Total), Lead, Mercury 1,2-Dichloroethane 1,1-Dichloroethylene, and all applicable constituents identified above the UHC regulatory limit.
Inorganic Solid Oxidizers	D&D of research laboratories and research and development (R&D)	Acceptable Knowledge	D001 D003 D005	Ignitability Reactivity Barium	NA[c] NA[c] 100.0	Barium and all applicable constituents identified above the UHC limit
Lead Waste	Radioisotope experiments and other reactor, accelerator, laser, and x-ray activities	Acceptable Knowledge	D002 D003 D007 D008 D009	Corrosivity Reactivity Chromium Lead Mercury	NA[c] NA[c] 5.0 5.0 0.2	Chromium, Lead, Mercury-all others, and all applicable constituents identified above the UHC regulatory~~-~~ limit
Noncombustible Debris	Maintenance, D&D, R&D, and environmental restoration~~ER~~ activities	Acceptable Knowledge	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011 F002 F005	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Spent halogenated solvents Spent non-halogenated solvents	NA[c] NA[c] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 NA[c] NA[c]	Arsenic, Barium, Cadmium, Chromium (Total), Lead, Mercury-all others, Selenium, Silver, and all applicable constituents identified above the UHC regulatory limit

Table C-2~~3~~ (continued)
Descriptions of Mixed Low-Level Waste Stored at the Facility

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Solid Wastes						
Combustible Debris	Maintenance, R&D, D&D, and environmental restoration~~ER~~ activities	Acceptable Knowledge	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011 F001 F002 F003 F005	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[c] NA[c] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 NA[c] NA[c] NA[c] NA[c]	Arsenic, Barium, Chromium, Lead, Mercury-all others, Selenium, Silver, Nickel, Zinc, and all applicable constituents identified above the UHC regulatory limit
Organic-Contaminated Noncombustible Solids	Vacuum pump maintenance, R&D, D&D, and environmental restoration ~~ER~~ activities	Acceptable Knowledge	D001 D004 D005 D006 D007 D008 D009 D010 D011 D018 D027 D030 D032 D033 D034 D035 D037 D038 D041 D042 F001 F002 F004 F005	Ignitability Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene 1,4-Dichlorobenzene 2,4-Dinitrotoluene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane Methyl ethyl ketone Pentachlorophenol Pyridine 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[c] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 7.5 0.13[d] 0.13[d] 0.5 3.0 200.0 100.0 5.0[d] 400.0 2.0 NA[c] NA[c] NA[c] NA[c]	Arsenic, Barium Cadmium, Chromium Lead, Mercury Selenium, Silver Benzene, 1,4-Dichlorobenzene 2,4-Dinitrotoluene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane, Methoxychlor, Methyl ethyl ketone, Pentachlorophenol, Pyridine, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, and all applicable constituents identified above the UHC regulatory limit

Table C-~~2~~3 (continued)
Descriptions of Mixed Low-Level Waste Stored at the Facility

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Solid Wastes						
Organic-Contaminated Combustible Solids	Maintenance, D&D, and environmental restoration~~ER~~ activities	Acceptable Knowledge	D001 D003 D007 D008 D009 D030 D035 F001 F002 F003 F005	Ignitability Reactivity Chromium Lead Mercury 2,4-Dinitrotoluene Methyl ethyl ketone Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[c] NA[c] 5.0 5.0 0.2 0.13[d] 200.0 NA[c] NA[c] NA[c] NA[c]	Chromium, Lead, Mercury-all other, 2,4-Dinitrotoluene, Methyl ethyl ketone, and all applicable constituents identified above the UHC regulatory limit
Water-Reactive Wastes	Cleanup of HE firing-site debris, machining and disassembly of test components	Acceptable Knowledge	D001 D003 D005 F002	Ignitability Reactivity Barium Spent halogenated solvents	NA[c] NA[c] 100.0 NA[c]	Barium~~,~~ and all applicable constituents identified above the UHC regulatory~~-~~ limit
Mercury Wastes	Cleanup operations	Acceptable Knowledge	D005 D007 D008 D009 F001	Barium Chromium Lead Mercury Spent halogenated solvents	100.0 5.0 5.0 0.2 NA[c]	Barium, Chromium, Lead, Mercury-all others and all applicable constituents identified above the UHC regulatory~~-~~ limit
Unused Solid Reagent Chemical Wastes	R&D activities	Acceptable Knowledge	D001 D002 D003 All P- and U-listed EPA Hazardous Waste Numbers[e]	Ignitability Corrosivity Reactivity Discarded commercial chemical products and off-specification species	NA[c] NA[c] NA[c] NA[c]	All applicable constituents above the UHC regulatory limit

Table C-2~~3~~ (continued)
Descriptions of Mixed Low-Level Waste Stored at the Facility

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Liquid Wastes						
Spent Solvents and Contaminated Solvent Mixtures	Maintenance, cleaning, and degreasing activities: R&D; processing operations, such as extraction, bench-scale experimental inorganic chemistry, environmental analysis, radiochemistry	Acceptable Knowledge	D001 D002 D004 D005 D007 D008 D009 D010 D011 D018 D019 D021 D022 D027 D028 D030 D032 D033 D034 D036 D042 D043 F001 F002 F003 F005	Ignitability Corrosivity Arsenic Barium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlorobenzene Chloroform 1,4-Dichlorobenzene 1,2-Dichloroethane 2,4-Dinitrotoluene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane Nitrobenzene 2,4,6-Trichlorophenol Vinyl chloride Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[c] NA[c] 5.0 100.0 5.0 5.0 0.2 1.0 5.0 0.5 0.5 100.0 6.0 7.5 0.5 0.13[d] 0.13[d] 0.5 3.0 2.0 2.0 0.2 NA[c] NA[c] NA[c] NA[c]	Arsenic, Barium, Chromium, Lead, Mercury-all others, Selenium, Silver, Benzene, Carbon tetrachloride, Chlorobenzene, Chloroform, 1,4-Dichlorobenzene, 1,2-Dichloroethane, 2,4-Dinitrotoluene, Hexachlorobenzene, Hexachlorobutadiene, Hexachloroethane, Nitrobenzene, Tribromomethane (Bromoform) 2,4,6-Trichlorophenol, Vinyl chloride, and all applicable constituents identified above the UHC regulatory limit
Corrosive Liquid Wastes	Radiochemistry research, plutonium-processing operations, and analytical chemistry	Acceptable Knowledge	D001 D002 D004 D006 D007 D008 D009 D010 D011 D036 D043 F001 F002 F005	Ignitability Corrosivity Arsenic Cadmium Chromium Lead Mercury Selenium Silver Nitrobenzene Vinyl chloride Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents	NA[c] NA[c] 5.0 1.0 5.0 5.0 0.2 1.0 5.0 2.0 0.2 NA[c] NA[c] NA[c]	Arsenic, Barium, Cadmium, Bromodichloromethane, Chromium (Total), Lead, Mercury-all others, Nitrobenzene, Nickel, Selenium, Silver, Vinyl c~~C~~hloride and all applicable constituents identified above the UHC regulatory limit

Table C-2~~3~~ (continued)
Descriptions of Mixed Low-Level Waste Stored at the Facility

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Liquid Wastes						
Oil Wastes	Equipment maintenance operations	Acceptable Knowledge	D004 D005 D006 D007 D008 D009 D010 D018 D019 D027 D028 D030 D032 D033 D034 D036 D037 D038 D041 D042 D043 F001 F002 F003 F005	Arsenic Barium Cadmium Chromium Lead Mercury Selenium Benzene Carbon tetrachloride 1,4-Dichlorobenzene 1,2-Dichloroethane 2,4-Dinitrotoluene Hexachlorobenzene Hexachlorobutadiene Hexachloroethane Nitrobenzene Pentrachlorophenol Pyridine 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol Vinyl chloride Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	5.0 100.0 1.0 5.0 5.0 0.2 1.0 0.5 0.5 7.5 0.5 0.13[d] 0.13[d] 0.5 3.0 2.0 100.0 5.0[d] 400.0 2.0 0.2 NA[c] NA[c] NA[c] NA[c]	Arsenic, Barium, Cadmium, Chromium Lead, Mercury-all others, Selenium, Silver, Thallium, Benzene, Carbon tetrachloride, 1,4-Dichlorobenzene, 1,2-Dichloroethane, 2,4-Dinitrotoluene, Diethylphthalate, Di-n-butyl phthalate, Hexachlorobutadiene, Hexachlorobenzene, Hexachloroethane, Hexachlorocyclopentadiene, Nitrobenzene, Pentachlorophenol, Pyridine, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, Vinyl chloride, and all applicable constituents identified above the UHC regulatory limit
Unused Liquid Reagent Chemical Wastes	R&D activities	Acceptable Knowledge	D001 D002 D035 All P- and U-listed EPA Hazardous Waste Numbers[e]	Ignitability Corrosivity Methyl ethyl ketone Discarded commercial chemical products and off-specification species	NA[c] NA[c] 200.0 NA[c]	Methyl ethyl ketone and all applicable constituents identified above the UHC regulatory limit

Table C-~~3~~2 (continued)
Descriptions of Mixed Low-Level Waste Stored at the Facility

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Liquid Wastes						
Aqueous and Nonaqueous Liquids Contaminated with Heavy Metals and/or Organics	Environmental restoration~~ER~~ activities, metal-polishing operations, and radiochemistry research	Acceptable Knowledge Sampling and Analysis	D001 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D019 D021 D022 D023 D024 F002 F005	Ignitability Reactivity Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlorobenzene Chloroform o-Cresol m-Cresol Spent halogenated solvents Spent non-halogenated solvents	NA[c] NA[c] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 0.5 100.0 6.0 200.0[f] 200.0[f] NA[c] NA[c]	Arsenic, Barium, Cadmium, Chromium (Total), Lead, Mercury-all others, Selenium, Silver, Benzene, Carbon ~~T~~tetrachloride, Chlorobenzene, Chloroform, o-cresol, m-cresol, 1,2-Dichloroethane, and all applicable constituents identified above the UHC regulatory~~-~~ limit
Gas Cylinder Waste						
Gas Cylinder Waste	R&D and general facility operations	Acceptable Knowledge	D001 D002 D003 Potential D-coded EPA Hazardous Waste Numbers Potential P- and U-listed EPA Hazardous Waste Numbers[e]	Ignitability Corrosivity Reactivity Toxicity characteristic wastes Discarded commercial chemical products and off-specification species	NA[c] NA[c] NA[c] -[b] NA[c]	All applicable constituents above the UHC regulatory limit

[a] Denotes information from the Los Alamos National Laboratory waste characterization documentation database.

[b] A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA, 1986), the extract from a representative sample of the waste contains any of the contaminants listed (D004-D043) at a concentration equal to or greater than the respective value given in 40 CFR ~~the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart II,~~ Part 261, Subpart C ~~[6-14-00]~~.

[c] Not applicable: Refers to the absence of regulatory limits for ignitable, corrosive, and reactive characteristic wastes and F-, P-, and U-listed wastes.

[d] The quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level (~~20.4.1 NMAC, Subpart II,~~40 CFR 261.24, Table 1 ~~[6-14-00]~~).

[e] Refers to the P- and U-listed wastes found in the most recent "Los Alamos National Laboratory General Part A Permit Application," ~~Revision 3.0, 2002,~~ Los Alamos National Laboratory, Los Alamos, New Mexico.

[f] If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 milligrams per liter.

Note: Fluoride, sulfide, vanadium, and zinc are not "underlying hazardous constituents" in characteristic wastes, according to the definition in 40 CFR § 268.2(i). Selenium is not an underlying hazardous constituent as defined at 40 CFR § 268.2(i) because its Universal Treatment Standard level is greater than its Toxicity Characteristic level, thus a treated selenium waste would always be characteristically hazardous, unless it is treated to below its characteristic level.

Table C-34

Facility ~~MTRUW~~Mixed Transuranic Waste Stream Waste Matrix Codes Correlated with Facility Waste Identification Systems

~~(This table is for informational purposes only)~~

Summary Category Group	Waste Matrix Code	Waste Stream Description	RSWD Code[a]		IDC[b]		TRUCON Code[c]	
S3000 - Homogeneous	S3100	Homogeneous Inorganic, Cemented	A-25	Leached Process Residues	002	Cemented Aqueous Waste	LA111	Solidified Aqueous or Homogeneous Inorganic Solids
			A-26	Evaporator Bottoms/Salts	006	Solidified Inorganic and Organic Process Solids	LA114	Solidified Inorganic Process Solids
			A-76	Cement Paste				
	S3100	Homogeneous Inorganic, Cemented Organics					LA126	Solidified Organic Process Solids
	S3100	Homogeneous Inorganic, Non-cemented	A-75	Chemical Treatment Sludge	003	Stabilized Aqueous Waste (dewatered sludge)	LA122	Solid Inorganic Waste
							LA130	Ash
	S3100	Homogeneous Inorganic, Salts	A-27	Nitrate Salts		Salt Waste	LA124	Pyrochemical Salt Waste
			A-28	Chloride Salts				
			A-29	Hydroxide Cake				
	S3100	Homogeneous Inorganic, Vermiculite	A-20	Hydrocarbon Oil – Liquid (Absorbed)			LA112	Solidified Organic Waste
			A-21	Silicon-Based - Liquid (Absorbed)				
S4000 – Soil/Gravel	S4100	Soil	A-90	Radioactively-Contaminated Soil				

Table C-34 (continued)

Facility Mixed Transuranic Waste Stream Waste Matrix Codes Correlated with Facility Waste Identification Systems

Summary Category Group	Waste Matrix Code	Waste Stream Description	RSWD Code[a]		IDC[b]		TRUCON Code[c]	
S5000 - Debris	S5100	Non~~-C~~combustible Debris	NA[d]	NA[d]	NA[d]	NA[d]	LA117	Metal Wastes
	S5300	Combustible Debris	A-14	Combustible Decon Waste	004	Combustible Waste	LA116	Combustible Debris
			A-15	Cellulosics				
			A-16	Plastics				
			A-17	Rubber Materials				
			A-18	Combustible Lab Trash				
			A-35	Combustible Building Debris				
			A-40	Combustible Hot-Cell Waste				
			A-60	Other Combustibles				
	S5400	Heterogeneous Debris	A-10	Graphite Solids	001	Metal Scrap and Incidental Combustibles	LA115	Graphite Waste
			A-19	Combined Combustible/Non-~~C~~combustible Lab Trash	005	Combined Noncombustible / Combustible Waste	LA117	Metal Waste
			A-30	PN Equipment	005LG	Glass Waste	LA118	Glass Waste
			A-31	Non-PN Equipment	005LM	Metal Waste	LA119	HEPA Filter Waste
			A-36	Noncombustible Building Debris	005P1	Leaded Rubber and Metal Waste	LA123	Leaded Rubber and Metal Waste

Table C-34 (continued)

Facility Mixed Transuranic Waste Stream Waste Matrix Codes Correlated with Facility Waste Identification Systems

Summary Category Group	Waste Matrix Code	Waste Stream Description	RSWD Code[a]		IDC[b]		TRUCON Code[c]	
			A-41	Noncombustible Hot-Cell Waste	005P2G	Graphite Waste	LA125	Mixed Combustible /-Noncombustible Waste
			A-46	Skull and Oxide				
			A-47	Slag and Porcelain				
			A-50	Metal Crucibles, Scrap, Dies				
			A-51	Precious Metals				
			A-52	Scrap Metal				
			A-55	Filter Media				
			A-56	Filter Media Residue				
			A-61	Other Noncombustibles				
			A-72	Beryllium Contaminated Debris				
			A-74	Ion Exchange Resin				
			A-80	Irradiation Sources				
			A-85	Firing Point Residues				
			A-95	Glass				

[a] RSWD = Radioactive Solid Waste Disposal [codes]
[b] IDC = Item Description Code
[c] TRUCON = TRUPACT-II Content [codes]
[d] NA = Not Applicable;, RSWD code and IDC usage was discontinued in 2010

Table C-4~~5~~
Descriptions of Mixed Transuranic Waste Stored at the Facility

Summary Category Group	Waste Matrix Code	Waste Description[a]	TRUCON Code	Waste-Generating Area	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and /or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents[c]
S3000 – Homogeneous Solids	S3120	LA-MIN03-NC.001, Homogeneous Solids – Solidified Inorganics~~,~~	LA111/211	TA-50	Plutonium processing operations	Acceptable Knowledge	D001 D002 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D019 D021 D022 D035 D038 D039 D040 F001 F002 F003 F005	Ignitable Corrosive Reactive Arsenic Barium hydroxide Cadmium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlorobenzene Chloroform Methyl ethyl ketone Pyridine Tetrachloroethylene Trichloroethylene Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[d] NA[d] NA[d] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 0.5 100.0 6.0 200.0 5.0[e] 0.7 0.5 NA[d] NA[d] NA[d] NA[d]	Arsenic Barium hydroxide Cadmium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlorobenzene Chloroform Methyl ethyl ketone Pyridine Tetrachloroethylene Trichloroethylene and all applicable constituents identified above the UHC regulatory- limit
	S3150	LA-CIN02.001, Homogeneous Solids, Solidified Inorganics	LA111/211	TA-50	Plutonium processing operations	Acceptable Knowledge				
	S3150	LA-CIN01.001, Homogeneous Solids, Solidified Inorganics	LA126/226 LA114/214	TA-55	Plutonium processing operations	Acceptable Knowledge				
	S3110	LA-MIN02-V.001, Homogeneous Solids – Solidified Inorganics	LA112/212 LA126/226 SQ112/212 SQ113/213 SQ129/229 SQ113/113 SQ126/216	TA-55	Plutonium processing operations	Acceptable Knowledge				
	S3140	LA-MIN-04-S.001, Homogeneous Solids – Salt Waste	LA124/224	TA-55	Plutonium p~~P~~rocessing operations	Acceptable Knowledge				
	S3150	LA-CIN03-001, Homogeneous Solids – Solidified Inorganics	LA126/226 LA114/214	TA-03	Plutonium p~~P~~rocessing operations	Acceptable Knowledge				
	S3900	LA-MIN05-V.001, Homogeneous Solids – Solidified Inorganics	SQ111/211 LA112/212 LA126/226 SQ113/213 SQ/126/226 SQ129/229	TA-03	Plutonium p~~P~~rocessing operations	Acceptable Knowledge				

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

Summary Category Group	Waste Matrix Code	Waste Description[a]	TRUCON Code	Waste-Generating Area	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and /or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents[c]
S4000 – Soil/ Gravel	S4200	LA-MSG04.001, Soils	LA111/211 SQ111/211	TA-21	D&D	Acceptable Knowledge	D004 D005 D006 D007 D008 D009 D010 D011 D018 D019 D021 D022 D035 D038 D039 D040 F001 F002 F003 F005	Arsenic Barium hydroxide Cadmium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlorobenzene Chloroform Methyl ethyl ketone Pyridine Tetrachloroethylene Trichloroethylene Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 0.5 100.0 6.0 200.0 5.0[e] 0.7 0.5 NA[d] NA[d] NA[d] NA[d]	Arsenic Barium hydroxide Cadmium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlorobenzene Chloroform Methyl ethyl ketone Pyridine Tetrachloroethylene Trichloroethylene and all applicable constituents identified above the UHC regulatory- limit
S5000 – Heterogeneous Debris	S5400	LA-MHD09.001, Heterogeneous Debris	LA125/225 LA116/216 LA117/217 LA120/220 LA123/223	TA-50	Plutonium processing operations; D&D	Acceptable Knowledge				
	S5400	LA-MHD01.001, Heterogeneous Debris	LA125/225 LA116/216 LA115/215 LA118/218 LA119/219 LA117/217 LA122/222 LA123/223 SQ133/233	TA-55	Plutonium processing operations	Acceptable Knowledge				
	S5100	LA-OS-00-01.001, Uncategorized Metal – Defense Sealed Sources	LA120A/ 220A	TA-03, TA-54, TA-55	Plutonium processing operations; D&D	Acceptable Knowledge				

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

Summary Category Group	Waste Matrix Code	Waste Description[a]	TRUCON Code	Waste-Generating Area	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and /or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents[c]
	S5100	LA-OS-00.03, Uncategorized Metal – Defense Sealed Sources (not in POC)	LA120B/ 220B	TA-03, TA-54, TA-55		Acceptable Knowledge				
	S5100	LA-OS-00-0.4, Uncategorized Metal – Mixed Sealed Sources	LA120A/ 220A	TA-03, TA-54, TA-55		Acceptable Knowledge				
	S5400	LA-MHD03.001, Heterogeneous Debris	LA125/225 LA116/216 LA117/217 LA120/220 LA123/223	TA-03		Acceptable Knowledge	D001 D002 D003 D004 D005 D006 D007 D008 D009 D010 D011 D018 D019 D021 D022 D035 D038 D039 D040 D043 F001 F002 F003 F004 F005 U080	Ignitable Corrosive Reactive Arsenic Barium hydroxide Cadmium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlorobenzene Chloroform Methyl ethyl ketone Pyridine Tetrachloroethylene Trichloroethylene Vinyl Chloride Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents Methylene c~~C~~hloride	NA[d] NA[d] NA[d] 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 0.5 100.0 6.0 200.0 5.0[e] 0.7 0.5 0.2 NA[d] NA[d] NA[d] NA[d] NA[d] NA[d]	Arsenic Barium hydroxide Cadmium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlorobenzene Chloroform Methyl ethyl ketone Pyridine Tetrachloroethylene Trichloroethylene Vinyl c~~C~~hloride Methylene c~~C~~hloride and all applicable constituents identified above the UHC regulatory- limit
	S5400	LA-MHD04.001, Heterogeneous Debris	LA125/225 LA116/216 LA117/217 LA123/223	TA-21		Acceptable Knowledge				
	S5400	LA-MHD08.001, Heterogeneous Debris	LA125/225 LA116/216 LA117/217 LA120/220 LA123/223	TA-48		Acceptable Knowledge				

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

Summary Category Group	Waste Matrix Code	Waste Description[a]	TRUCON Code	Waste-Generating Area	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and /or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents[c]
	S5400	LA-MHD05-ITRI.001, Heterogeneous Debris	LA125/225	TA-54		Acceptable Knowledge				

~~(This table is for informational purposes only)~~

~~Summary Category Group~~	~~Waste Matrix Code~~	~~Waste Description[a]~~	~~Waste-Generating Activity~~	~~Basis for Hazardous Waste Designation~~	~~Potential EPA Hazardous Waste Numbers~~	~~Potential Hazardous Waste Constituents and /or Characteristics~~	~~Regulatory Limits[b] (milligrams per liter)~~	~~Potential Underlying Hazardous Constituents[c]~~
~~S3000 - Homogeneous~~	~~S3100~~	~~Homogeneous Inorganic, Cemented~~	~~Plutonium processing operations~~	~~Acceptable Knowledge~~	~~D001~~	~~Ignitable~~	~~NA[d]~~	
					~~D002~~	~~Corrosive~~	~~NA[d]~~	
		~~Homogeneous Inorganic, Cemented Organics~~	~~Plutonium processing operations~~	~~Acceptable Knowledge~~	~~D003~~	~~Reactive~~	~~NA[d]~~	
					~~D004~~	~~Arsenic~~	~~5.0~~	
					~~D005~~	~~Barium hydroxide~~	~~100.0~~	
		~~Homogeneous Inorganic, Non-cemented~~	~~Plutonium processing operations~~	~~Acceptable Knowledge~~	~~D006~~	~~Cadmium~~	~~1.0~~	
					~~D007~~	~~Chromium~~	~~5.0~~	
		~~Homogeneous Inorganic, Salts~~	~~Plutonium processing operations~~	~~Acceptable Knowledge~~	~~D008~~	~~Lead~~	~~5.0~~	

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

~~Summary Category Group~~	~~Waste Matrix Code~~	~~Waste Description[a]~~	~~Waste-Generating Activity~~	~~Basis for Hazardous Waste Designation~~	~~Potential EPA Hazardous Waste Numbers~~	~~Potential Hazardous Waste Constituents and /or Characteristics~~	~~Regulatory Limits[b] (milligrams per liter)~~	~~Potential Underlying Hazardous Constituents[c]~~
					~~D009~~	~~Mercury~~	~~0.2~~	
					~~D010~~	~~Selenium~~	~~1.0~~	
					~~D011~~	~~Silver~~	~~5.0~~	
					~~D018~~	~~Benzene~~	~~0.5~~	
					~~D019~~	~~Carbon tetrachloride~~	~~0.5~~	
					~~D021~~	~~Chlorobenzene~~	~~100.0~~	
					~~D022~~	~~Chloroform~~	~~6.0~~	
					~~D035~~	~~Methyl ethyl ketone~~	~~200.0~~	
					~~D038~~	~~Pyridine~~	~~5.0[e]~~	
					~~D039~~	~~Tetrachloroethylene~~	~~0.7~~	
					~~D040~~	~~Trichloroethylene~~	~~0.5~~	
					~~F001~~	~~Spent halogenated solvents~~	~~NA[d]~~	
					~~F002~~	~~Spent halogenated solvents~~	~~NA[d]~~	
					~~F003~~	~~Spent non-halogenated solvents~~	~~NA[d]~~	
					~~F005~~	~~Spent non-halogenated solvents~~	~~NA[d]~~	

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

~~Table C-5 (continued)~~

~~Summary Category Group~~	~~Waste Matrix Code~~	~~Waste Description[a]~~	~~Waste-Generating Activity~~	~~Basis for Hazardous Waste Designation~~	~~Potential EPA Hazardous Waste Numbers~~	~~Potential Hazardous Waste Constituents and/or Characteristics~~	~~Regulatory Limits[b] (milligrams per liter)~~	~~Potential Underlying Hazardous Constituents[c]~~
~~S3000 – Homogeneous~~	~~S3100~~	~~Homogeneous Inorganic, Vermiculite~~	~~Plutonium processing operations~~	~~Acceptable Knowledge~~	~~D001~~	~~Ignitable~~	~~NA[d]~~	
					~~D002~~	~~Corrosive~~	~~NA[d]~~	
					~~D004~~	~~Arsenic~~	~~5.0~~	
					~~D005~~	~~Barium hydroxide~~	~~100.0~~	
					~~D006~~	~~Cadmium~~	~~1.0~~	

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

					~~D007~~	~~Chromium~~	~~5.0~~	
					~~D008~~	~~Lead~~	~~5.0~~	
					~~D009~~	~~Mercury~~	~~0.2~~	
					~~D010~~	~~Selenium~~	~~1.0~~	
					~~D011~~	~~Silver~~	~~5.0~~	
					~~D018~~	~~Benzene~~	~~0.5~~	
					~~D019~~	~~Carbon tetrachloride~~	~~0.5~~	
					~~D021~~	~~Chlorobenzene~~	~~100.0~~	
					~~D022~~	~~Chloroform~~	~~6.0~~	
					~~D027~~	~~1,4-Dichlorobenzene~~	~~7.5~~	
					~~D028~~	~~1,2-Dichloroethane~~	~~0.5~~	
					~~D030~~	~~2,4-Dinitrotoluene~~	~~0.13[e]~~	
					~~D032~~	~~Hexachlorobenzene~~	~~0.13[e]~~	
					~~D033~~	~~Hexachlorobutadiene~~	~~0.5~~	
					~~D034~~	~~Hexachloroethane~~	~~3.0~~	
					~~D035~~	~~Methyl ethyl ketone~~	~~200.0~~	
					~~D036~~	~~Nitrobenzene~~	~~2.0~~	
					~~D037~~	~~Pentachlorophenol~~	~~100.0~~	
					~~D038~~	~~Pyridine~~	~~5.0[e]~~	

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

~~Summary Category Group~~	~~Waste Matrix Code~~	~~Waste Description[a]~~	~~Waste-Generating Activity~~	~~Basis for Hazardous Waste Designation~~	~~Potential EPA Hazardous Waste Numbers~~	~~Potential Hazardous Waste Constituents and/or Characteristics~~	~~Regulatory Limits[b] (milligrams per liter)~~	~~Potential Underlying Hazardous Constituents[c]~~
					~~D039~~	~~Tetrachloroethylene~~	~~0.7~~	
					~~D040~~	~~Trichloroethylene~~	~~0.5~~	
					~~D042~~	~~2,4,6-Trichlorophenol~~	~~2.0~~	
					~~D043~~	~~Vinyl Chloride~~	~~0.2~~	
					~~F001~~	~~Spent halogenated solvents~~	~~NA[d]~~	
					~~F002~~	~~Spent halogenated solvents~~	~~NA[d]~~	
					~~F003~~	~~Spent non-halogenated solvents~~	~~NA[d]~~	
					~~F005~~	~~Spent non-halogenated solvents~~	~~NA[d]~~	

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

~~**Table C-5 (continued)**~~

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

~~Summary Category Group~~	~~Waste Matrix Code~~	~~Waste Description[a]~~	~~Waste-Generating Activity~~	~~Basis for Hazardous Waste Designation~~	~~Potential EPA Hazardous Waste Numbers~~	~~Potential Hazardous Waste Constituents and/or Characteristics~~	~~Regulatory Limits[b] (milligrams per liter)~~	~~Potential Underlying Hazardous Constituents[c]~~

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

~~S4000 – Soil/ Gravel~~	~~S4100~~	~~Soil~~	~~D&D~~	~~Acceptable Knowledge~~	~~D004~~	~~Arsenic~~	~~5.0~~	~~D004~~	
					~~D005~~	~~Barium hydroxide~~	~~100.0~~	~~D005~~	
					~~D006~~	~~Cadmium~~	~~1.0~~	~~D006~~	
					~~D007~~	~~Chromium~~	~~5.0~~	~~D007~~	
					~~D008~~	~~Lead~~	~~5.0~~	~~D008~~	
					~~D009~~	~~Mercury~~	~~0.2~~	~~D009~~	
					~~D010~~	~~Selenium~~	~~1.0~~	~~D010~~	
					~~D011~~	~~Silver~~	~~5.0~~	~~D011~~	
					~~D018~~	~~Benzene~~	~~0.5~~	~~D018~~	
					~~D019~~	~~Carbon tetrachloride~~	~~0.5~~	~~D019~~	
					~~D021~~	~~Chlorobenzene~~	~~100.0~~	~~D021~~	
					~~D022~~	~~Chloroform~~	~~6.0~~	~~D022~~	
					~~D035~~	~~Methyl ethyl ketone~~	~~200.0~~	~~D035~~	
					~~D038~~	~~Pyridine~~	~~5.0[e]~~	~~D038~~	
					~~D039~~	~~Tetrachloroethylene~~	~~0.7~~	~~D039~~	
					~~D040~~	~~Trichloroethylene~~	~~0.5~~	~~D040~~	
					~~F001~~	~~Spent halogenated solvents~~	~~NA[d]~~	~~F001~~	
					~~F002~~	~~Spent halogenated solvents~~	~~NA[d]~~	~~F002~~	
					~~F003~~	~~Spent non-halogenated solvents~~	~~NA[d]~~	~~F003~~	

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

~~Summary Category Group~~	~~Waste Matrix Code~~	~~Waste Description[a]~~	~~Waste-Generating Activity~~	~~Basis for Hazardous Waste Designation~~	~~Potential EPA Hazardous Waste Numbers~~	~~Potential Hazardous Waste Constituents and/or Characteristics~~	~~Regulatory Limits[b] (milligrams per liter)~~	~~Potential Underlying Hazardous Constituents[c]~~
					~~F005~~	~~Spent non-halogenated solvents~~	~~NA[d]~~	~~F005~~

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

~~**Table C-5 (continued)**~~

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

~~Summary Category Group~~	~~Waste Matrix Code~~	~~Waste Description[a]~~	~~Waste-Generating Activity~~	~~Basis for Hazardous Waste Designation~~	~~Potential EPA Hazardous Waste Numbers~~	~~Potential Hazardous Waste Constituents and/or Characteristics~~	~~Regulatory Limits[b] (milligrams per liter)~~	~~Potential Underlying Hazardous Constituents[c]~~

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

~~S5000 – Debris~~	~~S5100~~	~~Non-Combustible Debris~~	~~Plutonium processing operations; D&D~~	~~Acceptable Knowledge~~	~~D001~~	~~Ignitable~~	~~NA[d]~~	
					~~D002~~	~~Corrosive~~	~~NA[d]~~	
					~~D003~~	~~Reactive~~	~~NA[d]~~	
					~~D004~~	~~Arsenic~~	~~5.0~~	
					~~D005~~	~~Barium hydroxide~~	~~100.0~~	
					~~D006~~	~~Cadmium~~	~~1.0~~	
					~~D007~~	~~Chromium~~	~~5.0~~	
					~~D008~~	~~Lead~~	~~5.0~~	
					~~D009~~	~~Mercury~~	~~0.2~~	
					~~D010~~	~~Selenium~~	~~1.0~~	
					~~D011~~	~~Silver~~	~~5.0~~	
					~~D018~~	~~Benzene~~	~~0.5~~	
					~~D019~~	~~Carbon tetrachloride~~	~~0.5~~	
					~~D021~~	~~Chlorobenzene~~	~~100.0~~	
					~~D022~~	~~Chloroform~~	~~6.0~~	
					~~D035~~	~~Methyl ethyl ketone~~	~~200.0~~	
					~~D038~~	~~Pyridine~~	~~5.0[e]~~	
					~~D039~~	~~Tetrachloroethylene~~	~~0.7~~	
					~~D040~~	~~Trichloroethylene~~	~~0.5~~	
					~~D043~~	~~Vinyl Chloride~~		

Table C-4 (continued)
Descriptions of Mixed Transuranic Waste Stored at the Facility

~~Summary Category Group~~	~~Waste Matrix Code~~	~~Waste Description[a]~~	~~Waste-Generating Activity~~	~~Basis for Hazardous Waste Designation~~	~~Potential EPA Hazardous Waste Numbers~~	~~Potential Hazardous Waste Constituents and/or Characteristics~~	~~Regulatory Limits[b] (milligrams per liter)~~	~~Potential Underlying Hazardous Constituents[c]~~
					~~F001~~	~~Spent halogenated solvents~~	~~0.2~~	
					~~F002~~	~~Spent halogenated solvents~~	~~NA[d]~~	
					~~F003~~	~~Spent non-halogenated solvents~~	~~NA[d]~~	
					~~F004~~	~~Spent non-halogenated solvents~~	~~NA[d]~~	
					~~F005~~	~~Spent non-halogenated solvents~~ ~~Methylene Chloride~~	~~NA[d]~~	
					~~U080~~		~~NA[d]~~	
							~~NA[d]~~	

[a] This table is based on information from the *Acceptable Knowledge Information Summary for Los Alamos National Laboratory Transuranic Waste Streams* (AKIS), (TWCP-AK-2.1-019, R.0) (LA-UR-03-4870); and from waste characterization documentation information maintained by the Facility and Waste Operations Division. Waste with EPA Hazardous Waste Numbers that are not included in the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit will not be transported to WIPP. Additionally, recharacterization efforts for nitrate salt-bearing waste have been conducted and documented in several documents as outlined in Enclosure 3 of *Response to Ordered Action 2/3; Attachment A to Settlement Agreement and Stipulated Final Order HWB-14-20; Los Alamos National Laboratory.*

[b] A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA, 1986), the extract from a representative sample of the waste contains any of the contaminants listed at a concentration equal to or greater than the respective value given in ~~the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart II~~40 CFR, Part 261, Subpart C ~~[6-14-00]~~.

[c] Potential underlying hazardous constituents (UHC) have been included, where the information is available. UHC characterization for the purpose of Land Disposal Restrictions will apply for mixed transuranic waste to be disposed of at WIPP.

[d] Not Applicable: Refers to the absence of regulatory limits for ignitable, corrosive, and reactive characteristic wastes and F-, P-, and U-listed wastes.

[e] Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

Note: Fluoride, sulfide, vanadium, and zinc are not "underlying hazardous constituents" in characteristic wastes, according to the definition in 40 CFR § 268.2(i). Selenium is not an underlying hazardous constituent as defined at 40 CFR § 268.2(i) because its Universal Treatment Standard level is greater than its Toxicity Characteristic level, thus a treated selenium waste would always be characteristically hazardous, unless it is treated to below its characteristic level.

Table C-5 (continued)
Waste Streams Treated Through Open Burning (OB) and/or Open Detonation (OD) at the Facility

Table C-5~~6~~
Waste Streams Treated through Open Burning (OB) and/or Open Detonation (OD) at the Facility
~~(This table is reserved)~~

Waste Stream	Waste Stream Description	Percentage of Total Waste Treated[1]	Potential Explosives[2]	Other Potential Materials	Potential EPA Hazardous Waste Numbers[3]	Potential Hazardous Constituents and/or Characteristics	Regulatory Limits[4] (mg/L)
Explosives machining waste	Explosives machining chips, filters, filter solids, and water	80-95% OB	Pentaerythritol tetranitrate (PETN), Cyclo-1,3,5-trimethylene-2,4,6-trinitramine (RDX), Octahydro, 1,3,5,7-tetranitro, 1,3,5,7-tetrazocine (HMX), plastic-bonded explosives (PBX's or LX's), 4,4-diamino-3,3- azoxyfurazan (DAAF), 2,4,6-trinitrotoluene (TNT), Comp B, and triamino trinitrobenzene (TATB), Baratol, Cyclotol	Plastic bags	D003 D005 D008 D030	Reactivity Barium Lead 2,4-Dinitrotoluene	NA[5] 100.0 5.0 0.13
Excess explosives	Large, laboratory--sized, or small amounts of excess standard explosives. Explosives may be in the form of flakes, granules, crystals, powders, pressings, plastic bonded, putties, rubberized solids, or extrudable solids. Explosives infrequently contain barium or ammonium nitrate mixed with more than 0.2% combustible substances.	5-15% OB 50-90%OD	HMX, RDX, PETN, TATB, DAAF, (2,6-Bis[picrylamino]-3,5-dinitropyridine (PYX), Nitroguanidine (NQ), Nitrocellulose, PBX's and LX's, Comp B, TNT, Boracitol, Cyclotol, HBX-1, Octol, Pentolite, Tritonal, Baratol	Plastic bags, plastic wrapping, plastic casings, cardboard, paper, paper bags, and/or fiberboard containers. Small potential for aluminum, stainless steel, steel, and/or copper.	D001 D003 D005 D030	Ignitability Reactivity Barium 2,4-Dinitrotoluene	NA[5] NA[5] 100.0 0.13

Table C-5 (continued)
Waste Streams Treated Through Open Burning (OB) and/or Open Detonation (OD) at the Facility

Waste Stream	Waste Stream Description	Percentage of Total Waste Treated[1]	Potential Explosives[2]	Other Potential Materials	Potential EPA Hazardous Waste Numbers[3]	Potential Hazardous Constituents and/or Characteristics	Regulatory Limits[4] (mg/L)
Explosives-contaminated combustible debris	Explosives-contaminated debris generated in research laboratories and processing operations. Debris can involve filters removed from laboratories or processing bays, or may contain very small amounts of solvent. The most common solvents used are ethanol and acetone.	<1%OB <1%OD	HMX, RDX, PETN, Cyclotol, Octol, TATB, DAAF, PYX, TNT, PBXs, and LXs	Plastic bags, plastic wrapping, weigh boats, gloves, vials, cardboard, paper, paper bags, fiberboard containers, kimwipes, rags, swabs, flasks, watch glasses, tubing, and/or rods. Possible aluminum, stainless steel, steel, and/or copper. When solvents are present, may contain trace amounts of ethanol, acetone, methanol, ethyl acetate, toluene, cyclohexanone, benzene, chloroform, 1,2-dichloroethane, 1,2-dichloroethylene, methyl ethyl ketone, or trichloroethylene. Noncombustible portions of waste are minimized as much as possible.	D001 D003 D018 D022 D028 D029 D030 D035 D040 F001 F002 F003 F004 F005	Ignitability Reactivity Benzene Chloroform 1,2-Dichloroethane 1,1-Dichloroethylene 2,4- Dinitrotoluene Methyl ethyl ketone Trichloroethylene Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[5] NA[5] 0.5 6.0 0.5 0.7 0.13 200.0 0.5 NA[5] NA[5] NA[5] NA[5] NA[5]
Explosives-contaminated solvent waste	Dimethyl sulfoxide (DMSO) containing dissolved explosives~~.~~	<1%OB	HMX, RDX, PETN, TATB, DAAF, PBXs, and LXs		D003 D030	Reactivity 2,4-Dinitrotoluene	NA[5] 0.13

Table C-5 (continued)
Waste Streams Treated Through Open Burning (OB) and/or Open Detonation (OD) at the Facility

Waste Stream	Waste Stream Description	Percentage of Total Waste Treated[1]	Potential Explosives[2]	Other Potential Materials	Potential EPA Hazardous Waste Numbers[3]	Potential Hazardous Constituents and/or Characteristics	Regulatory Limits[4] (mg/L)
Explosives-contaminated noncombustible debris	Explosives-contaminated equipment including discarded, noncombustible equipment; debris from firing sites; noncombustible material from decommissioning and demolition activities; and material from explosives processing areas such as carbon or sand from filtering processes.	1-3%OB <1%OD[6]	HMX, RDX, PETN, TATB, DAAF, PYX, NQ, Nitrocellulose, PBX[2]s, LX[2]s, Comp B, TNT, Boracitol, Cyclotol, HBX-1, Octol, Pentolite, Tritonal, Baratol	Noncombustible material may include glass, ceramic, or metal piping or equipment. Rarely when solvents are present, they may include trace amounts of ethanol, acetone, methanol, ethyl acetate, toluene, cyclohexanone, benzene, chloroform, 1,2- dichloroethane, 1,2-dichloroethylene, methyl ethyl ketone, or trichloroethylene.	D003 D005 D008 D011 D018 D022 D028 D029 D030 D035 D040 F001 F002 F003 F004 F005	Reactivity Barium Lead Silver Benzene Chloroform 1,2-Dichloroethane 1,1-Dichloroethylene 2,4-Dinitrotoluene Methyl ethyl ketone Trichloroethylene Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents Spent non-halogenated solvents	NA[5] 100.0 5.0 5.0 0.5 6.0 0.5 0.7 0.13 200.0 0.5 NA[5] NA[5] NA[5] NA[5] NA[5]
Detonators, initiators, and mild detonating fuses	Detonators, initiators, and/or mild detonating fuses containing standard explosives. Explosives may be in metal or plastic casings and may contain lead--based primaries or be in a lead sheath. Typically nitromethane is used as fuel for treatment activities. This waste stream may include manufactured articles removed from fire protection systems.	1-2%OD	PETN, HMX, RDX, TATB, lead azide, lead styphnate, PBXs	Plastic bags, plastic wrapping, cardboard, paper, paper bags, and/or fiberboard containers. Possible aluminum, lead, stainless steel, steel, or copper present as well.	D003 D008	Reactivity Lead	NA[5] 5.0

Table C-5 (continued)
Waste Streams Treated Through Open Burning (OB) and/or Open Detonation (OD) at the Facility

Waste Stream	Waste Stream Description	Percentage of Total Waste Treated[1]	Potential Explosives[2]	Other Potential Materials	Potential EPA Hazardous Waste Numbers[3]	Potential Hazardous Constituents and/or Characteristics	Regulatory Limits[4] (mg/L)
Shaped charges and test assemblies	Shaped charges consisting of cores of explosives with metal sheaths or metal liners or high--explosives test assemblies consisting of standard explosives in plastic or metal holders. Assemblies may contain lead or silver metal.	1-2%OD	PETN, RDX, HMX, PBXs, and LXs	Plastic components, plastic bags, plastic wrapping, cardboard, paper, paper bags, and/or fiberboard containers. Aluminum, copper, lead, stainless steel, brass, and/or copper may be present.	D003 D008 D011 D030	Reactivity Lead Silver 2,4-Dinitrotoluene	NA[5] 5.0 5.0 0.13
Projectiles and munitions larger than 0.50 caliber	Projectiles and munitions larger than 0.50 caliber that may contain depleted uranium.	1-2%OD	Munitions/ projectiles	Plastic bags, plastic wrapping, fiberglass, cardboard, paper, fiberboard drums, lead, brass, steel, stainless steel, copper, and/or aluminum.	D003 D008	Reactivity Lead	NA[5] 5.0
Pressing molds	Adiprene (urethane) pressing molds contaminated with explosives.	1-2%OD	TNT	Adiprene, plastic bags, plastic wrapping, cardboard, paper, and/or paper bags.	D003 D030	Reactivity 2,4-Dinitrotoluene	NA[5] 0.13

1 Estimated percentage of the waste stream's representation of all waste that will be treated at the open burning and open detonation units.
2 Potential explosives do not include all of the possible explosives that may be treated at the unit, only those currently expected to be treated as part of the waste stream.
3 Potential EPA Hazardous Waste Numbers do not include all of the possible waste numbers that may be treated at the unit, only those currently expected to be treated. A full list of EPA Hazardous Waste Numbers that may be treated at the unit is included with the most recent version of the LANL Part A Permit Application.
4 A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA,- 1986), the extract from a representative sample of the waste contains any of the contaminants listed (D004-D043) at a concentration equal to or greater than the respective value given in 40 CFR Part 261, Subpart C. These are represented in milligrams per liter (mg/L).
5 Not Applicable

~~TABLE C-7~~

~~(This table is reserved)~~

~~Table C-8~~

~~(This table is reserved)~~

Table C-6~~9~~
Parameters, Characterization Methods, and Rationale for Parameter Selection for Hazardous Waste

Waste Description[a]	Parameters[b]	Characterization Methods	Rationale
Spent Solvents	Flash point (for liquid waste) pH (for liquid waste) RCRA[c]-regulated metals Volatile organic compounds (VOC) Semivolatile organic compounds (SVOC) Free liquids	Acceptable Knowledge Sampling and Analysis	Determine characteristic for ignitability, corrosivity, reactivity, and toxicity Determine concentration of F-listed solvents Determine underlying hazardous constituents
Contaminated Solid Wastes	RCRA[c]-regulated metals VOCs SVOCs	Acceptable Knowledge Sampling and Analysis	Determine characteristic for ignitability, reactivity, and toxicity Determine concentration of F-listed solvents
Paint and Related Wastes	Flash point (for liquid waste) RCRA[c]-regulated metals VOCs	Acceptable Knowledge Sampling and Analysis	Determine characteristic for ignitability and toxicity Determine concentration of F-listed solvents
Photographic and Photocopier Wastes	Flash point (for liquid waste) pH (for liquid waste) RCRA[c]-regulated metals	Acceptable Knowledge Sampling and Analysis	Determine characteristic for ignitability, corrosivity, and toxicity
Corrosive Liquid Wastes	Flash point (for liquid waste) pH (for liquid waste) RCRA[c]-regulated metals VOCs SVOCs	Acceptable Knowledge Sampling and Analysis	Determine characteristic for ignitability, corrosivity, and toxicity Determine concentration of F-listed solvents
Solid Metals and Metallic Compounds	RCRA[c]-regulated metals	Acceptable Knowledge Sampling and Analysis	Determine characteristic for ignitability, reactivity, and toxicity
Contaminated Noncorrosive Aqueous and Nonaqueous Solutions and Sludges	Flash point RCRA[c]-regulated metals VOCs SVOCs	Acceptable Knowledge Sampling and Analysis	Determine characteristic for ignitability, reactivity, and toxicity Determine concentration of F-listed solvents
Mercury Wastes	RCRA[c]-regulated metal	Acceptable Knowledge Sampling and Analysis	Determine ~~characterisitc~~characteristic for toxicity Determine the presence of a U-listed unused commercial chemical product
Used Batteries and Battery Fluids	pH (for liquid waste) RCRA[c]-regulated metals	Acceptable Knowledge	Determine characteristic for corrosivity and toxicity
Unused/Off-specification Commercial Chemical Products	Flash point (for liquid waste) pH (for liquid waste) RCRA[c]-regulated metals VOCs SVOCs	Acceptable Knowledge Sampling and Analysis	Determine characteristic for ignitability, corrosivity, reactivity, and toxicity Determine presence of P-listed or U-listed unused commercial chemical products
Gas Cylinder Waste	RCRA[c]-regulated metals VOCs SVOCs	Acceptable Knowledge	Determine ~~characterisitic~~characteristic for ignitability, corrosivity, and reactivity Determine presence of D-coded and U- and P-listed wastes
Environmental Restoration ~~(ER)~~ Soils and Sludges	RCRA[c]-regulated metals VOCs SVOCs	Acceptable Knowledge	Determine characteristic for ignitability, reactivity, and toxicity Determine concentration of F-listed solvents
Environmental Restoration ~~ER~~ Aqueous Liquids	pH RCRA[c]-regulated metals VOCs SVOCs	Acceptable Knowledge	Determine characteristic for ignitability, corrosivity, reactivity, and toxicity Determine concentration of F-listed solvents
Environmental Restoration ~~ER~~ Debris	RCRA[c]-regulated metals VOCs SVOCs	Acceptable Knowledge	Determine characteristic for ignitability, reactivity, and toxicity Determine concentration of F-listed solvents

[a] Information contained in this column is from the Los Alamos National Laboratory waste characterization documentation database

[b] Parameter selection is based on acceptable knowledge for each waste stream. Additional parameters may be selected for each waste stream as necessary

[c] Resource Conservation and Recovery Act. Use of the term "RCRA-regulated metals" refers to hazardous waste as defined in ~~the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart II,~~ 40 CFR 261.24 ~~[6-14-00]~~

Table C-7~~10~~
Parameters, Characterization Methods, and Rationale for Parameter Selection for Mixed Low-Level Waste

Waste Description[a]	Parameter[b]	Characterization Method	Rationale
Soils with Heavy Metals	RCRA-regulated metals[c]	Acceptable Knowledge Sample and analyze randomly selected drums in waste stream	Determine toxicity characteristic
Environmental Restoration Soils	RCRA-regulated metals[c] VOCs	Acceptable Knowledge Sample and analyze randomly selected drums in waste stream	Determine presence of F-listed solvents Determine toxicity characteristic
Inorganic Solid Oxidizers	RCRA-regulated metals[c]	Acceptable Knowledge Sample and analyze randomly selected drums in waste stream	Determine toxicity characteristic Determine characteristic for ignitability and reactivity
Lead Waste	RCRA-regulated metals[c]	Acceptable Knowledge	Determine characteristic for reactivity Determine toxicity characteristic
Noncombustible Debris	RCRA-regulated metals[c]	Acceptable Knowledge	Determine toxicity characteristic Determine characteristic for ignitability and reactivity
Combustible Debris	RCRA-regulated metals[c] VOCs	Acceptable Knowledge	Determine toxicity characteristic Determine presence of F-listed solvents Determine characteristic for ignitability and reactivity
Organic-Contaminated Noncombustible Solids	RCRA-regulated metals[c] VOCs	Acceptable Knowledge	Determine toxicity characteristic Determine presence of F-listed solvents
Organic-Contaminated Combustible Solids	RCRA-regulated metals[c] VOCs	Acceptable Knowledge	Determine characteristic for ignitability and reactivity Determine toxicity characteristic Determine presence
Solid Wastes			
Mercury Wastes	RCRA-regulated metals[c] VOCs	Acceptable Knowledge Sample and analyze randomly selected drums in waste stream	Determine toxicity characteristic Determine presence of F-listed solvents
Unused Solid Reagent Chemical Wastes	RCRA-regulated metals[c]	Acceptable Knowledge	Determine characteristic for ignitability and corrosivity Determine the presence of P- and U-listed unused commercial chemical product

Table C-~~10~~7 (continued)

Waste Description[a]	Parameter[b]	Characterization Method	Rationale
Solid Wastes			
Unused Solid Reagent Chemical Wastes	— RCRA-regulated metals[c]	— Acceptable Knowledge	— Determine characteristic for ignitability and corrosivity — Determine the presence of P- and U-listed unused commercial chemical product
Liquid Wastes			
Spent Solvents and Contaminated Solvent Mixtures	— Flash point — pH — RCRA-regulated metals[c] — VOCs — Semivolatile organic compounds (SVOCs)	— Acceptable Knowledge — Sampling and Analysis	— Determine characteristic for ignitability, corrosivity, and toxicity — Determine concentration of F-listed solvents
Corrosive Liquid Wastes	— Flash point — pH — RCRA-regulated metals[c] — SVOCs	— Acceptable Knowledge — Sampling and Analysis	— Determine characteristic for ignitability, corrosivity, and toxicity — Determine concentration of F-listed solvents
Aqueous and Nonaqueous Liquids Contaminated with Heavy Metals and/or Organics	— Flash point — RCRA-regulated metals[c] — VOCs — SVOCs	— Acceptable Knowledge — Sampling and Analysis	— Determine characteristic for ignitability and toxicity — Determine concentration of F-listed solvents
Oil Wastes	— RCRA-regulated metals[c] — VOCs — SVOCs	— Acceptable Knowledge — Sampling and analysis	— Determine characteristic for toxicity — Determine concentration of F-listed solvents
Unused Liquid Reagent Chemical Wastes	— Flash point — pH	— Acceptable Knowledge	— Determine characteristic for ignitability and corrosivity — Determine the presence of P- and U-listed unused commercial chemical product
Gaseous Wastes			
Gas Cylinder Waste	— RCRA[c]-regulated metals — VOCs — SVOCs	— Acceptable Knowledge	— Determine characteristic for ignitability, corrosivity, and reactivity — Determine presence of D-coded and P- and U-listed waste

[a] Information contained in this column is extracted primarily from Los Alamos National Laboratory, 1995, "LANL's Federal Facility Compliance Order Site Treatment Plan Background Volume," Los Alamos National Laboratory, Los Alamos, New Mexico.

[b] Parameter selection is based on acceptable knowledge for each waste stream. Additional parameters may be selected for each waste stream as necessary

[c] Resource Conservation and Recovery Act. Use of the term "RCRA-regulated metals" refers to hazardous waste as defined in ~~the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart II,~~ 40 CFR 261.24 ~~[6-14-00]~~

Table C-8~~11~~
Parameters, Characterization Methods, and Rationale for Parameter Selection for Mixed Transuranic Waste

Summary Category Group/ Description[a]	Waste Description	Parameters	Characterization Methods	Rationale
Storage				
S3000-Homogeneous Solids	—Solidified aqueous waste (*e.g.*, concreted/cemented aqueous waste)	—Free liquids in waste matrix —Physical form of the waste	—Visual examination —Real-time radiography (RTR) —Acceptable Knowledge	—Verify physical waste form —No free liquids allowed
	—Solidified aqueous waste (*e.g.*, dewatered sludge and chemical treatment sludge) —Solidified inorganic/organic process solids and liquids	—Resource Conservation and Recovery Act (RCRA)-regulated metals	—Sample and analyze statistically selected number of drums in waste stream —Acceptable Knowledge	—Determine toxicity characteristic —Determine concentration of metals
	—Homogeneous inorganic solids —Glass/noncombustible waste —Non-cemented inorganics —Absorbed organics on vermiculite	—Volatile organic compounds in container headspace gas	—Gas chromatography / mass spectrometry (GC/MS) —Fourier transform infrared spectrometry —Gas chromatography / Flame ionization detector —Acceptable Knowledge	Qualitative screening to confirm the presence of VOCs
S4000-Soils/Gravels	—Contaminated soil	—Free liquids in waste matrix —Physical form of the waste	—Visual examination —RTR —Acceptable Knowledge	—Verify physical waste form —No free liquids allowed
		—RCRA-regulated metals	—Sample and analyze statistically selected number of drums in waste stream —Acceptable Knowledge	—Determine toxicity characteristic —Determine concentration of metals
		—VOCs in container headspace gas	—GC/MS —Fourier transform infrared spectrometry —Gas chromatography / Flame ionization detector	Qualitative screening to confirm the presence of VOCs
S5000-Debris Waste	—Mixed metal scrap and incidental combustibles —Combustible waste —Graphite waste —Metal waste —Glass waste	—Free liquids —Physical form of the waste —VOCs in container headspace gas —VOCs and semivolatile organic compounds	—Visual examination —RTR —Acceptable Knowledge	—Verify physical waste form —No free liquids allowed —Determine compliance with land disposal restrictions (LDR) treatment standards, if applicable
	—Leaded-rubber and metal waste —High-efficiency particulate air filters —Noncombustible waste —Mixed combustible / noncombustible waste	—RCRA-regulated metals	—Gas chromatography / mass spectrometry —Fourier transform infrared spectrometry —Gas chromatography / Flame ionization detector —Acceptable Knowledge	—Qualitative screening to confirm the presence of VOC —Determine compliance with LDR treatment standards, if applicable

Table C-8 (continued)
Parameters, Characterization Methods, and Rationale for Parameter Selection for Mixed Transuranic Waste

~~**Table C-11 (continued)**~~

Treatment				
L1000 Aqueous Liquids/Slurries	Evaporator bottoms solutions, aqueous waste, and laboratory solutions	RCRA-regulated metals and corrosivity	Acceptable Knowledge Sampling and Analysis	Determine toxicity characteristics Determine concentration of metals
S3000 Homogeneous Solids	Inorganic process solids and cemented inorganic process solids	RCRA-regulated metals	Acceptable Knowledge Sampling and Analysis	Determine concentration of metals

[a] Information in this column is based on information from the *Acceptable Knowledge Information Summary for Los Alamos National Laboratory Transuranic Waste Streams* (AKIS), TWCP-AK-2.1-019, R.0, LA-UR-03-4870, Los Alamos National Laboratory, Los Alamos, New Mexico.

Table C-9~~12~~
Summary of Characterization Methods[a] for Explosives Waste Treatment Residue

WASTE DESCRIPTION	PARAMETER[a]	CHARACTERIZATION METHOD	RATIONALE
Explosives machining waste	Reactivity Resource Conservation and Recovery Act (RCRA)-regulated metals SVOCs	Acceptable Knowledge-[b] Field Screening-[c]	Determine characteristic for reactivity, the total concentration of metals, -and the presence of SVOCs
Excess explosives	Ignitability Reactivity RCRA-regulated metals SVOCs	Acceptable Knowledge-[b] Field Screening-[c]	Determine characteristic for ignitability and reactivity, the total concentration of metals, and the presence of SVOCs
Explosives-contaminated combustible debris	Ignitability Reactivity RCRA-regulated metals SVOCs Spent halogenated solvents Spent nonhalogenated solvents	Acceptable Knowledge-[b] Field Screening-[c]	Determine characteristic for ignitability and reactivity, the total concentration of metals, -and the presence of SVOCs or solvents
Explosives-contaminated solvent waste	Reactivity 2,4-Dinitrotoluene	Acceptable Knowledge-[b] Field Screening-[c]	Determine characteristic for reactivity and the presence of SVOCs
Explosives-contaminated noncombustible debris	Reactivity RCRA-regulated metals SVOCs Spent halogenated solvents Spent non-halogenated solvents	Acceptable Knowledge-[b] Field Screening-[c]	Determine characteristic for reactivity and the presence of SVOCs
Residue (ash) generated from treatment	Ignitability Reactivity RCRA-regulated metals SVOCs	Acceptable Knowledge-[b] Sampling and analysis-[d]	Determine characteristic for ignitability, reactivity, toxicity characteristic for metals, and the presence of SVOCs.
Excess explosives	Ignitability Reactivity	Acceptable Knowledge-[a] Field Screening	Determine characteristic for ignitability and reactivity
Detonators, initiators, and mild detonating fuses	Reactivity Lead	Acceptable Knowledge-[a] Field Screening Sampling and analysis[b]	Determine characteristic for reactivity Determine toxicity characteristic for lead
Shaped charges and test assemblies	Reactivity Lead 2,4-Dinitrotoluene	Acceptable Knowledge-[a] Field Screening Sampling and analysis[b]	Determine characteristic for reactivity Determine toxicity characteristic for lead and 2,4-Dinitrotoluene
Projectiles and munitions larger than 0.50 caliber	Reactivity Lead	Acceptable Knowledge-[a] Field Screening Sampling and analysis[b]	Determine characteristic for reactivity Determine toxicity characteristic for lead
Pressing molds	Reactivity 2,4-Dintirotoluene	Acceptable Knowledge [a] Field Screening	Determine characteristic for reactivity Determine toxicity characteristic 2,4-Dinitrotoluene

[a] Regulations do not specify a particular characterization method for reactivity of explosives waste streams; characterization of explosives waste is based mainly on the properties of the chemicals known or suspected to be in the waste (e.g., process knowledge or acceptable knowledge).

[b] Acceptable knowledge is defined in Section C.3.1.1 of this Waste Analysis Plan.

[c] Field screening such as High Explosives Spot Test can be used to determine the presence of explosives.

[d] Sampling and analysis is conducted in accordance with Section C.3.1.2 of this Waste Analysis Plan.

~~Table C-12~~

~~(This table is reserved)~~

~~**Table C-13**~~

~~(This table is reserved)~~

~~Table C-14~~

~~(This table is reserved)~~

Table C-10~~5~~
Recommended Sample Containers[a], Preservation Techniques, and Holding Times[b]

Analyte Class and Sample Type	Container	Preservative	Holding Time
	Volatile Organics		
Concentrated Waste Samples:	Method 5035: 40-milliliter (mL) vials with stirring bar. Method 5021: See method. Methods 5031 & 5032: 125-mL WM[c]-G[d]. Use Teflon-lined lids for all procedures.	Cool to 0-6~~4~~° degrees Celsius (°C)[e]	14 days
Aqueous Samples:			
No Residual Chlorine Present	Methods 5030, 5031, & 5032: 3~~2~~ x 40-mL vials with Teflon-lined septum caps.	Cool to 0-6~~4~~°C and adjust pH[f] to less than 2 with H_2SO_4, HCl, or solid $NaHSO_4$	14 days
Residual Chlorine Present	Methods 5030, 5031, & 5032: 3~~2~~ x 40-mL vials with Teflon-lined septum caps.	Collect sample in a 125-mL container which has been pre-preserved with 4 drops of 10% sodium thiosulfate solution. Gently swirl to mix sample and transfer to a 40-mL volatile organic analysis (VOA) vial. Cool to 0-6~~4~~°C and adjust pH to less than 2 with H_2SO_4, HCl, or solid $NaHSO_4$	14 days
Acrolein and Acrylonitrile	Methods 5030, 5031, & 5032: 3~~2~~ x 40-mL vials with Teflon-lined septum caps.	Adjust to pH of 4-5. Cool to 0-6~~4~~°C	7~~14~~ days
Soil/Sediments and Sludges:	Method 5035: 40-mL vials with stirring bar. Method 5021: See method. Methods 5031 & 5032: 125-mL WM[c]-G[d]. Use Teflon-lined lids for all procedures.	See the individual method	14 days

Table C-10~~5~~ (continued)

Recommended Sample Containers[a], Preservation Techniques, and Holding Times[b]

Analyte Class and Sample Type	Container	Preservative	Holding Time
Semivolatile Organics/Organochlorine Pesticides and Herbicides			
Concentrated Waste Samples:	125 mL WM[c]-G[d] with Teflon-lined lid	None	Samples must be extracted within 14 days and analyzed within 40 days following extraction.
Soil/Sediments and Sludges:	250 mL WM[c]-G[d] with Teflon-lined lid	Cool to 0-6~~4~~ºC	Samples must be extracted within 14 days and analyzed within 40 days following extraction.
Liquid Samples:			
No Residual Chlorine Present	1-gallon (gal.), 2 x 0.5 gal., or 4 x 1 liter (L) AG[g] container with Teflon-lined lid	Cool to 0-6~~4~~ºC	Samples must be extracted within 7 days and extracts analyzed within 40 days following extraction
Residual Chlorine Present	1-gal., 2 x 0.5 gal., or 4 x 1-L AG[g] with Teflon-lined lid	Add 3-mL 10% sodium thiosulfate solution per gallon (or 0.008%). Addition of sodium thiosulfate solution to sample container may be performed in the laboratory prior to field use. Cool to 4ºC.	Samples must be extracted within 7 days and extracts analyzed within 40 days following extraction
Metals			
Aqueous Samples:			
Metals (except hexavalent chromium and mercury)	1-L P[h] or G[d]	Add nitric acid to adjust pH to less than 2.	180 days
Hexavalent chromium	500-mL P[h] or G[d]	Cool to <6~~4~~ºC	24 hours
Mercury	500-mL P[h] or G[d]	Add nitric acid to adjust pH to less than 2.	28 days
Soil/Sediments and Sludges:			
Metals (except hexavalent chromium and mercury)	500-mL WM[c]-P[h] or G[d]	Cool to <6~~4~~ºC	180 days
Hexavalent chromium	500-mL WM[c]-P[h] or G[d]	Cool to <6~~4~~ºC	Samples must be extracted within 30 days and extracts analyzed within 7 days following extraction~~Not established - analyze as soon as possible~~.
Mercury	500-mL WM[c]-P[h] or G[d]	Cool to <6~~4~~ºC	28 days

[a] Smaller sample containers may be required due to health and safety concerns associated with potential radiation exposure, transportation requirements, and waste management considerations
[b] Information primarily from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846,* U.S. Environmental Protection Agency, 1986 and all approved updates
[c] Wide-mouth
[d] Glass

[e] Adjust to pH of less than 2 with sulfuric acid, hydrochloric acid, or solid sodium bisulfate
[f] A term used to describe the hydrogen-ion activity of a system
[g] Amber glass[h]; P = Polyethylene

Table C-11~~6~~
Summary of Characterization Methods for Non-Mixed Hazardous Waste

Parameter	Method Numbers	Test Methods	Rationale
Volatile organic compounds in waste matrix: Spent halogenated solvents Spent nonhalogenated solvents	ASTM Method D4547-91[a] U.S. EPA/540/4-91/001[b] *SW-846* (1311, ~~8260B~~8260D, 8275A)[c] or equivalent methods[d] Methods included in 20.4.1 NMAC §§ 265.1084(a)(2), (a)(3), and (a)(4)	Total and/or toxicity characteristic leaching procedure (TCLP) VOC analysis by gas chromatography/mass spectrometry (GC/MS) Semivolatile organic compound (SVOC) analysis by thermal extraction/gas chromatography/mass spectrometry (TE/GC/MS) Acceptable Knowledge	Determine total and/or TCLP and SVOC/VOC concentration in samples of solids or liquids
SVOCs in waste:	*SW-846* (1311 and 8270C)[c] or equivalent methods[d]	Total or TCLP SVOC analysis by GC/MS Acceptable Knowledge	Determine total and/or TCLP and SVOC concentration in samples of solids or liquids
Resource Conservation and Recovery Act-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	*SW-846* (1311, ~~6010B~~6010D, 7060A, 7061A)[c] (1311, ~~6010B~~6010D, 7080A, 7081)[c] (1311, ~~6010B~~6010D, 7130, 7131A)[c] (1311, ~~6010B~~6010D, 7190, 7191)[c] (1311, ~~6010B~~6010D, 7420, 7421)[c] (1311, ~~6010B~~6010D, 7470A, ~~7471A~~7471B, 7472)[c] (1311, ~~6010B~~6010D, 7740, 7741A, 7742)[c] (1311, ~~6010B~~6010D, 7760A, 7761)[c] or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Anodic stripping voltammetry Acceptable Knowledge	Determine total and/or TCLP concentration in samples of solids or liquids
Reactive Sulfide	*SW-846*, Test Method to Determine Hydrogen Sulfide Released from Wastes[e] *SW-846* (9030B, 9031, 9034)[c] or equivalent methods[d]	Colorimetric, titrametric, or spectrophotometric measurement of hydrogen sulfide released from waste following reflux distillation under acidic conditions	Determine concentration of reactive sulfides
Ignitability (Flash Point)	*SW-846* (1010, ~~1020A~~1020B, 1030)[c] or equivalent methods[d]	Pensky-Martens closed cup Setaflash closed cup Ignitability of solids	Determine ignitablity
pH (Corrosivity)	*SW-846* (~~9040B~~9040C, 9041A, ~~9045C~~9045D)[c] or equivalent methods[d]	pH electrometric measurement pH paper Soil and waste pH	Determine corrosivity

[a] American Society for Testing and Materials, 1991, "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds," ASTM D4547-91, *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials

[b] U.S. Environmental Protection Agency (EPA), 1991, "Soil Sampling and Analysis for Volatile Organic Compounds," EPA 154014-91001, Office of Research and Development

[c] U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*

[d] Equivalent methods subject to EPA approval may be substituted

[e] *SW-846*, Section 7.3.4.2 contains specialized methods to determine if a sulfide-containing waste exhibits the reactivity characteristic

Table C-1~~2~~7
Summary of Characterization Methods for Mixed Low-Level Waste

Parameter	Method Numbers	Test Method	Rationale
Solid Wastes			
Volatile organic compounds in waste matrix: Spent halogenated solvents Spent nonhalogenated solvents	ASTM Method D4547-91[a] U.S. EPA/540/4-91/001[b] *SW-846* (1311, ~~8260B~~8260D, 8275A)[c] or equivalent methods[d] Methods included in 20.4.1 NMAC §§ 265.1084(a)(2), (a)(3), and (a)(4)	Total and/or toxicity characteristic leaching procedure (TCLP) VOC analysis by gas chromatography/mass spectrometry (GC/MS) Semivolatile organic compounds (SVOC) analysis by thermal extraction/gas chromatography/mass spectrometry (TE/GC/MS) Acceptable Knowledge	Determine total and/or TCLP and VOC concentration in samples of solid process residues and soils
SVOCs in waste:	*SW-846* (1311 and 8270C)[c] or equivalent methods[d]	Total and/or TCLP SVOC analysis by GC/MS Acceptable Knowledge	Determine total and/or TCLP and SVOC concentration in samples of solid process residues and soils
Resource Conservation and Recovery Act (RCRA)-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	*SW-846* (1311, ~~6010B~~6010D, 7060A, 7061A)[c] (1311, ~~6010B~~6010D, 7080A, 7081)[c] (1311, ~~6010B~~6010D, 7130, 7131A)[c] (1311, ~~6010B~~6010D, 7190, 7191)[c] (1311, ~~6010B~~6010D, 7420, 7421)[c] (1311, ~~6010B~~6010D, 7470A, ~~7471A~~7471B, 7472)[c] (1311, ~~6010B~~6010D, 7740, 7741A, 7742)[c] (1311, ~~6010B~~6010D, 7760A, 7761)[c] or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Acceptable Knowledge	Determine total and/or TCLP concentration in samples of solid process residues and soils
Liquid Wastes			
VOCs in waste matrix: Spent halogenated solvents Spent nonhalogenated solvents	ASTM Method D4547-91[a] EPA/540/4-91/001[b] *SW-846* (1311 and ~~8260B~~8260D)[c] or equivalent methods[d]	Total and/or TCLP VOC analysis by GC/MS Acceptable Knowledge	Determine total and/or TCLP and VOC concentration in samples of liquid
SVOCs in waste:	*SW-846* (1311 and 8270B)[c] or equivalent methods[d]	Total and/or TCLP SVOC analysis by GC/MS Acceptable Knowledge	Determine total and/or TCLP and SVOC concentration in samples of liquid

Table C-12 (continued)
Summary of Characterization Methods for Mixed Low-Level Waste
~~Table C-17 (continued)~~

Parameter	Method Numbers	Test Method	Rationale
Liquid Wastes (cont.)			
RCRA-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	*SW-846* (1311, ~~6010B~~6010D, 7060A, 7061A)[c] (1311, ~~6010B~~6010D, 7080A, 7081)[c] (1311, ~~6010B~~6010D, 7130, 7131A)[c] (1311, ~~6010B~~6010D, 7190, 7191)[c] (1311, ~~6010B~~6010D, 7420, 7421)[c] (1311, ~~6010B~~6010D, 7470A, ~~7471A~~7471B, 7472)[c] (1311, ~~6010B~~6010D, 7740, 7741A, 7742)[c] (1311, ~~6010B~~6010D, 7760A, 7761)[c] or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Anodic stripping voltammetry Acceptable Knowledge	Determine total and/or TCLP concentration in samples of liquid
Ignitability (Flash Point)	*SW-846* (1010, ~~1020A~~1020B, 1030)[c] or equivalent methods[d]	Pensky-Martens closed cup Setaflash closed cup Acceptable Knowledge	Determine ignitability
pH (Corrosivity)	*SW-846* (~~9040B~~9040C, 9041A, ~~9045C~~9045D)[c] or equivalent methods[d] Equivalent methods: *HALO smart Electrode HI12302 polyetherimide gel-filled Bluetooth* (TA-54-0231 and TA-54-0412 units only. *HI98190 Professional Waterproof Portable pH/ORP Meter* (TA-54-0231 and TA-54-0412 units only)	pH electrometric Measurement pH paper Soil and waste pH Acceptable Knowledge	Determine corrosivity

[a] American Society for Testing and Materials, 1991, "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds," ASTM D4547-91, *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials

[b] U.S. Environmental Protection Agency (EPA), 1991, "Soil Sampling and Analysis for Volatile Organic Compounds," EPA 154014-91991, Office of Research and Development

[c] U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*

[d] Equivalent methods, subject to EPA approval, may be substituted

Table C-13~~8~~
Summary of Characterization Methods for Mixed Transuranic Waste

Parameter	Method Numbers	Test Methods	Rationale
Storage			
Physical Waste Form (Free liquids in waste matrix)		Waste inspection procedures Real-time radiography Visual examination Acceptable Knowledge	Verify waste container contents
Volatile organic compounds in waste matrix: Spent halogenated solvents Spent nonhalogenated solvents	ASTM Method D4547-91[a] U.S. EPA/540/4-91/001[b] *SW-846* (1311, ~~8260B~~8260D, 8275A)[c] or equivalent methods[d] Methods included in 20.4.1 NMAC §§ 265.1084(a)(2), (a)(3), and (a)(4)	Total and/or toxicity characteristic leaching procedure (TCLP) VOCs in container headspace gas VOC analysis by gas chromatography/mass spectrometry (GC/MS) Semivolatile organic compound (SVOC) analysis by thermal extraction/gas chromatography/mass spectrometry (TE/GC/MS) Acceptable Knowledge	Determine the presence or absence of VOCs in samples
SVOCs in waste	*SW-846* (1311 and 8270C)[c] or equivalent methods[d]	Total and/or TCLP SVOC analysis by GC/MS Acceptable Knowledge	Determine the presence or absence of SVOCs in samples
Resource Conservation and Recovery Act (RCRA)-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver	*SW-846* (1311, ~~6010B~~6010D, 7060A, 7061A)[c] (1311, ~~6010B~~6010D, 7080A, 7081)[c] (1311, ~~6010B~~6010D, 7130, 7131A)[c] (1311, ~~6010B~~6010D, 7190, 7191)[c] (1311, ~~6010B~~6010D, 7420, 7421)[c] (1311, ~~6010B~~6010D, 7470A, ~~7471A~~7471B, 7472)[c] (1311, ~~6010B~~6010D, 7740, 7741A, 7742)[c] (1311, ~~6010B~~6010D, 7760A, 7761) or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Anodic stripping voltammetry Acceptable Knowledge	Determine total and/or TCLP concentration in samples
Ignitability	*SW-846* (1010, ~~1020A~~1020B, 1030)[c] or equivalent methods[d]	Pensky-Martens closed cup Setaflash closed cup Ignitabililty of Solids Acceptable Knowledge	Determine ignitability
pH (Corrosivity)	*SW-846* (~~9040B~~9040C, 9041A, ~~9045C~~9045D) or equivalent methods[d]	pH electrometric measurement Acceptable Knowledge	Determine corrosivity

Table C-13 (continued)
Summary of Characterization Methods for Mixed Low-Level Waste

Parameter	Method Numbers	Test Methods	Rationale
Treatment			
RCRA-regulated metals in waste: Arsenic Barium Cadmium Chromium Lead Mercury Silver	*SW-846* (1311, ~~6010B~~6010D, 7060A, 7061A)[c] (1311, ~~6010B~~6010D, 7080A, 7081)[c] (1311, ~~6010B~~6010D, 7130, 7131A)[c] (1311, ~~6010B~~6010D, 7190, 7191)[c] (1311, ~~6010B~~6010D, 7420, 7421)[c] (1311, ~~6010B~~6010D, 7470A, ~~7471A~~7471B, 7472)[c] (1311, ~~6010B~~6010D, 7760A, 7761)[c] or equivalent methods[d]	Total and/or TCLP Inductively-coupled plasma atomic emission spectroscopy Atomic absorption Manual cold vapor atomic absorption Acceptable Knowledge	Determine total and/or TCLP metals concentration in samples
pH (Corrosivity)	*SW-846* (~~9040B~~9040C, 9041A, ~~9045C~~9045D) or equivalent methods[d] Equivalent methods: *HALO smart Electrode HI12302 polyetherimide gel-filled Bluetooth* (TA-54-02031 and TA-54-0412 units only. *HI98190 Professional Waterproof Portable pH/ORP Meter* (TA-54-0231, and TA-54-0412)	pH electrometric measurement Acceptable Knowledge	Determine corrosivity

a American Society for Testing and Materials, 1991, "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds," ASTM D4547-91, *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials

b U.S. Environmental Protection Agency (EPA), 1991, "Soil Sampling and Analysis for Volatile Organic Compounds," EPA 154014-91001, Office of Research and Development

c U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.

d Equivalent methods, subject to EPA approval, may be substituted

Table C-14~~9~~

Description of Cementation Waste Streams at Technical Area 55

~~(This table is for informational purposes only)~~

Summary Category Group	Waste Description	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Constituents in the Waste	Regulatory Limits[a] (milligrams per liter)
L1000 – Aqueous Liquids/Slurries	Evaporator bottoms solutions, aqueous waste, and laboratory solutions	Process residue from evaporator bottoms and other discardable solutions.	Acceptable Knowledge	D002 D004 D005 D006 D007 D008 D009 D010 D011	Nitric acid Arsenic Barium hydroxide Cadmium Chromium Lead Mercury Selenium Silver	NA 5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0
S3000 – Homogenous Solids	Inorganic process solids and cemented inorganic process solids	Process residue from evaporator bottoms and other discardable solutions; process-leached solids, ash, filter cakes, salts, metal oxides, and fines generated as a result of plutonium-processing	Acceptable Knowledge	D004 D005 D006 D007 D008 D009 D010 D011	Arsenic Barium hydroxide Cadmium Chromium Lead Mercury Selenium Silver	5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0

[a] A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *EPA-SW-846*, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C., the extract from a representative sample of the waste contains any of the contaminants listed at a concentration equal to or greater than the respective value given in ~~the New Mexico Administrative Code, Title 20, Chapter 4, Part 1, Subpart II,~~40 CFR 261.24~~, revised June 14, 2000~~

Table C-15~~20~~
Description of Stabilization Waste Streams at Technical Area 50, Building 69, and Technical Area 54, Dome 231; and Technical Area 54, Building 412

~~(This table is for informational purposes only)~~

Summary Category Group	Waste Matrix Code	Waste Description[a]	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and /or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents[c]
S3000 - Homogeneous	S3100	Homogeneous Inorganic, Cemented	Plutonium processing operations	Acceptable Knowledge	D001	Ignitable	NA[d]	
					D002	Corrosive	NA[d]	
					D003[e]	Reactivity	NA[d]	
		Homogeneous Inorganic, Cemented Organics	Plutonium processing operations	Acceptable Knowledge	D004	Arsenic	5.0	
					D005	Barium hydroxide	100.0	
					D006	Cadmium	1.0	
					D007	Chromium	5.0	
					D008	Lead	5.0	
		Homogeneous Inorganic, Non-cemented	Plutonium processing operations	Acceptable Knowledge	D009	Mercury	0.2	
					D010	Selenium	1.0	
					D011	Silver	5.0	
					D018	Benzene	0.5	
					D019	Carbon tetrachloride	0.5	
		Homogeneous Inorganic, Salts	Plutonium processing operations	Acceptable Knowledge	D021	Chlorobenzene	100.0	
					D022	Chloroform	6.0	
					D035	Methyl ethyl ketone	200.0	
					D038	Pyridine	5.0[e]	
					D039	Tetrachloroethylene	0.7	
					D040	Trichloroethylene	0.5	
					F001	Spent halogenated solvents	NA[d]	
					F002	Spent halogenated solvents	NA[d]	
					F003	Spent non-halogenated solvents	NA[d]	
					F004[e]	Spent non-halogenated solvents	NA[d]	
					F005	Spent non-halogenated solvents	NA[d]	
					F006[e]	Wastewater treatment sludges	NA[d]	
					F007[e]	Spent cyanide plating solutions	NA[d]	
					F008[e]	Spent strip/clean solutions	NA[d]	

Table C-15 (continued)
Description of Stabilization Waste Streams at Technical Area 50, Building 69, and Technical Area 54, Dome 231; and Technical Area 54, Building 412~~Table C-20 (continued)~~
~~(This table is for informational purposes only)~~

Summary Category Group	Waste Matrix Code	Waste Description[a]	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents[c]
S3000 - Homogeneous	S3100	Homogeneous Inorganic, Vermiculite	Plutonium processing operations	Acceptable Knowledge	D001	Ignitable	NA[d]	
					D002	Corrosive	NA[d]	
					D003[e]	Reactivity	NA[d]	
					D004	Arsenic	5.0	
					D005	Barium hydroxide	100.0	
					D006	Cadmium	1.0	
					D007	Chromium	5.0	
					D008	Lead	5.0	
					D009	Mercury	0.2	
					D010	Selenium	1.0	
					D011	Silver	5.0	
					D018	Benzene	0.5	
					D019	Carbon tetrachloride	0.5	
					D021	Chlorobenzene	100.0	
					D022	Chloroform	6.0	
					D027	1,4-Dichlorobenzene	7.5	
					D028	1,2-Dichloroethane	0.5	
					D030	2,4-Dinitrotoluene	0.13[e]	
					D032	Hexachlorobenzene	0.13[e]	
					D033	Hexachlorobutadiene	0.5	
					D034	Hexachloroethane	3.0	
					D035	Methyl ethyl ketone	200.0	
					D036	Nitrobenzene	2.0	
					D037	Pentachlorophenol	100.0	
					D038	Pyridine	5.0[e]	
					D039	Tetrachloroethylene	0.7	
					D040	Trichloroethylene	0.5	
					D042	2,4,6-Trichlorophenol	2.0	
					D043	Vinyl Chloride	0.2	
					F001	Spent halogenated solvents	NA[d]	
					F002	Spent halogenated solvents	NA[d]	
					F003	Spent non-halogenated solvents	NA[d]	
					F004[e]	Spent non-halogenated solvents	NA[d]	
					F005	Spent non-halogenated solvents	NA[d]	
					F006[e]	Wastewater treatment sludges	NA[d]	
					F007[e]	Spent cyanide plating solutions	NA[d]	
					F008[e]	Spent strip/clean solutions	NA[d]	

Table C-15~~20~~ (continued)
Description of Stabilization Waste Streams at Technical Area 50, Building 69, and Technical Area 54, Dome 231; and Technical Area 54, Building 412

~~(This table is for informational purposes only)~~

Summary Category Group	Waste Matrix Code	Waste Description[a]	Waste-Generating Activity	Basis for Hazardous Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents[c]
S5000 - Debris	S5300	Combustible Debris	Plutonium processing operations	Acceptable Knowledge	D001	Ignitable	NA[d]	
					D002	Corrosive	NA[d]	
					D003	Reactive	NA[d]	
					D004	Arsenic	5.0	
					D005	Barium hydroxide	100.0	
	S5400	Heterogeneous Debris	Plutonium processing operations; D&D	Acceptable Knowledge	D006	Cadmium	1.0	
					D007	Chromium	5.0	
					D008	Lead	5.0	
					D009	Mercury	0.2	
					D010	Selenium	1.0	
					D011	Silver	5.0	
					D018	Benzene	0.5	
					D019	Carbon tetrachloride	0.5	
					D021	Chlorobenzene	100.0	
					D022	Chloroform	6.0	
					D035	Methyl ethyl ketone	200.0	
					D038	Pyridine	5.0[e]	
					D039	Tetrachloroethylene	0.7	
					D040	Trichloroethylene	0.5	
					D043	Vinyl Chloride	0.2	
					F001	Spent halogenated solvents	NA[d]	
					F002	Spent halogenated solvents	NA[d]	
					F003	Spent non-halogenated solvents	NA[d]	
					F004	Spent non-halogenated solvents	NA[d]	
					F005	Spent non-halogenated solvents	NA[d]	
					U080	Methylene Chloride	NA[d]	

[a] This table is based on information from the *Acceptable Knowledge Information Summary for Los Alamos National Laboratory Transuranic Waste Streams (*AKIS), (TWCP-AK-2.1, 1-019, R.0)(LA-UR-03-4870); and from waste characterization documentation information maintained by the Facility and Waste Operations Division. Waste with EPA Hazardous Waste Numbers that are not included in the Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit will not be transported to WIPP. Additionally, recharacterization efforts for nitrate salt-bearing waste have been conducted and documented in several documents as outlined in Enclosure 3 of *Response to Ordered Action 2/3; Attachment A to Settlement Agreement and Stipulated Final Order HWB-14-20; Los Alamos National Laboratory.*

[b] A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1331 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA, 1986), the extract from a representative sample of solid waste contains any of the contaminants listed at a concentration equal to or greater than the respective value given in ~~the New Mexico Administrative Code , Title 20, Chapter 4, Part 1, Subpart II,~~ 40 CFR Part 261, Subpart C~~[6-14-00]~~.

[c] Potential underlying hazardous constituents (UHC) have been included, where the information is available. UHC characterization for the purpose of Land Disposal Restrictions will apply for mixed transuranic waste to be disposed of at WIPP.

[d] Not Applicable: Refers to the absence of regulatory limits for ignitable, corrosive and reactive characteristic waste and F-, P-, and U-listed wastes.

[e] Potential EPA Hazardous Waste Numbers only present at TA-54-0231 and TA-54-0412.

[f] Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

Table C-~~2~~16
Description of Hazardous and Mixed Macroencapsulation Waste Streams at Container Storage ~~Permitted~~ Units
~~(This table is for informational purposes only)~~

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Radioactive Lead Solids	Radioisotope experiments and other reactor, accelerator, laser, and x-ray activities	Acceptable Knowledge	D008	Lead	5.0	All applicable constituents identified above the UHC regulatory limit
Noncombustible Debris	Maintenance, D&D, R&D, and ER activities	Acceptable Knowledge	D004 D005 D006 D007 D008 D009 D010 D011 D018 D019 D020 D021 D022 D023 D024 D025 D026 D027 D028 D029 D030 D031 D032 D033 D034 D035 D036 D037 D038 D039 D040 D041 D042 D043 F001 F002 F004	Arsenic Barium Cadmium Chromium Lead Mercury Selenium Silver Benzene Carbon tetrachloride Chlordane Chlorobenzene Chloroform o-Cresol m-Cresol p-Cresol Cresol 1,4-Dichlorobenzene 1,2-Dichloroethane 1,1-Dichloroethylene 2,4-Dinitrotoluene Heptachlor (and its epoxide) Hexachlorobenzene Hexachlorobutadiene Hexachloroethane Methyl ethyl ketone Nitrobenzene Pentachlorophenol Pyridine Tetrachloroethylene Trichloroethylene 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol Vinyl chloride Spent halogenated solvents Spent halogenated solvents Spent non-halogenated solvents	5.0 100.0 1.0 5.0 5.0 0.2 1.0 5.0 0.5 0.5 0.03 100.0 6.0 200.0[d] 200.0[d] 200.0[d] 200.0[d] 7.5 0.5 0.7 0.13 0.008 0.13 0.5 3.0 200.0 2.0 100.0 5.0 0.7 0.5 400.0 2.0 0.2 NA[c] NA[c] NA[c]	Arsenic, Barium, Cadmium, Chromium (Total), Lead, Mercury-all others, Selenium, Silver, and all applicable constituents identified above the UHC regulatory limit

Table C-~~2~~16 (continued)

~~(This table is for informational purposes only)~~Description of Hazardous and Mixed Macroencapsulation Waste Streams at Container Storage Units

Waste Description[a]	Waste Generating Activity[a]	Basis for Hazardous Waste Designation[a]	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics	Regulatory Limits[b] (milligrams per liter)	Potential Underlying Hazardous Constituents
Combustible Debris	Maintenance, R&D, D&D, and environmental restoration ~~ER~~ activities	Acceptable Knowledge	D004	Arsenic	5.0	Arsenic, Barium, Chromium, Lead, Mercury-all others, Selenium, Silver, Nickel, Zinc and all applicable constituents identified above the UHC regulatory limit
			D005	Barium	100.0	
			D006	Cadmium	1.0	
			D007	Chromium	5.0	
			D008	Lead	5.0	
			D009	Mercury	0.2	
			D010	Selenium	1.0	
			D011	Silver	5.0	
			D018	Benzene	0.5	
			D019	Carbon tetrachloride	0.5	
			D020	Chlordane	0.03	
			D021	Chlorobenzene	100.0	
			D022	Chloroform	6.0	
			D023	o-Cresol	200.0[d]	
			D024	m-Cresol	200.0[d]	
			D025	p-Cresol	200.0[d]	
			D026	Cresol	200.0[d]	
			D027	1,4-Dichlorobenzene	7.5	
			D028	1,2-Dichloroethane	0.5	
			D029	1,1-Dichloroethylene	0.7	
			D030	2,4-Dinitrotoluene	0.13	
			D031	Heptachlor (and its epoxide)	0.008	
			D032	Hexachlorobenzene	0.13	
			D033	Hexachlorobutadiene	0.5	
			D034	Hexachloroethane	3.0	
			D035	Methyl ethyl ketone	200.0	
			D036	Nitrobenzene	2.0	
			D037	Pentachlorophenol	100.0	
			D038	Pyridine	5.0	
			D039	Tetrachloroethylene	0.7	
			D040	Trichloroethylene	0.5	
			D041	2,4,5-Trichlorophenol	400.0	
			D042	2,4,6-Trichlorophenol	2.0	
			D043	Vinyl chloride	0.2	
			F001	Spent halogenated solvents	NA[c]	
			F002	Spent halogenated solvents	NA[c]	
			F004	Spent non-halogenated solvents	NA[c]	

a Denotes informatio~~n~~ from the Los Alamos National Laboratory waste characterization documentation database

b A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, Test Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA, 1986), the extract from a representative sample of the waste contains any of the contaminants listed (D004-D043) at a concentration equal to or greater than the respective value given in ~~the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20.4.1 NMAC), Subpart II,~~ 40 CFR Part 261, Subpart C ~~[6-14-00]~~.

c Not applicable: Refers to the absence of regulatory limits for ignitable, corrosive, and reactive characteristic wastes and F-, P-, and U-listed wastes

[d] If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 milligrams per liter

Attachment 8

Revised Supplement 4-1, Assessment of Alternatives for Open Detonation and Open Burning Activities

Los Alamos National Laboratory Part B Permit Application for Renewal of the LANL Hazardous Waste Facility Permit

Assessment of Alternatives for Open Burn and Open Detonation Units

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List of Acronyms

AMSL	above mean sea level
BATF	Bureau of Alcohol, Tobacco, Firearms and Explosives
CFR	Code of Federal Regulations
CWP	contaminated waste processor
DOE	U.S. Department of Energy
DoD	U.S. Department of Defense
DOT	U.S. Department of Transportation
EWI	El Dorado Engineering Explosive Waste Incinerator
EPA	United States Environmental Protection Agency
ETSCP	Environmental Security Technology Certification Program
IHC	Interim Hazard Classification
JOCG	Joint Ordinance Commanders Group
LDR	Land Disposal Restriction
LANL	Los Alamos National Laboratory
MACT	maximum achievable control technology
NAP	National Academies of Sciences, Engineering, and Medicine
NAVAIR	Naval Air Systems Command
NMHWA	New Mexico Hazardous Waste Act
OB	Open Burn
OD	Open Detonation
RCRA	Resource Conservation and Recovery Act
SERD	Strategic Environmental Research and Development Program
TA	Technical Area
Triad	Triad National Security LLC
TSDF	treatment, storage, and disposal facilities
WAC	waste acceptance criteria

1.0 Introduction

Triad National Security LLC (Triad) is the operating contractor for the U.S. Department of Energy (DOE) Los Alamos National Laboratory (LANL). Since the 1940s, wastes explosives have been treated at LANL through open burning (OB) and open detonation (OD). LANL has safely treated these wastes, where no other disposition pathway was available or feasible. While the amount and types of wastes that are required to be treated through OB and/or OD at LANL have been reduced over time, today DOE/Triad operates an OB unit[1] at Technical Area (TA)-16-388 and two OD units, at TA-36-8 and TA-39-6, for the safe destruction of detonable quantities of explosive wastes and explosive-contaminated waste.

The waste explosives treated in LANL's OB and OD treatment units are considered hazardous under the Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Act (NMHWA). As such, OB and OD have been conducted in treatment units operated under RCRA operating requirements found in Title 40 of the Code of Federal Regulations, Part 265, Part P, which states that:

> …open burning of hazardous waste is prohibited *except* for the open burning and open detonation of waste explosives. Waste explosives include waste which has the potential to detonate and bulk military propellants which cannot safely be disposed of through other modes of treatment.

In 2002, the U.S. Environmental Protection Agency (EPA), Region III, published draft guidance for permitting and operation of OB and OD treatment units (EPA, 2002). In the draft permitting guidance, the EPA acknowledged that:

> [B]ecause of safety hazards, as well as the site-specific feasibility factors for alternative treatment technologies, there are certain circumstances and energetic wastes that necessitate the use of OB/OD treatment. Thus, OB/OD treatment is not expected to be totally replaced by alternative technologies in the near future.

In 2019, the National Academies of Science, Medicine, and Engineering published a study that evaluated alternative technologies to OB/OD titled *Alternatives for the Demilitarization of Conventional Munitions* (NAS, 2019). The findings of the evaluation continue to support the 2002 EPA acknowledgement that in circumstances, such as those at LANL based on site-specific feasibility factors, it is necessary to continue to utilize OB/OD treatment. These site-specific factors are discussed below.

In 2019, the EPA published its final report titled *Alternative Treatment Technologies to Open Burning and Open Detonation of Energetic Hazardous Waste*s that identifies and describes alternative OB/OD treatment technologies. Despite technological advances made since the EPA's 2002 draft guidance, the 2019 EPA report acknowledges that:

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[1] The term unit used throughout this document refers to a hazardous waste management unit. A hazardous waste management unit, as defined in 40 CFR 260.10, is a contiguous area of land on or in which hazardous waste is placed, or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area. Examples of hazardous waste management units include a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system and a container storage area. A container alone does not constitute a unit; the unit includes containers and the land or pad upon which they are placed.

> …even though there are many alternative treatment technologies today, some energetic hazardous wastes cannot be treated with these technologies. As such, for [U.S. Department of Defense] DoD and possible others, OB/OD will remain as the only option for certain energetic hazardous wastes until additional viable alternatives are developed or existing technologies are modified or improved upon (EPA 2019).

In 2002, 2007, 2011, and 2013, LANL submitted assessments and re-assessments of various alternatives for OB and/or OD to the New Mexico Environment Department (Department). In 2010, the Department stated that LANL should re-evaluate the alternatives to open burning, which it did first in 2013 and has again done with this Alternatives Assessment.

This Alternatives Assessment addresses explosives waste streams that are treated by OB and OD at LANL, the units used to treat this waste, and a reassessment of potential alternatives. Alternatives assessed are based on the information from all likely sources, including those focused on demilitarization of waste munitions, DoD evaluations, and EPA alternative assessments. The draft EPA guidelines for the operations of OB/OD hazardous waste treatment units state that the selection and appropriateness of OB and OD treatment must be based upon the following (EPA, 2002):

- **Site specific safety;,**
- **Transportation hazard potential;**
- **Offsite treatment options; and**
- **Feasibility of alternatives technology considerations.**

This assessment evaluates the feasibility of using technologies other than OB and OD for treatment of LANL's explosive waste streams. The applicability of alternative treatment methodologies is evaluated based upon safety, transportation hazard potential, offsite treatment options, percentages of the total amount of waste per waste stream the technology will treat, and the feasibility of alternative technologies that may be identified for each of these waste streams.

This assessment concludes that, for the limited amounts of waste and waste streams identified, OB or OD is the only feasible alternative for treatment. In addition to the factors identified above, this assessment also outlines other important factors used for developing the conclusion that onsite treatment by OB or OD is the safest and most feasible option to treat certain explosives hazardous waste.

1.1 Overall Conceptual Approach

The overall explosives waste management approach at LANL is based on the following hierarchy of consideration:

1. **Pollution prevention** and **waste minimization activities** are first identified and implemented to the maximum extent practicable to avoid waste generation. When feasible, based on safety concerns, funding, programmatic effectiveness, and other factors, LANL strives to eliminate and/or reduce the volume of explosives wastes and explosives contaminated waste that must be treated and disposed.
2. Explosives contaminated wastes are next reviewed stream-by-stream to **identify candidates for offsite treatment.** When feasible, LANL identifies wastes that can be safely transported offsite

to permitted facilities for treatment and disposal. LANL continually takes efforts to identify new opportunities for low risk offsite shipment of waste for treatment.

3. **Only when waste generation cannot be avoided and offsite treatment is not feasible is onsite treatment required**. When avoiding waste generation and offsite treatment are not feasible, then an evaluation of alternatives for onsite treatment becomes relevant. Alternative treatment methodologies and technologies to OB and OD for treating the remaining explosives waste streams onsite are evaluated using this conceptual approach to determine if alternative treatment methodologies and technologies are suitable for the treatment of explosive wastes.

1.2 Facility and Unit Descriptions

This section describes LANL's one OB and two OD treatment units, explosive waste streams at LANL that are currently treated at these units, as well as the current waste minimization and waste management practices. DOE/Triad treats waste by OB or OD with strict adherence to safety principles and rigorous operating procedures.

LANL is located in Los Alamos County in north-central New Mexico. It is approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. LANL is divided into Technical Areas (TAs) that occupy approximately 40 square miles and is situated on the Pajarito Plateau. The plateau consists of a series of finger-like mesas separated by deep east-west trending canyons. Ephemeral, interrupted, or intermittent streams lie at the bottoms of the canyons. The mesa tops range in elevation from approximately 7,800 feet (ft.) above mean sea level (AMSL) at the flank of the Jemez Mountains, located to the west of Los Alamos, to about 6,200 ft. AMSL at their eastern extent, where they terminate above the Rio Grande.

1.2.1 Open Burn Waste Treatment (TA-16-388 Flash Pad)

Historically at LANL, OB has been conducted in numerous RCRA interim status units: (1) the TA-16 Incinerator, (2) the TA-16-387 Flash Pad, (3) the filter beds at TA-16-401 and TA-16-406, (5) the TA-16-394 Solvent Tray, (6) the TA-14-23 Q-site Burn Cage, (7) the TA-16-399 Burn Tray, and (8) the TA-16-388 Flash Pad. OB operations now occur at a single OB unit – the TA-16-388 Flash Pad at the TA-16 Burn Ground on the northeast corner of TA-16. TA-16 is situated on a broad mesa that is bounded on the north by Canon de Valle, on the south by State Road 4 and Bandelier National Monument, and on the west by West Jemez Road (State Road 501) and the Santa Fe National Forest. Elevations ranges from approximately 7,700 ft. at the west end of the TA to approximately 6,800 ft. at the lower east end. Topography is varied, ranging from steep precipitous canyon walls to sloping mesa tops.

The TA-16-388 Flash Pad consists of a 22 ft. by 22 ft. concrete pad located within a sloped area that provides secondary containment to prevent hazardous constituents from leaving the area. The Unit has a concrete base that is 12 inches (in.) thick. The entire concrete pad is over a 45-mil Hypalion liner, which is six inches below grade underneath the bottom of the pad, and the liner extends out 2 ft. from the pad perimeter and curves up to ground level on all four sides. Along the two sides and back of the concrete pad, and inset 12 in. is a 3 ft. high, eight inch thick concrete wall that prevents any potential runoff from leaving the Flash Pad. The area around the TA-16-388 Flash Pad is relatively level. The Unit is equipped with a retractable steel cover, which covers the entire pad when not in use. Three 5 ft. long forced air propane burners provide the heat source for treatment activities at the Unit.

At the TA-16-388 Flash Pad, in 2019, the average quantity per burn was approximately 40 pounds. Most treatment events are conducted in the morning, when the wind is generally the lowest of the day. Technical standards generally require that preparations to burn or place explosives waste on a pad or in a pit shall not begin until 24 hours after the previous burn at the same burning point. Most OB treatment events are conducted at a single burn in approximately 30 minutes, and in 2019 LANL conducted 57 burns.

1.2.1.1 Waste Streams Treated through Open Burning

The explosives contaminated waste and explosives waste streams that are treated at the TA-16-388 Flash Pad are primarily generated from explosives processing operations, such as machining and pressing; research and development activities; decommissioning and demolition activities; and corrective action activities. Waste streams consist of: (i) explosive machining waste; (ii) excess explosive wastes; (iii) explosives contaminated combustible debris; (iv) explosive contaminated solvents; and (v) explosives contaminated noncombustible debris. These wastes exhibit the characteristic of reactivity, as defined in 40 CFR §261.23. Explosive waste and explosives contaminated waste meet the regulatory definition of reactivity, because they are capable of detonation or explosive reaction if subjected to a strong initiating source or if heated under confinement. An explosive material is defined as any compound or mechanical mixture that detonates or deflagrates when subjected to heat, impact, friction, shock, or other suitable initiation stimulus.

Waste streams requiring OB treatment are:

- <u>Explosive machining waste</u> – This waste stream is generated from explosives machining and pressing and typically represents most explosive wastes treated at the TA-16-388 Flash Pad. Machining and pressing wastes consist of explosives machining chips or cuttings, machining water, filters, and filter solids. Approximately one third of this waste stream is water. Cloth filters are sometimes present in the waste. This is the most frequently treated explosives waste stream at LANL.

  Recently, expanded LANL mission requirements have required more explosives machining operations; however, the need for treatment by OB has remained the same because of continuous evaluation of the use for excessive explosives. For example, sludge, a by-product of the machining process, was previously designated as explosive waste and treated by OB. However, based on an evaluation of the excess sludge, when possible, the sludge can be reused for other explosives operations.

- <u>Excess explosives</u> – This waste stream includes large and small pieces of excess conventional explosives that may be in the form of flakes, granules, crystals, powders, pressings, plastic bonding, putties, rubberized solids, or extrudable solids. Other materials that may be present in this waste stream include plastic bags, wrapping and casings, cardboard and paper, and fiberboard containers that surround excess explosives. A fraction of the waste stream may contain metals, such as aluminum, brass, steel, stainless steel, and copper. This waste stream can include waste generated from inventory reduction efforts, off-specification explosives, damaged explosives, and salvaged explosives. The excess explosives waste stream, on average, makes up 5-15% of the total waste treated at the TA-16-388 Flash Pad. The generation of this waste stream is not predictable as that of explosives machining wastes because of the variety of materials considered excess explosives. Excess explosives are the second most common waste stream treated by OB at LANL.

- Explosives contaminated combustible debris – This waste stream includes detonable explosives contaminated debris generated in research laboratories, processing areas, and prep rooms. Debris may include filters removed from laboratory equipment, which may contain trace amounts of solvents. Other materials that may be present in this waste stream include plastic pieces, bags, wrapping and tubing, weigh boats, latex or nitrile gloves, plastic vials, cardboard and paper, fiberboard containers, paper cloths, rags, swabs, and potentially other noncombustible materials in very small quantities such as glass vials, glassware, and metal. Metal constituents may include aluminum, stainless steel, steel, brass and copper. This waste stream makes up <1% of the waste treated by OB at LANL. When generated, these types of waste are generally characterized to be nonhazardous waste and are sent off-site for disposal. The waste stream described here, must be characterized as detonable in order to be eligible for treatment.

- Explosives contaminated solvents – Explosives contaminated solvent waste is treated rarely and quantifies less than 1% of the waste treated at the TA-16-388 Flash Pad. Solvents in the waste stream may include trace quantities of ethanol, acetone, methanol, ethyl acetate, toluene, cyclohexanone, benzene, chloroform, 1,2-dichloroethane, 1,2-dichloroethylene, methyl ethyl ketone, fluor-inerts or trichloroethylene. This waste is rarely treated by OB at LANL

- Explosives contaminated noncombustible debris – This waste stream consists of explosives-contaminated equipment that includes, discarded, noncombustible equipment; debris from firing sites; noncombustible material from decommissioning and demolition activities; and material from explosives processing areas. This waste stream is most often metal (i.e., processing equipment, ductwork, or pipes) that is typically recycled after treatment or sand or carbon that has been contaminated through water filtration. The volume of this waste stream is difficult to predict because generation is related to maintenance and decommissioning and demolition activities and may not occur on a regular basis. Any oil present within discarded equipment is drained and the equipment is then disassembled and/or steam cleaned if it can be done safely.

1.2.1.2 Historic and Current Waste Generation Rates

Table 1-1 lists, by waste stream, the quantities of explosives treated at the TA-16-388 Flash Pad from 2011 to 2019. Pollution prevention and waste minimization activities (Section 2) have drastically reduced the routine generation of each of the waste streams described by eliminating some activities that generated portions of the waste streams and/or through substitution, segregation, or other waste minimization activities. From 1996 to 2000, LANL burned on average 10,833 pounds (excluding non-combustible materials) by OB (LANL, 2007). In recent years, LANL has burned an average of 2,000 pounds per year at TA-16 by OB, which represents an approximately 80% reduction (Table 1-1).

Table 1-1. Explosive Waste Streams Treated at the TA-16-388 Flash Pad (2011 – 2019)

Year	Explosives Machining Waste (lbs.)	Excess Explosives (lbs.)	Explosives Contaminated Combustible Debris (lbs.)	Explosives Contaminated Solvents (lbs.)	Explosives Contaminated Non-Combustible Debris (lbs.[1])	Total Waste Treated (lbs.)
2011	1,292	320	15	0	0	**1,627**
2012	2,555	600	0	0	73	**3,228**
2013	2,283	0	11	0	5	**2,299**
2014	935	21	0	0	4	**960**
2015	1,665	0	0	0	195	**1,860**
2016	1,465	0	71	0	133	**1,669**
2017	1,671	0	30	0	32	**1,733**
2018	1,538	0	29	0	21	**1,588**
2019	1,130	0	10	0	38	**1,178**

[1] The weight listed is the weight of the estimated explosives content that is suspected to contaminate the equipment not the total weight of the equipment, debris, or sand in the case of noncombustible material. Only the explosive is being treated, therefore, it is what is counted.

1.2.2 Open Detonation Waste Treatment (TA-36-8 [Minie Site] and TA-39-6 [Point 6])

Hazardous waste treated by OD at LANL occurs at two firing sites, TA-36-8 Unit (also known as Minie Site) and TA-39-6 Unit (also known as Point 6). Both OD units are located within the LANL boundaries and away from public access areas.

TA-36 is located in the east central portion of LANL and is spread over several mesa tops between a branch of Pajarito Canyon to the north and Water Canyon to the south. The Minie Site is located near Control Building 8 in the southern portion of TA-36. The firing site consists of an irregularly shaped sand and grass covered area that measures approximately 500 ft. east to west and 300 ft. north to south. The Minie Site has a maximum treatment capacity of 2,000 pounds of explosive waste per detonation and an annual treatment Unit limit of 15,000 pounds.

TA-39 is located in the southern portion of LANL and includes much of the mesa between Water Canyon to the north and Ancho Canyon to the south. Point 6 is located near Control Building 6 and is a relatively flat, sand covered area that measures approximately 40 ft. by 40 in a canyon bottom. Steep canyon walls rise to heights of 100 feet or more in the immediate vicinity of the OD unit, and along with a retaining wall that has been installed, form a rough semi-circle around the unit. The unit has a maximum waste treatment capacity of 1,000 pounds of explosive wastes per detonation and an annual treatment Unit limit of 15,000 pounds.

Detonations at both OD units can be conducted at ground level (surface detonation), below ground level (buried detonation), or under a pile of soil (soil-covered detonation). Buried and soil-covered detonations are usually conducted to reduce blast noise and fragment travel distance. The materials to be detonated (treated) are arranged in a pile (detonation pile) in a manner that maximizes the destruction of the materials being detonated.

From 2015 to 2019, there have been no explosive waste streams treated at the TA-36-8 and TA-39-6 OD units. From 2011 to 2014 there were 54 detonations conducted at both units with an average quantity per detonation of approximately 43 pounds.

1.2.2.1 Waste Streams Treated through Open Detonation

The waste streams treated at the OD units consist of the following:

- Excess explosives – This waste stream includes large, laboratory sized, or small amounts of excess conventional explosives, developmental energetic materials, or novel formulations. Explosives may be in the form of flakes, granules, crystals, powders, pressings, plastic bonded, putties, rubberized solids, extrudable solids, or liquids. Developmental energetic materials are synthesized in small quantities in high explosives chemical labs. Explosives infrequently contain barium or ammonium nitrate mixed with more than 0.2% combustible substances. Approximately 3% to 7% of the explosives in this waste stream contain depleted uranium. Other materials that may be present in this waste stream include plastic bags, wrapping and casings, cardboard and paper, and fiberboard containers. A fraction of the waste stream may contain metals such as aluminum, brass, steel, stainless steel, and copper. This waste stream represents 50% to 90% of explosives waste treated by OD.

- Detonators, initiators, mild detonating fuses, and blasting caps – This waste stream includes detonators, initiators, mild detonating fuses, and blasting caps containing conventional explosives. Explosives may be in metal or plastic casings and may contain lead based primaries or be in metal sheaths. This waste stream includes manufactured articulates (detonators) removed from fire protection systems. Other materials that may be present in this waste stream include plastic bags and wrapping, cardboard and paper, and fiberboard containers. This waste stream may include metals such as aluminum, lead, brass, stainless steel, nickel, and copper. This waste stream represents 1% to 2% of all explosives waste treated by OD.

- Shaped charges and test assemblies – This waste stream include shaped charges consisting of cores of explosives with metal sheaths or metal liners, or high explosives test assemblies consisting of explosives in plastic or metal holders. Assemblies may contain metal including lead, aluminum, copper, brass, steel, tantalum, glass and stainless steel. Other materials that may be present in this waste stream include plastic explosive components, bags, or wrapping, cardboard or paper, and fiberboard containers. This waste stream represents 1% to 2% of the explosives waste treated by OD.

- Projectiles and munitions larger than 50 caliber – This waste stream includes military munitions such as projectiles larger than 50 caliber. A fraction of this waste stream includes materials bonded to depleted uranium. Other materials that may be present in this waste stream include plastic bags and wrapping, cardboard and paper, fiberboard drums, and metal such as lead, brass, steel, stainless steel, copper, and aluminum. This waste stream represents 1% to 2% of the explosives waste treated by OD.

- Pressing molds – This waste stream include urethane (Adiprene) pressing molds contaminated with detonable quantities of explosives. Other materials that may be present in this waste stream include plastic bags, plastic wrapping, cardboard and paper. When treated this waste stream represents 1% to 2% of the explosives waste treated by OD.

- Explosives contaminated debris – This waste stream includes detonable explosives contaminated debris generated in laboratories and prep rooms. Debris may include filters removed from laboratory equipment or may contain solvents. This waste stream may include depleted uranium. Other materials that may be present in this waste stream include pieces of plastic from manufacturing operations including bags, wrapping and tubing, weigh boats, latex and nitrile gloves, glass or plastic vials, cardboard and paper, fiberboard containers, paper cloths, rags, and swabs. Metal constituents may include aluminum, stainless steel, steel, brass, and copper. Solvents in the waste stream may include trace quantities of ethanol, acetone, methanol, ethyl acetate, toluene, cyclohexanone, benzene, chloroform, 1,2-dichloroethane, 1,2-dichloroethylene, methyl ethyl ketone, fluor-inerts or trichloroethylene. This waste stream represents less than 1% of all the explosives hazardous waste treated at the OD units. When generated, these types of waste are generally characterized to be nonhazardous waste and are sent off-site for disposal. The waste stream described here, must be characterized as detonable in order to be eligible for treatment.

- Smaller caliber ammunition – This waste stream is rarely treated and includes small caliber munitions (less than 50 caliber) that have unknown properties as a result of testing activities or damage. These materials are managed as explosives which pose a special risk in storage and transportation. Other materials that may be present in this waste stream include plastic bags and wrapping, cardboard and paper, and metal such as steel, brass, copper, lead and zinc. This waste stream represents less than 1% of explosives treated by OD.

- Black powder or gunpowder – This waste stream is rarely treated and includes standard commercial and military grades of black powder or gunpowder. These powders are typically potassium or sodium nitrate based. Other materials that may be present in this waste stream include plastic bags, wrapping, and cardboard and paper containers, tin and fiberboard containers. When treated this waste stream represents less than 1% of the explosives waste treated by OD.

1.2.2.2 Current Waste Generation Rates

Table 1-2 lists, by waste stream, the quantities of explosives treated at the TA-36-8 OD Unit and TA-39-6 OD Unit from 2011 to 2019. Pollution prevention and waste minimization activities (Section 2) have reduced the routine generation of each of the waste streams by eliminating some activities that generated portions of the waste streams and/or through substitution, segregation, or other waste minimization activities.

As shown in **Table 1-2**, OD operations have decreased significantly the last several years because of pollution prevention measures, including the reuse of materials for other mission requirements rather than having to be treated as waste.

Table 1-2 Quantities of Explosives Treated at the TA-36-8 and TA-39-6 OD Units from 2012-2020 By Waste Stream

Year	Excess Explosives (lbs.[1])	Explosives-Contaminated Combustible Debris (lbs.[1])	Detonators, initiators, and mild detonating fuses (lbs.[1])	Shaped charges and test assemblies (lbs.[1])	Projectiles and munitions larger than 50 caliber	Pressing molds	Small caliber ammunition	Black powder or gunpowder	Total Waste Treated (lbs.[1])
2011	1,548	0	0	0	0	0	0	0	1,548
2012	374	12	0	0	0	0	0	0	386
2013	356	0	0	0	0	0	0	20	376
2014	5	2	0	0	0	0	0	0	7
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

[1] The weight listed is the total weight of the treated waste, not of the explosives content that is suspected to contaminate the equipment or debris.

2.0 Pollution Prevention and Waste Minimization

The first step in the LANL waste management conceptual approach is to identify and implement waste minimization activities to the maximum extent practicable. Waste minimization requires implementation of processes, practices, and procedures to reduce the volume of explosives and explosives contaminated waste that must be ultimately managed as hazardous waste. Considerable effort has been made at LANL to eliminate, minimize, or reuse wastes. Operations and waste management personnel rigorously apply waste minimization principles to “green” the processes and significantly reduce the quantity of high explosives wastes treated by OB/OD.

2.1 Pollution Prevention Practices Implemented

Waste generators and waste professionals work continuously to improve the management of regulated and non-regulated wastes that are generated by implementing the following waste minimization practices:

- LANL has implemented a robust site-wide Pollution Prevention Program and Environmental Management System (EMS).
- LANL policies and procedures require generators of explosives contaminated combustible debris to carefully assess whether wastes generated from production and research activities have the potential to detonate. Segregating detonable explosives contaminated debris from non-detonable contaminated debris ensures that only the combustible debris is treated onsite. Non-detonable combustibles are treated and disposed offsite through incineration. As a result of these segregation practices, treatment of explosives-contaminated debris by OB or OD has generally decreased over time and is not expected to significantly increase in the future.
- Explosives parts can be pressed into their near final shapes using previously unavailable isostatic presses, which have reduced the amount of explosives machining wastes generated. New technology allows for pressing a cone directly, so that the shape requires only minimal finishing through machining.
- Alternative uses are found for explosive pieces that do not meet quality specifications, rather than treating them for waste.
- Explosives contaminated debris is transported for OB or OD operations using reusable containers rather than in disposable plastic bags. While this option is not always viable for some waste streams, extra waste generation is eliminated for explosives contaminated combustible debris.
- The operation of a solvent recovery system for the process generating the highest quantity of explosives contaminated solvents treated onsite. After recovery, the solvents are reused in experimental processes rather than disposed.
- Explosives contaminated oils and solvents that are contaminated with less than 25% explosives are shipped offsite for treatment and disposal. Below 25% explosives in solution are not considered an explosive hazard (DOE, 2019).
- OB waste treatment operators segregate or combine wastes streams to improve waste treatment effectiveness by reducing the burn time, reducing the amount of fuel used, and minimizing the quantity of residue generated by the waste treatment process.

- Excess explosives processing equipment resulting from decommissioning or maintenance activities that is potentially contaminated with explosives is steam cleaned or pressure washed instead of being treated with OB where feasible.
- Explosives machining operations, as well as most explosives pressing operations, have been consolidated into one building, thereby reducing the potential for explosives contamination at many locations.
- When possible, plastics are steam cleaned and disposed of offsite as non-hazardous waste.
- Highly contaminated molds that cannot be steam cleaned are treated by OD rather than OB because the products of combustion are more complete because of the higher temperature and pressure present during OD reactions.
- Implementation of a centralized explosive inventory system that is available to all explosives custodians provides the opportunity for owners and users to search a common inventory system for in-stock explosives materials before ordering new materials. The explosive inventory system further reduces unnecessary explosive wastes.
- Bulk propellants and munitions containing propellants are shipped to an offsite facility for treatment and disposal when possible and practical (e.g. an off-site facility is identified that can accept the waste and the munition is not damaged).
- The implementation of mercury/explosives separation technology has reduced the amount of toxicity in waste streams and of excess explosives contaminated wastes.

In addition, LANL systematically and successfully applies pollution prevention principles to reduce the toxicity of the explosive waste streams and the amounts of excess explosives and explosives contaminated waste treated onsite. These principles have been demonstrated with the reuse of machining sludge and the reduction of overall OD treatments.

2.2 Anticipated Waste Generation Practices and Continual Improvement

The waste minimization efforts have significantly reduced the quantity of waste that is treated onsite through OB or OD. Current onsite waste treatment activities by OB or OD is less than waste treatment quantities in the past because of careful evaluation of waste generating practices. From 2011 through 2019, LANL has treated an average of 1,794 pounds per year by OB and 257 pounds per year by OD. It is anticipated that future waste treatment quantities would remain at, or be less than, the current quantities. However, risk reduction efforts at LANL may increase the overall amounts of waste needing treatment in specific years, and may occasionally increase the annual quantity of waste to be treated in the future.

Explosive inventory reduction efforts will continue to reduce the explosives waste inventory. These efforts have included the increased shipment of explosives offsite for disposal, as well as onsite reuse and onsite treatment of excess explosives as necessary. Explosives are only treated by OB or OD when other options have not proved viable.

3.0 General and Site-Specific Safety and Feasibility Factors

DOE has an active role in research and development of explosive formulations, explosives synthesis, charge geometry, and explosive assemblies for national defense. DOE and operating organizations maintain explosives safety standards that fully address potential risks. Maintaining worker and public safety is paramount in all DOE explosives handling operations. The most important consideration when managing explosives waste streams is to minimize or eliminate, if possible, the danger and exposure to workers and the public from accidental ignition of the waste. At LANL, all work activities associated with explosives and other energetic materials are carefully controlled, and safety is maintained through compliance with the requirements outlined in the *DOE Standard for Explosive Safety* (DOE, 2019).

Site-specific safety and security are important concerns in every decision to treat explosives waste on- or offsite at LANL. Each onsite waste treatment activity at LANL is carefully planned to minimize worker exposure and handling of explosives. Personnel trained in explosives handling and familiar with the explosives' characteristics conduct the onsite waste treatment operations. This reduces the potential for compromising the energetic material and for the likelihood of serious injury or death. LANL explosive waste streams vary widely in form and constituents. Onsite explosives professionals are familiar with the specific types of explosives waste generated at LANL and the processes that generate them. Therefore, due to this site-specific knowledge and capability, it is safer to treat many of these specialized wastes onsite at LANL than to ship them offsite.

Likewise, site-specific safety concerns have been critically important in LANL's decisions regarding waste storage. Explosive wastes must be stored for a time to accumulate sufficient quantities for treatment or disposal, whether on- or offsite. Rigorous administrative processes are used to maintain explosives safety at LANL. Specific safety procedures address the precautions routinely taken in order to ensure compliance with established explosive weight limits in each explosives work area, in order to prevent overloading a facility or area. LANL has used multiple generator accumulation locations for explosive wastes in smaller quantities to prevent propagation of accidental explosions.

Any decision to further increase the types or quantities of explosives waste streams shipped offsite, or to adopt other onsite treatment technologies, would require additional storage areas and/or longer-term storage of explosives waste streams, which increases site-specific safety risks at LANL. Any increase in site-specific safety risks at LANL is not acceptable. Therefore, the additional safety hazards due to requiring additional storage must be taken into account when comparing treatment alternatives.

Additional site-specific feasibility factors include that the presence of depleted uranium and security considerations can also complicate the ability to treat LANL explosive waste offsite. Explosive wastes that contain depleted uranium are not accepted at offsite facilities. Security related considerations significantly delay or prohibit the acceptance by, or transport to, an offsite treatment facility. Both of these factors further affect the decision to treat waste onsite.

4.0 Transportation Hazard Potential

Section 1.0 and 2.0 describe the composition of explosive waste streams and efforts to avoid or minimize the generation of these wastes to the maximum extent practicable. The remaining wastes must be treated or disposed in accordance with applicable requirements. As described in the Section 1.1, the next step in the waste management conceptual approach is to review the remaining explosives contaminated waste stream-by-stream to identify candidate wastes that could be safely transported offsite to permitted facilities for treatment and disposal.

Most LANL wastes can be safely and securely shipped offsite. LANL continues to review its explosive wastes to identify additional opportunities for increased offsite shipment where feasible and where it can be done safely. However, as energetic materials age or are subjected to testing, the resulting waste may develop properties that are unpredictable. LANL explosive waste that are aged, sensitive, or otherwise-unstable and cannot be stabilized are legally prohibited from transportation on public roadways, in accordance with United States Department of Transportation (DOT) regulations (49 CFR Part 173, Subpart C, §173.53). When stabilized through desensitization, or another process, to lower the sensitivity, energy output, and flame temperature of the composition, these types of explosive wastes can be transported on public roadways and, when possible, this is LANL's practice. For those LANL explosives wastes that cannot be stabilized for offsite transportation because the transportation hazard potential is too great or is legally prohibited, the wastes are accumulated onsite in compliance with generator accumulation requirements and waste storage hazards are minimized by performing OB and/or OD treatment onsite as often as needed to avoid accumulating excess waste inventory and exceeding the work areas' explosives safety limits.

4.1 Transportation Safety and DOT Transportation Requirements

Shipments of numerous types of hazardous materials (including explosives) on public roads pose hazards and risks for both public and worker safety. Because of this, the DOT and States have imposed restrictions and prohibitions on transport of explosives and explosives contaminated wastes. Some waste streams generated at LANL cannot be legally or safely transported on public roadways to offsite commercial facilities. Waste streams that cannot be safely transported on public roadways are those that cannot be properly stabilized or do not meet offsite facilities waste acceptance criteria. In some cases, noncombustible debris contaminated with explosives cannot be released from LANL explosives areas without being flashed. DOT specifies explosives transportation requirements within the hazardous materials requirements in Title 49 CFR. The 49 CFR § 173.54 list of "Forbidden Explosives" that may not be offered for transport or transported includes:

- New explosives that have not been examined, classed and approved for transport;
- Explosives containing chlorates either as an ammonium salt or an acidic substance;
- Damaged packages or articles;
- Propellants that are unstable, condemned or deteriorated;
- Explosives specifically forbidden in the Table of Hazardous Materials (49 CFR § 172.101); and
- Explosives that fail to pass specified sensitivity, stability and burning tests.

LANL explosives include wastes that may not be offered for transport.

In addition, all LANL explosives waste streams that have not been previously shipped offsite must be tested, classified, and assigned proper shipping names and an EX number[2] by the DOT Associate Administrator in accordance with DOT requirements in 49 CFR §§ 173.56 through 173.58 in order to transport explosives wastes on public roads or highways. Any explosives waste streams that fail the required testing series cannot be assigned numbers or transported to commercial facilities. There is currently a substantial backlog of new explosives document requests pending review by the DOT Associate Administrator's office. Review of new requests may take several years. An Interim Hazard Classification (IHC), valid for up to one year, theoretically could be issued by DOE for new explosives in

[2] An EX number is issued by DOT to identify an explosive which has been tested and classified by DOT (49 CFR 171.8 and 49 CFR 173.56).

lieu of an EX-ID-number, if a commercial facility was willing to accept a waste transported under this condition; but, this too is a difficult and lengthy process, and few commercial facilities are willing to accept such wastes.

Therefore, because of the transportation hazards, and storage and security requirements, LANL will always need to maintain onsite waste treatment capability to safely disposition those materials which are prohibited from transport by DOT.

4.2 Federal Requirements for Transfer of Weapons Materials and Explosive Material to Commercial Facilities

Federal security and property requirements for classified waste and military munitions (as applicable) add to the complexity of handling, transport, and treatment of explosives wastes generated at LANL. Many of the LANL explosives waste streams that require OB or OD treatment, when unreacted, may contain classified components or features. These components or features complicate LANL's ability to transport an explosive hazardous waste offsite and add to the transportation hazard for LANL wastes. Offsite treatment may be entirely prohibited or may be significantly delayed due to prohibitions and restrictions on transportation of that waste to an offsite facility. Likewise, some explosive items may be controlled property according to DOE or DoD requirements, and may not be eligible for release to an offsite disposal facility, even for purposes of destruction.

5.0 Offsite Treatment Options

LANL currently maintains the capability to ship several of its explosive wastes offsite to RCRA permitted commercial treatment facilities. LANL ships permissible bulk propellants, munitions containing propellants, and excess explosives to offsite facilities for treatment, storage, and disposal when the waste meets the facility's waste acceptance criteria (WAC), offsite disposal is economically feasible, and the waste can be safely transported.

In order to be sent to an offsite permitted commercial treatment, storage, and disposal facility (TSDF), any explosive waste candidates must meet the following requirements:

- The TSDF's WAC comply with applicable Land Disposal Restriction (LDR) requirements;
- The Department of Transportation (DOT) requirements; and
- The Federal requirements for transfer of weapons materials and explosive materials to commercial facilities, including security and property requirements for classified waste and military munitions (as applicable).

Offsite treatment decreases the overall quantity of explosive waste that must be treated onsite by OB or OD. However, wastes awaiting shipment must be accumulated and stored onsite until the treatment facility approves the waste shipments which, as noted above in Section 3, is a significant site-specific safety consideration.

5.1 Offsite Facilities' Waste Acceptance Criteria and Acceptance Process

Offsite commercial TSDFs establish criteria to ensure that explosive waste streams accepted for disposition meet the facility's individual RCRA permit requirements and can be safely handled and properly treated by the facility (i.e., to ensure compliance with applicable LDR standards). Requests for treatment and disposal must include documentation that confirms compliance with the facility's WAC including a description of the physical form, chemical constituents, EPA Hazardous Waste Numbers (EPA HW No.), DOT Proper Shipping Name (PSN), and explosive ID number.

Shipments of LANL's explosive wastes offsite are also subject to the availability of appropriate storage and treatment capacity at the receiving facility. Wastes cannot be transported until shipments are approved by the facility. The elapsed time between submitting a request for transport and receiving authorization to ship can sometimes be significant (up to six months).

5.2 Current Offsite Treatment Options

Options for waste treatment offsite are limited because explosive wastes streams that are considered detonable, or have the capability of exploding, require a special permit to be shipped as non-regulated waste. There are currently three commercial facilities capable of accepting and/or treating some of the explosives waste streams generated at LANL, including the Clean Harbors, Colfax Facility; the General Dynamics Ordnance and Tactical Systems, Main Office and Disposal Facility; and the Veolia ES Technical Solutions-Trade Waste Incineration (Veolia-TWI). At this time, LANL will typically send explosive waste streams to Veolia-TWI and Clean Harbors, Colfax Facility.

The Clean Harbors, Colfax Facility, located in Colfax, Louisiana, consists of twenty separate treatment units (40 CFR Part 264, Subpart X, Thermal Treatment Units) with the capability of treating reactive (D003) characteristic hazardous wastes through OB processes. The facility is capable of treating up to 480,000 pounds of explosives waste annually and has the capability of storing up to 50,000 pounds of explosives (Clean Harbors, 2019).

Veolia-TWI, located in Sauget, Illinois, consists of three permitted treatment units (two fixed hearth thermal treatment units and one rotary kiln thermal treatment unit) with the capability of treating explosives waste that has been properly characterized; provided that the waste does not contain any prohibited wastes as listed within the facility permit (Veolia Environmental Services, 2019). The facility includes a magazine that is used to store up to 100,000 pounds Bureau of Alcohol, Tobacco, Firearms and Explosives (BATF) low explosives. The facility has no capability to store BATF high explosives or detonators, but it can process them.

The General Dynamics Ordinance and Tactical Systems facility, located in Joplin, Missouri, consists of two RCRA Part B permitted and maximum achievable control technology (MACT) compliant incinerators (one of which is a rotary kiln incinerator) and a car bottom furnace (General Dynamics, 2019).

5.3 Public and Worker Safety Issues with Offsite Treatment

Each of the available offsite facilities is located at some distance from LANL. Clean Harbors, Colfax Facility is located 842 miles east of LANL; General Dynamics Ordnance and Tactical Systems, Carthage, is located approximately 800 miles east of LANL; and Veolia-Trade Waste Incineration Facility is located 1,084 miles northeast of LANL. Transportation of waste from LANL to any of these facilities would be via motor carrier over public roads. Transportation of explosives by motor carrier occurs nationwide on a daily basis, but not without risk to the public. In contrast, the public has limited contact with or access to explosives transported for onsite treatment at LANL. By treating onsite, LANL can control the transportation of the waste by controlling the traffic in the area, the speed at which it can travel, and can limit the area within which the waste is moved. Treatment of waste onsite decreases the potential for the public to be exposed to these hazards. Onsite treatment also decreases the handling of waste required by workers. Packaging and transport for onsite treatment are conducted by explosives personnel that have experience handling the specific wastes generated at LANL that are not in pristine condition, have been subjected to damage, and/or are generated from unique processes. Shipment to offsite facilities requires that explosives wastes be handled by personnel who are less knowledgeable and experienced with these particular waste streams. In addition, offsite transportation increases offsite human and environmental impact along the transportation route, the overall carbon emissions from transport vehicles and the increased risk of transportation incidents, theft, or diversion.

Most TSDFs require a minimum volume per shipment, as specified in the facility's WAC. Quantities of explosives waste streams generated at LANL have been generally decreasing with the implementation of waste reduction initiatives; however, generation rates are not consistent because they are based on programmatic activities from year to year. Wastes treated onsite are currently treated within days or weeks of generation. Without the treatment capabilities, LANL shippable wastes would have to be accumulated until the minimum volume accepted by an offsite treatment facility was reached or a lesser quantity for transport can be brokered with the receiving facility (see Section 2.3 for additional discussion on the hazards of increased storage). Explosives may deteriorate or become unsuitable for transport while waiting for disposal approval. The inability to promptly remove and dispose of excess, aging, or insulted explosives rapidly and minimize time and amounts in storage unnecessarily exposes workers to greater hazards.

5.4 National Security Considerations for Offsite Treatment

As part of its national security mission, DOE/Triad will continue to develop explosive formulations and assemblies that may be related to threat reduction, homeland security, and enhanced security projects. During times of heightened security risk, LANL has prohibited the shipment of certain explosives waste because of the increased risk of transportation-related incidents, theft, or diversion. These concerns affect the selection of alternatives for treating such non-shippable wastes onsite.

5.5 Summary of Offsite Treatment Options

Although LANL has worked to increase the amounts and types of explosive waste streams shipped offsite for treatment and disposal and further to reduce the overall quantity of explosives waste treated onsite, increased offsite treatment and disposal is not feasible at this time. LANL employs offsite treatment whenever practicable. However, options for increased offsite treatment are often limited and the following factors are taken into account:

- Explosives may deteriorate or become unsuitable for transport while waiting for disposal approval, presenting site-specific safety considerations and increased transportation volume pose some public risk;
- Additional storage requirements would pose greater permitting liability and increased hazards to accumulate effective shipment quantities; and
- Under any scenario, onsite treatment via both OB and OD at LANL will always be required to treat the excess explosives, non-shippable and classified wastes, and noncombustible debris wastes that cannot be shipped offsite for disposal without prior treatment.

6.0 Feasibility of Onsite Treatment through Alternative Technology

A part of LANL's explosive waste management practice is to address the wastes that must be treated onsite. Currently, these wastes are treated through OB and OD. The following sections of this chapter describe how alternative technologies to OB or OD were identified and categorized for treatment of current and future explosives wastes, screened and compared, and rigorously evaluated for effectiveness as alternative candidates to OB or OD.

In accordance with the approach outlined in the 2002 EPA Region III *Draft Permitting Guidelines*, the following approach was used:

1. Identify and categorize alternative treatment technologies other than OB or OD to treat explosives contaminated waste onsite.
2. Screen each candidate technology for its state of development and availability, and for its applicability to treat LANL's energetic waste streams.
3. Evaluate the effectiveness of each alternative technology relative to OB or OD using a rigorous set of evaluation criteria.

6.1 Identification of Candidate Technologies

OB/OD treatment alternatives have been researched for nearly three decades, primarily by the DoD military munitions community in support of global demilitarization efforts. Most research on alternative technologies has been oriented toward the disposition of excess military munitions due to the volumes of unwanted excess munitions stockpiled at DoD facilities throughout the world and the cleanup of firing ranges. Waste munitions consist primarily of encased weapons, such as rockets, missiles, bombs, mortar rounds, artillery ammunition, grenades, cluster munitions, and land mines. Technology development has focused mainly on production-scale demilitarization activities, with little consideration of wastes from explosives research and development.

In an effort to exercise due diligence in considering all possible alternatives, DOE/Triad sought to obtain information from all likely sources, including those focused more on demilitarization of waste munitions. Publicly available information was collected and reviewed from the national and global demilitarization communities including from organizations, such as the Defense Technical Information Center (DTIC, 2019), the DoD facilities and programs recent reviews of alternatives (e.g., Naval Air Warfare Center Weapons Division (NAVAIR-WD, 2004)); the National Academy of Sciences (NAP, 2019); the EPA (EPA, 2019); the Global Demilitarization Symposium (JOCG 2010, 2011); the Strategic Environmental Research and Development Program (ETSCP, 2006 and SERDP, 2013); and from private industry (Eldorado Engineering, 2019; Dynasafe; 2019). LANL screened each candidate's technology for its state of development and availability, and for its applicability to treat LANL's energetic waste stream.

Candidate technologies were first pre-screened to eliminate methods or technologies that are either inapplicable to the explosive waste streams at LANL, those that are pre- or post-processing steps in a treatment train rather than primary treatment processes, and those that were not considered sustainable for LANL site-specific requirements. Therefore, treatment technologies that were identified as pre-treatment, mitigation methods, or in-situ techniques were screened from identified candidate technologies. The rationale is described further below:

Demilitarization/pre-treatment methods. Demilitarization/pre-treatment methods are not applicable to OB or OD at LANL. Demilitarization focuses on reclaiming and recovering the explosives from munitions for sale or reuse, and on disassembling surplus military equipment for recycling and disposal. At LANL, explosives encased in metal or plastic comprise an extremely small amount of LANL's explosives waste stream and cannot be recovered or reclaimed for sale or reuse.

Mitigation technologies. Mitigation technologies do not destroy the explosive, but rather mitigate effects of the primary treatment activity taking place. For example, foam may be used with OD to prevent fragment dispersal and mitigate the sound of the destruction technology (i.e., sometimes, earth fill has been placed atop an OD shot for this purpose). As such, mitigation technologies are not applicable alternatives to the explosives waste streams discussed here.

In-situ technologies. In-situ technologies such as biodegradation are applied to environmental media (soils and groundwater) as part of remedial actions. As such, they are not applicable to the LANL explosives waste streams discussed here, which do not include explosives-contaminated environmental media.

After prescreening, a list of nineteen potential technologies that could treat explosives contaminated waste to meet LDRs was compiled. Commercially available technologies identified for further evaluation are listed in **Table 6-1**. These technologies include alternatives for both OB and OD, such as case opening, chemical conversion, co-firing in boilers, contained burn (i.e., confined burn facility and energetic-contaminated waste), contained detonation, incinerator (i.e., plasma arc and rotary kiln), and oxidation (i.e., base hydrolysis). Some technologies are potential alternatives for only open burn, including a contaminated waste processor, cryofracture, flashing furnace, open detonation, and oxidation (cerium-catalyzed). Other technologies are considered potential alternatives for only open detonation, including cryogenic cutting, hydromilling, liquid ammonia extraction, and open burn.

Table 6-1. Initial Identified Technology Candidate List

	Technology	Treatment Type	Description
1	Case Opening	OB/OD	Case opening involves a variety of techniques to separate a munitions' body (projectile) from the cartridge case. The remaining energetic material will need to be treated and/or destroyed using alternative technologies.
2	Chemical Conversion	OB, OD	Chemical conversion involves using processes such as solvent extraction and solvolytic extraction to convert recovered explosives and propellants to other products. This technology can only treat specific types of explosives waste based upon the specific chemical makeup of the explosive. Extraction technologies frequently create a secondary hazardous waste stream consisting of organic solvents.
3	Co-firing in Boilers	OB, OD	Co-firing in boilers can be utilized for explosives that can be desensitized so that they can be co-fired with traditional fuels in commercial boilers for heating. The explosive must be soluble in fuel oil #2.
4	Contained Burn (#1), at a Confined Burn Facility	OB, OD	Contained burn at a confined burn facility consists of explosives contaminated wastes that are treated in blast-reinforced chambers. In some cases additional fuel (such as kerosene) must be added to the waste stream. The combustion gases are contained and processed through air emissions control equipment. This treatment is frequently used by the military to destroy small caliber ammunition and bulk explosives. Small-scale confined burn facilities are currently in use by law enforcement agencies nationwide. The waste is ignited using a squib and allowed to burn of its own accord.
5	Contained Burn (#2), Energetic-Contaminated Waste	OB, OD	Energetic-contaminated waste technology is designed for wastes contaminated with small amounts of explosive material. It is similar to contained burning, but is targeted more toward burning combustible wastes contaminated with explosives rather than ammunition or bulk explosives. It is used mostly for combustible wastes (e.g., rags, gloves, wipes, plastic, etc.) that are contaminated with small amounts of explosives. Because there is no controlled fuel supply or "controlled flame device", a contained burn unit may be permitted as a miscellaneous unit under RCRA Subpart X, rather than being permitted as an incinerator. This waste is ignited using a squib and is allowed to burn of its own accord, with the aid of added fuel (e.g. kerosene) in some cases.
6	Contained Detonation	OB, OD	Contained detonation involves the detonation of explosive wastes inside a steel chamber constructed to dampen the blast. After burning reactions are suppressed to protect the integrity of the chamber. Particulates are filtered from the detonation gases. This technology is best suited for small pieces of explosives, and residuals may transform into toxic or more complex compounds than those created when treating the same waste by OB or OD.

Table 6-1 Initial Identified Technology Candidate List (continued)

	Technology	Treatment Type	Description
7	Contaminated Waste Processor	OB	A contaminated waste processor (CWP) consists of a car bottom furnace that treats contaminated combustible waste, such as rags, gloves, wipes, fiber drums, pallets, plastic, coveralls, etc. Typically, the CWP does not require a RCRA permit and is capable of batch or continuous feed operations.
8	Cryofracture	OB	Cyrofracture process used to cool ferrous munition bodies below their embrittlement temperature and allow the munitions to be fractured in a hydraulic press. This process allows access to the energetics so they can be treated by thermal destruction. This technology is suitable for size reduction prior to a thermal treatment. This treatment method has mostly been used for projectile explosives and is not suitable for explosive materials at LANL.
9	Cryogenic cutting	OD	Cyrogenic cutting technology uses liquid nitrogen that is pressurized and then ejected through a small orifice at high velocities. The system includes a cryogenic fluid supply system, a pressurization system, a temperature control system, a nozzle system, a recovery system, and a manipulation system. This treatment is effective as a pre-treatment to cut through casings for the purpose of removing the casing from the explosive prior to treatment; however, a static charge can build up under certain circumstances and is a safety concern. Secondary materials spray is an additional waste stream. This treatment method is not suitable for explosive materials at LANL.
10	Flashing Furnace	OB	A flashing furnace thermally decontaminates metal parts with explosive contamination. Up to 10,000 pounds of contaminated metal can be flashed per hour. The furnace can be installed in a fixed location or can be trailer mounted for field applications. Because this technology is enclosed and has a controlled flame device, permitting of the unit may require adherence to 40 CFR 264, Subpart O (incinerator) requirements.
11	Incinerator, Fluidized Bed	OB, OD	A fluidized bed incineration is an enclosed incinerator that utilizes the injection of explosives waste into a turbulent bed of hot sand, created by forced air. Emissions are filtered prior to release to the environment. This process is limited to liquids, slurries, and powders with low organic content. The powders must be homogeneous in size.
12	Incinerator, Plasma Arc	OB, OD	A plasma arc incineration uses molten slag (i.e., soil with iron fluxing agent) which destroys inorganic compounds. The technology encapsulates inorganic toxic solid wastes in the molten slag and when hardened is disposed. Emissions are filtered prior to release to the atmosphere. This is an enclosed alternative to incineration that can be utilized for explosive wastes that are high in organic compounds (e.g., paint, solvents).
13	Incinerator, Rotary Kiln	OB, OD	A rotary kiln incineration is an enclosed incinerator treatment technology. The rotary kiln slowly moves waste from one end to the other and waste detonates or combusts within the chamber;

Table 6-1 Initial Identified Technology Candidate List (continued)

	Technology	Treatment Type	Description
			therefore, only small amounts of explosive waste can be treated at one time. Emissions are filtered prior to release to the atmosphere. Small explosive items with casings (<40 grams energetic material) can also be treated with this technology. Uniform explosive waste streams are treated most efficiently.
14	Hydromilling	OD	Hydromilling of explosive waste uses high pressure water jets to “cut” through the material. This is a pre-treatment technology that is not conducive for experimental explosive waste streams. A secondary hazardous waste stream of water and explosives is created by this process.
15	Liquid Ammonia Extraction	OD	Liquid ammonia extraction uses propellant, explosive fuel and oxidizer ingredients to extract, separate, and recover the explosive using liquid ammonia. This treatment method can treat explosive wastes that have a plastic binder associated with the waste in a limited capacity.
16	Open Burning	OB	Open burn of explosives waste destroys waste by self-sustained combustion after being ignited or by controlled burning in an open environment. This technology best serves waste generated during machining of explosives, excess explosive powders and pieces, explosive contaminated combustible wastes, laboratory samples of experimental explosives, and large pieces of equipment that must be flashed prior to shipment offsite for recycle or disposal.
17	Open Detonation	OD	Open detonation involves the detonation of explosive wastes in an open air environment. This technology is best suited for small or large pieces of explosives. OD is especially appropriate for aged explosive material with difficult to predict properties because OD requires a minimum of moving and handling.
18	Oxidation, Cerium-catalyzed	OB	Cerium-catalyzed electrochemical oxidation operates at atmospheric pressure and can convert organic hazardous waste materials into carbon dioxide and water. This technology is used to treat organic pumpable fluids.
19	Oxidation, Base Hydrolysis	OB, OD	Base hydrolysis oxidation heats waste to mild temperatures (90 to 150 ˚C) and usually elevated pressures (200 pounds per square in. gauge) with a strong base (pH>12). The explosive waste is converted to water-soluble, non-energetic products. The resulting solution is hazardous and must be further treated using bio-remediation or supercritical water oxidation.

6.2 Screening for State of Development and Availability and for Applicability to Treat LANL's Energetic Waste Streams

The screening, summarized in **Table 6-2**, used the following criteria to determine which, if any, of the initial candidates could be viable technology alternatives to OB or OD for onsite treatment:

1. Which of the explosives waste streams (and/or what percentage of all the explosives wastes) can be effectively treated with this technology?
2. What are the limitations of the technology regarding its implementability and/or short-term effectiveness (e.g., size and weight limitations to input; the need for multi-step processes; safety issues; and production of secondary hazardous waste streams)?
3. Is the technology a viable alternative to OB or OD? In this context, to be considered 'viable' by LANL, the technology must be commercially available today (from a qualified vendor), and must have a proven track record of performance in treating explosive wastes. Only proven, commercially-available alternatives should be considered. Technologies that are still in the bench- or pilot-scale or demonstration phase of development are candidates for future further assessment but, currently, are not feasible alternatives.

Through this screening process, LANL determined that five of the candidate alternative technologies could potentially treat at least some portions of LANL's explosives waste streams. There is no alternative that could eliminate OB/OD treatment for all LANL explosive waste streams. The technologies that could treat some LANL explosive waste streams are: (1) contained burn in a confined burn facility (to treat excess explosives), (2) contained burn for explosives contaminated waste, (3) contained detonation (to treat smaller amounts of excess explosives and smaller combustible debris items), (4) a flashing furnace (to treat some noncombustible debris), and (5) rotary kiln incineration (to treat machining waste and powdered explosives). A graphical representation of the screening process is included as **Figure 6-1**.

Table 6-2. Comparison of Alternative Technologies for Opening Burning/Open Detonation Waste Treatment

Treatment Technology	OB Waste Stream Applicability	OD Waste Stream Applicability	Waste Streams that can be Treated by Technology	Limitations	Viable Alternative to OB/OD	RCRA Permit needed?
Case Opening	None	None	None	• Only used for treating thinned-and thick cased munitions	NO	YES (Subpart X)
Chemical conversion	None	None	None	• Creates a secondary waste stream • Not suitable for any explosive waste streams routinely generated	NO	YES (Subpart X)
Co-firing in Boilers	None	None	None	• Not suitable for any explosive waste streams routinely generated • Limited to explosives that are soluble in Fuel Oil #2	NO	YES (Subpart X)
Contained Burn Facility	~7%	~50%	• Excess explosives (small sized only)	• Limited by the size of explosives • Secondary waste streams created are scrubber waste and bag house dust	YES	YES (Subpart X)
Contained burn for explosives-contaminated wastes	<1%	<1%	• Explosives-contaminated combustible debris	• Limited to explosives-contaminated combustible debris	OB – NO OD - YES	YES (Subpart X)

Table 6-2 Comparison of Alternative Technologies for Opening Burning/Open Detonation Waste Treatment (continued)

Treatment Technology	OB Waste Stream Applicability	OD Waste Stream Applicability	Waste Streams that can be Treated by Technology	Limitations	Viable Alternative to OB/OD	RCRA Permit needed?
Contained Detonation	~5%	~50%	• Explosives-contaminated combustible debris (smaller)	• Limited to small bulk explosives and combustible debris • Secondary waste stream consists of ash and fragments • Limited lifetime on number of detonations the chamber can treat • Chamber becomes a difficult to dispose of hazardous waste	YES	YES (Subpart X)
Contaminated waste processor	<1%	None	• Explosives-contaminated combustible debris	• Limited to combustible debris	NO	Need for Subpart X Permit questioned
Flashing furnace	~3%	None	• Explosives-contaminated non-combustible debris	• Limited to noncombustible debris	YES	Need for Subpart X Permit questioned
Incineration, Fluidized Bed	~70%	<1%	• Explosives machining waste (powdered only)	• Limited to treating powders, liquids and slurries • Cannot treat most bulk explosives or noncombustible debris • Secondary waste streams include ash and scrubber residues	NO	YES (Subpart O)
Molten salt oxidation	~70%	None	• Explosives machining Waste (no filters)	• Limited to homogenous waste like machining waste with no filters • May be interference with chlorine in explosives binders	NO	YES (Subpart X)

Table 6-2 Comparison of Alternative Technologies for Opening Burning/Open Detonation Waste Treatment (continued)

Treatment Technology	OB Waste Stream Applicability	OD Waste Stream Applicability	Waste Streams that can be Treated by Technology	Limitations	Viable Alternative to OB/OD	RCRA Permit needed?
Incineration, Rotary Kiln	~95%	<1%	• Explosives machining waste (powdered only)	• Limited types and amount of explosives that can be treated at one time • Cannot treat most bulk explosives or noncombustible debris • Secondary waste streams include ash and scrubber residues	OB – YES OD - NO	YES (Subpart O)
Incineration, Plasma Arc	~5%	~50%	• Explosives-contaminated solvents (powdered only)	• Limited to bulk explosives and solvent waste • Secondary waste streams created are ash, scrubber residue and slag	NO	YES (Subpart O)
Base Hydrolysis /Supercritical Water Oxidation	None	~25%	None	• Limited to organic waste streams with no plastic	NO	YES (Subpart X)

6.3 Focused Evaluation of Potential Alternative Technologies

Based on the initial screening provide in **Table 6-2**, LANL determined that there is no single alternative OB or OD technology that is capable of treating the breadth of explosives contaminated waste streams that exist at LANL. However, an evaluation was conducted to determine if a combination of alternative treatment technologies could replace OB and OD for wastes that must be treated onsite. The evaluation entails a comparison of OB and OD to the four remaining alternative technologies identified in **Table 6-2** using rigorous evaluation criteria. These evaluation criteria include:

- The percentage of LANL's OB or OD hazardous energetic waste stream each technology is capable of treating;
- Industry proven technology including relative costs;
- Public acceptance of the technology;
- Potential secondary hazardous waste streams created from the treatment technology, reliability and maintenance of treatment equipment;
- Personnel safety; and
- Whether the technology meets RCRA regulatory guidelines including human health and the environment.

In order for a technology to replace OB and/or OD, the alternative technology would need to meet each criteria in a similar manner as OB or OD. The results of the focused evaluation are included in **Table 6-3**. Based on this evaluation, there is no combination of the four alternative treatment technologies that would be capable of treating all the LANL explosives waste streams currently treated by OB and OD. Therefore, regardless of whether these alternative technologies were used, LANL still requires permitted OB and OD units.

6.4 Summary of Open Burn/Open Detonation Onsite Treatment

Based on the evaluation of alternative OB and OD technologies, there is no way to eliminate the need for permitted OB and OD units at LANL at this time. The implementation of alternative technologies would not alleviate the explosive waste treatment requirements that OB and OD provide. Based on the LANL waste management practices, LANL will continue to minimize explosives wastes or transport to offsite treatment facilities when available; however, for wastes streams that cannot meet these requirements, onsite treatment through OB or OD is the best available option based on site-specific safety, security requirements, effectiveness, public safety, and feasibility.

Table 6-31 Focused Comparison of Applicable Waste Treatment Technologies to Open Burning/Open Detonation

Criteria	Open Burning (OB)*	Open detonation (OD)*	Contained Burn Facility	Incineration, Rotary Kiln	Flashing Furnace	Contained detonation
Waste Streams Treated	All	Explosives contaminated combustible debris	Excess explosives (small sized only)	Explosives machining waste (powdered only)	Explosives contaminated non-combustible debris	Explosives contaminated combustible debris (smaller)
Proven Technology	Yes	Yes- Most waste streams that can be open detonated are treated with this method rather than open burning.	Yes- Although larger explosive pieces, machining waste, liquids or noncombustible debris cannot be treated and may require a burn study to evaluate treatment of LANL waste streams.	Yes- Although cannot treat most sizes of explosives or noncombustible debris, and technology is not proven with undetermined or insulted explosives.	Yes- Although can only treat one explosives waste stream generated at LANL.	Yes – Although the size and quantity of the waste is limited per treatment. Larger pieces of explosives and odd-sized equipment cannot be treated in a contained detonation unit as fragments or the pressure from a large explosion will damage the chamber.
Relative Cost**	0	0	-	-	-	-

Table 6-3 Focused Comparison of Applicable Waste Treatment Technologies to Open Burning/Open Detonation (continued)

Criteria	Open Burning (OB)*	Open detonation (OD)*	Contained Burn Facility	Incineration, Rotary Kiln	Flashing Furnace	Contained detonation
Public Acceptance	Limited- Public opposition has been voiced concerning open burning.	Limited- Public concerns about contamination and opposition to noise have been voiced.	Limited- Previous public opposition to operation of incinerators. Support of confined burn facilities during open burning permit process.	Limited- Historic public opposition has led to the closure of formerly permitted facilities	Unknown	Unknown
Process effluents	Residual ash is analyzed for hazardous constituents. Expected emissions are CO, CO_2, H_2O, NO_x N_2, and little to no secondary combustion products due to short residence time.	Metal fragments, CO_2, H_2O, and N_2.	Emissions from scrubbing system, burn and scrubber residue, residues from quench rinse, and decontamination waters. Emissions scrubbing system must be designed to capture dioxins/furans that may be generated during the process, as the temperature is not controlled.	Emissions from scrubbing system, burn and scrubber residue, residues from quench rinse, and decontamination waters.	Expected emissions are CO, CO_2, H_2O, NO_x N_2, and little to no secondary combustion products due to short residence. Residual ash is not expected.	Metal fragments, pulverized gravel, air pollution control unit residue, major burn emissions including CO, CO_2, H_2O, NO_x N_2; secondary combustion products due to residence time; and limited lifetime of chamber with replacement required and disposal of used chamber

Table 6-3 Focused Comparison of Applicable Waste Treatment Technologies to Open Burning/Open Detonation (continued)

Criteria	Open Burning (OB)*	Open detonation (OD)*	Contained Burn Facility	Incineration, Rotary Kiln	Flashing Furnace	Contained detonation
Reliability and Maintainability	Very reliable and maintenance is minimal. Maintenance of burn trays, propane burners, and electronic matches are minimal.	Very reliable with experienced technicians. Requires minimal maintenance of pit area and run-on run-off controls.	Maintenance for the unit would require replacement of filters and periodic assessment of containment structure for damage.	The reliability and maintenance requirements are unknown at this time for LANL variable and unique explosive waste streams.	The reliability and maintenance requirements are unknown at this time for LANL variable and unique explosive waste streams.	Smaller units have proven reliable. Larger units (100 pounds) experienced leaking seals, weld failures and weak points. Fragments may damage chamber and increase maintenance.

Table 6-3 Focused Comparison of Applicable Waste Treatment Technologies to Open Burning/Open Detonation (continued)

Personnel Safety	Specific training for operators and explosives safety personnel are required and the area must be secured. The burn is monitored remotely through cameras. Specific operating parameters are invoked for open burning to assure the safety of personnel and protect human health and the environment.	Larger detonations for explosives pieces that are greater than the capacity of a confined detonation chamber. This requires less handling for workers. Also, the explosive would not have to be size-reduced prior to treatment by OD. LANL conducts detonations from a remote location inside the control building following specific operating procedures for OD to assure the safety of human health and the environment.	With undetermined or insulted explosives waste, a contained burn is an unacceptable risk to personnel. There is no controlled flame to ensure complete detonation or burn of the explosive or a capability to view if the explosive has been fully treated prior to opening the chamber. Unit increases the potential for catastrophic failure (explosion) when compared to current treatment technique.	Specific training for operators and explosives safety personnel would be required and would have to be conducted within a secure area. Training on treatment techniques for limited waste streams would also be necessary. Confinement of explosives within a treatment unit could additionally lead to a build-up of residual pressure from breakdown products within the unit—a potential explosion hazard.	If the unit is mobile, precautions will have to be in place to ensure that fuel can be located at each specific location within the explosives area. Trained personnel would be required to conduct treatment activities.	Large pieces of explosives may require size reduction prior to treatment in order to meet the operating capacity of the unit. This requires more handling by the worker and subsequent safety concerns. Potential for catastrophic failure

Table 6-3 Focused Comparison of Applicable Waste Treatment Technologies to Open Burning/Open Detonation (continued)

Criteria	Open Burning (OB)*	Open detonation (OD)*	Contained Burn Facility	Incineration, Rotary Kiln	Flashing Furnace	Contained detonation
Meet regulatory guidelines	Yes with applicable RCRA Hazardous waste permits for the facility.	Yes with applicable RCRA Hazardous waste permits for the facility.	Yes with applicable RCRA Hazardous waste permits for the facility.	Yes with applicable RCRA Hazardous waste permits for the facility.	RCRA hazardous waste permit is not required for some states. New Mexico may require Subpart X (Miscellaneous Unit) Permit.	Yes with applicable RCRA Hazardous waste permits for the facility.
Human Health and Environment* **	0	0	+	+	+	+

*OB/OD serve as the baseline for comparison with a "0" rating for each criterion, "–" indicates that the alternative technology performs less effectively than OB/OD, "+" indicates that the technology performs better than OB/OD, and "0" indicates the technology is about the same as OB/OD in terms of each criterion.

**Relative Costs – based on findings of the NAS, there is a paucity of sufficient data to perform quantitative analysis and draw general conclusions regarding the relative life cycle costs of OB/OD and the alternative treatment technologies; however, technologies such as those comprising Contained Burn/Contained Detonation (CB/CD) are expected to have higher capital and operating costs (which may vary widely) than the relatively low-tech OB/OD because of the need to procure and install equipment, site, design, construct the facility, pay for utilities, maintenance, and personnel. This cost differential would be even greater were automation used to minimize the handling of munitions. Conversely, the closure and cleanup of alternative technology facilities would likely be less expensive than OB/OD, as potential contamination of the surrounding environment during OB/OD operations may require extensive mitigation during closure. In the specific case at LANL, it should be noted that there is a baseline condition from the history of the units, as well as the updates that have been made to waste processes over the years. The addition of treatment technologies would require investments in closure and cleanup beyond cost estimates based exclusively on the new technology chosen. Additionally, closures for units currently in use at LANL may be delayed due to the duel use nature of the unit.

***Human Health and Environment – based on findings of the NAS, each technology's ability to monitor, prevent, minimize, and control emissions of contaminants to all environmental media (water, air, soil), during all process phases and during any process upsets, will determine environmental impact. Moreover, because various treatment technologies and pollution abatement systems result in the accumulation of secondary waste streams, it is important to consider the ability to meet the management and disposal requirements of these streams along with any effects on ecological and cultural resources. Regulators consider permitted OB/OD operations to be protective of human health and the environment. Alternative treatment technologies such as those comprising CB/CD are enclosed and would likely have lower emissions and less of an environmental and public health impact. Regulation of waste streams allowed for treatment and regular monitoring of constituents of concern in the environment can be used to mitigate and identify any potential releases that may occur.

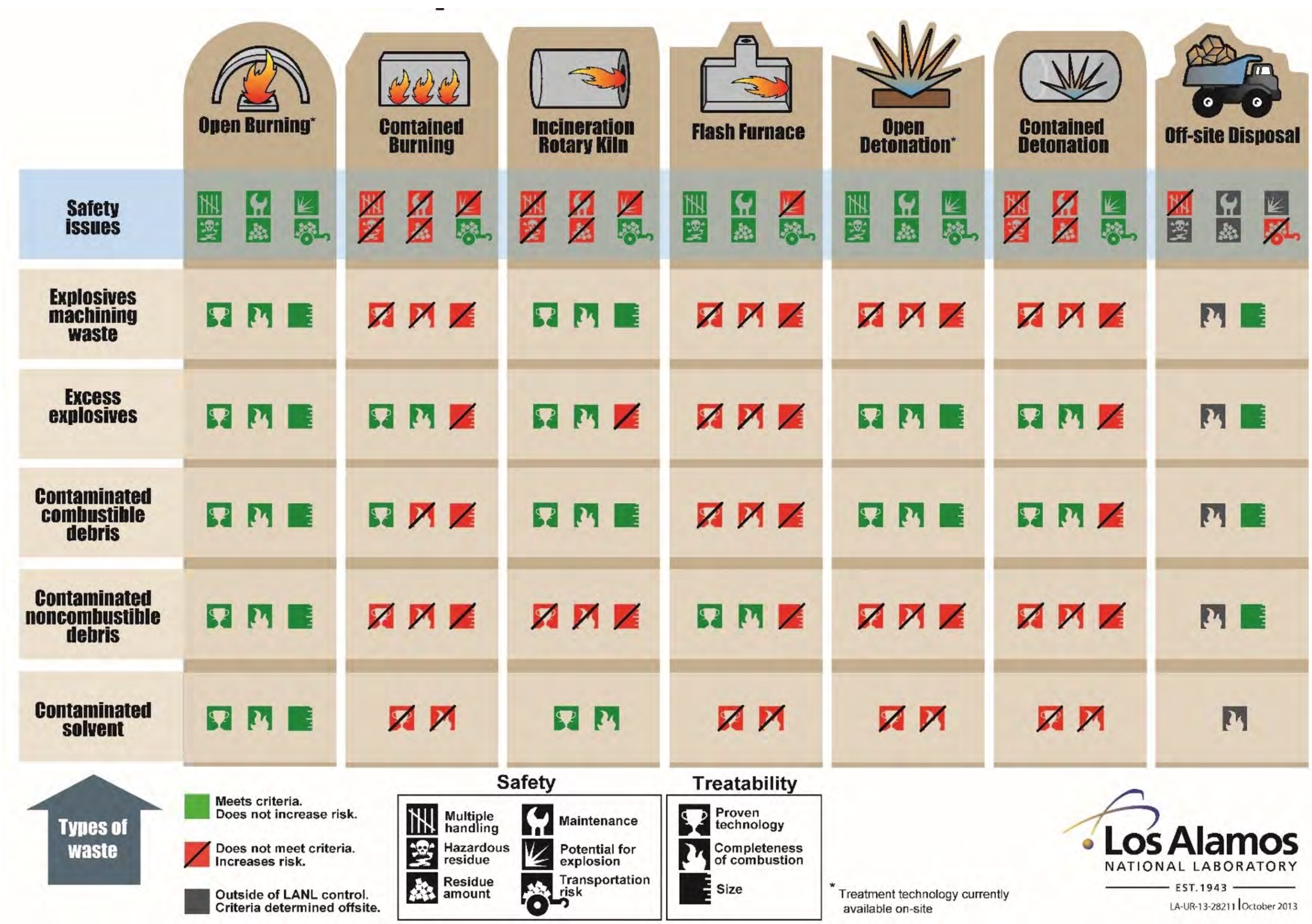

Figure 1 Explosives Waste Treatment Alternatives

7.0 Conclusions

In Section 2.0 of this alternatives assessment report, DOE/Triad described aggressive waste minimization efforts, operational practice changes, and process efficiencies which have significantly decreased the overall volume of explosives waste generated at LANL during routine operations. These efforts are effective and are continuing, but they cannot eliminate the need for continued onsite OB and OD treatment in the foreseeable future.

For over seventy years, OB and OD have been shown to be effective treatment technologies for explosives waste streams at LANL that cannot be minimized or transported offsite for treatment. These waste streams include the explosive waste streams listed in Table 1-1. The baseline risk assessment evaluates the effect of past OB and OD operations at the current and past waste treatment units and demonstrates that there is no unacceptable risk to either human health or ecological receptors from past operations. These evaluations can be found in the following supplements to the Permit Renewal Application:

- Supplement 4-7, *Open Detonation Unit at Technical Area 36 Human Health and Ecological Risk-Screening Assessments*
- Supplement 4-8, *Open Detonation Unit at Technical Area 39 Human Health and Ecological Risk-Screening Assessments*
- Supplement 4-16, *Technical Area 16 - Open Burn/Open Detonation (OB/OD) Area - Technical Area 16-388 Flash Pad Human Health and Ecological Risk- Screening Assessments*

In Section 5.0 it was determined that there are no technically viable offsite alternatives to OB or OD that can address every explosives waste generated at LANL and that OB and OD would still be required. In addition, there are explosives waste streams generated at LANL that cannot be safely transported or securely disposed at offsite facilities. All explosives waste streams that have not been previously shipped offsite would have to be tested, categorized, and assigned proper shipping names and an EX-ID No. in accordance with the requirements set forth in 49 CFR §173.56 by the DOT Associate Administrator before being shipped offsite. In order to complete this process additional onsite storage will be required. The potential for degradation of explosives during the extended storage period would result in unnecessary additional risk to workers and the environment. The potential need to stockpile explosive contaminated waste in order to meet minimum treatment quantity requirements for transporting waste to offsite treatment facilities, likewise would result in unnecessary additional risk to workers and the environment. In addition, explosives that present export complications in accordance with 22 CFR §§120-130 cannot be shipped offsite for treatment and all explosives contaminated noncombustible debris that cannot be steam cleaned, must undergo treatment per Section 18 of the DOE Explosives Safety Standard (DOE, 2019) prior to leaving the firing site.

In Section 6.0, it was determined that there is no alternative single treatment technology that can treat onsite all of the explosives wastes streams generated at LANL that are currently treated onsite by OB/OD; therefore, multiple treatment technologies would have to be acquired, constructed, permitted, and operated onsite in order to accomplish the same waste treatment effort. These other treatment technologies are an incinerator (to treat machining waste, explosives-contaminated combustible debris and explosives-contaminated solvent waste), and a flashing furnace (to treat noncombustible debris). All three thermal treatment units would require RCRA permits and still involve the burning or detonation of explosive wastes.

Therefore, for all of these reasons, and those previously submitted to the New Mexico Environment Department, continued OB and OD treatment is the only feasible alternative for LANL explosives contaminated waste based on site-specific safety considerations, transportation hazard potential and prohibitions, offsite treatment options, and the feasibility of alternative technologies. While LANL will continue to seek methods to reduce the need for treatment of explosives contaminated waste and ship such wastes offsite to the extent practicable, continued OB and OD treatment at levels maintained in recent years is most protective of worker and public safety.

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Attachment 9

Revised Appendix 1 - Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit

Appendix 1 - Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit

Introduction

This appendix to the Part B Permit Application for Renewal of the Los Alamos National Laboratory (LANL) Hazardous Waste Facility Permit (2010 Permit) summarizes the changes proposed by the United States Department of Energy (DOE) and its field offices, the National Nuclear Security Administration Los Alamos Field Office (NA-LA), the DOE-Environmental Management Los Alamos Field Office (EM-LA), along with Triad National Security, LLC (Triad), and Newport News Nuclear BWXT-Los Alamos, LLC (N3B)—collectively, the Permittees. Changes have been proposed within the following permit sections:

- Permit Table of Contents
- Permit Section 1.2, Permittees and Permitted Activity, Table 1.2.1
- Permit Section 1.4.1, Effect of this Permit on Interim Status Units
- New Permit Section 1.4.2, Integration with Consent Order
- Permit Section 1.5, Effects of Inaccuracies in Permit Application
- Permit Section 1.8, Definitions
- Permit Section 1.9.1, Duty to Comply
- Permit Section 1.9.8, Inspection and Entry
- Permit Section 1.9.14, Other Noncompliance
- Permit Section 1.10, Information Repository
- Permit Section 1.13, Public Notification Via Electronic Mail (E-Mail)
- Permit Section 1.16, Transfer of Land Ownership
- Permit Section 1.17.2, Demolition Activities Update
- Permit Section 2.4.7, Waste Characterization Review
- Permit Section 2 .8, Special Requirements for Ignitable, Reactive, or Incompatible Waste
- Permit Section 2.8.1, Ignitable and Reactive Waste Precautions
- Permit Section 2.9, Waste Minimization Program
- Permit Section 2.10.2, Testing and Maintenance of Equipment
- Permit Section 2.12.2, Facility Operating Record
- Permit Section 3.5, Management of Containers
- Permit Section 3.10.2, Secondary Containment
- Permit Section 3.12.1, General Operating Conditions
- Permit Section 3.14.2(1), Retention Basin
- Permit Section 3.14.3, Subsurface Vapor Monitoring

Appendix 1 - Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit

- Permit Section 4.6, TA-50 Radioactive Liquid Waste Treatment Facility
- Permit Part 5, Treatment by Open Detonation
- Permit Part 6, Treatment by Open Burning
- Permit Section 9.1, Introduction
- Permit Section 9.1.1, Regulated Units
- Permit Section 9.3, Closure Requirements for Regulated Units
- Permit Section 11.1, Corrective Action Requirements Under the Consent Order
- Permit Section 11.2, Corrective Action Requirements Under the Permit
- Permit Section 11.3.1.1, Notification of Detections
- Permit Section 11.3.2, Groundwater Monitoring Reporting
- Permit Section 11.4.1.1, Groundwater Cleanup Level for Perchlorate Permit Section 11.2, Corrective Action Requirements Under the Permit
- Permit Section 11.10.2.7.i, Groundwater Levels

Additionally, changes are proposed in the following Attachments to the Permit:

- Attachment A, Technical Area Unit Descriptions
- Attachment B, Part A Application
- Attachment C, Waste Analysis Plan
- Attachment D, Contingency Plan
- Attachment E, Inspection Plan
- Attachment F, Personnel Training Plan
- Attachment J, Hazardous Waste Management Units
- Attachment N, Figures

Necessary changes to the closure plans for the active hazardous waste management units (HWMUs) at LANL have been included in a separate appendix to the Permit Renewal Application.

The summary tables contained within this appendix detail the location of the change, depict the change or direct to the supplement document where the change is included, and provide justification for the proposed change to the Permit. Where specific changes are not included within the table, there are multiple small changes within a section that are described or the changes are too large to see clearly within the table and are more easily seen within the supplement document that contains the proposed changes. The supplemental document may also be referenced when a longer or entire section has been added, moved, or removed.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit
Permit Parts 1 – 11

<table>
<tr><th>Permit Section</th><th>Proposed modification</th><th>Justification</th></tr>
<tr><td>Table of Contents</td><td>Please see revised Table of Contents within Supplement 1-1, Permittees' Proposed Changes to Permit Parts 1 – 11.</td><td>The table of contents within the permit has been updated to include deleted sections as well as address additions for treatment units that the Permittees propose to be added to the Los Alamos National Laboratory (LANL) Hazardous Waste Facility Permit.</td></tr>
<tr><td>1.2, Permittees and Permitted Activity, Table 1.2.1</td><td>Table 1.2.1. List of Hazardous Waste Management Units and Co-Operators
<table>
<tr><th>Location</th><th>Type of Permitted Unit</th><th>Owner/Co-operator</th></tr>
<tr><td>TA-3</td><td>Storage and Treatment</td><td>DOE/Triad</td></tr>
<tr><td>TA-14</td><td>Interim Status
Open Burning/Open Detonation</td><td>DOE/Triad</td></tr>
<tr><td>TA-16</td><td>~~Interim Status~~
Open Burning</td><td>DOE/Triad</td></tr>
<tr><td>TA-36</td><td>~~Interim Status~~
Open Detonation~~Denotation~~</td><td>DOE/Triad</td></tr>
<tr><td>TA-39</td><td>~~Interim Status~~
Open Detonation~~Denotation~~</td><td>DOE/Triad</td></tr>
<tr><td>TA-50</td><td>Storage and Treatment</td><td>DOE/Triad</td></tr>
<tr><td>TA-55</td><td>Storage and Treatment</td><td>DOE/Triad</td></tr>
<tr><td>TA-63</td><td>Storage and Treatment</td><td>DOE/Triad</td></tr>
<tr><td>TA-54-38 West</td><td>Storage and Treatment</td><td>DOE/Triad</td></tr>
<tr><td>TA-54
Areas G, H and L</td><td>Storage, Treatment and Disposal (Including Units Undergoing Closure)</td><td>DOE/N3B</td></tr>
</table></td><td>The Permittees propose to update the text within the table to include the locations where macroencapsulation treatment processes were added in 2017 to the list of hazardous waste management units for units at TA-3 (macroencapsulation), TA-63 (macroencapsulation), TA-54-38 West (macroencapsulation), and TA-54 Areas G, H, and L (macroencapsulation). The Permittees also propose to update the table to remove "interim status" from TA-16, TA-36, and TA-39 open burning/open detonation units, as the Permittees propose to permit these units in the Permit Renewal Application.</td></tr>
<tr><td>1.4.1, Effect of this Permit on Interim Status Units</td><td>1.4.1 Effect of this Permit on Interim Status Units

The Permittees have submitted a revised closure plan for~~For~~ the interim status units listed in Table J-1 that the Permittees have determined to close~~do not choose to operate, the Permittees shall submit to the Department within 180 days of the effective date of this Permit either a notice of intent to close in accordance with a current closure~~</td><td>The Permittees' Permit Renewal Application proposes to permit the interim status units as hazardous waste management units. Closure plans for each of the remaining interim status hazardous waste management units have been</td></tr>
</table>

	~~plan, or a revised closure plan~~. These documents ~~shall~~ indicate that the closure of these interim status units shall be initiated in accordance with 40 CFR § 265.113(a) no later than 270 days after the approval of the individual plan~~of the effective date of this Permit~~. ~~For the interim status units listed in Table J-1 that the Permittees propose to permit, the Permittees shall submit to the Department 180 days of the effective date of this Permit a permit modification request in accordance with 40 CFR § 270.42 that includes all applicable information required at 40 CFR §§ 270.10, 270.11, 270.14, and 270.23 for each unit.~~	submitted to the Department for review and approval.
New section 1.4.2, Integration with Consent Order	**1.4.2 Integration with Consent Order** **1.4.2.1 MDAs G, H, and L** The Consent Order requires the Permittees to conduct corrective action for releases of hazardous waste, hazardous waste constituents, and contaminants as defined in Section III of the Consent Order, at all solid waste management units (SWMUs) and Areas of Concern (AOCs) to fulfill, among other requirements, the requirements of 40 CFR § 264.101. TA-54 Material Disposal Areas (MDAs) G, H, and L, in their entirety, are undergoing corrective action under the Consent Order. The Department has determined that all corrective action for releases of hazardous waste and hazardous constituents from the “regulated units” at MDAs G, H, and L will be conducted solely under the Consent Order and not under this or any future Permit, with the exception of long-term monitoring and maintenance which will be conducted under a future modified permit. MDAs G, H, and L include land disposal units that meet the definition of regulated units as defined in 40 CFR § 264.90(a)(2). These regulated units are situated among SWMUs or AOCs. Investigations performed under the Consent Order have found that releases have occurred at MDAs G, H, and L and that both SWMUs and regulated units have likely contributed to these releases. These regulated units meet the conditions in 40 CFR §§ 264.90(f) and 264.110(c) for the use of alternative requirements under the Consent Order in place	The Permittees propose to add this section as the result of the 2017 Settlement Agreement in *U.S. v. Curry* (*see* Section 6.1 of the Permit Renewal Application). This language reflects NMED’s decision that the regulated units at TA-54 MDAs G, H, and L qualify for alternative closure requirements pursuant to 40 CFR §§ 264.90(f) and 264.110(c) under the June 2016 Consent Order. The regulated units at MDAs G, H, and L are co-located with solid waste management units and areas of concern, and contaminants from these units are commingled and cannot be addressed separately. As such, these regulated units qualify for alternative closure under the Consent Order to meet the closure, groundwater monitoring, and post-closure requirements of the LANL Hazardous Waste Facility Permit under Part 264, Subparts F and G.

	of the closure, groundwater monitoring, and post-closure requirements in 40 CFR Part 264, Subparts F and G. The Permittees shall propose remedies in the Corrective Measures Evaluation Report under the Consent Order that achieve compliance with the closure performance standards at 40 CFR § 264.111. Fulfilling the requirements of the approved Corrective Measures Implementation Plan under the Consent Order shall also satisfy the requirements of 40 CFR Part 264, Subpart G. **1.4.2.2 Public Participation** Pursuant to Consent Order Section XVII.B, statements of basis and remedies selected by the Department under Consent Order Section XVII associated with MDAs G, H, and L will follow the public participation requirements applicable to remedy selection under sections 20.4.1.900 NMAC incorporating 40 C~~.~~F~~.~~R § 270.41, 20.4.1.901 NMAC, 20.4.1.902 NMAC, and 20.1.4 NMAC. This will include a public comment period that extends for at least 60 days, and an opportunity for a public hearing on the remedy.	This section explains the change and how the work will be executed under the Consent Order. The Permittees propose addition of this Public Participation section as the result of the Settlement Agreement in *U.S. v. Curry* (*see* Section 6.1 of the Permit Renewal Application).
1.5 Effects of Inaccuracies in Permit Application	**1.5 EFFECT OF INACCURACIES IN PERMIT APPLICATION** This Permit is based on information submitted in the Permittees' Application. The Application has numerous iterations; however, this Permit is based on: (1) the Part A Application dated ~~August 2018~~June 2020; (2) the General Part B Permit Application dated August 2003; (3) the TA-3-29 CMR Part B Application dated September 1999; (4) the TA-50 Part B Permit Application dated August 2002; (5) the TA-54 Part B Permit Application dated June 2003;	The Permittees propose to add the appropriate references to include the documents submitted in support of the open burning/open detonation units as proposed permitted units and update to the most recent Part A and B applications for the Permit Renewal Application.

	(6) the TA-55 Part B Permit Application dated September 2003; ~~and~~ (7) the TA-63 Permit Modification Request dated August 2011; (8) the Permit Modification Request for Open Detonation Units at TAs 36 and 39 (TA-36-8 & TA-39-6) dated July 2011; (9) the Permit Modification Request for an Open Burning Unit at TA-16 dated September 2013; (10) Request for Class 3 Permit Modification, Settlement Agreement Case No. 10-01251, Los Alamos National Laboratory Hazardous Waste Facility Permit, EPA I.D. #NM0890010515 (NA/LA, EM/LA) dated July 2017; and (11) the Los Alamos National Laboratory Part B Permit Application for Renewal of the LANL Hazardous Waste Facility Permit dated June 2020.	
1.8, Definitions	**Consent Order** means the June 2016~~March 1, 2005~~ Compliance Order on Consent (as modified) issued to the DOE~~Permittees~~ pursuant to the HWA and the New Mexico Solid Waste Act requiring the DOE~~Permittees~~ to conduct Facility-wide investigations and cleanups of contaminants released to the environment. **Regulated Unit** means a surface impoundment, waste pile, land treatment unit, or landfill that accepted hazardous waste after July 26, 1982 (*see* 40 CFR 264.90(a)(2)). **Waste Stream** means each waste material generated from a single process or from an activity that is similar in the materials from which it was generated, similar in its physical form and hazardous constituents, and distinguishable from other wastes by EPA Hazardous Waste Numbers or~~and~~ Land Disposal Restriction (LDR) status.	The Permittees propose to update the definition of "Consent Order" to the "June 2016 Consent Order" and to add a definition of "Regulated Unit" consistent with the regulatory definition at 40 CFR § 264.90(a)(2) as a result of the settlement Agreement in *U.S. v. Curry* (*see* Section 6.1). Propose to update the definition of "Waste Stream" to correct a typographical error.
1.9.1, Duty to Comply	The Permittees shall comply with all applicable conditions in this Permit except to the extent and for the duration such noncompliance is authorized in a temporary emergency permit pursuant to 40 CFR § 270.61. Any Permit noncompliance, except	The Permittees propose deletion of language from Section 1.9.1, Duty to Comply, as the result of the

	under the terms of an emergency permit, constitutes a violation of the HWA and RCRA and is grounds for enforcement or other Department action and may subject the Permittees to an administrative or civil enforcement action, including civil penalties and injunctive relief, as provided in Permit Section 1.9.2, or permit modification, suspension, termination, or revocation, or denial of a permit application or modification request under § 74-4-4.2 of the HWA and 40 CFR §§ 270.41 and 270.43. ~~No delegation or assignment of the Permittees' responsibilities under this permit can be made to any person or entity, including a separately organized agency, without the expressed permission of the Department; this prohibition does not preclude the Permittees' use of contractors for remediation.~~ ~~The Permittees shall not allow any person or entity which currently exists or may be created, including a separately organized agency, to interfere with the performance of their obligations or responsibilities under this Permit.~~	Settlement Agreement in *U.S. v. Curry* (*see* Section 6.1).
1.9.8, Inspection and Entry	(4) have access to, and copy, at reasonable times, any records that must be kept; and (5) sample or monitor, for the purposes of ensuring Permit compliance or as otherwise authorized by the HWA or RCRA, any substances or parameters at any location. (*see* 40 CFR § 270.30(i)) In the event that the Permittees are not able to immediately provide inspection and entry as identified above in Permit Section 1.9.8(1) through (5)~~entry, access, or the ability to photograph or sample is not immediately available~~ due to security or safety restrictions, the Permittees shall provide needed inspection and entry~~, photographs, or samples~~ as soon as reasonably possible.	The Permittees propose minor changes to this section to reflect the regulatory requirement under 40 CFR 270.30(i) which expressly includes the requirement to allow NMED to access "and copy, at reasonable times any records that must be kept under conditions of the permit". The additional change clarifies that if entry and inspection requirements cannot be met due to security or safety concerns, the requirements will be met as soon as possible.
1.9.14, Other Noncompliance	The Permittees shall report all instances of noncompliance not reported under Permit Section 1.9.11. This report shall be submitted to the Department annually by December 15~~1~~ for the year ending the previous September 30. These reports shall	The Permittees request that this deliverable due date be moved from December 1 to December 15 of each year to facilitate compliance and

	contain the information listed in Permit Section 1.9.12.2 and 40 CFR § 270.30(1)(10), which is incorporated herein by reference. The Permittees shall notify the Department in writing if there were no instances of noncompliance during the reporting period. This notice shall be submitted to the Department by December 15~~1~~ for the year ending the previous September 30.	implementation due to Laboratory operations. There are several reasons to support this minor change. The first is because the Laboratory "data calls" for information cannot be finalized until September 30 of each year due to the nature of the Laboratory's reporting system. It is difficult to provide reports by December 1st because this provides only 61 days for the Permittees to gather, draft, finalize the data, complete security review, and finalize the submittal. Additionally, there are now two contractors coordinating a single reporting deliverable, which can require more time for all parties to review and approve the submittal. Lastly, the Thanksgiving holiday at the very end of the drafting and finalization window (e.g., the last weekend in November) results in complications for timely submittal to the NMED and subsequent addition to the Information Repository.
1.10, Information Repository	The Permittees shall conduct annual training to inform inexperienced computer users of how they can access and utilize the electronic IR. The Permittees shall inform the public of this training at least 30 days prior to the training by methods specified in Permit Section 1.10(9) through (11). The Permittees shall document the training content and all efforts to inform the public in the Facility Operating Record.	The Permittees propose the addition of the words "at least" to accommodate timing of public notices published in multiple newspapers and mailed for which the date cannot be coordinated to be exactly 30 days.

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1.13, Public Notification Via Electronic Mail (E-Mail)	The Permittees shall notify individuals by e-mail of submittals as specified in this Permit. The Permittees shall maintain a list of individuals who have requested e-mail notification and send such notices to persons on that list. The notice shall be sent within fifteen~~seven~~ days of the submittal date and shall include a direct link to the specific document to which it relates.	The Permittees request a change from seven days to fifteen days to submit the notice to align more closely with the timing of placement of documents in the information repository. In addition, the seven-day requirement has unnecessarily created an administrative burden for the Permittee with very little (or no) additional benefit. Please see Section 6.2 of the Permit Renewal Application for further description.
1.16, Transfer of Land Ownership	The provisions of this Permit Section shall apply to any transfer in fee of Facility property subject to the requirements of this Permit to another entity. ~~This Section does not apply to Facility property subject to requirements of Section III.Y of the Consent Order.~~	The Permittees propose to revise this section to reflect that there is not a section regarding land transfer within the 2016 Consent Order.
1.17.2, Demolition Activities Update	**1.17.2 Demolition Activities Update** On or before ~~the last day of each quarter (December 31,~~ March 30 every year, ~~June 30, and September 30),~~ the Permittees shall update the list to include any additional buildings and fixed structures that may contain hazardous material scheduled for demolition, or shall notify the Department in writing that no such additional demolitions have been scheduled. In the event a demolition project is identified after the previous notice due date, but will occur prior to the next notice due date, Permittees shall submit a supplemental notice conforming to Section 1.17.1 not less than 30 days prior to demolition.	The Permittees propose a change to frequency of reporting for demolition activities that would include only a single update to the annual report, due September 30 every year. The proposed change reduces the administrative reporting and review burden on Permittees and the Department while at the same time ensuring adequate notice is provided. Based on experience over the last several years, a twice per year reporting requirement will capture the majority of demolition projects. The supplemental notice provision captures any "in between" projects. Please see Section 6.2 of

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		the Permit Renewal Application for further description.
2.4.7, Waste Characterization Review	(4) Recharacterize a hazardous waste stream whenever the Permittees are notified by a receiving off-site facility that the characterization of a hazardous waste they obtained from the Permittees' Facility does not match a pre-approved waste analysis certification or accompanying waste manifest or shipping paper. The Permittees shall notify the Department in writing within fifteen~~three~~ days of their receipt of the notice of the discrepancy from a receiving facility.	The Permittees propose to adjust the notification requirement from three days to fifteen days to account for the communication time between the off-site facility and the Facility and to account for the time to process the waste discrepancy notice and to align better with the regulatory requirement for notification. Please see Section 6.2 of the Permit Renewal Application for further discussion of this change.
2.8, Special Requirements for Ignitable, Reactive, or Incompatible Waste	The Permittees shall ensure that containers holding ignitable or reactive wastes are located at least 15 meters from the facility boundary defined as the technical area (TA) specific ~~boundary~~ boundaries identified in Figure~~s 11, 22, 24, and 38~~ 2 in Permit Attachment N (*Figures*). At TA-63, the Permittees shall ensure that containers holding ignitable or reactive waste are located at least 15 meters from the TWF fence line, as shown in Figure ~~55~~ 13 in Permit A~~a~~ttachment N (*Figures*) (*see* 40 CFR §§ 264.176 and 270.32(b)(2)).	The Permittees propose to modify language to be grammatically correct when referring to multiple technical area boundaries. Also, note that figure number updates are consolidated in a separate table of this appendix for completeness.
2.8.1, Ignitable and Reactive Waste Precautions	(4) use only non-sparking tools or non-sparking processes when managing hazardous waste containers that contain ignitable or reactive wastes; (8) stack containers of ignitable and reactive wastes no more than 2 drums high to comply with the National Fire Protection Association's (NFPA) *Flammable and Combustible Liquids Code*; ~~and~~ (9) ensure that each permitted unit's fire suppression system is compatible with the hazardous waste being stored or treated at the permitted unit or that any waste containers stored within a unit that may hold waste incompatible with a fire suppression system discharge are stored in a manner that will prevent contact with fire suppression system discharges; and	The Permittees propose the addition of "non-sparking processes" to the requirements for the use of non-sparking tools in order to provide flexibility that has been required in the past to safely plan for and conduct the work based on the circumstances present at the time the work is conducted and on the tools and processes available.

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	(10) ensure "No Smoking" signs are conspicuously placed prior to entry at a permitted unit.	The Permittees also propose addition of language for safety and to prevent potential contact of incompatible fire suppression discharge with waste containers as is the practice at the facility at this time. Lastly, the Permittees propose addition of language to include a requirement from the regulations at 40 CFR § 264.17 for completeness.
2.9, Waste Minimization Program	The Permittees shall submit to the Department a report regarding progress made in the waste minimization program in the previous year. The report shall address items (1)-(8) above, shall show changes from the previous report, and shall be submitted annually by December 15~~1~~ for the year ending the previous September 30.	The Permittees request that the submittal date change from December 1st to the 15th. Data calls for information cannot be finalized until September 30 of each year due to the nature of the report. This provides only 61 days for data gathering, drafting, finalizing, security review, and submittal. Additionally, there are now two contractors coordinating a single reporting deliverable, which can require more time for all parties to review and approve the submittal. Lastly, the Thanksgiving holiday at the very end of the drafting and finalization window (e.g., the last weekend in November) results in complications for timely submittal to the NMED and subsequent addition to the LANL Information Repository.

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2.10.2 Testing and Maintenance of Equipment	If testing or inspections identify any missing or nonfunctioning communication equipment, alarm system, fire protection component, spill control, or decontamination equipment, the Permittees shall ensure it is promptly repaired or mitigated, or provide substitute equipment, or provide other functionally equivalent~~mit~~ measures and/or equipment (e.g., placement of fire watch and use of fire extinguishers, or limiting operations in the immediate area). If applicable, the~~.~~ ~~The~~ Permittees shall ensure that employees and contractors working in the area are notified of the presence of substitute equipment and, if necessary, provide them with training in its use (*see* 40 CFR § 270.32(b)(2)). The Permittees shall document in the Facility Operating Record instances of such notifications and trainings. The Permittees shall ensure that malfunctioning equipment is clearly marked as out of use and that the location of the substitute or functionally equivalent equipment and/or measures are ~~is~~ clearly posted on or adjacent to the faulty equipment or that such equipment/measures are communicated to any personnel working within the area (*see* 40 CFR §§ 264.31 and 270.32(b)(2)).	The Permittees propose minor changes to allow for the use of functionally equivalent equipment and/or measures until such time as the equipment is returned to normal operating conditions, rather than the options currently included. Functionally equivalent equipment and/or measures could include (but aren't limited to) fire watch and use of fire extinguishers or limiting operations in the immediate area. The proposed change will allow the Permittees to exercise multiple options that are functionally equivalent to the existing emergency equipment or system when it is found to be out of service or requires maintenance and/or replacement and ensures safety and compliance with permit.
2.12.2, Facility Operating Record	(11) if applicable, for hazardous wastes left in the ground after closure (*i.e.*, disposal units), the information required of a treatment facility under 40 CFR § 268.7(c~~b~~), which is incorporated herein by reference;	The Permittees propose correction of a typographical error to track the correct regulatory citation.
3.5, Management of Containers	(2) The Permittees shall establish and maintain lines of demarcation which identify the boundaries of all permitted CSUs. The line may be identified by paint, tape, signs, or other permanent, visible marking on the floor or base material (*see* 40 CFR § 270.32(b)(2)). Permanent fences marking the unit boundary, or rooms or buildings whose walls constitute the boundary of the permitted units, satisfy this requirement.	The Permittees propose to include signs to be used as lines of demarcation for hazardous waste management units.
3.10.2, Secondary Containment	~~**3.10.2 Secondary Containment**~~	The Permittees propose to remove this permit condition because containers with free liquids stored

	~~The Permittees shall paint the floors in Rooms 9010, 9020, and 9030 within the TA-3-29 permitted unit with an epoxy sealant. The sealant must be maintained in accordance with Permit Section 3.7.1 of this Part and the manufacturer's specifications.~~	within the hazardous waste management unit at TA-3-29 are managed on secondary containment pallets as allowed for in Permit Section 3.7, *Containment Systems*. The requirement to paint and maintain floors in these specific rooms at TA-3-29 with an epoxy sealant is an unnecessary requirement because the epoxy coats the floor and although chemical-resistant, this material is not designed to operate as secondary containment per the requirements of 40 CFR § 264.175. The Permittees maintain the epoxy flooring as part of general facility management; however, secondary containment requirements are met through storage of free liquids on secondary containment pallets.
3.12.1, General Operating Conditions	(2) The Permittees shall ensure that at Area G, all containers storing hazardous waste with free liquids are stored on secondary containment pallets, except inside the following structures: Dome~~s~~ 230, and Sheds 144, 145, 146, 177, 1027, 1028, 1030~~1029~~, and 1041.	The Permittees propose correction of a typographical error.
3.14.2(1), Retention Basin	The Permittees shall control run-on and run-off as specified in Permit Attachment A, Section A.8.8~~6.9.~~, *Control of Run-on/Run-off*. Run-off collected in the retention basin shall be evaluated before discharge. If the run-off is known to be or potentially contaminated with hazardous waste constituents from a spill, leak, or other release, it shall be sampled.	The Permittees propose an update to Permit Attachment section.
3.14.3, Subsurface Vapor Monitoring	The subsurface vapor monitoring network is described in Permit Attachment A, Section A.8.9~~-6-10~~, and Figure ~~56-~~32 in Attachment N (Figures).	The Permittees propose an update to Permit Attachment section. Also, note that figure number updates are

	--Additional Changes— The Permittees shall monitor subsurface vapors to evaluate for releases at the TWF from Material Disposal Area (MDA) C. -and- The written notification shall be submitted to the Department in a letter report that includes, at a minimum, in table format, the date or dates of the sampling event, the well designation, the location of the well, a list of the analytical data that triggered the reporting requirement, any known issues with sample quality, and the specific category for which the data is reported under this Section (3.14.3). The Permittees may submit a proposal for further sampling or investigation or, alternately, the Department may require further investigation. Any ~~further~~ sampling~~, or~~ investigation, or correction action involving MDA C would be conducted solely~~performed in accordance with the corrective action required~~ under the 2016~~2005~~ Order on Consent or Permit Part 11.	consolidated in a separate table of this appendix for completeness. The Permittees also propose to update the language regarding the soil vapor monitoring conducted under the Permit and correct the reference to the 2016 Consent Order.
4.6, TA-50 Radioactive Liquid Waste Treatment Facility	~~**4.6 TA-50 RADIOACTIVE LIQUID WASTE TREATMENT FACILITY**~~ ~~The Permittees shall discharge all treated wastewater from the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) through the outfall permitted under Section 402 of the federal Clean Water Act, or as otherwise authorized by the terms of an applicable Clean Water Act permit that regulates the treatment and use of wastewater. If the Permittees intentionally discharge through a location other than the permitted outfall or as otherwise authorized, they will fail to comply with this requirement, and as a consequence the wastewater treatment unit exemption under 40 CFR § 264.1(g)(6) will no longer apply to the RLWTF. The Permittees shall not accept listed hazardous wastes as specified at 40 CFR Part 261 Subpart D at the RLWTF.~~	The Permittees propose this section be removed as the result of the Settlement Agreement in *U.S. v. Curry* (*see* Section 6.1 of the Permit Renewal Application).
5, Treatment by Open Detonation	Please see Permit Part 5 of Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1 – 11*.	The Permittees propose the addition of Permit Part 5 to incorporate permitted operations for open detonation treatment at

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		two units at LANL. Application requirements for these units are included and described in Section 4 of this Permit Renewal Application.
6, Treatment by Open Burning	Please see Permit Part 6 of Supplement 1-1, *Permittees' Proposed Changes to Permit Parts 1 – 11*.	The Permittees propose the addition of Permit Part 6 to incorporate permitted operations for an open burning treatment unit at LANL. Application requirements for this unit are included and described in Section 5 of this Permit Renewal Application.
9.1, Introduction	(1) regulated units; ~~(*i.e.*, material disposal areas G, H, L);~~	The Permittees propose to remove the reference to material disposal areas G, H, and L per the Settlement Agreement in U.S. v. Curry (*see* Section 6.1 of the Permit Renewal Application).
9.1.1, Regulated Units	The closure requirements for regulated units within MDAs G, H, and L shall be addressed under~~not accept hazardous or mixed waste and shall undergo closure. The Permittees shall adhere to~~ the Consent Order (*see*~~closure performance standards in~~ Permit Section 1.4~~9~~.2.1).~~and the closure requirements in Permit Sections 9.3 and 9.5 for the closure of these units.~~	The Permittees propose to add language requiring closure requirements for regulated units with MDAs G, H, and L to be addressed under the Consent Order per the Settlement Agreement in *U.S. v. Curry* (*see* Section 6.1 of the Permit Renewal Application).
9.3, Closure Requirements for Regulated Units	**9.3 RESERVED~~CLOSURE REQUIREMENTS FOR REGULATED UNITS~~** ~~Closure of the regulated units must meet the corrective action requirements of the March 1, 2005 Compliance Order on Consent (Consent Order). The Consent Order is an enforceable document that sets forth alternative closure requirements in accordance with 40 CFR § 264.110(c). The Permittees shall propose remedies in the Corrective Measures Evaluation Report under the Consent Order that achieve~~	The Permittees propose that this section be changed to "Reserved" per the Settlement Agreement in *U.S. v. Curry* (*see* Section 6.1 of the Permit Renewal Application).

	~~compliance with the closure performance standards at 40 CFR § 264.111. Fulfilling the requirements of the approved Corrective Measures Implementation Plan under the Consent Order shall also satisfy the requirements of 40 CFR Part 264, Subpart G.~~	
11.1, Corrective Action Requirements Under the Consent Order	The Department and the Permittees have agreed to a Compliance Order on Consent (Consent Order) dated ~~March 1, 2005~~June 2016, which requires the Permittees to conduct corrective action at all solid waste management units (SWMUs) and Areas of Concern (AOCs), at the Facility to fulfill the requirements of 40 CFR § 264.101.	The Permittees propose to update the reference to the 2016 Consent Order.
11.2, Corrective Action Requirements Under the Permit	The Permittees shall conduct corrective action under this Permit (or other enforceable document) rather than under the Consent Order, in the following circumstances: (1) new releases and newly discovered releases of hazardous waste or hazardous constituents from hazardous waste management units at the Facility; (2) the closure and post-closure care requirements of 40 CFR Part 264, Subpart G, as they apply to hazardous waste management units at the Facility; (3) implementation of the controls, including long-term monitoring, for any SWMUs or AOCs listed in the Permit in~~on~~ Attachment K (*Listing of SWMUs and AOCs*), Table K-2 (*Corrective Action Complete with Controls*); ~~and~~ (4) any corrective action conducted under this Part (11) to address releases of hazardous waste or hazardous constituents that occur or are discovered after the date on which the Consent Order terminates; and (5) newly created SWMUs and AOCs from non-permitted operations. (*see* § VII.A~~III.W.1~~ of the Consent Order)	The Permittees propose to revise this section to add bullet number 5, which will make the permit language consistent with Section VII of the 2016 Consent Order.
11.3.1.1, Notification of Detections	~~(4) Detection of perchlorate in a spring or screened interval of a well at a concentration of 2 µg/L or greater if perchlorate at such concentration has not previously been detected in the spring or screened interval;~~ (~~5~~4) Detection of a hazardous constituent that is a metal or other inorganic compound in a spring or screened interval of a well at a concentration that	The Permittees propose deletion of the notification requirement for perchlorate language that was included per the 2005 Consent Order and is no longer included in the 2016 Consent Order.

	exceeds two times the background level for the third consecutive sampling of the spring or screened interval; and (~~6~~5) Detection of a hazardous constituent in a spring or screened interval of a well at a concentration that exceeds one-half the cleanup level established in Permit Section 11.4.1 and that has increased for the third consecutive sampling of that spring or screened interval.	Renumbering of the remainder of the section is included as part of this proposed change.
11.3.2, Groundwater Monitoring Reporting	The Permittees shall propose a schedule for such reporting to the Department for approval. Such reporting shall be coordinated with, and may be combined with, the reporting conducted under § ~~IV.A.6~~XII of the Consent Order.	The Permittees propose to revise this section to update the section regarding groundwater monitoring reporting in the 2016 Consent Order.
11.4.1.1, Groundwater Cleanup Level for Perchlorate	~~**11.4.1.1 Groundwater Cleanup Level for Perchlorate**~~ ~~If, during the term of this Permit, the WQCC adopts a groundwater quality standard for perchlorate, or EPA or the EIB adopts an MCL for perchlorate, such standard or MCL shall be the cleanup level in accordance with Permit Section 11.4.1. If perchlorate is detected, the Permittees shall evaluate the nature and extent of the perchlorate contamination. In the absence of a groundwater quality standard or MCL, if perchlorate is detected at concentrations at or greater than 4 µg/L, then the cleanup level shall be established using a HI of 1.0 in accordance with Permit Section 11.4.1 above.~~	The Permittees propose to remove the perchlorate language that was included per the 2005 Consent Order and is no longer included the 2016 Consent Order.
11.10.2.7.i, Groundwater Levels	Groundwater levels shall be measured in all wells at the facility (or the number of wells otherwise specified in a Department approved groundwater monitoring work plan) within 21~~14~~ days of the commencement of the monitoring activities. The Permittees shall conduct periodic measuring events, the schedule for which shall be provided in the groundwater monitoring work plans.	The Permittees propose to change this section based on the findings of the first triennial review for which the final report was issued on September 14, 2018, in accordance with the January 2016 Settlement Agreement and Stipulated Final Order. The Permittees propose the change to align with the LANL

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit
Permit Parts 1 – 11

		Interim Facility-wide Groundwater Monitoring Plan.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit
Attachment A

Permit Attachment A has been modified to include proposed text changes as follows: (1) update section numbering and references to accommodate the proposed addition of open burning and open detonation units; (2) correct typographical errors within Permit Attachment A, including correction of the title of the attachment; (3) format headings and section numbering consistency; (4) remove redundant information that may be inconsistent or that may not be complete when compared to the other instances within the 2010 Permit; (5) update the description of security and access at Technical Area 50; (6) update the descriptions of the hazardous waste management units at Technical Area 55; and (7) conduct technical editing to formatting and consistency of unit references and other changes that are grammatical in nature and do not make technical changes to the document.

Permit Attachment Section	**Proposed modification**	**Justification**
Title of Attachment	**ATTACHMENT A** **TECHNICAL AREA ~~(TA)~~ UNIT DESCRIPTIONS**	The Permittees propose correction of a typographical error. All of the mentions within Parts 1-11 of the Permit include the name as proposed.
Table of Contents	Please see revised Table of Contents within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The table of contents within the attachment has been updated to incorporate the changes within this attachment to the 2010 Permit.
Throughout document	Heading formatting and leveling have been updated to be consistent throughout the document. Formatting and other grammatical edits have been made for consistency. These changes do not make technical changes to the document. Revisions are included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	Permittees propose changes to improve the quality of the document and correct inconsistencies. Technical edits proposed are all reflected in the redline document, but may not be specifically highlighted in this table because formatting changes are difficult to highlight in table format.
Attachment A Introduction Paragraph	This attachment contains TA-specific unit descriptions, including the dimensions, materials of construction, and security procedures~~, and emergency equipment~~ of each unit provided by the Permittees.	Permittees propose to remove "emergency equipment" language from this section. Emergency equipment is included within Permit Attachment D, *Contingency Plan that* is more concise and directive than the deletions proposed to the plan.

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Permit Attachment Section	**Proposed modification**	**Justification**
A.1.2, Security and Access	~~Bilingual (*i.e.*, English and Spanish) warning signs are also posted at the entrances to each portion of the permitted unit within the building and can be seen from any approach to these locations. The legends on the signs indicate "Danger: Hazardous Waste Storage Area" and "Unauthorized Persons Keep Out." The signs are legible from a distance of at least 25 ft.~~	Permittees propose the removal of a duplicative permit condition that is included within Permit Section 2.5.1, *Warning Signs*. This language is deleted so that the requirement is included in only one area of the Permit.
A.1.3, Emergency Equipment	The Permittees propose this section for deletion. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	Permittees propose the removal of a duplication within the Permit. A listing of emergency equipment is included within Permit Attachment D, *Contingency Plan that* is more concise and directive than the deletions proposed to the plan.
A.2, TA-16 and Subsections	The Permittees propose to include the Technical Area-specific unit descriptions, including the dimensions, materials of construction, and security procedures for the open burning unit at Technical Area 16. Subsections include A.2.1 and A.2.2. Please see the revisions included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose these additions to incorporate the operations for an open burning treatment at LANL. Application requirements for this unit are described or included in Section 5 of this Permit Renewal Application.
A.3, TA-36 and Subsections	The Permittees propose to include the Technical Area-specific unit descriptions, including the dimensions, materials of construction, and security procedures for the open detonation unit at Technical Area 36. Subsections include A.3.1 and A.3.2. Please see the revisions included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose these additions to incorporate the operations for an open detonation treatment unit at TA-36 at LANL. Application requirements for these units are described or included in Section 4 of this Permit Renewal Application.

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Permit Attachment Section	Proposed modification	Justification
A.4, TA-39 and Subsections	The Permittees propose to include the Technical Area-specific unit descriptions, including the dimensions, materials of construction, and security procedures for the open detonation unit at Technical Area 39. Subsections include A.4.1 and A.4.2. Please see the revisions included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	These additions have been proposed by the Permittees to incorporate the operations for an open detonation treatment unit at TA-39 at LANL. Application requirements for these units are described or included in Section 4 of this Permit Renewal Application.
Throughout remaining Attachment	Renumbered sections are reflected in the document included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	Permittees propose the changes because of the added sections.
A.5, TA-50 and A.5.2, TA-50-69 Outdoor Permitted Unit	Moved descriptive text from renumbered Section A.5.2, TA-50-69 Outdoor Permitted Unit. Changes are reflected in the document included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose correction of a typographical error in a road name at the beginning of the section. The Permittees propose the move because the descriptions of the unit are most appropriate within Section A.5, TA-50, not in a section associated with the TA-50-69 Outdoor Permitted Unit.

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Permit Attachment Section	**Proposed modification**	**Justification**
A.5.3, Security and Access	~~Bilingual (*i.e.*, English and Spanish) warning signs are posted on the fences at approximately 50 to 75-foot intervals. Warning signs are also posted at the entrances to each area that will manage hazardous and mixed waste and are visible from any approach to these areas. The legends on the posted signs indicate "Danger–Hazardous Waste Storage Area" and "Unauthorized Persons Keep Out." Existing signs with a legend other than "Danger–Unauthorized Persons Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the active portion, and that entry into the active portion can be dangerous. The signs are legible from a distance of 25 ft. Additionally, signs are posted at the entrance to each hazardous and mixed waste permitted unit to address requirements associated with entering and working in the area.~~	Permittees propose the removal of a duplicative permit condition that is included within Permit Section 2.5.1, *Warning Signs*. This language is being deleted so that the requirement is included in only one area of the Permit.

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A.5.3, Security and Access	There ~~are four entry gates into TA-50. Two entry gates are located north of TA-50-1. During normal business hours, the easternmost of these two gates may remain open to receive deliveries. After normal business hours, this gate is padlocked. The westernmost of these two gates is the main access gate and remains open during normal business hours for personal and government-owned passenger vehicles. After normal business hours, access through this gate is by badge reader only. The third gate~~ is a fire access and shipping gate which is located west of TA-50-69 and is routinely kept closed and locked. When this gate is opened for shipments of materials or waste, facility personnel are present in the yard west of TA-50-69 to limit entry by unauthorized persons. When shipments are completed, the gate is re-closed and locked. Bollards prevent vehicle access to the area on both the north and south sides of Building 50-69. ~~A fourth gate to the south of TA-50-1 is locked except when authorized access is necessary.~~ ~~All personnel involved in waste management activities at the TA-50-69 indoor and outdoor permitted units have immediate access to an internal alarm or emergency communication device. In the event of an emergency, this communication equipment allows personnel to contact the operating group management, the Emergency Management and Response personnel, or the Central Alarm Station operator.~~ ~~TA-50-69 is equipped with an audible alarm system to alert personnel to evacuate the area. The alarm system may be activated by one of the fire alarm pull stations located throughout the building. Personnel can also use phones to summon assistance from local emergency response teams in case of an emergency. Personnel may carry pagers, two-way radios, or cellular telephones so they can contact, or be contacted by, on-site and the Facility emergency support personnel at all times.~~ ~~TA-50-69 is equipped with fire extinguishers and fire suppression systems. Depending on the size of a fire and the fuel source, fire extinguishers may be used by on-site personnel. However, the Facility policy encourages~~	Permittees propose the changes to the description of security and access at the TA-50 permitted units because the other information that was previously included in the applications that were drafted in the 1990s included additional units at TA-50 that made the additional discussion of fences and gate necessary. The information in this section is no longer relevant because of changes made to the configuration of TA-50. The information is also extraneous and does not need to be included as part of the Permit. The Permittees also propose to remove "emergency equipment" language from this section. The emergency equipment information is included within the Contingency Plan, Permit Attachment D, which is more concise and directive compared to the language proposed to be deleted from this section.

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Permit Attachment Section	Proposed modification	Justification
	~~immediate evacuation of the area and notification of appropriate emergency personnel. The fire alarm control panel continuously monitors all fire suppression and detection systems and transmits signals to the Los Alamos County Fire Department through the Facility's central alarm system.~~ ~~A fire hydrant installed according to National Fire Protection Association standards is located approximately 55 feet west of TA-50-69. Water is supplied to the fire hydrant by a municipal water system through eight inch pipes at an adequate volume and pressure (*i.e.*, 200 gallons per minute and 90 pounds per square inch static pressure) to supply a water hose in the event of a fire.~~ ~~TA-50-69 has an automatic wet-pipe sprinkler system in the main building and in the large glove box enclosure. The sprinkler system is heat-activated at 100°C (212°F). The TA-50-69 Outdoor permitted unit transportainers and weather protective structures are not equipped with automatic sprinkler systems; however, a fire extinguisher is located within 20 feet of the unit. Personnel may use the fire alarm pull station at TA-50-69 in the event of a fire at both the indoor and the outdoor permitted units.~~ ~~Two spill centers are located in TA-50-69 Room 102. They contain spill control equipment, personal protective equipment, and sorbents. Trained personnel may use this equipment to mitigate small containable spills when they are certain their actions will not put themselves or others at risk. Depending on the size and severity of the spill, EM&R provides additional spill control equipment and assistance upon request. Available personnel decontamination equipment includes safety showers and eye wash stations located in the TA-50-69 indoor permitted unit~~	

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Permit Attachment Section	Proposed modification	Justification
A.5.3, Security and Access	The Permittees' proposed deletions to the end of this section are associated with emergency equipment and procedures. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	Permittees propose the removal of duplication within the Permit. A listing of emergency equipment is included within Permit Attachment D, *Contingency Plan*, that is more concise and the deletion removes duplication of emergency procedures.
A.6, TA-54	Waste containers are transported to the permitted units at Areas L, G, and West by flatbed trucks, closed-box trucks, or trailers. The permitted units have design features that promote safe unloading and handling of waste containers from these trucks and trailers. Ramps are typically located at vehicle entrances to the dome structures at the Area L and Area G permitted units. Shed 31 at Area L and Shed 8 at Area G have sloped entryways for container-handling equipment. The storage domes have roll-up or roll-away vehicle access doors. The loading dock at TA-54 West allows access from the transport vehicles to the loading dock platform. ~~These design features facilitate safe handling of containers in and out of the permitted units.~~	Permittees propose the removal of a duplicative sentence within this section.
A.6.1, Area L, Storage Shed 31	~~The total capacity of the three sumps is approximately 285 gallons, which exceeds the amount necessary to hold 10% of the total storage capacity of the shed (1,320 gallons).~~	Permittees propose the removal of a duplicative sentence within this section.
A.6.4, Security and Access Control	The gate is also open during normal working hours. Access to any part of TA-54 before or after normal working hours or on weekends requires approval of the appropriate ~~Group Leader or Facility Manager~~ manager at TA-54.	The Permittees propose the changes to allow for variability to the specific title designation due to the separate contractors that have operational control at separate units.

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Attachment A

Permit Attachment Section	**Proposed modification**	**Justification**
A.6.4, Security and Access Control	~~Bilingual (*i.e.*, English and Spanish) warning signs are posted on the fence at 50- to 75-ft intervals, are legible from a distance of 25 ft, and can be seen from any approach to this area. The legends on the signs indicate "Danger – Hazardous Waste Storage Area" and "Unauthorized Persons Keep Out."~~	Permittees propose the removal of duplicative permit language that is included within Permit Section 2.5.1, *Warning Signs*. The proposed deletion addresses the fact that the requirement is included in Permit Section 2.5.1 and removal of the repetitive requirement will help maintain consistency.
Former A.4.4, Emergency Equipment	The Permittees propose deletion of this section associated with emergency equipment and procedures. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	Permittees propose the removal of duplication within the Permit. A listing of emergency equipment is included within Permit Attachment D, *Contingency Plan*, that is more concise and the deletion removes duplication of emergency procedures.
A.7, TA-55	The Permittees propose correction of the number of hazardous waste management units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose correction of the number of hazardous waste management units at TA-55.
A.7.1, B40	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.
A.7.2, B05	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.
A.7.3, K13	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.
A.7.4, B45	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.

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Permit Attachment Section	Proposed modification	Justification
A.7.5, B13	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.
A.7.6, G12	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.
A.7.7, Vault	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.
A.7.8, Outdoor Storage Pad	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.
A.7.10, Mixed Waste Storage Tank System	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.
A.7.10.1, Evaporator Glovebox Tank Component	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.
A.7.10.2, Stabilization Unit Pencil Tanks Component	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.
A.7.10.3, Ancillary Equipment	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.
A.7.10.4, Secondary Containment	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.
A.7.11, Mixed Waste Stabilization Unit	The Permittees propose updates to facility descriptions for units at TA-55. Please see the revision included within Supplement 1-2, *Permittees Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to descriptions of units located at TA-55.

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Permit Attachment Section	Proposed modification	Justification
A.7.12, Security and Access Control	~~Warning signs are posted on the perimeter fences at approximately 40 to 110-ft intervals and can be seen from any approach to TA-55. Warning signs are also posted at each access to the waste management units in sufficient numbers to be seen from any approach. The legends on the signs are bilingual (*i.e.*, English and Spanish) and indicate "No Trespassing by Order of the United States Department of Energy." The signs are legible from a distance of 25 ft.~~	Permittees propose the removal of duplicative permit language that is included within Permit Section 2.5.1, *Warning Signs*. The proposed deletion addresses the fact that the requirement is included in Permit Section 2.5.1 and removal of the repetitive requirement will help maintain consistency.
Former A.5.13, Emergency Equipment	The Permittees propose deletion of this section associated with emergency equipment and procedures. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	Permittees propose the removal of duplication within the Permit. A listing of emergency equipment is included within Permit Attachment D, *Contingency Plan*, that is more concise and the deletion removes duplication of emergency procedures.
A.8.1, Concrete Pad	~~The perimeter of the pad has a 15" to 18" gutter and 6" high curb to provide run-off control. A valley gutter isolates the northern portion of the pad. Storm water and potentially contaminated fire suppression water flow from the northern portion of the pad flows to the valley gutter that drains to the retention basin. This feature substitutes for berms, dikes, or sumps specific to each storage building. The southern portion of the pad, which is outside the hazardous waste management unit where waste is not stored, slopes to the southeast and drains off the pad toward the parking lot. Figure 55 provides details regarding the pad configuration.~~	Permittees propose removal of duplicative information presented in a later section of Permit Attachment A associated with containment at the hazardous waste management unit.
A.8.2, Storage Buildings	~~The building floors (i.e., mat slabs) are six inches higher than the outside surface of the concrete pad to prevent run-on, and are sloped toward the roll-up door at the building entrances for drainage, in accordance with 40 CFR §264.175(b)(2) and (c).~~	Permittees propose removal of duplicative information presented in a later section of Permit Attachment A associated with containment at the hazardous waste management unit.

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Permit Attachment Section	Proposed modification	Justification
A.8.7, Security and Access Control	~~Warning signs stating "Danger – Unauthorized Personnel Keep Out," are posted on the perimeter fences and gates in accordance with Permit Section 2.5.2, *Warning Signs*. The text on the signs are bilingual (i.e., English and Spanish) and indicate "No Trespassing by Order of the United States Department of Energy." The signs are legible from a distance of 25 feet.~~	Permittees propose the removal of duplication within the Permit. A listing of emergency equipment is included within Permit Attachment D, *Contingency Plan*, that is more concise and the deletion removes duplication of emergency procedures.
Former A.6.8, Required Equipment	The Permittees propose deletion of this section associated with emergency equipment and procedures. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	Permittees propose the removal of duplication within the Permit. A listing of emergency equipment is included within Permit Attachment D, *Contingency Plan*, that is more concise and the deletion removes duplication of emergency procedures.
A.8.9, Subsurface Vapor Monitoring	The Permittees propose deletion of this section associated with emergency equipment and procedures. Please see the revision included within Supplement 1-2, *Permittees' Proposed Changes to Attachment A, Technical Area Unit Descriptions*.	The Permittees propose updates to this section to reflect that the soil vapor well monitoring network as required by the 2010 Permit is installed and regularly sampled.

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Attachment B

Permit Section	Proposed modification	Justification
Part A Form Parts 1 and 2	The updated form is provided within the Los Alamos National Laboratory General Part A Permit Application, Revision 10.0, provided concurrently with this Permit Renewal Application.	The Permittees have revised Form 8700-23 to include updates to names of managers and updated addresses. There were no substantive changes to the form and there were no additions or deletions proposed to the hazardous waste management units or the US Environmental Protection Agency Hazardous Waste Numbers treated or stored at each of the Technical Areas. The process code for the storage shaft unit at Technical Area 54, Area G was updated to be consistent with the 2010 Permit (from S01 in former Part A applications to S99).

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit
Attachment C

The waste analysis plan modification proposed text is as follows: (1) text has been added to support permit issuance of the interim status open burning unit and two open detonation units; (2) text in sections related to mixed transuranic waste have been updated and reorganized; (3) permit sections have been reorganized with minor text changes to improve clarity and readability, and to facilitate permit implementation; and (4) minor non-substantive editorial changes have been made that are grammatical or formatting in nature. Note, the majority of proposed text changes address the addition of the interim status open burning and open detonation units and the reorganization associated with the sections related to mixed transuranic waste.

Permit Attachment Section	Proposed modification	Justification
Table of Contents	Please see revised Table of Contents within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose updates to the table of contents within the attachment to include deleted sections as well as additions for treatment units that the Permittees propose to be added to the 2010 Permit.
List of Tables	Please see revised List of Tables within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees have revised the list of tables to reflect the rearrangement of tables and removal of reserved or outdated tables from the attachment for clarity.
Throughout document	Changes to heading formatting and leveling, as well as formatting and grammatical edits have been made in the attachment to be consistent throughout the document. Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	Permittees propose changes to improve the quality of the document and correct inconsistencies. Technical edits proposed are all reflected in the redline document, but may not be specifically highlighted in this table because formatting changes are difficult to highlight in table format.
Introduction	This Waste Analysis Plan (WAP) presents the characterization procedures used to determine the chemical and physical nature of waste streams ~~non-mixed hazardous waste, the hazardous component of mixed low-level waste (MLLW), and the hazardous component of mixed transuranic waste (MTRUW)~~ stored and treated at hazardous waste management units at the	The Permittees have proposed editorial changes throughout the introduction for a clearer presentation of information, to include explosives waste streams,

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Permit Attachment Section	Proposed modification	Justification
	Los Alamos National Laboratory (LANL or the Facility) in accordance with 40 CFR § 264.13. These waste streams or hazardous constituents are non-mixed (non-radioactive) hazardous waste including explosives waste streams, the hazardous component of mixed low-level waste, and the hazardous component of mixed transuranic waste. The ~~waste characterization~~ requirements contained in this WAP are used for characterization of wastes stored in containers and tanks, and to support treatment processes covered by the ~~stabilization process~~LANL Hazardous Waste Facility Permit (Permit). Waste analysis regulatory requirements are specified in 40 CFR §§ 264.13, 270.14(b), and 268.7. The general overview of ~~Waste analysis~~ permit requirements for waste analysis is ~~are~~ specified in Permit Section 2.4. This WAP discusses how the waste characterization information is obtained, ~~data prepared by generators are~~ reviewed, supplemented, and used by the Permittees to comply with 40 CFR Part 264 and Part 268 regulatory requirements. Section C.2 Waste Analysis Parameters: Includes a discussion of the ~~proposed~~ hazardous waste analytical parameters and methods used by the Permittees and the criteria/rationale for parameter selection. Section C.5 Special Procedural Requirements: Includes a discussion of the characterization procedures in place ~~for ignitable, reactive, and incompatible wastes; procedures~~ to ensure compliance with 40 CFR 268 Land Disposal Restrictions~~land disposal restrictions~~ (LDR),~~;~~ and procedures to ensure compliance with 40 CFR Part 264 Subpart CC requirements.	provide updated terminology, and remove abbreviations and acronyms wherever possible to improve understandability of the document.
C.1, Facility Description	LANL ~~(the *Facility*)~~ is located in Los Alamos County in north-central New Mexico. It is approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe. The Facility and the associated residential and commercial areas of Los Alamos County are situated on the Pajarito Plateau. The Facility is owned by the U.S. Department of Energy (DOE) and is operated jointly by DOE; Triad National Security, LLC, (Triad); and	The Permittees propose consolidation of the locations of descriptions of hazardous waste management units at LANL within this plan.

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Permit Attachment Section	Proposed modification	Justification
	Newport News Nuclear BWXT-Los Alamos, LLC (N3B) (collectively the *Permittees*). ~~A more complete Facility description is provided in Attachment A~~The permitted units used for storage and treatment of wastes addressed in this WAP are located within various Technical Areas (TAs) at the Facility. These units are listed in Attachment J (*Hazardous Waste Management Units*). Detailed information on the permitted units is provided in Attachment A (*Technical Area Unit Descriptions*).~~.~~	
C.1.1, Facility Waste-Generating Processes and Activities	Wastes are primarily generated at the Facility ~~primarily~~ from research and development (R&D) activities, processing and recovery operations, decontamination and decommissioning (D&D) projects, and environmental restoration ~~(ER)~~ activities. Wastes generated from these types of processes and activities may also be received from off-site facilities (*see* Section C.4~~Attachment L (*Listing of Off-Site Facilities*)~~) and Permit Section 2.2.1. Tables C-1~~2~~ through C-4~~5~~ present descriptive information on non-mixed hazardous wastes, mixed low-level waste~~MLLW~~, and mixed transuranic waste~~MTRUW~~ potentially generated at the Facility. ~~Wastes generated at off-site facilities that may be received at the Facility are described in Table C-8.~~ These tables include brief waste descriptions, brief descriptions of the waste-generating process or activity, the characterization basis for waste designation, potential U.S. Environmental Protection Agency (EPA) Hazardous Waste Number(s), the hazardous constituent(s) listed in Appendix VIII of 40 CFR Part 261 and/or the characteristic(s) defined at 40 CFR Part 261, Subpart C that make the waste hazardous, and the regulatory limits, as appropriate.	The Permittees propose the editorial changes within this section to clarify text to point to the correct Permit Section, spell out acronyms, and delete reference to a table that is not included in the plan.
C.1.2, Stored Waste	Non-mixed hazardous waste, mixed low-level waste~~MLLW~~, and mixed transuranic waste~~MTRUW~~ are stored at various container storage hazardous waste management units throughout the Facility.	The Permittees propose the edits within this section for clarity and to remove abbreviations and acronyms wherever possible to improve understandability of the document.

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C.1.2.1, Non-Mixed Hazardous Waste	Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose the edits to this section to make minor editorial changes to language within the section, to add information regarding explosives waste for the addition of open burning and open detonation units, and to remove abbreviations and acronyms wherever possible to improve understandability of the document.
C.1.2.2, Mixed Low-Level Waste	Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	Permittees have proposed the edits to this section for clarity, to update relevant references, to add identification numbers to the mixed waste descriptions, to remove reference to a waste stream that is well documented within other waste streams, and to remove abbreviations and acronyms wherever possible to improve understandability of the document.
C.1.2.3, Mixed Transuranic Waste	Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose the edits to this section to update the section overall, as this section was originally drafted prior to the Waste Isolation Pilot Plant's (WIPP) ability to accept waste. In the time since the operational start for the WIPP, descriptions, practices, characterization, and shipment to the WIPP have been updated from those terminologies and practices

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		originally utilized for transuranic waste. Information that appears to be deleted has been incorporated into the table representation of mixed transuranic waste in Table C-4, *Descriptions of Mixed Transuranic Waste Stored at the Facility*. Additionally, the section has been updated for clarity and to remove abbreviations and acronyms wherever possible to improve understandability of the document.
C.1.3, Treated Wastes and added subsections C.1.3.1, Open Burning/Open Detonation C.1.3.2, Macroencapsulation Wastes C.1.3.3, Stabilization in Containers C.1.3.4, Cementation Wastes	Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose rearrangement of information and subsections to provide detailed information of the types of treatment processes including the addition of open burning and open detonation waste treatment units for the proposed addition of these units to the Permit; add information and references regarding waste treated by macroencapsulation; treatment by stabilization in containers; and cementation wastes. Additionally, the section and subsections have been updated for clarity and to remove abbreviations and acronyms wherever possible to improve understandability of the document.

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Former C.1.4, Description of Permitted Units	~~**C.1.4 Description of Permitted Units**~~ ~~The permitted units used for storage and treatment of wastes addressed in this WAP are located within various TAs at the Facility. These units are listed in Attachment J (*Hazardous Waste Management Units*). Detailed information on the permitted units is provided in Attachment A (*Technical Area Unit Descriptions*).~~	The Permittees propose to move this information to the plan in Section C.1 where it is more appropriate.
C.2, Waste Analysis Parameters	The Permittees shall conduct detailed chemical and physical characterization for ~~on~~ non-mixed hazardous wastes, the hazardous component of ~~MLLW~~mixed low-level waste, and the hazardous component of ~~MTRUW~~mixed transuranic waste as required by 40 CFR § 264.13 and Permit Section 2.4. The Permittees shall select waste analysis parameters to ensure that the waste characterization documentation will contain the information necessary to manage the waste in accordance with Resource Conservation and Recovery Act (RCRA) general facility standards in 40 CFR Part 264 and the LDR requirements in 40 CFR Part 268.	The Permittees propose edits to the section for minor editorial changes and to remove abbreviations and acronyms wherever possible to improve understandability of the document.
C.2.1, Analytical Parameters and Methods	The Permittees shall use the characterization methods for non-mixed hazardous wastes, ~~MLLW~~mixed low-level waste, and ~~MTRUW~~mixed transuranic waste summarized in Tables C-6~~9~~ through C-8~~11~~ to quantify the waste characterization parameters in those tables. The Permittees shall comply with the sampling and analysis requirements of Permit Sections 2.4.1 through 2.4.9. The Permittees shall use the methods listed below, as necessary, for the wastes listed in ~~Attachment~~ Section C.1. 1. Acceptable Knowledge (AK); 2. Sampling and laboratory analysis to determine the presence and concentrations of~~:~~ - RCRA-regulated metals,	The Permittees propose edits to the section to include the revised table numbers and to remove abbreviations and acronyms wherever possible to improve understandability of the document.

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	- RCRA-regulated volatile organic compounds (VOC), and - RCRA-regulated semi-volatile organic compounds (SVOC); 3. Additional ~~MTRUW~~mixed transuranic waste characterization sampling methods:~~;~~ - Headspace gas sampling to determine the presence of VOCs in container headspace, and - Physical waste form characterization through real-time radiography (RTR) and/or visual examination;	
C.2.2, Criteria and Rationale for Characterization Methodology Selection	Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose edits to the section to include the table revision numbers and to remove abbreviations and acronyms wherever possible to improve understandability of the document. Other minor editorial changes condense language and descriptions of laboratory test methods required by the Facility and removal of duplicative language that is covered in another section of the plan.
C.3, Characterization Methods	Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose edits to move language around in section and provide clearer language; make minor editorial changes; change "permitted unit" to "hazardous waste management

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		unit" for clarification; bullet a numbered list that does not describe steps, and to refer to waste characterization documentation and not limit the language to "forms", an outdated practice.
C.3.1, Hazardous and Mixed Low-Level Waste Characterization	Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose minor editorial changes for clarity, update references to tables, remove numbers from listed items that are not steps, and to remove abbreviations and acronyms wherever possible to improve understandability of the document.
C.3.1.1, Acceptable Knowledge	Edits to spell out acronyms and update language, to the types of acceptable knowledge, and to change numbered list to bulleted list. Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose minor editorial changes for clarity, remove outdated references, adjust language regarding recordkeeping, remove numbering from a list that does not describe steps, update the types of acceptable knowledge that exist, update terminology, and remove abbreviations and acronyms wherever possible to improve understandability of the document.
C.3.1.1.1, Process Knowledge	Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose edits to remove numbering from a list that does not describe steps, to spell out an acronym, and to remove outdated terminology for safety data sheets.

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C.3.1.2, Sampling and Analysis	The Permittees shall, when it is necessary to conduct sampling and analysis to fully characterize a waste, utilize the analytical methods specified in Tables C-11~~9~~ through C-13~~18~~ for the identification of any hazardous constituents likely to be present based on the source of the waste stream and AK.	The Permittees propose updated references to tables.
Former C.3.1.2.1, Solid Waste Analysis renamed to Toxicity Characteristic Analysis and removal of former C.3.1.2.2, Liquid Waste Analysis	Consolidation of language and sections for clarification and renaming the section. Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*. Propose section name to change to *Toxicity Characteristic Analysis*.	The Permittees propose edits to change the name of the section and updates to the description of characterization for toxicity to include discussion of the applicable method in one location within the waste analysis plan. Additional changes include the removal of the 2nd part of the subsection because the same method is utilized for characterization of both solid and liquid waste.
Renumbered C.3.1.2.2, Sample Handling, Preservation, and Storage	Table C-10~~15~~ presents ~~requirements specified in~~ the most recent ~~version of~~ *SW-846* requirements for ~~regarding~~ sample containers, preservation techniques, and holding times associated with sample collection. These~~The Permittees shall adhere to these~~ requirements to ensure that sampling and analysis meet quality objectives for data.~~. In the event the specified criteria are not met, the Permittees shall collect another sample~~ and ~~submit it for~~ analysis. meet quality objectives for data~~.~~	The Permittees propose editorial changes to clarify language, to update table references, and to propose change to requirement to collect an additional sample since adherence to the SW-846 method meets data quality objectives.
Renumbered C.3.1.2.3, Analytical Laboratory Selection and Analytical Methods	The Permittees shall ensure that analytical laboratories at the Facility and approved contractor laboratories conduct the detailed qualitative and quantitative chemical analyses specified in Tables C-11~~16~~ and C 12~~-17~~.	The Permittees propose edits to update table references.
Renumbered C.3.1.3, Characterization of Waste to be Treated by Macroencapsulation	Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose to change the subsection title to correct a typographical error. The remaining changes to the section provide a

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		more detailed description of macroencapsulation.
Newly added C.3.1.4, Characterization of Waste to be Treated by Open Burning and Open Detonation	Language added to incorporate waste streams for proposed permitted treatment. Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose the added section to provide description of waste treated by open burning/open detonation since these units are proposed to be permitted in the Permit Renewal Application.
Renumbered C.3.1.5, Verification Frequencies	Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose renumbering of the section based on the updated and added sections prior.
C.3.2, Mixed Transuranic Waste Characterization	Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose edits to update table references, to spell out acronyms, to provide clarification regarding the characterization process of acceptable knowledge and the WIPP certification procedures for waste acceptance, and minor editorial changes for clarity. Information regarding the WIPP certification procedures are moved from a later section to this section to consolidate the information. Additionally the Permittees propose changes to emphasize that the waste characterization determination performed per Permit Section 2.4.1, *General Waste Characterization Requirements*, of the 2010 Permit will lead to the container

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Permit Attachment Section	Proposed modification	Justification
		management requirements associated with free liquids.

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Permit Attachment Section	Proposed modification	Justification
Renumbered C.3.2.1, Real-Time Radiography	**C.3.2.1.~~1~~ Real-Time Radiography** ~~MTRUW~~Mixed transuranic waste containers may~~generated after the effective date of the Permit and that are~~ not be~~wastes taken from retrievable storage after that date are not~~ required to undergo RTR if associated AK documentation contains the information necessary to fully characterize the waste in accordance with Permit Section 2.4.1 and the requirements of the WIPP waste acceptance criteria.~~Permit Section 2.4.1.~~ Otherwise, all ~~MTRUW~~mixed transuranic waste~~MTRUW~~ containers require RTR prior to storage at the Facility. RTR is a nondestructive, qualitative, and semi-quantitative characterization technique that involves x-ray scanning of waste containers to identify and verify the physical form(s) of waste container contents using appropriate equipment and qualified operators. The Permittees shall use RTR to verify the absence of free liquids, to confirm the physical form of containerized waste, and to document the materials present. The Permittees shall ensure that during RTR the waste container is scanned while the operator views and permanently records the image from the television screen on audio and videotape. The radiography image is examined for evidence of liquids by repetitively moving the container-handling system and searching for evidence of wave motion. The Permittees shall utilize a radiography data form to document the materials present and all other relevant characterization information about the containerized waste. The Permittees shall allow only properly trained personnel to operate radiography equipment. Standardized training requirements for radiography operators are based upon existing industry standard training requirements. Operators must requalify ~~at least every two years~~periodically, as required.	The Permittees propose edits to renumber subsection, provide updated protocol for the real-time radiography process, and provide additional description of how liquids are screened.

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Renumbered C.3.2.2, Visual Examination	**C.3.2.~~1.~~2 Visual Examination** Visual ~~The Permittees may use visual~~ examination (VE) or visual inspection (VI) is used to verify the contents of mixed transuranic waste~~MTRUW~~ containers as a substitute to RTR or during packaging of the waste. VE/VI is performed by physically examining the contents of a waste container to verify that the container is properly included in the appropriate waste stream, to verify the absence of free liquids, to confirm the physical form of containerized waste, and to document the materials present. The Permittees shall ensure that waste characterization determined through VE/VI is recorded in the associated waste's AK documentation. ~~Standardized training for VE shall be developed.~~ Visual examination operators shall be trained in the specific waste generating processes, typical packaging configurations, and waste material parameters expected to be found in each waste stream at the generator site. The training shall be site-specific to include the various waste configurations generated at the site. Operators must requalify ~~at least every two years~~periodically, as required.	Edit to spell out acronyms and add "visual inspection" wording to the section as well as a proposed change to allow frequency of requalification as needed.

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New C.3.2.3, Headspace Gas Analysis	**C.3.2.3 Headspace Gas Analysis** Headspace gas analysis is used to confirm the presence and concentration of flammable gas/volatile organic compounds (VOCs), hydrogen, and methane in a mixed transuranic waste container intended for shipment to WIPP. A sample of headspace gas is taken through the vent assembly of a waste container at controlled temperatures and analyzed by gas chromatography and thermal conductivity. Waste characterization information collected through headspace gas analysis is recorded in the associated waste's AK documentation.	The Permittees propose insertion of a section to describe headspace gas screening characterization.
Renumbered C.3.2.4, Characterization to Meet LDR Requirements	**C.3.2.4~~2~~ Characterization to Meet LDR Requirements** Mixed transuranic waste is characterized~~The Permittees shall characterize MTRUW~~ to determine its land disposal restriction status in accordance with Attachment Section C.5.2.	The Permittees propose a renumbering of the section and an edit to spell out acronym.

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Former C.3.2.3, WIPP Characterization	~~**C.3.2.3 WIPP Characterization**~~ ~~Most MTRUW waste at the Facility is destined for disposal at the Waste Isolation Pilot Project (WIPP) in Carlsbad, New Mexico. Therefore, prior to shipment to WIPP, additional characterization to meet WIPP certification procedures will be implemented to meet requirements of the WIPP permit for these wastes. Waste information that is derived from the WIPP waste characterization will be used for Facility MTRUW characterization as additional information for AK.~~	The Permittees propose movement of this information to the introductory Section C.3.2, *Mixed Transuranic Waste Characterization,* to consolidate the information.
Renumbered and repurposed C.3.2.5, Characterization Procedures for Treatment of Mixed Transuranic Wastes by Stabilization (Cementation)	Description of stabilization treatment process at TA-55 and removal of text associated with process at TA-50-69. Please see specific revisions within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose edits to renumber the subsection and to discuss the characterization procedures specifically used at the cementation unit at TA-55. This would no longer combine the two distinctly separate processes in a single section and would organize the plan to discuss transuranic waste treatment processes separately.

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Renumbered and repurposed C.3.2.6, Characterization Procedures for Treatment of Mixed Transuranic Waste by Stabilization in Containers	Description of stabilization treatment process at TA-50-69 and removal of text associated with remediated and unremediated nitrate salt-bearing waste. Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees have proposed edits to this section to discuss the stabilization unit at TA-50-69 that is permitted for treatment of mixed transuranic waste by stabilization, spell out acronyms, and update references to the correct table as well as minor editorial changes for clarity. Removal of the nitrate salt-bearing waste text is proposed because these waste containers have been treated and all required verification testing has been conducted.
Former C.3.2.4.2, Characterization Procedures for Waste Treated by Stabilization	~~C.3.2.4.2 Characterization Procedures for Waste Treated by Stabilization~~ ~~**The Permittees shall characterize waste treated by stabilization (*i.e.*, MTRUW) in accordance with Attachment Section C.3.2. For treatment at the TA-50-69 Indoor Permitted Unit, samples will be collected from a minimum of 1% of treated waste containers from each waste stream and analyzed at an onsite laboratory to confirm chemical composition when compared to that of the surrogates tested.**~~	The Permittees propose deletion of this section since more detailed information treated at the unit is proposed in previous subsection C.3.2.6.
Former C.3.2.5, Sample Handling, Preservation, And Storage	~~C.3.2.5 Sample Handling, Preservation, and Storage~~ ~~Table C-15 presents the most recent *SW-846* requirements regarding sample containers, preservation techniques, and holding times associated with sample collection. The Permittees shall adhere to these requirements to ensure that sampling and analysis meet quality objectives for data.~~	The Permittees propose deletion of this section since SW-846 is discussed in Section C.3.2.3.1.

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C.5.2, Procedures to Ensure Compliance with LDR Requirements	Waste designated to be disposed of at the ~~Waste Isolation Pilot Plant (~~WIPP~~)~~ must undergo characterization to determine whether it is subject to the land disposal prohibitions, but it is not required to be characterized to determine all applicable underlying hazardous constituents listed in 40 CFR § 268.48.	The Permittees propose correction of a typographical error.
C.5.4, Procedures To Ensure Compliance With Subpart CC Requirements	However, if sampling and analysis is needed, the Permittees shall conduct it in accordance with the approved methods identified at 40 CFR §§ 265.1084(a)(3)(iii)(A) through 265.1084(a)(3)(iii)(I), and listed in Tables C-11~~16~~, C-12~~17~~, and C-13.~~18.~~ The Permittees shall review the characterization documentation before acceptance of the waste at ~~TA-54~~ any permitted storage unit as required in Permit Section 2.4.7.	The Permittees propose edits to update table numbers and to encompass all permitted storage units.
C.6, References	DOE, 2011~~1999~~, "Radioactive Waste Management Manual," *DOE Manual~~Order~~ M435.1*, U.S. Department of Energy, Washington, D.C. DOE, 1995, "DOE Waste Treatability Groups Guidance," Revision 0.0, U.S. Department of Energy, Idaho Operations Office. ~~EPA, 1994a, "Waste Analysis at Facilities that Generate Treat, Store, and Dispose of Hazardous Wastes, A Guidance Manual," *OSWER 9938.4-03*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.~~ EPA, 2015, "Waste Analysis at Facilities that Generate Treat, Store, and Dispose of Hazardous Wastes, A Guidance Manual," EPA 530-R-12-001, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C. EPA, 1994~~b~~, "Use of Total Waste Analysis in Toxicity Characteristic Determinations," FAXBACK 13647, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C.	The Permittees update the list of referenced documents to reflect other changes to the plan.

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All Tables	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose the renumbering of tables so that there are no table names listed as "reserved" at permit renewal issuance. Additional tables are proposed to incorporate the open burning/open detonation units in Permit Renewal Application. Technical edits that include grammatical changes and formatting consistency are also proposed within the tables for consistency and readability.
Table C-1	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose deletion of the reservation placeholder and moving former Table C-2 to Table C-1. Minor edits to title, formatting, and footnotes are proposed for consistency and readability.
Table C-2	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose movement of former Table C-3 to Table C-2. Minor edits to title, formatting, spelling out acronyms, and footnotes for consistency and readability.
Table C-3	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose movement of former Table C-4 to Table C-3. Minor edits to title and formatting for consistency and readability.

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Table C-4	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose movement of former Table C-5 to Table C-4. A replacement table provides clearer summary information for mixed transuranic waste table. The replacement table provides newer information and correlation of TRUCON codes with LA waste description categories and waste generating facilities.
Table C-5	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan.*	The Permittees propose removal of the reservation placeholder and adding the table to accommodate open burning and open detonation treatment processes.
Table C-6	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose the removal of the previous reservation placeholder for Tables C-7 and 8. The Permittees propose movement of former Table C-9 to Table C-6. Minor edits to title, formatting, spelling out acronyms, and footnotes for consistency and readability.
Table C-7	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose movement of former Table C-10 to Table C-7. Minor edits to title, formatting, defining an acronym, and updating the footnotes for consistency and readability.
Table C-8	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose movement of former Table C-11 to Table C-8. Minor edits to title and formatting for consistency and readability.

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Table C-9	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose removal of the reservation placeholder and addition of a table to accommodate open burning and open detonation treatment processes.
Table C-10	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose deletion of previous placeholder Tables C-13 and 14. The Permittees propose movement of former Table C-15 to Table C-10. Several edits have been proposed to incorporate updated sample holding time and temperature requirements from SW-846, Update VI, Rev. 6, December 2018. Minor edits to title and formatting for consistency and readability.
Table C-11	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose movement of former Table C-16 to Table C-11. Minor edits to title and formatting, and updates to U.S. Environmental Protection Agency method numbers for consistency and readability.
Table C-12	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose movement of former Table C-17 to Table C-12. Minor edits to title and formatting, and updates to U.S. Environmental Protection Agency method numbers for consistency and readability.

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Table C-13	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose movement of former Table C-18 to Table C-13. Minor edits to title and formatting, and updates to U.S. Environmental Protection Agency method numbers for consistency and readability.
Table C-14	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose movement of former Table C-19 to Table C-14. Minor edits to title and formatting for consistency and readability.
Table C-15	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose movement of former Table C-20 to Table C-15. Minor edits to title and formatting for consistency and readability.
Table C-16	Please see revised text within Supplement 1-3, *Permittees' Proposed Changes to Attachment C, Waste Analysis Plan*.	The Permittees propose movement of former Table C-21 to Table C-16. Minor edits to title, spelling out of acronyms, and formatting for consistency and readability.

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The contingency plan has been modified to include proposed text as follows: (1) text has been added to support permit issuance of the interim status open burning unit and two open detonation units; (2) permit sections have been reorganized by deleting introductory text for specific technical areas and consolidating this text in one location (with no text change); and (3) minor non-substantive editorial and/or clarifying text (e.g., substituting "hazardous" waste for "mixed" waste; consolidation of table numbers; removal of duplicative references; and correction of formatting and grammatical errors). Note, the vast majority of the proposed text changes address the addition of the interim status open burning and open detonation units and the reorganization and consolidation of permit sections associated with introductory text for specific technical areas.

Permit Attachment Section	Proposed modification	Justification
Table of Contents	Please see revision to the list of tables within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The table of contents for the attachment has been updated to incorporate the changes proposed within the attachment.
List of Tables	Please see revision to the list of tables within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose to revise the list of tables to reflect the rearrangement of tables and address the Permittees' proposal to remove duplicative tables from the attachment for clarity.
Throughout the document	All references to "or mixed" or "and mixed" when referring to "hazardous waste" are proposed to be removed. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose this change throughout the Permit where appropriate. The distinction between hazardous waste and mixed waste is a distinction that the Permittees previously included within permit applications and is now an outdated usage. The Permittees propose removal of "mixed waste" for clarity. It is understood that the term "hazardous waste" means both non-radioactive hazardous and mixed waste.

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Permit Attachment Section	Proposed modification	Justification
Throughout the document	Numbering of paragraphs within most sections has been removed and formatting and other grammatical edits have been made for consistency. These changes do not make technical changes to the document. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose these edits in the cases where paragraphs do not require numbering as they are not instructions or steps that need to be followed in sequential order. Technical edits proposed are all reflected in the redline document, but may not be specifically highlighted in this table because formatting changes are difficult to highlight in table format.
Renamed D.1, Hazardous Waste Emergency Response Resources	**D.1 HAZARDOUS ~~AND MIXED~~ WASTE EMERGENCY RESPONSE RESOURCES** ~~1.~~ The management of hazardous and mixed waste emergency incidents at the Facility resides within the Permittees' emergency management and emergency response organizations. edits: Additional Facility resources that may provide assistance in an emergency include personnel from health physics, industrial hygiene, environment compliance, emergency response, and radiation protection ~~personnel~~ at the Facility. These personnel as well as other resources are discussed in Attachment Sections D.1.2, D.1.3, D.1.~~6~~4, and D.1.6~~D.5~~ of this Attachment.	The Permittees propose the renaming of the section and adding "emergency response" organization in addition to the emergency management organization for completeness. Proposal of additional technical edits and corrections are also included.
D.1.1, Emergency Management	The Incident Response Commander ~~will~~ responds to emergency incidents involving the release of hazardous ~~or mixed~~ waste to the environment, including spills, fires, and explosions.	The Permittees propose this change to reflect present tense, rather than future tense.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment D

Permit Attachment Section	Proposed modification	Justification
D.1.1, Emergency Management	The Incident Response Commander responding to an emergency shall have access to various tools to include Emergency Actions Levels with prescribed protective actions and ~~ChemLog with~~ a current chemical inventory of the appropriate building(s) in the area in which the incident is occurring.	The Permittees propose the change because the database utilized for chemical inventory is no longer referred to as "Chemlog" and to remove unnecessary specificity within the Permit.
D.1.1, Emergency Management	(H~~h~~)	The Permittees propose the correction of a typographical error.
D.1.2, Hazardous Materials Response	Hazardous Materials (HAZMAT) personnel are responsible for the aggressive mitigation of chemical, radiological, and hazardous waste~~, and mixed waste~~ emergencies, including field decontamination of responders and response equipment.	The Permittees propose to change the sentence structure to address the removal of "mixed waste" from the sentence.
D.1.6.2, Occupational Medicine Personnel	The locations of this and other emergency facilities are shown on Figure D-2, *Emergency Facilities at Los Alamos National Laboratory*~~49 in Attachment N *(Figures)*~~.	The Permittees propose the inclusion of this figure within the contingency plan rather than presenting it separately in Permit Attachment N, because it is more appropriate for the figure to be part of the contingency plan rather than reference a separate attachment of the Permit.
D.2.1, Emergency Equipment	Attachment Tables D-3 through D-15~~TA-3, D-1; TA-50, D-1; TA-54, Area L, D-1; TA-54, Area G, D-2; TA-54 West, D-3; TA-55 Building 4 First Floor, D-1; TA-55 Building 4 Basement, D-2; TA-55 Container Storage Pad, D-3; TA-55-0355 Pad, D-4; and TA-63 Transuranic Waste Facility, D-1~~.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity, to remove inconsistent and redundant information, and to remove subtitle pages within the attachment. The changes proposed in this section reflect proposed revisions later in the contingency plan.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment D

Permit Attachment Section	Proposed modification	Justification
D.4.1, Spill Control Procedures	Attachment Tables D-3 through D-15~~TA-3, D-1; TA-50, D-1; TA-54, Area L, D-1; TA-54, Area G, D-2; TA-54 West, D-3; TA-55 Building 4 First Floor, D-1; TA-55 Building 4 Basement, D-2; TA-55 Container Storage Pad, D-3; TA-55-0355 Pad, D-4; and TA-63 Transuranic Waste Facility, D-1~~ list emergency equipment available.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity, to remove inconsistent and redundant information, and to remove subtitle pages within the attachment. The changes proposed to this section reflect proposed revisions later in the contingency plan.
D.4.2, Decontamination Verification	Appropriate analytical method(s) given in the most recent version of the U.S. EPA's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846) ~~Analytical method(s) given in Table D-3~~ will be utilized, as appropriate. If the spill is from other than an identifiable source, the spilled material will be analyzed for the appropriate parameters listed in ~~Table D-3~~40 CFR 261, Subpart C.	The Permittees propose updating the reference so that it cites the listing of test methods and the location in the regulations that list characteristic waste. The methods are kept up-to-date and this reduces the risk of the Permittees failing to update a table within the contingency plan when the methods are updated.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment D

Permit Attachment Section	Proposed modification	Justification
D.4.2, Decontamination Verification	The baseline samples and final washwater/used sorbent samples will be analyzed for the applicable parameters within 40 CFR 261, Subpart C, and analyzed using the appropriate devices and methods as described in the most recent version of the SW-846. These and other approved methods approved by the Department will be used as necessary, to determine whether a waste stream is hazardous and to identify underlying hazardous constituents~~given in Attachment Table D-2~~. If the decontamination samples contain hazardous constituents that are not present in the baseline samples, the decontamination procedure shall be repeated. An alternative demonstration of decontamination may be proposed and justified to the Department, who will evaluate the proposed alternative in accordance with the standards and guidance currently in effect. If the proposed alternative is accepted, decontamination levels will meet the levels approved by the Department. ~~Each sample will be collected with an appropriate sampling device (*e.g.*, a thief or trier) as specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (EPA, 1986), and approved updates, as applicable.~~	The Permittees propose updated reference to the listing of test methods and the location of those methods according to the hazardous waste regulations. The methods are kept up-to-date and this reduces the risk of the Permittees failing to update a table within the contingency plan when the methods are updated.
D.6, Fire	Information related to the various fire alarms at the specific units is included in Attachment Tables D-3 through D-15~~TA-3, D-1; TA-50, D-1; TA-54, Area L, D-1; TA-54, Area G, D-2; TA-54 West, D-3; TA-55 Building 4 First Floor, D-1; TA-55 Building 4 Basement, D-2; TA-55 Container Storage Pad, D-3; TA-55-0355 Pad, D-4; and TA-63 Transuranic Waste Facility, D-1~~.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity, to remove inconsistent and redundant information, and to remove subtitle pages within the attachment. The changes proposed to this section reflect proposed revisions later in the contingency plan.
D.9.2, Evacuation Plan	Attachment Table D-2~~3~~ lists the criteria for evacuation, persons responsible for initiating evacuations, and reentry conditions.	The Permittees propose to update the table numbering based on the deletion of a table.

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Permit Attachment Section	Proposed modification	Justification
D.11, Emergency Response Records and Reports	The Permittees shall ensure that any emergency that requires implementation of this Plan will be documented and reported in accordance with requirements of 40 CFR § 264.56 and Permit Sections 1.9.12, 1.9.13, and 2.11.6.3. This information will be maintained in the facility operating record.	The Permittees propose to add a reference to the regulation for completeness and correction of a typographical error.
D.13 References	~~**D.13 REFERENCES**~~ ~~EPA, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *EPA-SW-846*, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, U.S. Government Printing Office, Washington, D.C.~~ ~~LANL, 2014. *LANL Emergency Procedures and Protective Actions, P1201-4, R3.* Los Alamos National Laboratory, Security and Emergency Operations Division, Los Alamos, New Mexico~~ ~~LANL, 2002, "Los Alamos National Laboratory General Part B Permit Renewal Application", Revision 2.0, August 2002, LA-UR-03-5923, Los Alamos National Laboratory, Los Alamos, New Mexico.~~	The Permittees propose the removal of this section because the references are no longer relevant or are no longer included within this contingency plan.
Table D-1, Los Alamos National Laboratory-Wide Emergency Equipment	Formatting for the table has been corrected. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose formatting corrections within the table.

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Permit Attachment Section	Proposed modification	Justification
Removed Table D-2, Waste Analysis Parameters and Test Methods	Deletion of the table. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose deletion of this table as it is more appropriate for waste analysis parameters and test methods to be referenced from a waste analysis plan or SW-846 as discussed in Section D.4.2 rather than included within a plan to be implemented in case of an emergency.
Renumbered and renamed Table D-2, Evacuation Determination and Reentry Conditions	Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose to update the table numbering based on the deletion of a table and to update the title of the table to match the content.
Figure D-1, General Hazardous Waste Emergency Notification Structure	Figure name updated and moved after tables within the attachment. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose to remove "and Mixed" from the title, and move the figures after the tables within the contingency plan to be consistent with other attachments of the Permit.
Former TA-3, Attachment D Contingency Plan	Removed subtitle page and the general information for TA-3 permitted unit. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the subtitle pages and general information for each of the Technical Areas be removed from the contingency plan to decrease redundancy within the plan and make the plan more concise to follow in case of an emergency.

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Renumbered Table D-3, TA-3, Building 29 Emergency Equipment	**Table D-3~~1~~** **~~T~~A-3, Building 29** Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity, to remove inconsistent and redundant information, and to remove subtitle pages within the attachment. Additionally, the building number was added to the table name for clarity.
Table D-4, TA-16 Emergency Equipment	Addition of table. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The addition of Table D-4 to the plan is proposed by the Permittees to incorporate the emergency equipment for an open burning treatment at LANL. Application requirements for this unit are described or included in Section 5 of this Permit Renewal Application.
Table D-5, TA-36 Emergency Equipment	Addition of table. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The addition of Table D-5 to the plan is proposed by the Permittees to incorporate the emergency equipment for an open detonation treatment at LANL. Application requirements for this unit are described or included in Section 4 of this Permit Renewal Application.

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Table D-6, TA-39 Emergency Equipment	Addition of table. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The addition of Table D-6 to the plan is proposed by the Permittees to incorporate the emergency equipment for an open detonation treatment at LANL. Application requirements for this unit are described or included in Section 4 of this Permit Renewal Application.
Former TA-50, Attachment D Contingency Plan	Removed subtitle page and the general information for TA-50 permitted units. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the subtitle pages and general information for each of the Technical Areas be removed from the contingency plan to decrease redundancy within the plan and make the plan more concise to follow in case of an emergency.
Renumbered Table D-7, TA-50 Emergency Equipment	**Table D-7~~1~~** Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity and to remove inconsistent and redundant information and subtitle pages within the attachment.
Former TA-54, Attachment D Contingency Plan	Removed subtitle page and the general information for TA-54 permitted units. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the subtitle pages and general information for each of the Technical Areas be removed from the contingency plan to decrease redundancy within the plan and make the plan more concise to follow in case of an emergency.

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Permit Attachment Section	Proposed modification	Justification
Renumbered Table D-8, TA-54 Area L Emergency Equipment	**Table D-8~~1~~** Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity, to remove inconsistent and redundant information, and to remove subtitle pages within the attachment.
Renumbered Table D-9, TA-54 Area G Emergency Equipment	**Table D-9~~2~~** Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity and to remove inconsistent and redundant information and subtitle pages within the attachment.
Renumbered Table D-10, TA-54 West Emergency Equipment	**Table D-10~~3~~** Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity and to remove inconsistent and redundant information and subtitle pages within the attachment.
Former TA-55, Attachment D Contingency Plan	Removed subtitle page and the general information for TA-55 permitted units. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the subtitle pages and general information for each of the Technical Areas be removed from the contingency plan to decrease redundancy within the plan and make the plan more concise to follow in case of an emergency.

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Permit Attachment Section	**Proposed modification**	**Justification**
Renumbered Table D-11, TA-55 Building 4, First Floor Emergency Equipment	**Table D-~~1~~11** Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity and to remove inconsistent and redundant information and subtitle pages within the attachment.
Renumbered Table D-12, TA-55 Building 4 Basement Emergency Equipment	**Table D-~~2~~12** Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity and to remove inconsistent and redundant information and subtitle pages within the attachment.
Renumbered and renamed Table D-13, TA-55 Outdoor Storage Pad Emergency Equipment	**Table D-13~~3~~** **TA-55 ~~Container~~ Outdoor Storage Pad** Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity and to remove inconsistent and redundant information and subtitle pages within the attachment. The Permittees also propose to correct the name of this unit within the table.

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Renumbered Table D-14, TA-55-0355 Pad Emergency Equipment	**Table D-14~~4~~** Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity and to remove inconsistent and redundant information and subtitle pages within the attachment.
Former TA-63, Attachment D Contingency Plan	Removed subtitle page and the general information for TA-63 permitted unit. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the subtitle pages and general information for each of the Technical Areas be removed from the contingency plan to decrease redundancy within the plan and make the plan more concise to follow in case of an emergency.
Renumbered Table D-15, TA-63 Transuranic Waste Facility Emergency Equipment	**Table D-15~~1~~** Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose the rearrangement and renaming of the tables of emergency equipment included within the contingency plan for clarity and to remove inconsistent and redundant information and subtitle pages within the attachment.
Figure D-2, Emergency Facilities at Los Alamos National Laboratory	Figure moved to after tables within the attachment. Please see specific revisions within Supplement 1-4, *Permittees' Proposed Changes to Attachment D, Contingency Plan*.	The Permittees propose movement of this figure to the contingency plan from Figure 49 in Attachment N, *Figures*. It is more appropriate to include this figure within the contingency plan.

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The inspection plan has been modified to include proposed text as follows: (1) permit sections have been reorganized by moving text to a different section to improve clarity and readability and to facilitate permit implementation (with no text change); (2) minor editorial changes to improve clarity and readability and to facilitate permit implementation; and (3) formatting and grammatical changes are included to promote consistency.

Permit Attachment Section	Proposed modification	Justification
Table of Contents	Please see revised Table of Contents within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The table of contents within the permit has been updated to include deleted sections as well as additions for treatment units that the Permittees have proposed to be added.
List of Forms	FORM~~IGURE~~ NO. TITLE E-1 Hazardous Waste Facility Inspection Record Form E-2 Annual TA-50-69 Storm Water Drainage Inspection Form E-3 Monthly Area L, Dome 215 Holding Tank Inspection Form ~~E-1 Hazardous Waste Facility Inspection Record Form~~	The Permittees propose to update the list of figures within this Permit Attachment to a list of forms and include the three forms that are part of the attachment.
Throughout the document	All references to "or mixed" or "and mixed" when referring to "hazardous waste" are proposed to be removed. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose this change throughout the Permit where appropriate. The distinction between hazardous waste and mixed waste is a distinction that the Permittees previously included within permit applications and is now outdated and is proposed for removal for clarity. It is understood that the term "hazardous waste"

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Permit Attachment Section	Proposed modification	Justification
		means both non-radioactive hazardous and mixed waste.
Throughout document	Please see revised Table of Contents within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	Throughout the document technical edits have been proposed to provide consistency with formatting, update and correct grammatical errors. Technical edits proposed are all reflected in the redline document, but may not be specifically highlighted in this table because formatting changes are difficult to highlight in table format.
Throughout document	Heading formatting and leveling have been updated to be consistent throughout the document. Revisions are included within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	Permittees propose changes to improve the quality of the document and correct inconsistencies.
Throughout the document	Numbering of paragraphs within most sections has been removed. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose these edits in the cases where paragraphs do not require numbering as they are not instructions or steps that need to be followed in sequential order.
Introduction	This Attachment presents inspection requirements applicable to ~~all~~ active hazardous ~~or mixed~~ waste management units (permitted units) at Los Alamos National Laboratory (LANL). Inspection schedules for the units have been developed to identify equipment malfunctions and deterioration, operator errors, and discharges that ~~might~~ may cause or lead to a release of hazardous ~~or mixed~~ waste and pose a threat to human health and the environment. ~~The Permittees~~ Inspections~~,~~ shall be conducted ~~Inspections,~~ at the schedule specified herein to identify problems in time to correct them before they may adversely impact~~harm~~ human health or the environment. Inspection schedules or methods may differ at	The Permittees propose editorial changes within the section for clearer language.

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Permit Attachment Section	Proposed modification	Justification
	certain hazardous waste management units based upon worker safety issues or the nature of the safety and emergency equipment.	
E.1, General Inspection Schedules and Requirements	A copy of this Inspection Plan, which includes inspection schedules, shall be maintained by the Permittees' hazardous waste compliance personnel and by the site operator (i.e., the division or operating group that is responsible for or manages the permitted unit), as ~~required~~ outlined in Permit Section 2.6, *General Inspection Requirements*~~-~~. Hazardous waste management unit personnel ~~The Permittees shall~~ follow the inspection schedules outlining the items to be addressed on the Permittees' Hazardous Waste Facility Inspection Record Form (IRF), ~~)~~ and inspection frequencies for the unit types are provided in ~~this Attachment's~~ Sections E.2 through E.8, and in Technical Area (TA)~~-~~-specific Attachment E sections. The IRF and instructions for its completion are provided at the end of this Attachment ~~Section~~; the form may be supplemented, changed, or otherwise replaced through a permit modification pursuant to 40 CFR § 270.42(a). The IRF lists the items to be inspected.	The Permittees propose the updates to reference the title of Permit Section, to distinguish that hazardous waste management unit personnel are responsible for following the inspection schedules, and to make minor editorial changes.
E.1.1, Inspection Records	Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose updates to the section to simplify the language regarding the inspection record form and update it, to clarify to reflect the changes made to the form instructions, and to correct a typographical error.
E.1.2, Actions Resulting from Inspections	Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose an editorial changes to the section.

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Permit Attachment Section	Proposed modification	Justification
E.2, Inspection Schedule and Requirements for Container Storage Units	Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose edits to remove abbreviations and acronyms where ever possible to improve understandability of the document.
E.2.1, On Day(s) of Waste Handling	Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose edits to reference the inspection record form, to remove abbreviations and acronyms wherever possible to improve understandability of the document, to remove numbering from the list, and to update the revised numbering on the inspection record form.
E.2.2, Weekly	Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose edits to reference the inspection record form, to remove abbreviations and acronyms wherever possible to improve understandability of the document, to remove numbering from the list of inspection items, and to update the revised numbering on the inspection record form.
Additional E.2.3, Special Inspection Requirements at Technical Area 55, and subsections E.2.3.1, Non-Intrusive Inspection Systems, and E.2.3.2, Intrusive Inspection Procedures	Movement of information from a different section of the plan to the container storage inspection section. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose to move requirements from the TA-55-specific subsection of the Permit Attachment to the main portion for hazardous waste management units that are used for container storage. This move consolidates the requirements for these hazardous waste management units.
E.3.1, Daily (During Operation)	Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose clarifying language within the section, clarifying language within inspection

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Permit Attachment Section	Proposed modification	Justification
		list, removing numbering from the list of inspection items, and updating the revised numbering on the inspection record form.
E.3.2, Weekly	Revision of inspection items to reflect currently permitted unit inspection requirements. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose updated language to remove inspection requirements that are not applicable for the currently permitted tank storage unit, to remove numbering from the list of inspection items, and to update the revised numbering on the inspection record form. Former tank systems at LANL drove additional inspection requirements that are no longer applicable.
Newly added E.4, Inspection Schedule and Requirements for Open Burning and Open Detonation Units, and subsections E.4.1, On the Day of Treatment, and E.4.2, Weekly	Addition of sections associated with the inspection of open burning and open detonation treatment units. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose the added sections to provide inspection requirements for open burning/open detonation since these units are proposed to be permitted in Sections 4 and 5 of the Permit Renewal Application.
E.5, Inspection Schedule and Requirements for Stabilization Units	Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose to correct the title of the section.
E.5.1, Daily (During Operation)	Removal of numbering from list, correction of numbering on list, editorial changes. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose clarifying language within the inspection list, removing numbering from the list of inspection items, and updating the revised numbering on the inspection record form.
E.5.2, Weekly	Removal of numbering from list, correction of numbering on list, editorial changes.	The Permittees propose clarifying language within the inspection list,

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	Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	removing numbering from the list of inspection items, and updating the revised numbering on the inspection record form.
E.6, Inspection and Monitoring for Units Subject to Subpart AA Requirements	Inspection and monitoring requirements for units subject to 40 CFR Part 264, Subpart AA, are currently not applicable at any hazardous waste management units located at the Facility. If applicable, these requirements would be addressed~~, if applicable, in the TA-specific Sections of this Attachment~~.	The Permittees propose clarification regarding the applicability of the inspection and monitoring requirements that currently exist at the Facility.
E.7, Inspection and Monitoring for Units Subject to Subpart BB Requirements	The Permittees shall inspect units subject to 40 CFR Part 264, Subpart BB, according to the schedule and procedures provided below. There are currently no hazardous waste management units located at the Facility where these inspections are required.	The Permittees propose clarification regarding the applicability of the inspection and monitoring requirements that currently exist at the Facility.
E.7.1, Requirements for Pumps in Light Liquid Service	Replace numbered list with bulleted list. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose removing numbering from the list of inspection items.
E.7.2, Requirements for Pressure Relief Devices in Gas/Vapor Service	Replace numbered list with bulleted list. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose removing numbering from the list of inspection items and correcting the title of the section.
E.7.3, Requirements for Open-ended Valves or Lines	Replace numbered list with bulleted list. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose removing numbering from the list of inspection items.
E.8, Inspection and Monitoring for Units Subject to Subpart CC Requirements	Formatting and line spacing has been updated within the section. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose changes to the formatting in the section.
E.9, Additional Inspections Required, and subsections E.9.1, Technical Area 50, Building 69 Storm Water Drainage, and E.9.2, Technical	Movement of requirements for inspections that are required by sections of the Permit other than Permit Section 2.6, *General Inspection Requirements*. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose the consolidation of these additional inspections into one section with appropriate subsections.

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Permit Attachment Section	Proposed modification	Justification
Area 54, Area L 215 Holding Tank		
Form E-1, Hazardous Waste Facility Inspection Record Form	Reorganization of the inspection record form to include a form number and revisions to the form and the instructions for the form. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees have updated the form and the instructions for clarity and because the examples of hazardous waste management units that are inspected utilizing the form require updating. The instructions to complete the inspection record form have been updated for clarity and to simplify the form to reduce the potential for error while filling out the form.
Form E-2, Annual TA-50-69 Storm Water Drainage Inspection Form	Reorganization of the plan to include no subtitled sections and describe inspection forms in appropriate sections. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose the reorganization of the plan to eliminate the confusion that comes with the utilization of the technical area-specific subtitled sections within the document. For clarity, description of the required inspection is included in the appropriate section of the plan and each inspection form has been assigned a number.
Form E-3, Monthly Area L, Dome 215 Holding Tank Inspection Form	Reorganization of the plan to include no subtitled sections and describe inspection forms in appropriate sections. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose the reorganization of the plan to eliminate the confusion that comes with the utilization of the technical area-specific subtitled sections within the document. For clarity, the description of the required inspections is included in the appropriate section of the plan and

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment E

Permit Attachment Section	Proposed modification	Justification
		each inspection form has been assigned a number.
Removed subtitle sections for TA-50 Attachment E Inspection Plan, TA-54 Attachment E Inspection Plan, and TA-55 Attachment E Inspection Plan	Reorganization of the plan to include no subtitled sections and describe inspection forms in appropriate sections. Please see specific revisions within Supplement 1-5, *Permittees' Proposed Changes to Attachment E, Inspection Plan*.	The Permittees propose to eliminate the confusion that comes with the utilization of the technical area-specific subtitled sections within the plan and remove redundancy within the plan.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment F

The personnel training plan has been modified to include proposed text as follows: (1) permit sections have been reorganized by moving text to a different section to improve clarity and readability and to facilitate permit implementation (no text changes); and (2) minor editorial changes to improve clarity and readability and to facilitate implementation.

Permit Attachment Section	Proposed modification	Justification
Table of Contents	Please see revised Table of Contents within Supplement 1-6, *Permittees' Proposed Changes to Attachment F, Personnel Training Plan*.	The Permittees propose to revise the table of contents to incorporate the changes within this attachment.
List of Tables	~~F-2 Outline of Facility-Specific and On-the-Job Training for Treatment and Storage Facility Operations~~	The Permittees propose the deletion of the reference to a table removed from the plan.
Throughout document	Heading formatting and leveling have been updated to be consistent throughout the document. Revisions are included within Supplement 1-6, *Permittees' Proposed Changes to Attachment F, Personnel Training Plan*.	Permittees propose changes to improve the quality of the document and correct inconsistencies.
Throughout the document	All references to "or mixed" or "and mixed" when referring to "hazardous waste" are proposed to be removed. Please see specific revisions within Supplement 1-6, *Permittees' Proposed Changes to Attachment F, Personnel Training Plan*.	The Permittees propose this change throughout the Permit where appropriate. The difference between hazardous waste and mixed waste is a distinction that the Permittees previously included within permit applications and is now outdated and proposed for removal for clarity. It is understood that the term "hazardous waste" means both non-radioactive hazardous and mixed waste.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit
Attachment F

Renamed F.1, Hazardous Waste Management Responsibilities	**F.1 HAZARDOUS ~~AND MIXED~~ WASTE MANAGEMENT ~~/~~RESPONSIBILITIES** Waste management activities and responsibilities at specific hazardous ~~and/or mixed~~ waste management units are handled by the appropriate organization~~LANL division or group. Waste management personnel within the Environmental Projects Associate Directorate are responsible for most centralized waste management activities~~ at LANL. Hazardous waste compliance personnel are responsible for providing waste management regulatory guidance to all ~~LANL~~ personnel regarding waste~~and~~ operations. Other personnel at LANL who may provide assistance in various waste management activities are discussed in the following paragraph and in Attachment D, ~~(~~*Contingency Plan*.~~).~~ Laboratory-contracted support services provide trained personnel to assist in waste-handling activities. The Permittees shall ensure that radiation protection, health physics, occupational medicine, industrial hygiene and safety, nuclear criticality safety, occurrence reporting, hazardous material response, meteorology and air quality, water quality and hydrology, ecology, and hazardous waste compliance personnel are trained in their respective specialties to provide emergency response support and that LANL security provides workers trained in traffic and site-access control. The emergency management organization provides emergency planning and response at LANL and ~~have~~ has the overall responsibility for LANL's Emergency Management Plan (EMP) training. Training~~Central training~~ personnel are responsible for the analysis, design, development, and delivery of LANL-wide environment, safety, and health ~~(ES&H)~~ training. Training~~Courses~~ on hazardous ~~and/or mixed~~ waste is~~are~~ designed with substantial input from hazardous waste compliance personnel, hazardous waste operations personnel, and other subject matter experts, as appropriate.	The Permittees propose changes to remove references to "mixed waste" and updates to reflect organizational and contractual changes.
Renamed F.2, Training Content,	Text revisions include changes to allow for two contracted co-operators and describe how training is conducted and tracked.	The Permittees propose updates within the section to be more specific regarding responsibility for

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit
Attachment F

Permit Attachment Section	Proposed modification	Justification
Frequency, and Implementation	Please see specific revisions within Supplement 1-6, *Permittees' Proposed Changes to Attachment F, Personnel Training Plan*.	training, to clearly reflect how training is conducted, to generalize tracking systems and naming conventions for units to allow for multiple contractors and differing title designations, and to update the terminology to indicate that not all personnel training would be conducted through "courses".
Renamed F.2.1, Facility-Wide Training	Text revisions include changes to allow for two contracted co-operators and describe the intent of the training and how training is conducted and tracked. Please see specific revisions within Supplement 1-6, *Permittees' Proposed Changes to Attachment F, Personnel Training Plan*.	The Permittees propose updates within the section to be more specific regarding responsibility for training, to clearly reflect how training is conducted, to generalize tracking systems and naming conventions for units to allow for multiple contractors and differing title designations, and to update the terminology to indicate that not all personnel training would be conducted through "courses". Text associated with the intent of the training provided was moved to this section for consolidation.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment F

Permit Attachment Section	Proposed modification	Justification
F.2.2, Unit-Specific Training	Waste-handling personnel shall participate in hazardous waste management~~permitted~~ unit-specific training at their particular work locations. Section ~~Table~~ F.~~-~~2.3 addresses program requirements that ensure that hazardous ~~and mixed~~ waste management and handling personnel know the specific requirements for their particular facilities and are able to respond effectively to emergencies. Personnel who work within hazardous waste management units shall be~~The Permittees shall ensure that personnel become~~ familiar with emergency procedures, equipment, and systems at their particular facility, including emergency and monitoring equipment use, inspection, repair, and replacement, as appropriate. The Permittees shall ensure that they also receive instruction on immediate emergency response actions~~contingency plan contents and implementation~~ (as they apply to their particular facility) including, but not limited to, communications or alarm systems, response to fires and explosions at their facility, key parameters for automatic waste-feed cutoff systems, shutdown of facility operations, and response to groundwater contamination incidents.	The Permittees propose updates to referenced sections and revision of text to reflect preferred terminology by the Permittees and for consistency throughout the Permit.
F.2.3, On-the-Job Training	Text revisions include updates in terminology, changes to allow for the two contracted operators, and movement of text from a removed section. Please see specific revisions within Supplement 1-6, *Permittees' Proposed Changes to Attachment F, Personnel Training Plan*.	The Permittees propose updates to include references to on-the-job training (OJT), updates to preferred terminology, addition of information regarding explosives, and inclusion of unit-specific training topics from a section later in the document that is proposed for deletion to consolidate information within the plan.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment F

Permit Attachment Section	Proposed modification	Justification
Renamed F.2.4, Training Coordination	**F.2.4 Training Coordination~~Coordinator~~** The Permittees' ~~institutional~~ training organization(s) shall implement ~~shall direct~~ the applicable Facility-wide hazardous waste~~ES&H~~ training program and provide training coordinator support~~that the Division Leader (or designee) serves as the Training Coordinator~~ for Facility-wide waste management training. ~~The~~ Training coordination~~Coordinator~~ shall support~~be trained in~~ the operation of hazardous ~~and mixed~~ waste management units~~facilities~~, waste management practices, and emergency procedures~~ and is responsible for coordinating training courses~~.	The Permittees propose changes to the description of training management at the Facility.
Renamed F.3, Training for Emergency Events	Text revisions include updates to terminology and generalization of title names to allow for the two contracted co-operators. Please see specific revisions within Supplement 1-6, *Permittees' Proposed Changes to Attachment F, Personnel Training Plan*.	The Permittees propose updates to revise titles for responsible positions and updates to preferred terminology.
Former F.4, Implementation of Training Programs	Removed section. Please see specific revisions within Supplement 1-6, *Permittees' Proposed Changes to Attachment F, Personnel Training Plan*.	The Permittees propose removing this section to decrease redundancy within the plan and because implementation requirements are better represented in previous sections of the plan.
Table F-1, Facility-Wide Training Program Outline	Edits to the table include formatting, updating of site worker titles, and updates to footnotes, and reflect changes to delivery of some training. Please see specific revisions within Supplement 1-6, *Permittees' Proposed Changes to Attachment F, Personnel Training Plan*.	The Permittees propose changes to update the table, the footnotes, and the titles of personnel referenced within the table.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment F

Permit Attachment Section	Proposed modification	Justification
Former Table F-2, Outline of Permitted Unit Specific on On-the-Job Training for Treatment and Storage Facility Operations	Removed table. Please see specific revisions within Supplement 1-6, *Permittees' Proposed Changes to Attachment F, Personnel Training Plan*.	The Permittees propose deletion of this table that includes information proposed for incorporation into previous sections within the plan.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit
Attachment J

Permit Attachment Section	Proposed modification					Justification
Table J-1 (Active Portion of the Facility)	TA-16-388	X01*		Flash Pad Total square footage - 484 ~~Interim Status Unit~~	Outdoor (associated with an open burning unit)	The Permittees propose to permit the open burning unit at TA-16-388 and remove the "interim status unit" designation from the table.
	TA-36-8	X01**	2000 lbs/ detonation	Near Structure TA-36-8 ~~Interim Status Unit~~	NA	The Permittees propose to permit these open detonation units at TA-36-8 and TA-39-6 and remove the "interim status" designation from the table.
	TA-39-6	X01**	1000 lbs/ detonation	Near Structure TA-39-6 ~~Interim Status Unit~~	NA	
	TA-54 "G," unspecified pits, shafts, or trenches	D80	NA	Material Disposal Area Unit not permitted to receive hazardous waste	Regulated unit(s)	The Permittees propose the addition of language to the table of active hazardous waste management units as a result of the Settlement Agreement in *U.S. v. Curry* (*see* Section 6.1 of the Permit Renewal Application). The revisions to the descriptions of this unit were agreed upon among the parties to the settlement.
	TA-54 Area G Pad 5	S01 T04	623,480 gal	Includes Storage Domes 49 and 224 and Storage Sheds	Outdoor (associated with a regulated unit)	The Permittees propose a minor editorial change to add a return after macroencapsulation.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment J

Permit Attachment Section	Proposed modification						Justification
				23,160 gal/day	144, 145, 146, 177, 1027, 1028, 1030, and 1041 Pad 5 is a consolidation of former Pads 5, 7, and 8. Includes treatment process for macroencapsulation Total square footage – 59,900		
	TA-54 "H," unspecified pits, shafts, or trenches	D80	NA	Material Disposal Area H Unit not permitted to receive hazardous waste	Regulated unit(s)		The Permittees propose the addition of language to the table of active hazardous waste management units as the result of the Settlement Agreement in *U.S. v. Curry* (*see* Section 6.1 of the Permit Renewal Application). The revisions to the descriptions of these units were agreed upon among the parties.
	TA-54 "L," unspecified pits, shafts, or trenches	D80	NA	Material Disposal Area L Unit not permitted to receive hazardous waste	Regulated unit(s)		
	TA-55-4, B40	S01 T04	21,500 gal 3,441 gal/day	Located in basement ~~Referred to as Area 1~~ Includes treatment process for macroencapsulation Total square footage – 3,380	Indoor		The Permittees propose to remove area designations for TA-55-4, room B40, that are no longer valid.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment J

Permit Attachment Section	Proposed modification					Justification
Table J-1 (Active Portion of the Facility)	TA-55-4, K13	S01	2,500 gal	Located in basement ~~Referred to as Area 4~~ Total square footage - 208	Indoor	The Permittees propose to remove area designations for TA-55-4, rooms K13 and B05, that are no longer valid.
	TA-55-4, B05	S01	3,600 gal	Located in basement ~~Referred to as Area 5~~ Non-liquid wastes only Total square footage - 260	Indoor	
	TA-55-4, Vault	S01	4,000 gal	Located in basement ~~Referred to as Area 6~~ Total square footage – 4,020	Indoor	

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment N

This table describes changes proposed by Permittees to the figures within Attachment N of the Permit. Updates and consolidations have been proposed to Attachment N, *Figures,* to consolidate and reduce redundancy within the attachment.

New Figure Number	2010 Permit Figure Number(s)	Proposed Modification	Justification
Figure 1 Regional Location Map of Los Alamos National Laboratory (LANL)	Figure 1	Replace with an updated Figure 1 and update the title of the figure. Update the preferred name of pueblo. Update the legend to distinguish ownership boundaries. General updates to improve the old map.	The Permittees propose to update the contents of the figure to more clearly depict the property boundary of the Facility after consultation with the Pueblo de San Ildefonso Indian Reservation to update their name.
Figure 2 Facility Boundary and Location Map of LANL Technical Areas (TAs)	Figure 2 Replaces Figures 11, 22, 24, 25, 38, & 54	Replace with updated Figure 2 and update the title of the figure. Update the preferred name of pueblo. Added main roads and approximate locations for the current hazardous waste management units so that multiple location figures are not necessary.	The Permittees propose to update the figure with newer content, to improve the old map, and to update the preferred name of the Pueblo. This figure replaces all current location figures within the Permit so as to reduce redundant figures and for ease in updating.
Figure 3 LANL Facility Boundary with Details of Non-LANL Areas	Figure 3	Replace with updated Figure 3 and update the title of the figure. Update the preferred name of pueblo. Update the name of the trailer park from Royal Crest to Elk Ridge.	The Permittees propose to update the figure to provide new information regarding name changes.
Figure 4 TA-3 Location Map Showing Security, Fences, Entry Gates, and Entry Station	Replaces Figure 4 and Figure 12	Update the title of the figure and replace figure with new version.	The Permittees propose an editorial change to the figure title and update to the figure.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment N

New Figure Number	2010 Permit Figure Number(s)	Proposed Modification	Justification
Figure 5 TA-16-388 Flash Pad Location Map Showing Security, Fences, and Entry Gate	New figure	Propose to insert new Figure 5 to depict the location and security at the TA-16-388 Flash Pad.	The Permittees propose to insert a new Figure 5 to depict the location and security features at the proposed TA-16-388 open burning unit.
Figure 6 TA-36-8 Open Detonation Location Map Showing Security Fences and Entry Gate	New figure	Insert figure to depict the location and security features of the proposed TA-36-8 open detonation unit.	The Permittees propose to move the current 2010 Permit Figure 6 to a new Figure 8 (TA-50 security features, see below). The Permittees propose to change Figure 6 to depict the security at the proposed TA-36-8 open detonation unit.
Figure 7 TA-39-6 Open Detonation Location Map Showing Security Fences and Entry Gate	New figure	Insert a new Figure 7 for the location and security at the proposed TA-39-6 open detonation unit.	Propose to move Figure 7 (TA-54, Area L, location and security features) in the current 2010 Permit, to new Figure 9 for consistency. The Permittees propose new Figure 7 to depict the location security features at the proposed open detonation unit TA-39-6.
Figure 8 TA-50 Location Map Showing Security Fences and Entry Gate	Replaces Figure 6 and Figure 23	Propose to renumber Figure 8 (TA-54, Area G, location and security) in the current 2010 Permit to new Figure 10 and replace with a new Figure 8 for the TA-50 location and security.	The Permittees propose to rearrange the order of figures to insert the proposed new units and for consistency. Former Figure 8 is now Figure 10. The figure has been updated to depict the one gate at TA-50 for security.
Figure 9 TA-54, Area L, Location Map Showing Security Fences, Entry Gates, and Entry Stations	Figure 7 and Figure 26	Propose to renumber Figure 7 in the current 2010 Permit to Figure 9 (Technical Area 54, Area L, Security Fences, Entry Gates, and Entry Stations). No changes were made to the figure, however, the title of the figure was updated for consistency. Removal of redundant Figure 26 in the current 2010 Permit is also proposed.	The Permittees propose to rearrange and renumber figures to align with proposed changes and place the TA-location maps and security figures in order.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment N

New Figure Number	2010 Permit Figure Number(s)	Proposed Modification	Justification
Figure 10 TA-54, Area G, Location Map Showing Security Fences, Entry Gates, and Entry Station	Figure 8	Propose to renumber Figure 8 in the current 2010 Permit to new Figure 10 (Technical Area 54, Area G, Security Fences, Entry Gates, and Entry Stations). No changes were made to the figure, however, the title of the figure was updated for consistency.	The Permittees propose to rearrange and renumber figures to align with proposed changes and place the TA-location maps and security figures in order.
Figure 11 TA-54 West Location Map Showing Security Fences, Entry Gates, and Entry Stations	Figure 9 and Figure 37	Propose to renumber Figure 9 in the current 2010 Permit to new Figure 11 (TA-54 West Location Map Showing Security Fences, Entry Gates, and Entry Stations). The figure has been updated to reflect the allowed treatment at the outdoor unit and the title of the figure has been updated for consistency. Removal of redundant Figure 37 in the current 2010 Permit is also proposed.	The Permittees propose to rearrange and renumber figures to align with proposed changes and place the TA-location maps and security figures in order.
Figure 12 TA-55 Location Map Showing Security Fences and Entry Gates	Figure 10 and Figure 39	Propose to renumber Figure 10 in the current 2010 Permit to new Figure 12 (TA-55 Location Map Showing Security Fences and Entry Gates). The figure has been updated to reflect the allowed treatment at several units and the title of the figure has been updated for consistency. Removal of redundant Figure 39 in the current 2010 Permit is also proposed.	The Permittees propose to rearrange and renumber figures to align with proposed changes and place the TA-location maps and security figures in order.
Figure 13 TA-63 Transuranic Waste Facility Location Map Showing Security Fences, Entry Gates, and Vehicle Barriers	Figure 55	Propose to renumber Figure 55 in the current 2010 Permit to new Figure 13 (TA-63 Transuranic Waste Facility Location Map Showing Security Fences, Entry Gates, and Vehicle Barriers). The figure has been updated to reflect the allowed treatment at the unit and the title of the figure has been updated for consistency.	The Permittees propose to rearrange and renumber figures to align with proposed changes and place the TA-location maps and security figures in order.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment N

New Figure Number	2010 Permit Figure Number(s)	Proposed Modification	Justification
Figure 14 TA-3 Chemistry Metallurgy Research (CMR) Building Basement Layout	Figure 13, Figure 14, and Figure 15	Propose to replace old Figures 13 through 15 with a single figure for the TA-3 Chemistry Metallurgy Research (CMR) building basement layout that depicts all of the units in one figure.	The Permittees also propose to insert an updated figure here for the CMR basement units figure.
Figure 15 Diagram of the TA-16-388 Flash Pad Showing Location of Burners and Retractable Metal Roof	New figure	Propose to insert new figure diagram of the TA-16-388 Flash Pad showing the location of the burners and the metal roof to depict the proposed open burning unit.	The Permittees propose a new figure to illustrate the design of the proposed open burning unit.
Figure 16 TA-54, Area G, Container Storage Unit	Figure 27	Propose to renumber Figure 27 in the current 2010 Permit to new Figure 16 (Technical Area 54, Area G, Container Storage Unit). No changes were made to the figure, however, the title of the figure was updated for consistency.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 17 TA-54, Area G, Pad 9 (Transuranic Waste Inspectable Storage Project (TWISP) Domes 229, 230, 231 & 232)	Figure 28	Propose to renumber Figure 28 in the current 2010 Permit to new Figure 17 (Technical Area (TA)-54, Area G, Pad 9 (TWISP Domes 229, 230, 231 & 232)). No changes were made to the figure, however, the title of the figure was updated for consistency.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 18 TA-54, Area G, Pad 1	Figure 29	Propose to renumber Figure 29 in the current 2010 Permit to new Figure 18 (TA-54, Area G, Pad 1) and propose to update the figure title.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment N

New Figure Number	2010 Permit Figure Number(s)	Proposed Modification	Justification
Figure 19 TA-54, Area G, Pad 3	Figure 30	Propose to renumber Figure 30 in the current 2010 Permit to new Figure 19 (Technical Area (TA)-54, Area G, Pad 3) and propose to update the figure title.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 20 TA-54, Area G, Pad 10	Figure 31	Propose to renumber Figure 31 in the current 2010 Permit to new Figure 20 (TA-54, Area G, Pad 10) and propose to update the figure title.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 21 TA-54, Area G, Pad 5 (Domes 49 and 224; and Storage Sheds 114, 145, 146, 177, 1027, 1028, 1030, and 1041)	Figure 32	Propose to renumber Figure 32 in the current 2010 Permit to new Figure 21 (Technical Area (TA)-54, Area G, Pad 5 (Domes 49 and 224; and Storage Sheds 114, 145, 146, 177, 1027, 1028, 1030, and 1041)) and propose to update the figure title.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 22 TA-54, Area G, Pad 6, Domes 153 & 283	Figure 33	Propose to renumber Figure 33 in the current 2010 Permit to new Figure 22 (TA-54, Area G, Pad 6, Domes 153 & 283) and propose to update the figure title.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 23 TA-54, Area G, Storage Shed 8	Figure 34	Propose to renumber Figure 34 in the current 2010 Permit to new Figure 23 (TA-54, Area G, Storage Shed 8) and propose to update the figure title.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 24 TA-54, Area G, Building 33	Figure 35	Propose to renumber Figure 35 in the current 2010 Permit to new Figure 24 (TA-54, Area G, Building 33) and propose to update the figure title.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 25 TA-54, Area G, Pad 11	Figure 36	Propose to renumber Figure 36 in the current 2010 Permit to new Figure 25 (TA-54, Area G, Pad 11) and propose to update the figure title.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit Attachment N

New Figure Number	2010 Permit Figure Number(s)	Proposed Modification	Justification
Figure 26 TA 55, Basement Floor Plan	Figures 40, 41, 42, 43, 44, 57 and 58	Propose to replace Figures 40 through 44 and Figures 57 & 58 with a single figure depicting the Unclassified Controlled Nuclear Information (UCNI) regarding the TA-55 units	The Permittees propose to depict all of the TA-55 UCNI units all in one UCNI figure rather than have multiple UCNI files.
Figure 27 TA-55, Building 4, Outdoor Container Storage Pad	Figure 45	Propose to renumber Figure 45 in the current 2010 Permit to new Figure 27 (TA-55, Building 4, Outdoor Container Storage Pad). The figure has been updated for clarity.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 28 TA-55-355 Container Storage Pad	Figure 59	Propose to renumber Figure 59 in the current 2010 Permit to new Figure 28 (TA-55-355 Container Storage Pad) and update the figure title.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 29 TA-55, Building 4, Room 401, Storage Tank System Process Flow Diagram	Figure 47	Propose to renumber Figure 47 in the current 2010 Permit to new Figure 29 (TA-55, Building 4, Room 401, Storage Tank System Process Flow Diagram).	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 30 TA-55, Building 4, Room 401, Cementation Unit Process Flow Diagram	Figure 48	Propose to renumber Figure 48 in the current 2010 Permit to new Figure 30 (TA-55, Building 4, Room 401, Cementation Unit Process Flow Diagram) and update the title of the figure.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 31 TA-54, Material Disposal Area (MDA) H	Figure 50	Propose to renumber Figure 50 in the current 2010 Permit to new Figure 31 (TA-54, Material Disposal Area (MDA) H) and update the title of the figure.	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.
Figure 32 TA-63 Transuranic Waste Facility Subsurface Vapor Monitoring Network	Figure 56	Propose to renumber Figure 56 in the current 2010 Permit to new Figure 32 (TA-63 Transuranic Waste Facility Subsurface Vapor Monitoring Network).	The Permittees propose to rearrange and renumber figures to align with proposed changes and reduce redundancy within the attachment.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit
Attachment N

New Figure Number	2010 Permit Figure Number(s)	Proposed Modification	Justification
	Figure 49	Propose to move the figure depicting emergency facilities to Figure D-2, within Attachment D, *Contingency Plan*.	The Permittees propose to include the figure within Attachment D, *Contingency Plan*, rather than include it in Attachment N. It is a more appropriate location and will be easier to locate in an emergency if it is within the contingency plan.

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit
Attachment N – Text Changes

This table describes changes proposed by Permittees to text throughout the Permit Parts and Permit Attachments. Revisions are all necessary to accommodate the updates and consolidations proposed to Attachment N, *Figures,* to consolidate and reduce redundancy within Attachment N.

Permit or Attachment Section	Proposed Modification	Justification
Permit Parts 1-11		
2.5, Security	The Permittees shall maintain and ensure the effectiveness of all security fences, entry gates, and entry stations surrounding the permitted units as specified in Figures 4 -through ~~10 and 55~~13 in Attachment N (*Figures)*.	Figures 4-13 are proposed to be updated to depict the location and security features of all of the Technical Areas.
2.8, Special Requirements for Ignitable, Reactive, or Incompatible Waste	The Permittees shall manage ignitable, reactive, and incompatible hazardous wastes in containers and tanks in compliance with the requirements of 40 CFR §§ 264.17, 264.176, 264.177, 264.198, and 264.199, which are incorporated herein by reference, and Permit Parts 3 and 4. The Permittees shall ensure that containers holding ignitable or reactive wastes are located at least 15 meters from the facility boundary defined as the technical area (TA) specific ~~boundary~~ boundaries identified in Figure~~s~~ ~~11, 22, 24, and 38~~ 2 in Permit Attachment N (*Figures*). At TA-63, the Permittees shall ensure that containers holding ignitable or reactive waste are located at least 15 meters from the TWF fence line, as shown in Figure ~~55~~ 13 in Permit attachment N (*Figures*) (*see* 40 CFR §§ 264.176 and 270.32(b)(2)).	Figure 2 depicts all of the TAs at LANL; therefore, the Permittees propose to use Figure 2 as a reference for the location of all of the TA boundaries. Figure 2 includes the location of all of the hazardous waste management units as well. The Permittees propose to update the figure number for the figure that depicts the fence line at TA-63 TWF.
3.14.1, General Operating Conditions	(2) The Permittees shall not store containers with ignitable or reactive waste (E.P.A. Hazardous Waste Numbers D001 or D003) within 15 meters of the permitted unit's security barrier system shown in Figure ~~55~~ 13 (*see* 40 CFR §264.176 and §270.32(b)(2)).	The Permittees propose to update the figure number of the TA-63 TWF location and security figure.
3.14.3, Subsurface Vapor Monitoring	The subsurface vapor monitoring network is described in Permit Attachment A, Section A.8.9~~6 10~~, and Figure ~~56~~ 32 in Attachment N (Figures).	The Permittees propose to update the figure number for the vapor monitoring network at the TA-63 TWF from Figure 56 to Figure 32 to account for other proposed changes to the figures in Attachment N.
Attachment A		
A.1.1, TA-3 Building 29	TA-3-29, the Chemistry Metallurgy Research Building (CMR), was established in 1952 as a research facility (*see* Figure ~~12~~ 4 in Permit Attachment N (*Figures*)).	The Permittees propose to depict the location of all of the TA-3 units in one

Summary Table of Proposed Changes to Los Alamos National Laboratory Hazardous Waste Facility Permit
Attachment N – Text Changes

Permit or Attachment Section	Proposed Modification	Justification
A.1.1.1, TA-3-29 Room 9010	Room 9010 measures 21 feet by 8 inches wide by 106 feet, 9 inches (in) long (*see* Figure ~~13~~14 in Permit Attachment N (*Figures*)).	figure, Figure 4, rather than in individual figures.
A.1.1.3, TA-3-29 Portion of Room 9030	The permitted container storage area within Room 9030 measures approximately 30 feet long by 8 feet wide (*see* Figure ~~15~~14 in Permit Attachment N (*Figures*)) and is located in the southwest corner of the room.	
A.~~3~~ 5, TA-50	TA-50 is located at the northeast corner of the intersection of Pajarito Drive and Pecos Road, on the finger mesa bounded by Mortandad Canyon to the north and Two Mile Canyon to the south (*see* Figure ~~2~~2 in Attachment N (*Figures*)).	The Permittees propose to depict the location of all of the TAs in Figure 2 rather than in individual figures.
A.~~3~~5.1, TA-50-69 Indoor Permitted Unit	The TA-50-69 Indoor permitted unit consists of Rooms 102 and 103 as shown in Figure ~~23~~ 8 in Attachment N (*Figures*).	The Permittees propose to depict the units at TA-50 in one figure, Figure 8.
A.~~3~~5.2, TA-50-69 Outdoor Permitted Unit	It is located in the southwest corner of TA-50 (*see* Figure ~~23~~ 8 in Attachment N (*Figures*)).	
A.~~3~~5.3, Security and Access	The locations of the security fences and entry gates at TA-50 are shown on Figure ~~6~~ 8 in Permit Attachment N (*Figures*).	
A.~~4~~ 6, TA-54	TA-54 consists of 130 acres atop Mesita del Buey and is used for storage of hazardous and mixed waste generated throughout the Facility (*see* Figure 24 in Attachment N (*Figures*)). A principal mission of TA-54 is to manage Facility waste safely and efficiently, consistent with federal and state regulations and U.S. Department of Energy (DOE) requirements. TA-54 has three separate areas where hazardous and mixed waste is stored; Area L, Area G, and TA-54 West (*see* Figure 2~~5~~ in Attachment N (*Figures*)). There is one permitted unit at Area L, nine permitted units at Area G, and two permitted units at TA-54 West (*see* Attachment J (*Hazardous Waste Management Units*)).	Figure 2 depicts the location of all of the TAs and the Permittees propose to refer to Figure 2 rather than multiple, individual figures. The Permittees propose to depict the units at TA-54 in Figures 9 through 11.

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A.6.1 Area L	The Area L permitted unit is the area within the fence and is comprised of several storage structures: dome 215; concrete pad with canopy 32; concrete pads 35 and 36; storage sheds 68, 69, 70, 31; modular units 39 and 58 (*see* Figure ~~26~~ 9 in Attachment N (*Figures*)).	The Permittees propose to update the figure number from Figure 26 to Figure 9 to account for other proposed changes to Attachment N.
A.6.1.1, Storage Dome 215	Storage Dome 215 is 60 feet wide, approximately 266 feet long, and 26 feet high (*see* Figure ~~25~~ 9 in Attachment N (*Figures*)).	
A.6.1.2, Storage Sheds 68, 69, and 70	Storage sheds 68, 69, and 70 are prefabricated sheds constructed of steel (Safety Storage Building, Model 22) (*see* Figure ~~26~~9 in Attachment N (*Figures)).*	
A.6.1.3, Storage Shed 31	Storage Shed 31 is a prefabricated shed constructed of steel. It measures approximately 14 feet long, 13 feet wide, and 8 feet high (*see* Figure ~~26~~ 9 in Attachment N (*Figures*)).	
A.6.1.4, TA-54-32	TA-54-32 (*see* Figure ~~26~~ 9 in Attachment N (*Figures*)) consists of a concrete pad that is 116.5 feet long by 15.5 feet wide.	
A.6.1.5, TA-54-35	TA-54-35 (*see* Figure ~~26~~ 9 in Attachment N (*Figures*)) consists of a concrete pad that measures 31.5 feet long by 31.5 feet wide.	
A.6.1.6, TA-54-36	TA-54-36 (*see* Figure ~~26~~ 9 in Attachment N (*Figures*)) is a 33-feet-long by 31.5-feet-wide concrete pad.	
A.6.1.7, TA-54-58	TA-54-58 (*see* Figure ~~26~~ 9 in Attachment N (*Figures*)) is a pad that measures 33 ft long by 31.5 ft wide.	
A.6.1.8, TA-54-39 and Containment Pad	TA-54-39 measures 40 ft long by 40 ft wide (*see* Figure ~~26~~ 9 in Attachment N (*Figures*)).	
A.6.2, AREA G	The permitted units at Area G are used to store containers of hazardous, mixed low level, and mixed transuranic wastes in solid and liquid form (*see* Figure ~~27~~ 10 in Attachment N (*Figures*).	The Permittees propose to update the reference figures related to TA-54 from the figures originally referenced in these sections to the updated, proposed figures to account for proposed changes to Attachment N.
A.6.2.1, Pad 9	The 4 to 6 in thick asphalt pad is approximately 570 feet long and 275 feet wide (*see* Figure ~~28~~17 in Attachment N (*Figures)*).	
A.6.2.2, Pad 1	TA-54-412 (*see* Figure ~~29~~18 in Attachment N (*Figures))* is a one story building that is approximately 220 feet long by 60 feet wide (13,200 ft^2).	

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A.6.2.3, Pad 3	Storage Dome 48, located at the eastern end of pad 3, is 285 feet long and 50 feet wide and has a peak height of 24 feet (*see* Figure ~~30~~19 in Attachment N (*Figures*)).	
A.6.2.4, Pad 10 (former Pads 2 and 4)	The asphalt pad measures approximately 350 feet long by 250 feet wide and is constructed of asphalt (*see* Figure ~~31~~20 in Attachment N (*Figures*)).	
A.6.2.5, Pad 5	This asphalt pad consists of former pads 5, 7, and 8, located on the south-central portion of Area G, has one dome and eight sheds (*see* Figure ~~32~~21 in Attachment N (*Figures*)) associated with it.	
	Storage dome 49, located on former Pad 5, is 440 feet long and 60 feet wide and has a peak height of approximately 26 feet (*see* Figure ~~32~~21 in Attachment N (*Figures*)).	
	Storage Dome 224, located on former pad 8, is approximately 110 feet long and 60 feet wide, with a peak height of 26 feet (*see* Figure ~~32~~21 in Attachment N (*Figures*)).	
	Sheds 1027, 1028, 1030, and 1041 contain a single compartment and sump within each shed (*see* Figure ~~32~~21 in Attachment N (*Figures*)).	
A.6.2.6, Pad 6	Storage domes 153 and 283 are located on Pad 6 (*see* Figure ~~33~~22 in Attachment N (*Figures*)) and the design and materials of construction for domes 153 and 283 are the same as the other domes at TA-54.	
	Dome 153 is approximately 326 ft long and 60 ft wide, with a peak height of 26 ft (*see* Figure ~~33~~22 in Attachment N (*Figures*)).	
	Dome 283 is approximately 260 ft long and 60 ft wide with a peak height of 26 ft (*see* Figure ~~33~~22 in Attachment N (*Figures*)).	
A.6.2.7, Storage Shed 8	Storage shed 8 is located in the north-central portion of Area G (*see* Figure ~~34~~23 in Attachment N (*Figures*)).	
A.6.2.8, TA-54-33	TA-54-33 is located in the north-central portion of Area G and consists of a dome attached to a concrete-block building (*see* Figure ~~35~~24 in Attachment N (*Figures*)).	
A.6.2.9, Pad 11	It measures approximately 300 ft long by 100 ft wide (*see* Figure ~~36~~25 in Attachment N (*Figures*)).	

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Permit or Attachment Section	Proposed Modification	Justification
A.6.3, TA-54 West	The permitted units at TA-54 West are used to store solid mixed low level and mixed transuranic waste (*see* Figure ~~37~~ 11 in Attachment N (*Figures*)).	
A.6.3.1, TA-54 West Building (RANT)	The building is divided into several offices and houses the Indoor permitted unit which includes the low bay and the high bay (*see* Figure ~~37~~ 11 in Attachment N (*Figures*)).	
A.6.3.2, TA-54 West Outdoor Pad	The outdoor permitted asphalt pad (which is approximately 4 inches thick and slopes toward the curbed edges to allow for storm water runoff (*see* Figure ~~37~~ 11 in Attachment N (*Figures*)) consists of the loading dock at TA-54-38 and the storage pad located on the north, east, and south sides of TA-54-38.	
	The canopy located on the pad and approximate dimensions of the pad are shown on Figure ~~37~~11. Storage sheds for supplies and equipment are also located on the pad at the outdoor permitted unit (*see* Figure ~~37~~ 11 in Attachment N (*Figures*)).	
A.6.4, Security and Access Control	The locations of the security fence, entry gates, and entry stations are shown on Figures ~~7, 8, and~~ 9, 10, and 11 in Attachment N (*Figures*).	
A.7, TA-55	TA-55 is located in the north central portion of Los Alamos National Laboratory on a mesa between a branch of Mortandad Canyon on the north and Two Mile Canyon on the south (*see* Figure ~~38~~ 2 in Attachment N (*Figures*)).	Figure 2 depicts the location of all of the TAs; the Permittees propose to refer to Figure 2 rather than multiple, individual figures.
A.7.8, Outdoor Storage Pad	The pad is located outside and south southwest of TA-55-4, as shown on Figures ~~39~~12 and ~~45~~27 in Attachment N (*Figures*).	The Permittees propose to update the figure references in these sections to refer to the new proposed numbering of figures in Attachment N.
A.7.9, TA-55-0355 Pad	The TA-55-0355 Pad is located outside and south of the Outdoor Storage Pad and TA-55-4, as shown in Figure ~~59~~28 in Attachment N (*Figures*).	
A.7.12, Security and Access Control	The locations of the security fences, entry gates, and entry stations are shown on Figure ~~10~~ 12 in Attachment N (*Figures*).	
A.8, TA-63	The TWF is located at TA-63 on a mesa between Ten-Site Canyon, a tributary of Mortandad Canyon, on the north and Pajarito Canyon on the south in the central portion of the Facility (*see* Figure ~~54~~ 2 in Attachment N (*Figures*)).	Figure 2 depicts the location of all of the TAs and the Permittees propose to refer to Figure 2 rather than multiple, individual figures.
	The TWF permitted storage unit is constructed on 1.82 acres (79,239 square feet). The layout of the unit is depicted in Figure ~~55~~13.	The Permittees propose to update the figure references in these sections to

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Permit or Attachment Section	Proposed Modification	Justification
A.8.9, Subsurface Vapor Monitoring	Two of the monitoring wells must be located as close as possible to the building foundations that are adjacent to the unit boundary facing MDA C and the utility corridor on Puye Road as depicted by locations VMW-1 and VMW-2 on Figure ~~56~~32 in Attachment N (*Figures*). A third monitoring well must be located at a point on the western edge of the permitted unit as close as possible to the utility corridor on Pajarito Road as depicted by location VMW-3 on Figure ~~56~~32. Two monitoring wells must be located between MDA C and Puye Rd as depicted by locations VMW-4 and VMW-5 on Figure ~~56~~32	refer to the new proposed numbering of figures in Attachment N.
Attachment D		
D.1.6.2, Occupational Medicine Personnel	The location of this and other emergency facilities are shown on Figure D-2, *Emergency Facilities at Los Alamos National Laboratory*~~49 in Attachment N (Figures)~~.	The Permittees propose to include the figure within Attachment D, Contingency Plan, rather than include it in Attachment N. It is a more appropriate location and will be easier to locate in an emergency if it is within the contingency plan.